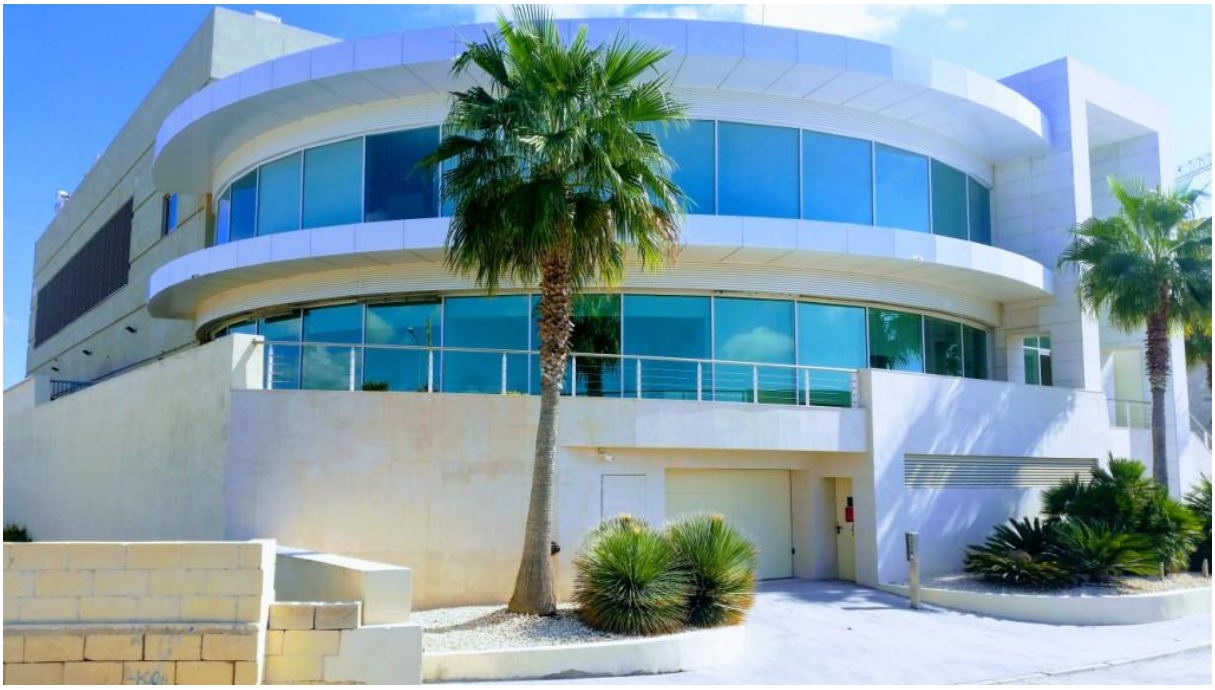
STERLING CHEMICAL MALTA LTD, HAL FAR

APPLICATION FOR VARIATION OF IPPC PERMIT
VOLUME 2: IPPC APPLICATION DOCUMENT



Version 9: May 2024

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Quality Assurance

Sterling Chemical Malta Ltd, Hal Far
Application for Variation of IPPC Permit: Volume 2
May 2024

Report for: Sterling Chemical Malta Ltd

Revision Schedule

Rev	Date	Details	Prepared by	Reviewed by	Approved by
00	Sep. 2022	Submission to client	**Collette Lynch** Environmental Consultant	**Rachel Xuereb** Director	**Adrian Mallia** Managing Director
01	Oct. 2022	Updates and submission to client following feedback from client	**Collette Lynch** Environmental Consultant	**Rachel Xuereb** Director	**Adrian Mallia** Managing Director
02	Dec. 2022	Submission to ERA	**Collette Lynch** Environmental Consultant	**Rachel Xuereb** Director	**Adrian Mallia** Managing Director
03	Jun. 2023	Inclusion of proposed generators and changes to waste warehouse	**Collette Lynch** Environmental Consultant	**Rachel Xuereb** Director	**Adrian Mallia** Managing Director
04	Aug. 2023	Inclusion of Section C3.3.1 (Sewer Connection) following ERA's review.	**Collette Lynch** Environmental Consultant	**Rachel Xuereb** Director	**Adrian Mallia** Managing Director
05	Aug. 2023	Minor update to Table 5 following ERA's comments.	**Collette Lynch** Environmental Consultant	**Rachel Xuereb** Director	**Adrian Mallia** Managing Director
06	Nov. 2023	Updates following ERA Review & Regulatory Feedback.	**Collette Lynch** Environmental Consultant	**Rachel Xuereb** Director	**Adrian Mallia** Managing Director
07	Apr. 2024	Updates following ERA Review & Regulatory Feedback.	**Collette Lynch** Environmental Consultant	**Rachel Xuereb** Director	**Adrian Mallia** Managing Director
08	May. 2024	Final updates following ERA's 3rd Review & Regulatory Feedback.	**Collette Lynch** Environmental Consultant	**Rachel Xuereb** Director	**Adrian Mallia** Managing Director

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CONTENTS

FIGURES

TABLES

ANNEXES

1. INTRODUCTION

1.1. This application for a variation of the Integrated Pollution Prevention and Control (IPPC) permit was commissioned by Sterling Chemical Malta Ltd, herein referred to as 'the Operator'.

1.2. Sterling Chemical Malta Ltd operates a factory for the development, optimisation and manufacture of Active Pharmaceutical Ingredients (APIs) at HF 50, HF 51 and HF53, Hal Far Industrial Estate.

1.3. The operation of the facility is regulated by IPPC permit number IP 0004/21 issued by the Environment and Resources Authority (ERA). The area authorised by the IPPC permit is shown in **Figure 1**.

1.4. This application covers the following variations:

- The introduction of two additional emission to air points, namely from the micronisation plant and a fire safety cabinet for the storage of raw materials, both located in the HF 51 block;
- Authorisation to relocate a small amount of raw materials from the raw materials warehouse to the QC laboratory;
- The inclusion of the existing emission to air point emanating from the diesel operated emergency fire pump;
- The inclusion of the existing Emission Point **EM15** (HVAC system for Production Line 7)
- The inclusion of reverse osmosis (RO) reject water as a source of effluent being discharged to sewer; and
- Changes to the use and layout of the waste warehouse hereinafter referred to as the 22-MR Warehouse.

1.5. In September 2023, as requested by ERA, a comparative assessment was undertaken to determine the Scheme's compliance against *Commission Implementing Decision (EU) 2022/2427 establishing the best available techniques (BAT) conclusions, under Directive 2010/75/EU of the European Parliament and of the Council on industrial emissions, for common waste gas management and treatment systems in the chemical sector,* herein referred to as the "WGC (BAT) Conclusions. Several additional emissions to air that require monitoring were identified through this process.

1.6. Subsequently, ERA requested an Emissions to Air Monitoring Programme Method Statement to address the newly identified substances that necessitate monitoring. Section C3.10 of this document provides a concise overview of the additional substances to be monitored.

Structure of the IPPC Application

1.7. The IPPC Application consists of three volumes:

- **Volume 1** comprises the IPPC application forms A and C;
- **Volume 2** (the current volume) consists of the IPPC application document; and
- **Volume 3** Risk to Land and Groundwater (Addendum 4).

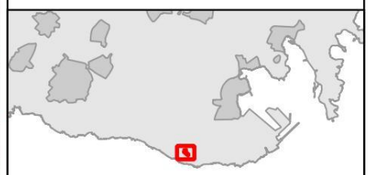
Figure 1: Location of Site

Location of site

Legend

Site boundary

Sterling IPPC Micronisation Variation



Map by:

Client: Sterling Chemical Ltd
Ref: ES_STG013
Date: 1 / 2022

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2. THE PROPOSED VARIATIONS

C1.2 Non-Technical Description

2.1. Sterling Chemical Malta Ltd operates a factory for the development, optimisation and manufacture of Active Pharmaceutical Ingredients (APIs).

2.2. This application covers the following variations:

- The introduction of two additional emission to air points, namely from the micronisation plant and a fire safety cabinet for the storage of raw materials, both located in the HF 51 block;
- Authorisation to relocate a small amount of raw materials from the raw materials warehouse to the QC laboratory;
- The inclusion of the existing emission to air point emanating from the diesel operated emergency fire pump;
- The inclusion of the existing Emission Point E**M15** (HVAC system for Production Line 7)
- The inclusion of reverse osmosis (RO) reject water as a source of effluent being discharged to sewer; and
- Changes to the use and layout of the waste warehouse hereinafter referred to as the 22-MR Warehouse.

2.3. A modification to the current authorised micronisation facility, which is used for size reduction and to increase the absorbability of some products already synthesised on site, is required to accommodate an increase in nitrogen pressure. Once the milling process within the microniser has completed, the modification required involves the diversion of nitrogen from the entering the existing scrubber and directed to a new emission to air point (**EM23**).

2.4. It is noted that the channelled emissions of nitrogen, which may contain small quantities of particulate matter, are treated with existing cyclone and HEPA filters (**Annex 5**). Monitoring will also be carried out from this emission point, as relevant.

2.5. Another new emission to air point is required for the in-built ventilation system of a fire safety cabinet used for the storage of flammable raw materials, mainly solvents.

2.6. Additionally, this variation application is to authorise the relocation of a small amount of raw materials from storage in the raw materials warehouse to two temperature-controlled fire safety storage cabinets located in the QC laboratory.

2.7. In the event of a spillage of raw materials from inside the safety cabinet, emissions will be directed through a carbon filter via an extraction system before leaving the facility.

2.8. The Scheme also proposes to discharge RO effluent to sewer. The scheme operates a small-scale RO plant which is currently discharging RO reject effluent to an IBC tank, which is then sent for recovery. A modification is proposed whereby the effluent will be discharged to an existing sewer connection. The proposed operation is already covered by a Sewer Discharge Permit (DMU 6745); a copy is included in Volume 1 of the IPPC application.

2.9. The remaining proposal includes the reorganisation of the 22-MR Warehouse (referred to as the 'waste warehouse' in IP 0004/21), which currently stores only non-flammable waste; however, provisions are being made to divide the warehouse into two, half of which is to remain as a storage area for waste, with the other half being utilised for the storage of raw materials, namely non-flammable solvents.

C1.3 The Proposed Variations

2.10. As mentioned, the proposed variations comprise:

- The introduction of two additional emission to air points, namely from the micronisation plant and a fire safety cabinet for the storage of raw materials, both located in the HF 51 block;
- Authorisation to relocate a small amount of raw materials from the raw materials warehouse to the QC laboratory;
- The inclusion of the existing emission to air point emanating from the diesel operated emergency fire pump;
- The inclusion of the existing Emission Point **EM15** (HVAC system for Production Line 7)
- The inclusion of reverse osmosis (RO) reject water as a source of effluent being discharged to sewer; and
- Changes to the use and layout of the waste warehouse hereinafter referred to as the 22-MR Warehouse.

2.11. The suggested variations to the current IPPC permit are summarised in **Table 1**.

Table 1: Proposed Changes to the IPPC Permit

Reference (IP 0004/21)	Subject	Variation requested
Table 2.2.1	Emission points to air	• To include an additional emission point from the microniser (**EM23**). • To include new Emission Point **EM24** from the fire safety cabinet in the Q.C laboratory. • To include existing emission to air point EM25: emergency diesel fueled fire pump. • To change the name of the Emission Point EM22 from Waste Warehouse to 22-MR Warehouse.
Table 2.2.2	Emissions to air monitoring	• To update the emissions to air monitoring programme in line with Table 5 of this document.
Condition 2.5.1	Discharge to sewer	Update condition permitting the discharging of trade effluent to sewer (it is noted that the effluent will discharge to an existing sewer connection: **E9**).
Schedules 3b and 3c	Emissions to air and HEPA filter layout plans	To be updated as per section C3.1 of this IPPC application.
IP 0004/21/Doc1	Site layout plans	To include latest drawings and emission points to air.

C1.4 Site Maps and Reports

2.12.. A Land and Groundwater Risk Assessment had been prepared for the facility in 2015[1], to cover the activities permitted at the time, with a second and third Addendum prepared in 2018[2] and 2019[3] respectively to cover proposed new activities that have since been permitted.

2.13. An Addendum to the 2019 Assessment, covering the proposed variations addressed by this IPPC variation application, is included as Volume 3 of this IPPC application.2.13. Current Scheme site layout plans of levels 0,1 and 3 have been included in **Figure 2**, **Figure 3** and **Figure 4**.

[1] En-Sure Ltd, 2015. *Sterling Chemical Malta Ltd, Hal Far: Land and Groundwater Risk Assessment* (Version 1). San Ġwann, December 2015; iv + 41 pp. + 3 Appendices.
[2] En-Sure Ltd, 2018. *Sterling Chemical Malta Ltd, Hal Far. Application for Variation of IPPC Permit: Volume 3: Addendum 1 to Land and Groundwater Risk Assessment* (Version: 2). San Gwann, August 2018; vi + 28 pp. + 1 Appendix.
[3] En-Sure Ltd, 2019. *Sterling Chemical Malta Ltd, Hal Far. Application for Variation and Renewal of IPPC Permit: Volume 3: Addendum 2 to Land and Groundwater Risk Assessment* (Version: 3). San Gwann, August 2019; vi + 31 pp.

Figure 2: Scheme Site Layout Plan Level 0

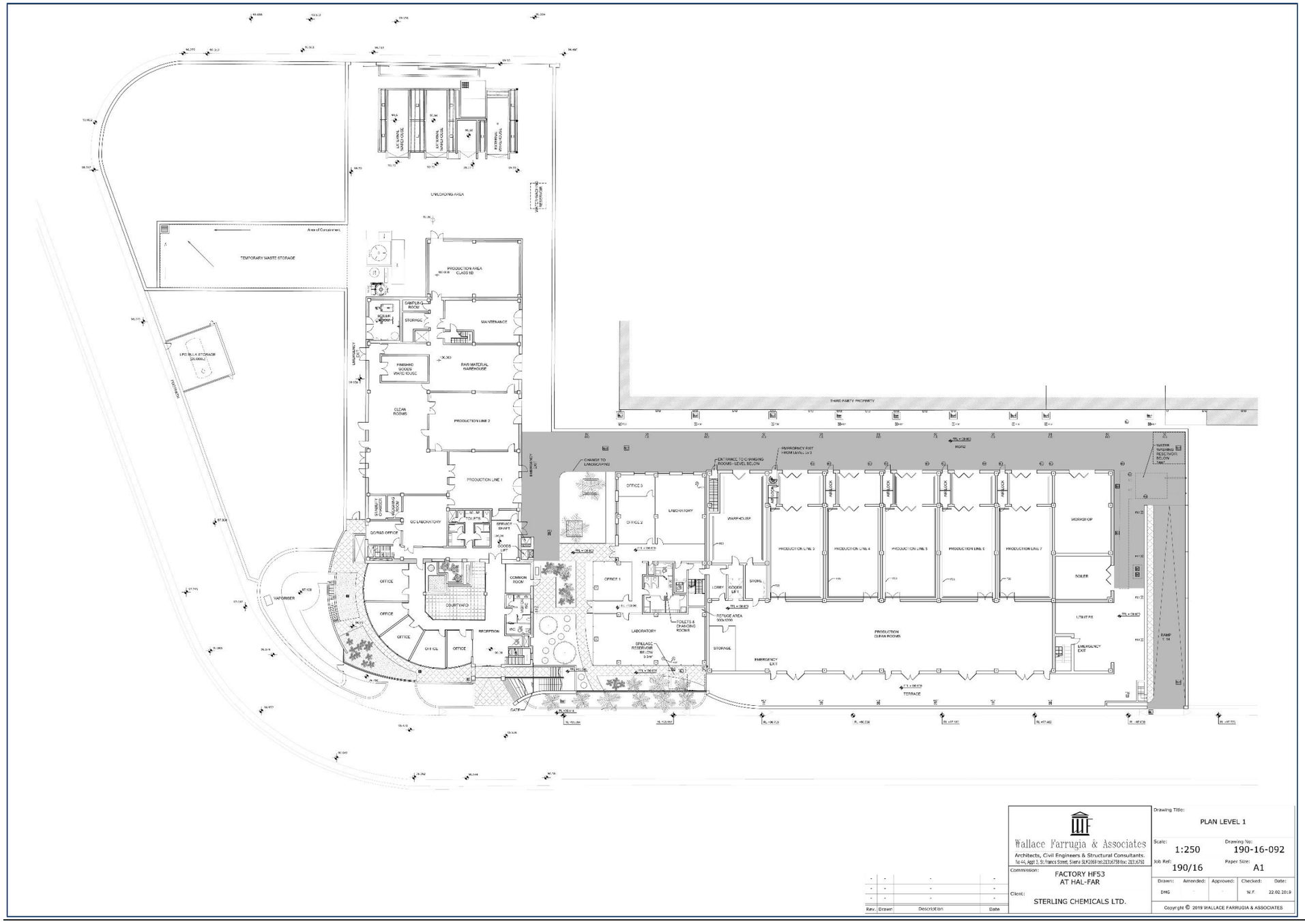


Figure 3: Scheme Site Layout Level 1

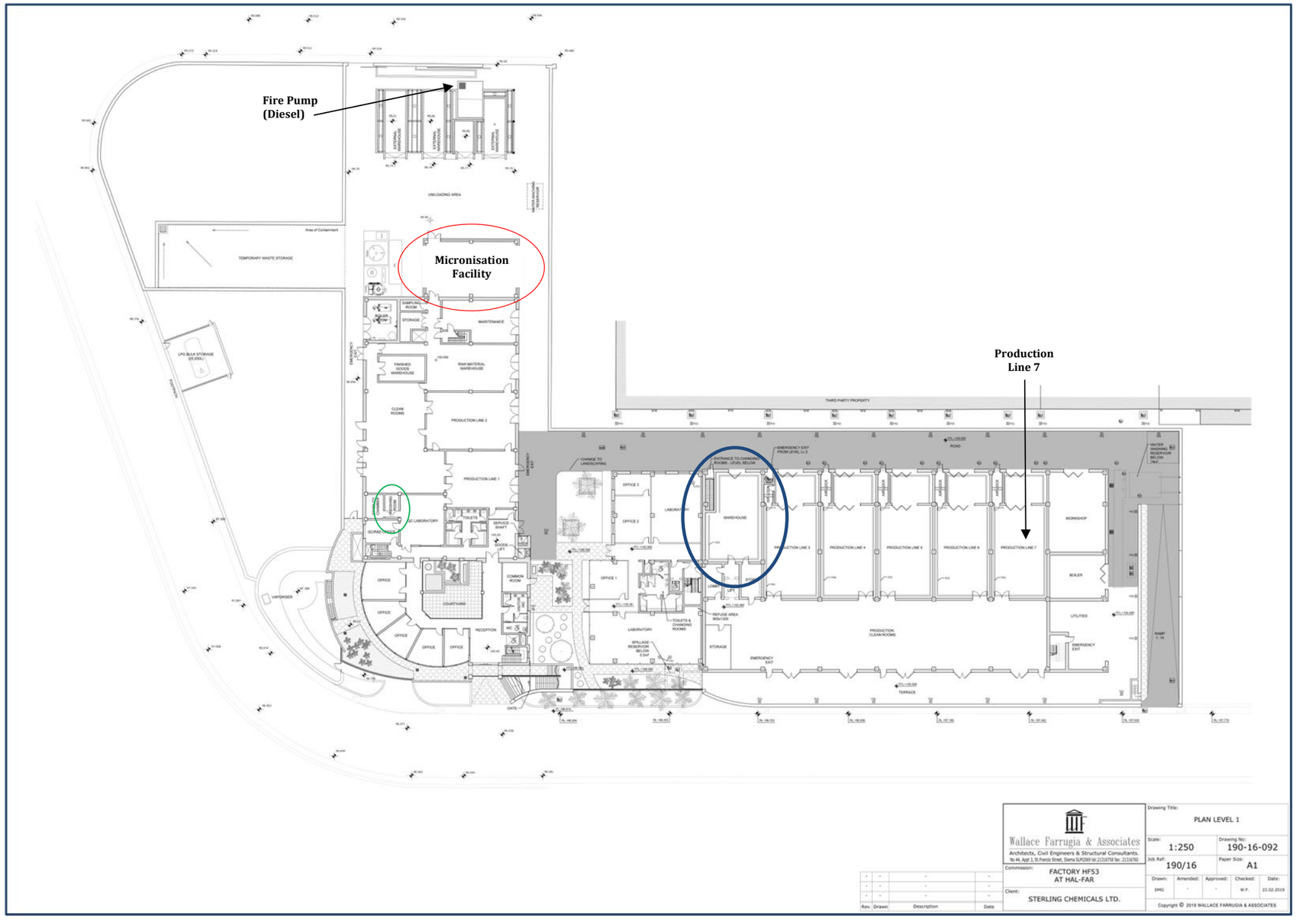
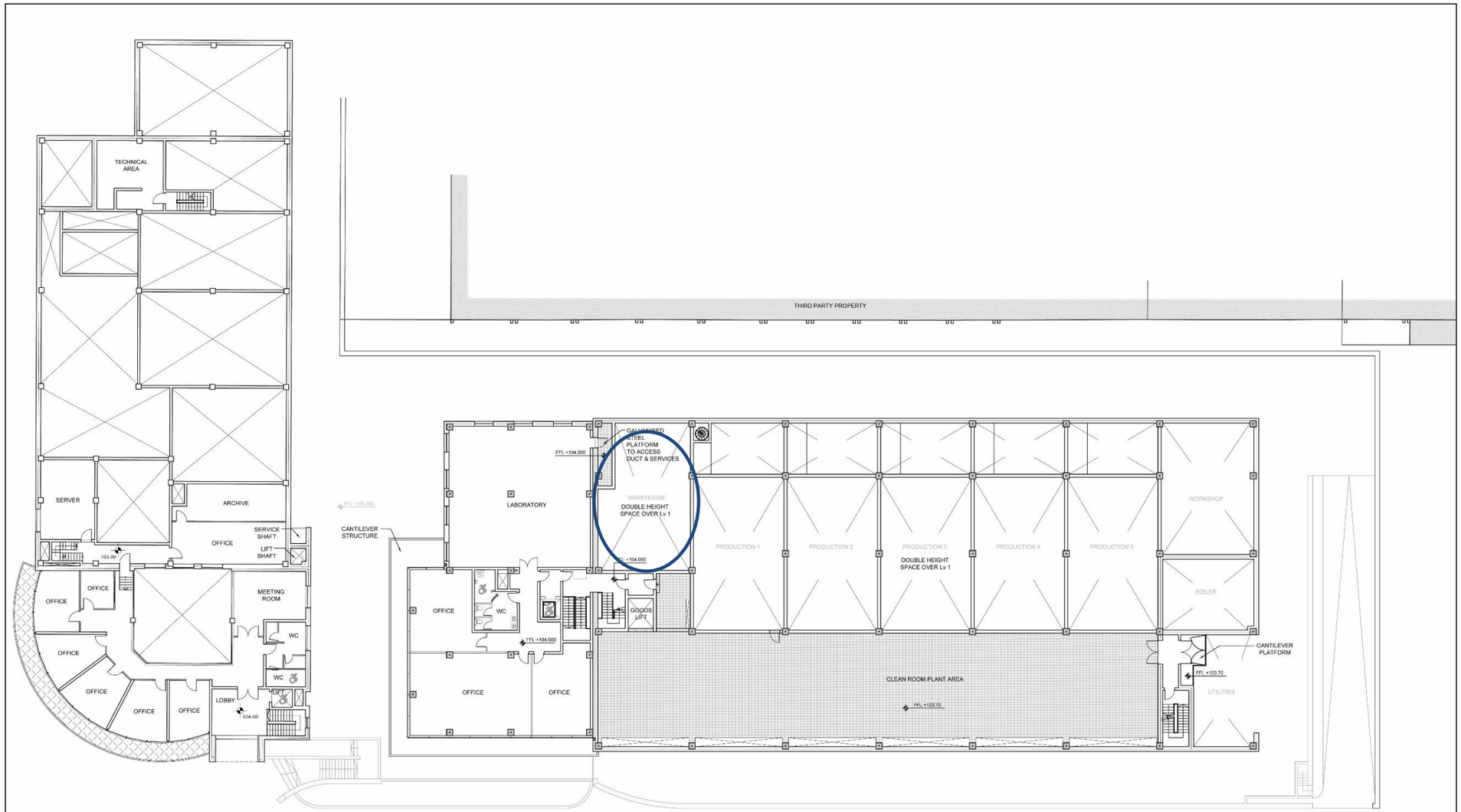


Figure 4: Scheme Site Layout Level 2



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Commission: FACTORY HF53 AT HAL-FAR

Client: STERLING CHEMICALS LTD.

Drawing Title: PLAN LEVEL 2

Scale:	Drawing No:
1:250	190-16-093
Job Ref:	**Paper Size:**
190/16	A2

Drawn:	Amended:	Approved:	Checked:	Date:
DMG	-	-	W.F.	22.02.2019

3. TECHNIQUES

C2.1 Environmental Management System

3.1. The Operator has an Environmental Management System (EMS) in place, which is certified to the ISO 14001:2015 standard. A copy of the ISO 14001 certificate, as well as key relevant documentation has previously been submitted to ERA.

3.2. The activities covered by this variation application are already included in the existing EMS in addition to relevant SOPs and training requirements.

C2.2 Proposed Activities

3.3. As noted, the proposed variations comprise:

- The introduction of two additional emission to air points, namely from the micronisation plant and a fire safety cabinet for the storage of raw materials, both located in the HF 51 block;
- Authorisation to relocate a small amount of raw materials from the raw materials warehouse to the QC laboratory;
- The inclusion of the existing emission to air point emanating from the diesel operated emergency fire pump;
- The inclusion of the existing Emission Point **EM15** (HVAC system for Production Line 7)
- The inclusion of reverse osmosis (RO) reject as a source of effluent being discharged to sewer; and
- Changes to the use and layout of the waste warehouse hereinafter referred to as the 22-MR Warehouse.

3.4. The following sub-sections give further details on the above variations.

Micronisation Facility

2.3. Micronisation is an existing activity carried out at the Scheme and refers to the size reduction of particles to the micron scale, in addition to increasing the absorbability of the product. In the pharmaceutical industry, size reduction of APIs is becoming important because:

- Research is creating APIs with very low solubility in water; reducing the particle size increases the surface area and therefore the solubility of the APIs;

- Particles of micrometer size may be used in inhalation therapy, as they would present a reduced systemic toxicity and quickly become available in the target organ (the lungs) at high concentration;
- Micronisation causes changes in the crystal structure of the product (breaking it down to an amorphous form), which increases the product's dissolution rate; and
- Crystallisation (and particle size dimension reduction) may be difficult for large / complex products; micronisation enables better control of particle size and formulation homogeneity.

3.5. Size reduction of particles is carried out using a process known as jet milling where the particle size produced ranges from around 0.5 to 20 µm (typically <5 µm) and uses fluid energy (provided by pressurised nitrogen) rather than by mechanical means.

3.6. As mentioned, micronisation is an existing authorised activity carried out at the Scheme and occurs at the end of the production process, after the APIs would already have been produced and dried in the existing production lines.

3.7. The location of the micronisation facility can be seen in circled in "red" in **Figure 3**.

3.8. A modification to the existing micronisation plant is required to accommodate an increase in nitrogen pressure. In the current process, nitrogen is sent back for reuse; however, when using a very high nitrogen pressure, the quality of nitrogen recovered is affected and not fit for reuse. Therefore, when jet milling at a very high pressure, the nitrogen will be required to by-pass the scrubber and exit the Scheme from a separate emission point, since releasing the nitrogen at such a high pressure will overload the scrubber.

3.9. It is noted that for certain products that require a lower nitrogen pressure and for cleaning purposes, the current micronisation process will remain the same, with the nitrogen being reused and VOC emissions generated during cleaning abated by a carbon filter and scrubber before being allowed to exit the facility.

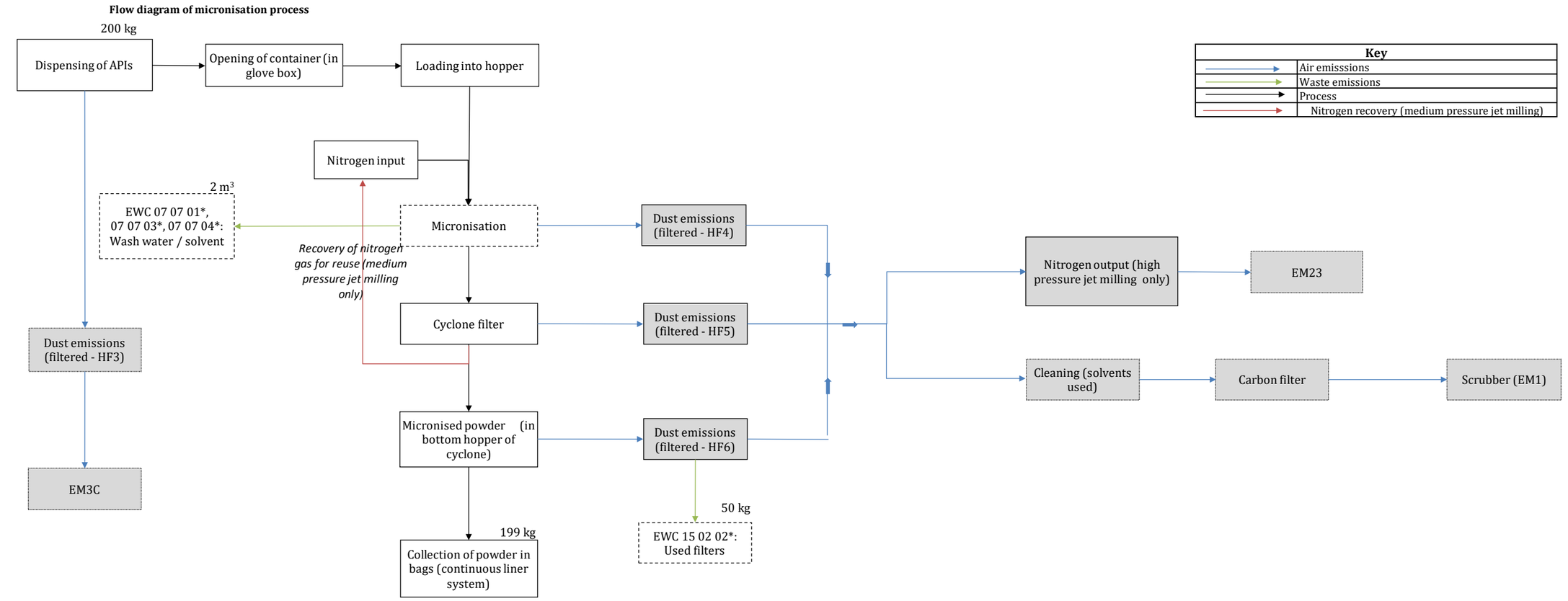
3.10. Refer to section C3.6: Emission to Air for further information on the locations of all existing and proposed emission points.

3.11. Additionally, as highlighted in the previous IPPC application, not all products require micronisation.

3.12. A flow diagram of the amended micronisation process is included in **Figure 5**. As can be seen, the nitrogen is introduced into the mill at the required pressure level through jet nozzles placed around the circular chamber of the mill. This causes acceleration of the particles inside the milling chamber, where they are dragged in a circular motion causing them to collide repeatedly. This process causes the

particles to break up into progressively small particles until the accumulated energy is reduced to negligible values. As per the original procedure outlined in IPPC Variation IP 0001/14/B this step of the process will remain to be connected to HEPA filters.

Figure 5: Proposed Micronisation Process



3.13. The micronised particles are then carried by the nitrogen gas into a cyclone filter. A series of fabric filters are located in the inner part of the cyclone filter. The nitrogen is filtered through these fabric filters. When jet milling at a very high nitrogen pressure a modification to the existing procedure is then required from this point onwards, whereby instead of the nitrogen being returned for reuse, it will be directed out once processed by the cyclone filter and treated with a HEPA filter so that any dust emissions containing APIs carried by the nitrogen will be removed. The nitrogen will then be allowed to exit the facility via Emission Point **EM23**.

3.14. As mentioned, when jet milling at a lower nitrogen pressure, the nitrogen will continue to be filtered through the cyclone filter before being returned for reuse.

3.15. Likewise, during cleaning, there are no proposals to change the current procedure, with air emissions being treated by HEPA filters before being directed to a carbon filter and then channelled through the scrubber before being allowed to exit the facility.

3.16. As mentioned in IPPC Variation IP 0001/14/B, in the event of a leak being detected from the microniser, a loss of pressure will be registered and the micronisation process will automatically be stopped.

3.17. As is the current practice, all equipment inside the micronisation room will be ATEX rated.

3.18. There are no proposed changes to the storage of nitrogen as a raw material at the Scheme site. Nitrogen will continue to be stored in the existing nitrogen tank in the external utilities area. It is estimated that there will be a 20% annual increase in nitrogen consumption as a raw material as a result of these proposals, since when jet milling at a very high pressure, nitrogen will no longer be reused. The Scheme will continue to report annual consumption as part of the Annual Environmental Report (AER) for the Scheme

3.19. Further information on this emission point, including their location and further details on the abatement techniques, is provided in section C3.6.

Fire Safety Cabinet

3.20. The fire safety cabinet is being proposed to improve accessibility of certain raw materials, mainly solvents, that are frequently used during in the Quality Control (QC) laboratory. Currently, all raw materials are stored in the raw materials warehouse (**Figure 3**). The installation of two cabinets is being proposed in the area marked in "green" in **Figure 3.**

3.21. As is the current practice, the list of raw materials used in the previous year will continue to be reported as part of the Annual Environmental Report (AER) for the Scheme.

3.22. **Table 2** includes an indicative list of raw materials to be kept in the cabinet. It is noted that all raw materials are currently in use at the Scheme, with no new materials being proposed.

3.23. Since all materials are highly flammable, storage in a temperature-controlled fire-resistant safety cabinet is required. The specifications of the proposed fire safety cabinets can be seen in **Annex 1**. The cabinet will be certified to EN14470-1 EN16121 standard.

Table 2: Raw materials stored in the fire cabinet (indicative)

Raw Materials	Maximum Quantity
Acetonitrile	125 L
Methanol	125 L
Ethanol	125L
Acetone	5 L
Toluene	5 L
Hexane	5 L
Ethyl acetate	5 L
Hydranal	5 L

3.24. Raw materials are typically stored in glass jars.

3.25. As per the fire safety cabinet specifications (**Annex 1**), the cabinets are equipped with epoxy coated steel tray shelves having a capacity of 16 L per shelf. In addition, there is a 45 L steel tank at the bottom of the cabinet which would contain any additional spills. Moreover, the cabinet is certified to EN14470-1 standards, a criterion of which includes the requirement for containment to 110% of the volume stored within the cabinet.

3.26. In precaution, the Scheme has an existing Spill Standard Operating Procedure in place, which will be followed in the event if a spillage of a raw material (**Annex 1**). A spill kit is also available next to the cabinet.

3.27. The flooring here is an epoxy-based resin, laid on top of concrete. In the event of a spill, any residual raw materials remaining once the spill has been cleaned up will drain to an existing wastewater reservoir (Reservoir 1 as seen in **Figure 6**).

3.28. Wastewater collected in this reservoir is exported abroad for further treatment.

3.29. The cabinet will be made from steel sheet and has a heat detection system inbuilt, whereby the doors (if left open) would automatically close once the temperature reaches 40 °C and the air inlet and outlet valves will close when the temperature reaches 70 °C. In the event of a fire, the cabinet is certified to withhold such temperatures for 90 minutes.

3.30. As mentioned, the cabinet requires a ventilation system to regulate the temperature, and therefore, a new emission to air point (**EM24**) is required. Air is allowed to enter the cabinet from an external connection. At the outlet, an extraction system channels emissions of air through a carbon filter having an efficiency of 95-99%. In the event of a spillage of a raw material inside the cabinet, such abatement will significantly reduce any potential VOC emissions being released to air.

3.31. It is therefore noted that only in the event of a spill inside the cabinet will there be potential emissions of VOCs.

3.32. A flow diagram outlining the storage and ventilation process has been included in **Figure 7**.

3.33. Further information on this emission point, including the location and further details on the abatement techniques, is provided in section C3.6.

Figure 6: Drainage Process

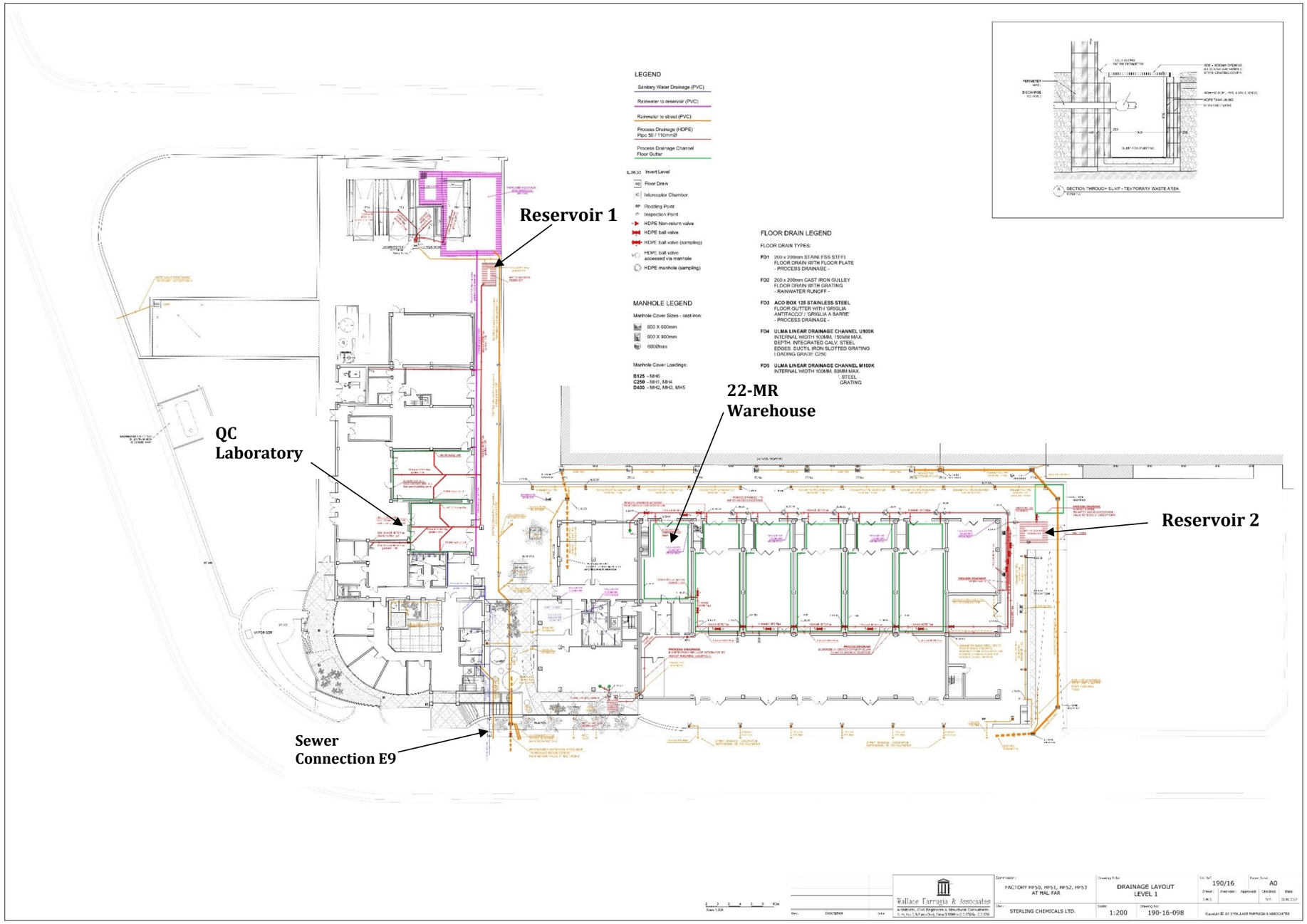
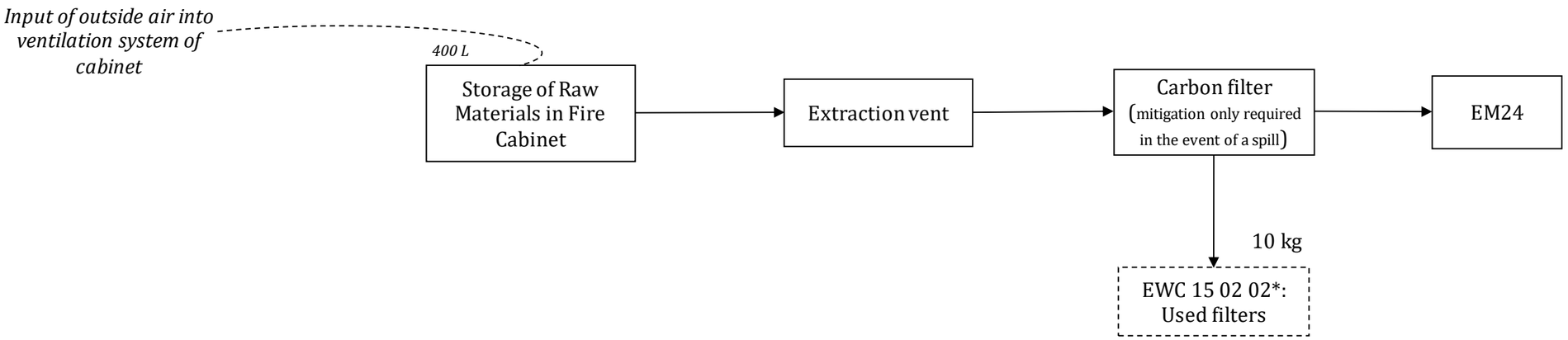


Figure 7: Fire Cabinet Storage and Ventilation Process



Emergency Fire Pump

3.34. There are four emergency fire pumps installed at the Scheme site, one of which is diesel operated (see **Figure 3**) with the remaining pumps connected to mains electricity. In the event of a fire, the fire pumps facilitate the supply of water from the rainwater reservoir to the hose reels. In which case, the operation of the diesel-fuelled pump would result in an emission to air (combustion by-products), and therefore, has been assigned Emission Point **EM25** (**Table 4**).

Inclusion of Emissions Point EM15 into Monitoring Programme

3.35. It was noted that the monitoring of Emission Point **EM15**, the HVAC system for the clean rooms in Production Line 7 (**Figure 3**) was not included in the current programme. The sources of emissions for **EM15** are the same as emission points **EM3A** and **EM3B** (HVAC for production line 1 and 2) – diffuse particulate matter channelled through the HVAC system. Emissions from **EM15** are treated with a HEPA filter (HF7). The annual monitoring of PM from **EM15** is to be added to the programme.

Discharge of RO reject to sewer

3.36. A small-scale reverse osmosis (RO) unit (**Figure 8**) has been installed in the QC Laboratory.

Figure 8: Small-scale RO Unit

3.37. The system receives water from the mains supply and filters out organic, inorganic, and particulate matter using resin filters. The purified water is used solely for the washing of laboratory equipment. The full specification sheet for the RO unit can been seen in **Annex 3**.

3.38. It is noted that no raw materials are used in the process, filters are changed periodically, and the wash water generated from the washing of equipment is channelled within a closed system to an IBC for export.

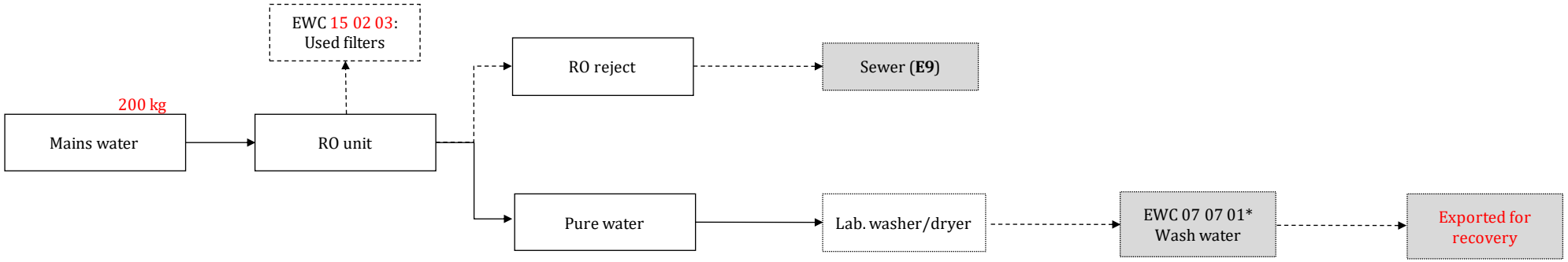
3.39. Currently, the reject effluent is channelled to a separate IBC then exported. The Scheme now proposes to discharge the RO reject effluent to sewer.

3.40. A flow diagram of the effluent discharge process is included in **Figure 9**. The reject effluent will be discharged to existing sewer connection **E9** (**Figure 6**).

3.41. Following water quality tests carried out by the Water Services Corporation[4] (WSC), authorisation to discharge the RO reject effluent to sewer has been obtained, a copy of which has been appended to Volume 1 of this application.

[4] Results of the water quality testing were not disclosed to the Applicant, only the authorization to discharge RO reject to sewer.

Figure 9: RO Reject Flow Diagram



Changes to the 22-MR Warehouse

3.42. In February 2021, an IPPC variation application (IP 0004/21) was submitted to ERA proposing the operation of a new warehouse in the HF53 block for the storage of waste, which included details on the ventilation system of the warehouse.

3.43. IPPC Permit IP 0004/21 was determined in September 2021 permitting the storage of non-hazardous waste in the warehouse.

3.44. In order to improve internal logistics, it is being proposed that in addition to the storage of non-hazardous waste, raw materials will also be stored in the warehouse, namely non-flammable solvents.

3.45. A defined list of the specific solvents and their quantities to be stored is not currently available; however, it can be confirmed that they will be of the same variety currently stored in the Raw Materials Warehouse.

3.46. There are no changes being proposed to the current External Warehouse, used for the storage of flammable raw materials, or the Raw Materials Warehouse, both of which are located in the HF51 block (**Figure 3**), which stores the majority of the raw materials used at the facility, nor are any new raw materials being proposed.

3.47. The updated proposed layout plans of the 22-MR Warehouse can be seen in **Figure 10**.

3.48. As is the current procedure for the storage of raw materials in both the External Warehouse and the Raw Materials Warehouse, raw materials stored in the 22-MR Warehouse will be stored on pallets in a variety of containers (e.g. IBCs, plastic drums, paper / cardboard containers if solids).

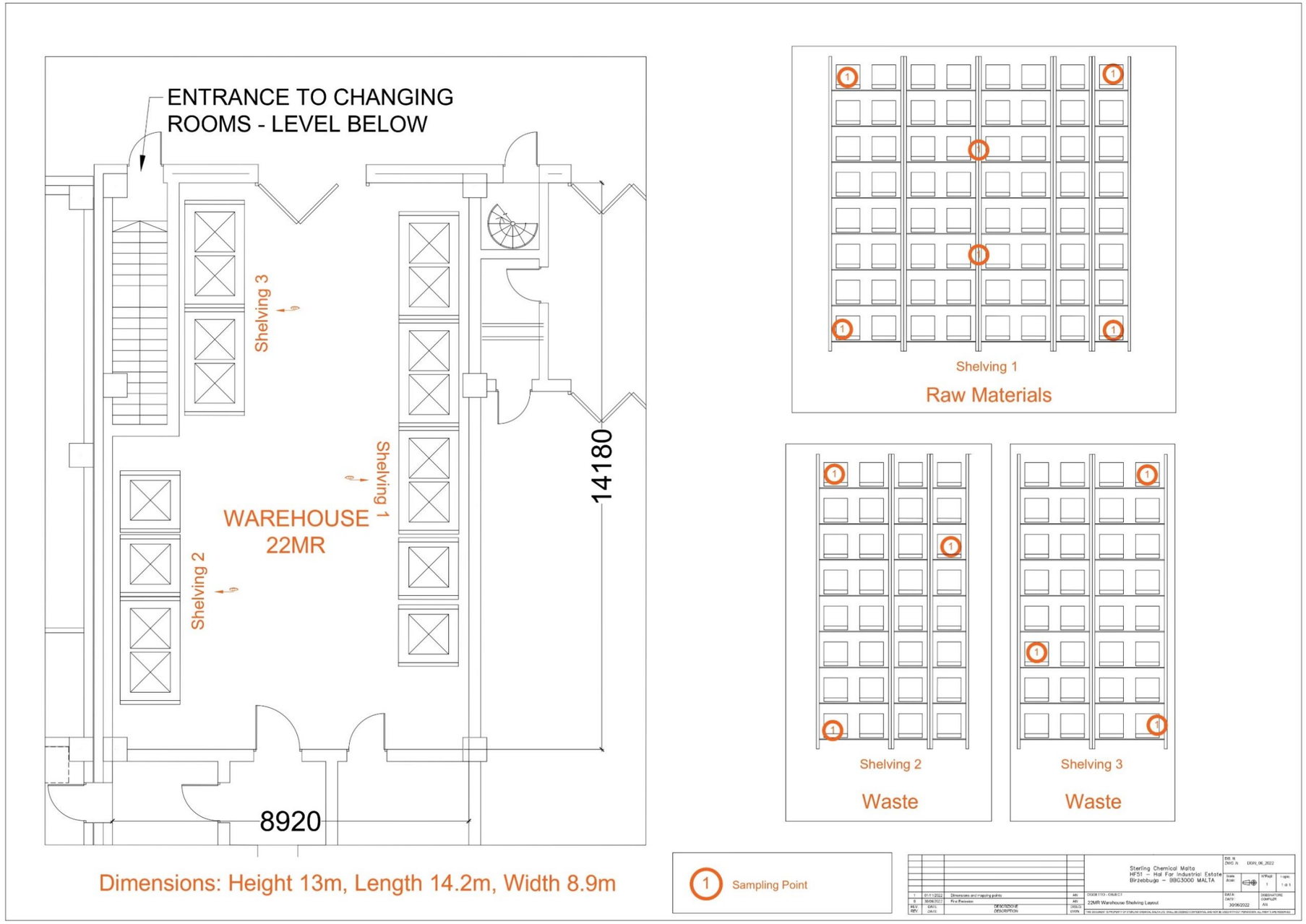
3.49. The 22-MRWarehouse is underlain by an impermeable concrete layer. The floor has stainless steel gutters around the internal perimeter, draining to a 57 m^3 'water washing reservoir' at the northeastern corner of the HF 53 block (labelled as 'Reservoir 2 in **Figure 6**), the contents of which are currently exported abroad for further treatment; however, as mentioned there are plans to install a wastewater treatment plant (WWTP) to process the effluent at the Scheme site[5]. The gutters will collect any spilt waste and wash water from floor washing.

3.36. A spill kit is also available in the 22-MR Warehouse.

3.37. In the event of a spillage of a raw material, procedure MIOS_ 4.4.7-C will be followed.

[5] An additional IPPC Variation Application will be submitted prior to the installation of the plant.

Figure 10: Proposed Layout of the 22-MR Warehouse



C2.2.5 Alternatives

3.38. With regards to the installation of the new emission point required to by-pass the nitrogen from entering the scrubber when exiting the facility, the consideration to continue reusing the nitrogen, as is the current practice, was initially considered; however, when using nitrogen at a very high-pressure during jet milling, the quality of the nitrogen is no longer suitable for reuse, hence it needs to be directed out of the micronisation plant. As mentioned, when jet milling at such a high pressure, if the nitrogen was to be directed to the exiting emission point (**EM1**), the gas would need to be passed through the scrubber first, which would overload the scrubber.

3.39. Another alternative would be to only produce micronised products that do not require a very high nitrogen pressure during jet milling, and therefore, continue with the existing process; however, commercially, this limits the Scheme since it prohibits responding to the current pharmaceutical market.

3.40. The reorganisation of the storage of frequently used raw materials to utilise both the fire safety cabinets in the Q.C laboratory and 22-MR Warehouse, means that such materials are more easily accessible to the Operator, improving operational efficiency. There are no alternatives to making such raw materials more accessible, other than moving the location they are stored.

3.41. Additionally, since the fire safety cabinet is to be used for the storage of mainly solvents, the relocation of a small amount of such materials will reduce the risk of a spillage during transfer to the QC laboratory (**Figure 3).**

3.42 An alternative would be to procure a cabinet that is not temperature controlled, hence there would not be the requirement to install a new emission to air point; however, due to the volatility of the raw materials to be stored, a temperature-controlled environment is required for fire safety reasons; therefore, an emission to air point is required.

3.43 The proposal of discharging the RO reject to sewer instead of exporting abroad is more cost efficient and reduces emission of greenhouse gases as no shipping is required.

3.44 Additionally, to remain exporting such effluent as waste from the Scheme represents a higher cost to the Operator.

C2.3 Raw Materials

3.46 No new raw materials are being proposed as part of this application.

C2.5 Maintenance

3.49 The facility's maintenance plan includes maintenance of the air emissions abatement equipment that is included as part of this variation application.

3.50 Maintenance requirements are in accordance with manufacturer specifications and with any applicable legal requirements.

C2.7 Water

3.50. Considering that the small-scale RO unit is already in operation at the Scheme, the proposal of discharging the RO reject to sewer will not result in an increased consumption of mains water.

3.51. As for the remaining proposed changes, none are expected to affect proposed annual water consumption.

C2.8 Risk Assessment

3.52. An update to the existing Land and Groundwater Risk Assessment has been prepared as part of the current IPPC application (**Volume 3**). The risk assessment considered, the scenarios of spillage of raw materials, the risk of contamination from used firefighting extinguishant and the emissions to air from the fire safety cabinet and micronisation plant. The Risk Assessment concluded that with the proposed mitigation measures in place, all pollutant linkages would be removed in relation to the used extinguishant and a spillage of a raw material, and the reduction in the resultant risk from moderate to very low and low in relation to the eventual risk to land and groundwater from emissions to air.

4. EMISSIONS

C3.1 Waste

Waste Identification

4.1. As a result of all the proposed changes described above, the only waste stream to be generated are the filters, which require to be changed periodically. It is noted that the Scheme already generates this type of waste stream, so no new waste types are envisaged.

4.2. Furthermore, no additional cyclone or HEPA filters will be installed in the micronisation plant since the nitrogen will be channelled through existing filters.

4.3. The carbon filter of the fire safety cabinet will be changed annually or following the spillage of a raw materials from within the fire safety cabinet, whichever comes sooner.

4.4. The increase in storage capacity of raw materials at the Scheme will directly increase the amount of packaging waste generated, contaminated hazardous packaging, which the Scheme exports abroad for further treatment; however, the increase is not considered significant.

4.5. It is noted that Sterling Chemical (Malta) Ltd are registered as Producers of Packaging and Packaging Material with ERA, with all packaging generated at the Scheme being declared on an annual basis.

4.6. Additionally, the resin filters of the RO plant require replacing every five to ten years. **Table 3** summarises the waste streams to be further generated as a result of the proposals.

Table 3: Waste Streams

EWC code	Description
15 02 02*	Filters contaminated with hazardous substances
15 01 10*	Contaminated packaging

4.7. The spent filters will be stored in appropriate containers in the 22-MR Warehouse (**Figure 3** and **Figure 4)**. It is noted that the resin filters are non-hazardous and will therefore be kept separate to the hazardous carbon and HEPA filters to avoid contamination.

4.8. The quantities of waste generated from the facility will not change significantly as a result of the proposed variations.

4.9. As noted, the proposed variations will result in less waste requiring to be exported abroad for treatment, since the RO reject effluent will be discharged to sewer instead.

4.10. All waste on site will continue to be transferred to licensed facilities using authorised waste carriers, and records will continue to be maintained and reported to ERA as per current practice.

4.11. Movements of hazardous waste will also be covered by consignment permits / notes, as is the current practice.

C3.3 Emissions to Sewer

4.12. As already outlined, the RO reject will be discharged to existing sewer connection E9 (see **Figure 6** for drainage block plan).

4.13. Authority from the Water Service Corporation (WSC) to discharge trade effluent to sewer has already been sought. A copy of the relative permit issued by the WSC has been included in Volume 1 of this Application.

C3.6 Emissions to Air

4.14. As mentioned, the proposed variations include the addition of emission points to air, as shown in **Table 4**.

Table 4: Emission points to air

Ref.	Source	Abatement/location
Existing		
EM1	Production area	HEPA filters (HF4, HF5, HF6), carbon filter, heat exchanger, scrubber
	Weighing room	
	Finished goods area (clean rooms)	
	Microniser	
EM2	HVAC (General ventilation and air-conditioning) – HF 51 block	Fabric filter
EM3A	HVAC Production Line 2 clean rooms	HEPA filter (HF1)
EM3B	HVAC Production Line 1 clean rooms	HEPA filter (HF2)
EM3C	Micronisation plant clean rooms	HEPA filter (HF3)
EM4A	Laboratories	Fume Hood Extraction vent
EMAB	Laboratories	Fume Hood Extraction vent
EM4C	QC lab fume hoods	Carbon filter
EM4D	QC lab fume hoods	Carbon filter
EM4E	QC lab fume hoods	Carbon filter
EM5	Boiler	Stack
EM6	Boiler	Stack
EM7	Cooling Tower	Cooling tower stack
EM8A	AMS (Quality Control) lab fume hoods	Carbon filter
EM8B	AMS (Quality Control) lab fume hoods	Carbon filter
EM8C	AMS (Quality Control) lab fume hoods	Carbon filter
EM8D	AMS (Quality Control) lab cabinet and localised hoods	Carbon filter
EM10A	R&D laboratory	Fume Hood Extraction vent
EM10B	R&D lab fume hoods	Carbon filter

EM10C	R&D lab fume hoods	Carbon filter
EM10D	R&D lab fume hoods	Carbon filter
EM11	Micronization laboratory	Fume Hood Extraction vent
EM12	Cold rooms	Vent
EM13A	Production area	Scrubber
EM13B	Production area	Scrubber backup fan
EM14	General ventilation	HVAC
EM15	HVAC Production Line 7 clean rooms	HEPA filter (HF7)
EM16	Laboratory	Fume Hood Extraction vent
EM17	Laboratory	Fume Hood Extraction vent
EM18	Laboratory	Fume Hood Extraction vent
EM19	Laboratory	Fume Hood Extraction vent
EM20	Laboratory	Fume Hood Extraction vent
EM21	Laboratory	Fume Hood Extraction vent
EM22	22-MR Warehouse	None
Proposed		
EM23	**Microniser (nitrogen outlet)**	**Cyclone & HEPA filters (HF4, HF5, HF6)**
EM24	**Fire Safety Cabinet**	**Extraction vent and carbon filter**
EM25	**Emergency diesel-fuelled fire pump**	**None**

Emissions from Microniser

4.15. One new emission point being introduced will emanate from the micronisation plant, located in the HF51 block (**Figure 5)**. The emission point is required in order to by-pass nitrogen from entering the scrubber before exiting the facility during very high-pressure jet milling. As mentioned, when nitrogen is injected at a lower pressure, as is the current practice, nitrogen will continue to be reused within the micronisation plant.

4.16. Exhaust air from this point is released through air grilles having a basic fabric filter; information on this system is included in **Annex 4**. The point at which the nitrogen leaves the facility is labelled as **EM23** in **Figure 11.** It is noted that during high-pressure milling, when nitrogen will be released once the milling process is complete, emissions will be treated by the existing cyclone filter and H13 HEPA filters (HF4, HF5 & HF6 in **Figure 11**) before leaving the facility to remove any dust that may be carried by the nitrogen.

4.17. As mentioned, the HEPA filters are existing filters within the micronisation plant. Specifications of the HEPA filters have been included **Annex 5**; these show that the filtration efficiency is greater than 99.95%. It is noted that a differential pressure device is installed before and after each HEPA filter in order to monitor the operation of the filter; the filters are already included in the facility's maintenance programme and replaced as per the maintenance schedule.

4.18. As explained, when jet milling at a very high nitrogen pressure, the quality of used nitrogen deteriorates and is no longer suitable for reuse. Therefore, in such instances, the nitrogen must be released; however, if the nitrogen is released through the current emission point (**EM1**), the gas would first be directed

through the existing scrubber, which would cause an overload. Therefore, this is not an option. It is noted that during the cleaning cycles of the micronisation plant, where solvents are used, emissions will continue to be directed to the scrubber before being released from the facility.

Emissions from Fire Cabinet

4.19. Another new emission point is being proposed from the QC Laboratory in the HF51 block (**Figure 3**)The emission point is required to operate a dedicated ventilation system for the temperature-controlled fire safety cabinet, where raw materials, to include solvents, are to be stored in small quantities. An extraction unit is used to circulate the air and in the event of a spill from within the fire cabinet, such emissions are treated through a carbon filter before being released at roof level (labelled as **EM24** in **Figure 11**) through basic fabric filters as shown in **Annex 4**. Specification sheets for typical carbon filters to be used are included in **Annex 6**.

4.20. It can therefore be confirmed that there are no significant emissions emanating from the fire cabinet, unless there is a spillage of a raw material from within the cabinet as described.

Emissions from Fire Pump

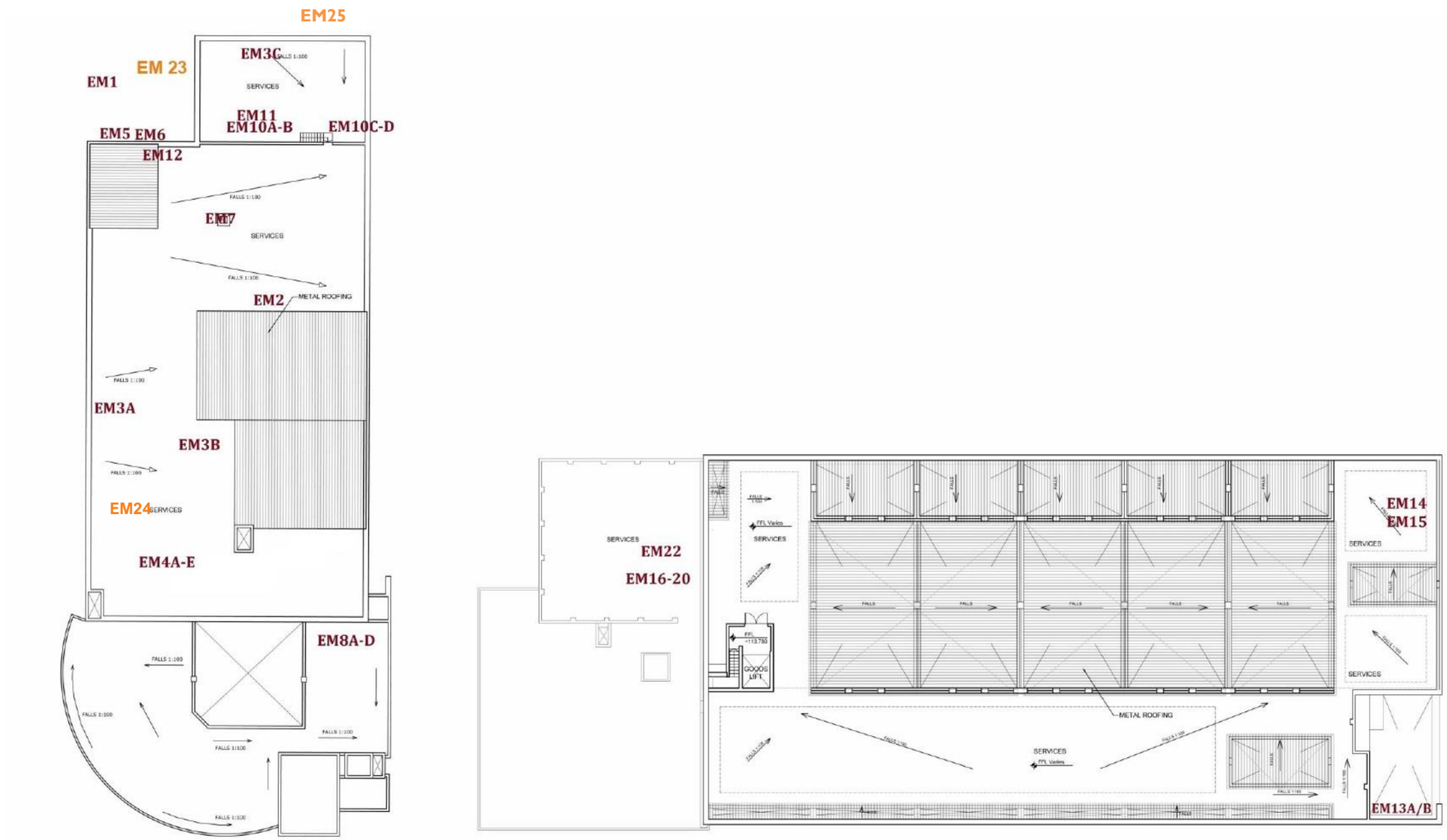
4.21. In the event of a fire, the fire pumps facilitate the supply of water from the rainwater reservoir to the hose reels. In which case, the operation of the diesel-fuelled pump would result in an emission to air (combustion by-products). The potential occurrence of a fire that would warrant the use of the hose reel, is considered very low; therefore, emissions to air from Emission Point **EM25** (Figure 11) are considered to be a rare occurrence.

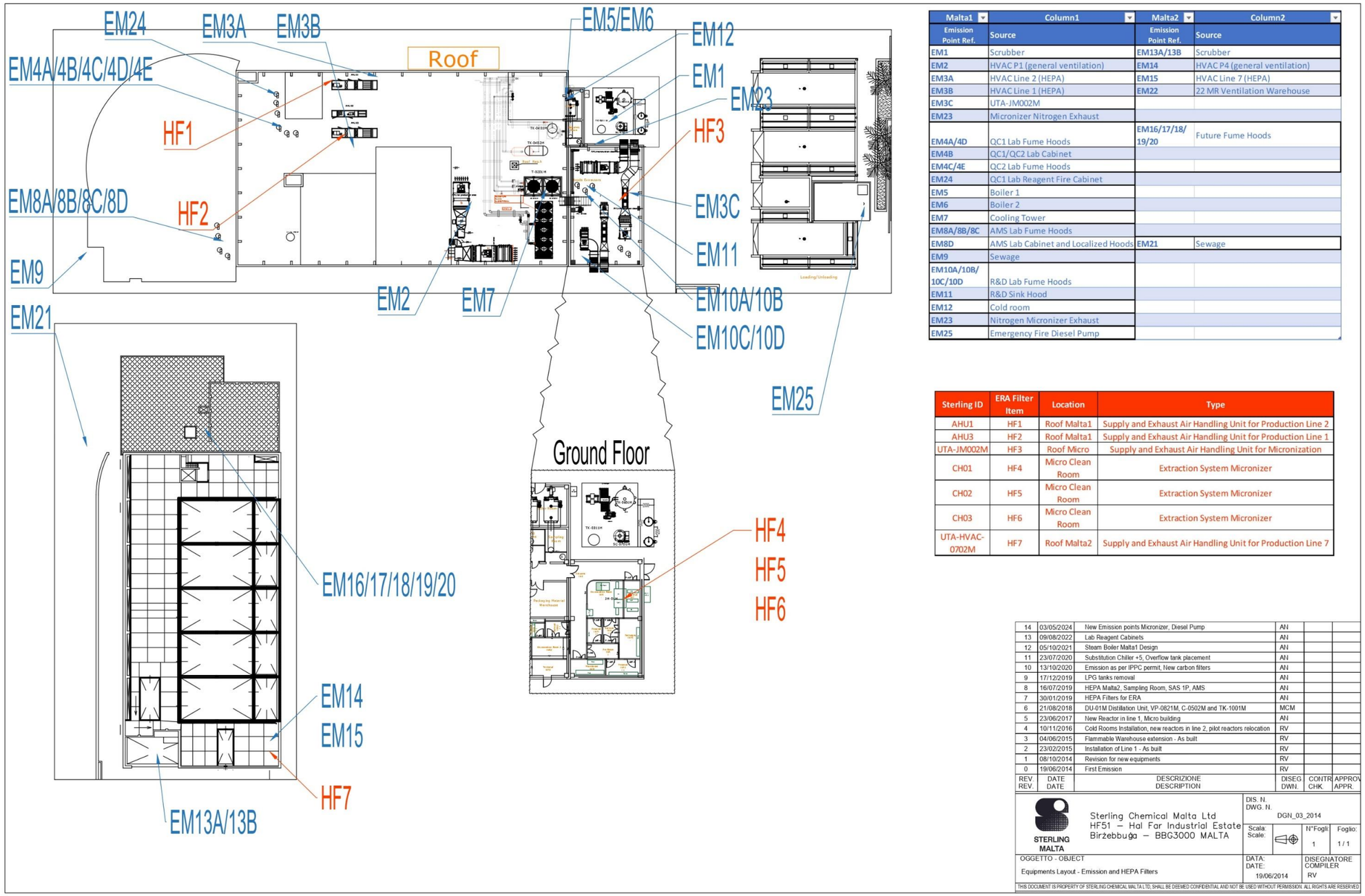
Emission Point EM15

4.22. Emission Point **EM15** (Figure 11) relates to the heating and ventilation system connected to the clean rooms of Production Line 7 (**Figure 3**). Operations within Production Line 7 are already authorised by ERA, with emissions to air being considered; however, erroneously, Emission Point **EM15** was not included in the Emissions to Air Monitoring Programme.

4.23. Emissions from this source are limited to Particulate Matter only as when the APIs reach the clean rooms, they are in a solid state.

Figure 11: Emission points to air and Location of HEPA Filters





Malta1	Column1	Malta2	Column2
Emission Point Ref.	Source	Emission Point Ref.	Source
EM1	Scrubber	EM13A/13B	Scrubber
EM2	HVAC P1 (general ventilation)	EM14	HVAC P4 (general ventilation)
EM3A	HVAC Line 2 (HEPA)	EM15	HVAC Line 7 (HEPA)
EM3B	HVAC Line 1 (HEPA)	EM22	22 MR Ventilation Warehouse
EM3C	UTA-JM002M		
EM23	Micronizer Nitrogen Exhaust		
EM4A/4D	QC1 Lab Fume Hoods	EM16/17/18/19/20	Future Fume Hoods
EM4B	QC1/QC2 Lab Cabinet		
EM4C/4E	QC2 Lab Fume Hoods		
EM24	QC1 Lab Reagent Fire Cabinet		
EM5	Boiler 1		
EM6	Boiler 2		
EM7	Cooling Tower		
EM8A/8B/8C	AMS Lab Fume Hoods		
EM8D	AMS Lab Cabinet and Localized Hoods	EM21	Sewage
EM9	Sewage		
EM10A/10B/10C/10D	R&D Lab Fume Hoods		
EM11	R&D Sink Hood		
EM12	Cold room		
EM23	Nitrogen Micronizer Exhaust		
EM25	Emergency Fire Diesel Pump		

Sterling ID	ERA Filter Item	Location	Type
AHU1	HF1	Roof Malta1	Supply and Exhaust Air Handling Unit for Production Line 2
AHU3	HF2	Roof Malta1	Supply and Exhaust Air Handling Unit for Production Line 1
UTA-JM002M	HF3	Roof Micro	Supply and Exhaust Air Handling Unit for Micronization
CH01	HF4	Micro Clean Room	Extraction System Micronizer
CH02	HF5	Micro Clean Room	Extraction System Micronizer
CH03	HF6	Micro Clean Room	Extraction System Micronizer
UTA-HVAC-0702M	HF7	Roof Malta2	Supply and Exhaust Air Handling Unit for Production Line 7

REV.	DATE	DESCRIZIONE / DESCRIPTION	DISEG. DWN.	CONTR. CHK.	APPROV. APPR.
14	03/05/2024	New Emission points Micronizer, Diesel Pump	AN		
13	09/08/2022	Lab Reagent Cabinets	AN		
12	05/10/2021	Steam Boiler Malta1 Design	AN		
11	23/07/2020	Substitution Chiller +5, Overflow tank placement	AN		
10	13/10/2020	Emission as per IPPC permit, New carbon filters	AN		
9	17/12/2019	LPG tanks removal	AN		
8	16/07/2019	HEPA Malta2, Sampling Room, SAS 1P, AMS	AN		
7	30/01/2019	HEPA Filters for ERA	AN		
6	21/08/2018	DU-01M Distillation Unit, VP-0821M, C-0502M and TK-1001M	MCM		
5	23/06/2017	New Reactor in line 1, Micro building	AN		
4	10/11/2016	Cold Rooms Installation, new reactors in line 2, pilot reactors relocation	RV		
3	04/06/2015	Flammable Warehouse extension - As built	RV		
2	23/02/2015	Installation of Line 1 - As built	RV		
1	08/10/2014	Revision for new equipments	RV		
0	19/06/2014	First Emission	RV		

STERLING MALTA

Sterling Chemical Malta Ltd
HF51 – Hal Far Industrial Estate
Birżebbuġa – BBG3000 MALTA

DIS. N. / DWG. N.: DGN_03_2014
Scala: / Scale:
N°Fogli: 1
Foglio: 1 / 1

OGGETTO - OBJECT
Equipments Layout - Emission and HEPA Filters

DATA: / DATE: 19/06/2014
DISEGNATORE / COMPILER: RV

C3.10 Monitoring

4.24. The relevant emissions associated with the proposed variations included in this application are emissions to air generated from the micronisation. A monitoring proposal for emissions to air is included in **Table 5**.

4.25. The monitoring proposal for the new emission point being added to the micronisation plant (**EM23**) is based on the nature of substances that could be emitted from the hopper of the micronisers (primarily dust, because some dry powder may be carried with the nitrogen being released from the facility). It is noted that solvents are only used during the cleaning of the plant, and as noted, during cleaning, VOC emissions will continue to be treated in the scrubber and emitted from Emission Point **EM1**.

4.26. The monitoring stipulated in **Table 5** would be carried out when activities associated with the respective emission point are underway.

4.27. The methodology used and the results obtained will be reported to ERA as part of the Annual Environmental Report and compared against the emission limits set in the IPPC permit.

4.28. Since the only emissions potentially emitted from the fire safety cabinet would occur in the event of a spill and failure in current mitigation, no monitoring proposals are being proposed for Emission Point **EM24**.

4.29. The monitoring of RO reject effluent to sewer will be monitored according to conditions stipulated in the WSC permit.

4.30. As mentioned, following the comparative assessment carried out in order to check for alignment against the 2022 WGC (BAT) Conclusions, several additional waste gas emissions already generated at the Scheme were identified.

4.31. Table include a summary of the proposed Emissions to Air Monitoring Programme, which includes both the current and prospective substances that are required to be monitored.

Table 5: Proposed Emissions to Air Monitoring Programme

Parameter	Emissions Point Reference	Emission Limit Value	Frequency[6]	Standard	Method
TVOCs (Total Organic Carbon)	EM1, EM13	20 mg C/Nm^3	Annually	EN 12619: 2013	In situ sampling and analysis
	EM4A, EM4B, EM4C, EM4D, EM4E, EM8A, EM8B, EM8C, EM8D, EM10A EM10B, EM10C, EM10D, EM11		Every four years		
Toulene	EM1, EM13	1 mg/Nm^3	Every six months	CEN / TS 13649:2015	Laboratory analysis
Dichloromethane	EM1, EM13	1 mg/Nm^3	Every six months	CEN / TS 13649:2015	Laboratory analysis
Dimethylformamide[7]	EM1, EM13	2 mg/Nm^3	Every six months	NIOSH 2004:1994	Laboratory analysis
Tetrahydrofuran[8]	EM1, EM13	10 mg/Nm^3	Every six months	CEN / TS 13649:2015	Laboratory analysis
Methyl Isobutyl[7]	EM1, EM13	10 mg/Nm^3	Every six months	CEN / TS 13649:2015	Laboratory analysis
Total Particulate Matter (Dust)	EM1, EM13, EM3A, EM3B, EMC3, EM15	<1 mg/Nm^3	Annually[9]	EN 13284-1: 2017	Laboratory analysis Laboratory analysis
	EM4A, EM4B, EM4C, EM4D, EM4E, EM8A, EM8B, EM8C, EM8D, EM10A EM10B, EM10C, EM10D, EM11, EM23		Every four years		
Gaseous Chlorides (HCl)	EM1, EM13	7.5 mg/Nm^3	Annually	EN 1911	Laboratory analysis
Gaseous Fluorides (HF)	EM1, EM13	<1 mg/Nm^3	Annually	ISO 15713:2006	Laboratory analysis
Sulphur Dioxide (SO_2)	EM1, EM13	<150 mg/Nm^3	Every six months	EN 14791: 2017	Laboratory analysis
Ammonia (NH_3)	EM1, EM13	10 mg/Nm^3	Every six months	EN 21877	Laboratory analysis
Carbon monoxide (CO)	EM1, EM13	No limits apply	Annually	EN 15058: 2017	In situ sampling and analysis

Note: Items marked in blue are new emissions that will be monitored

[6] In the instances where monitoring is required ever four years, this is subject to compliance with the emission limit values, otherwise, monitoring shall be carried out annually.
[7] Classified as a CMR 1A and 1B substance – i.e. VOCs carrying Hazardous Statements H340, H350, H350i, H360D or H360F[7]
[8] Classified as a CMR substance – i.e. VOCs carrying Hazardous Statements H341 or H351
[9] The mass flow of PM being emitted from emission point EM23, post HEPA filer, is 0.000003 kg/h. Calculations have been based on the worst-case scenario.

5. IMPACT ON THE ENVIRONMENT

C4.1 Environmental Effects

5.1. As described in this application, the potential significant emissions arising from the proposed variations are emissions to air.

5.2. The surrounding land uses are mapped in **Figure 12**. The predominant land uses in the surrounding area are industrial, predominantly manufacturing activities (including pharmaceutical production, detergent manufacture, production of climate control systems, and printing presses) and storage / warehousing.

5.3. The facility is also located around 12 m from the valley sides of Wied Żnuber, which forms part of a Special Protected Area (SPA), a Natura2000 Special Area of Conservation (SAC) – Site of International Importance, and an Area of Ecological Importance (AEI). Some cultivated agricultural land is also found along both sides of the Wied Żnuber valley.

5.4. There are no residential properties within 250 m of the site.

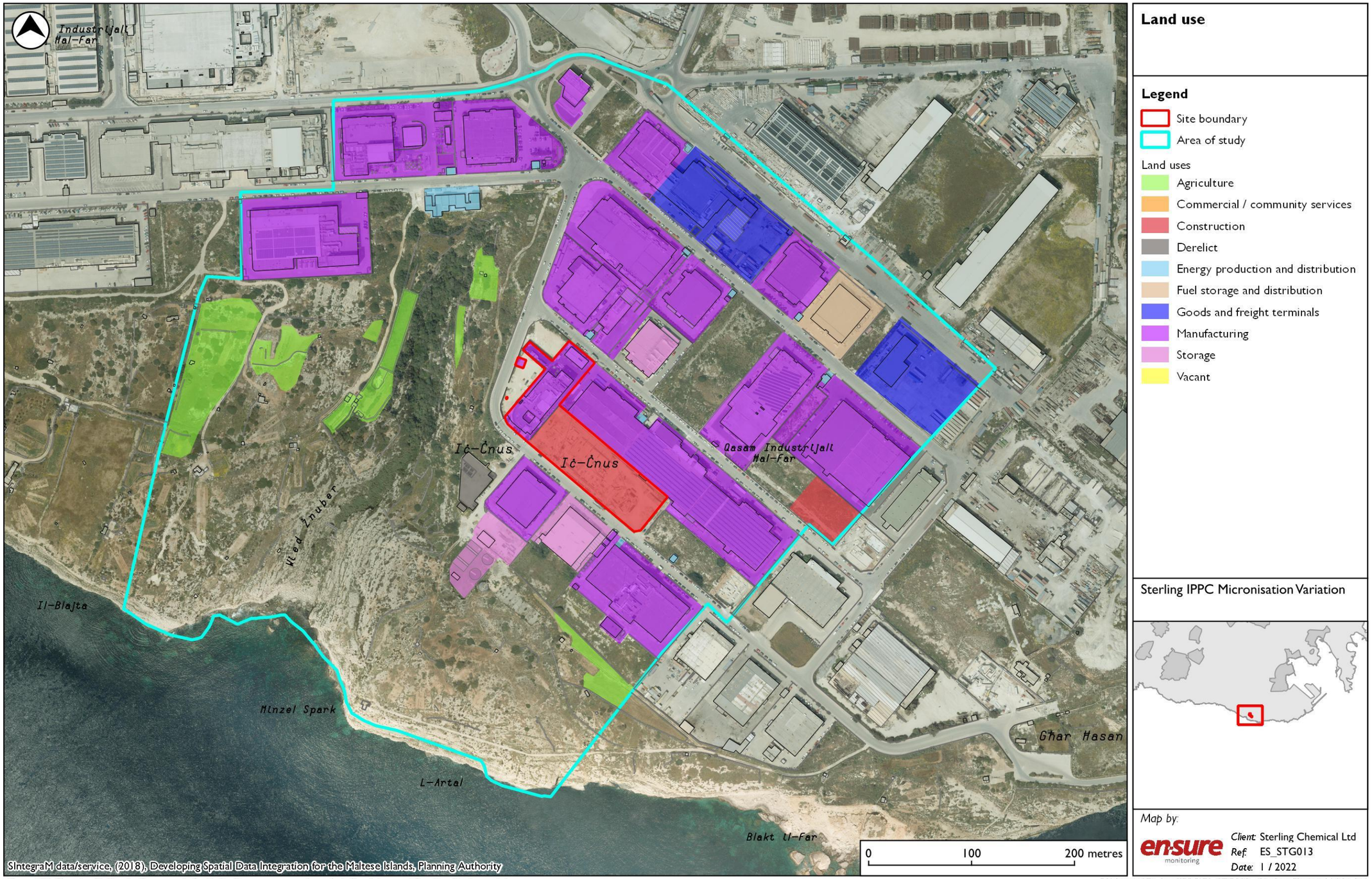
5.5. Emissions to air from the proposed variations are described in section C3.6 of this application. As mentioned, air emissions will be mitigated, including the use of cyclone and HEPA filters for the micronisation plant, and a carbon filter for the fire safety cabinet.

5.6. As noted in the IPPC application form (**Volume 1**), no emissions to land and groundwater are proposed. In the scenario that all mitigation measures proposed in this application has been installed, the Addendum to the Land and Groundwater Risk Assessment (**Volume 3**) identifies the risks to land and groundwater as ranging from none (where there is no pollutant linkage) to very low.

C4.2 Effects on Other Sites

5.7. Considering that the mitigation measures that will be in place, as well as the nature of the other industrial sites in the vicinity, it is considered that the proposed variations are unlikely to have a significant effect on other sites.

Figure 12: Surrounding land uses



SIntegraM data/service, (2018), Developing Spatial Data Integration for the Maltese Islands, Planning Authority

P:\Mapping\En-Sure\IPPC\ES_STG013 - Sterling Chemical Malta Ltd

Annex 1: Specifications of Safety Fire Cabinet

CSF232BMY11

SAFETY CABINET FOR STORAGE OF FLAMMABLE PRODUCTS WITH FIRE RESISTANCE **Type90** MINUTES CERTIFIED ACCORDING TO **EN14470-1 EN16121**

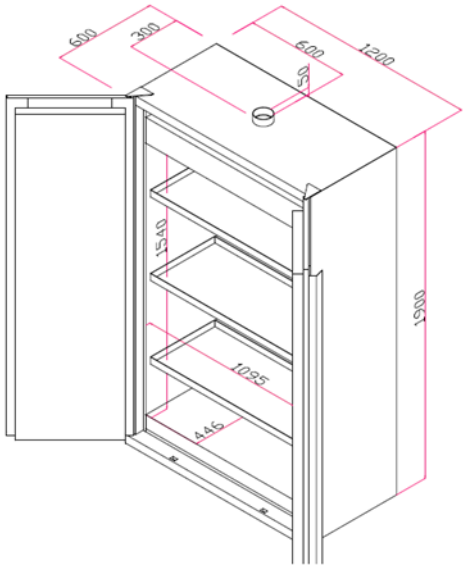
Construction

Completely built in steel sheet with thickness 1 / 1.5 mm at cold bent painted with anti-acid epoxy powders and subsequent passage in a thermal tunnel at 200 ° C.
Particular insulation formed by high density fiber panels (free of Fibroceramic) for high temperatures (800 ° C) and calcium sulphate panels.
Internal finishing panels in melamine laminate with high resistance to even aggressive vapors.
Certification according to the new EN 14470-1 standard.

Specifications

• Hydraulic closing of doors with a temperature above 47 ° C
• Lock with key and door lock
• Adjustable feet
• Automatic closing valves (70 ° C) for air inlet and outlet products, certified 90 minutes, placed on the top and bottom of the cabinet.
• Ejection hole diam. 100mm on the roof of the cabinet.
• Sparkproof hinge
• 3cm thermo-dilating gasket.
• 3 epoxy coated steel tray shelves (16L≃ capacity), certified 80Kg capacity.
Size: 1093x420x39h mm, adjustable in height with steel pins on a painted steel rack.
• Painted steel bottom tank with support grid.
Dimension: 1093x445x100h mm (45L≃ capacity).
• "Earth" terminal to prevent electrostatic charges.
• Weight: 390Kg
• Dimensions
External: 1200x600x1950h mm
Internal: 1095x446x1540h mm

Technical drawing



Image

CSF240BMY11

SAFETY CABINET FOR STORAGE OF FLAMMABLE PRODUCTS WITH FIRE RESISTANCE **Type90** MINUTES CERTIFIED ACCORDING TO **EN14470-1 EN16121**

Construction

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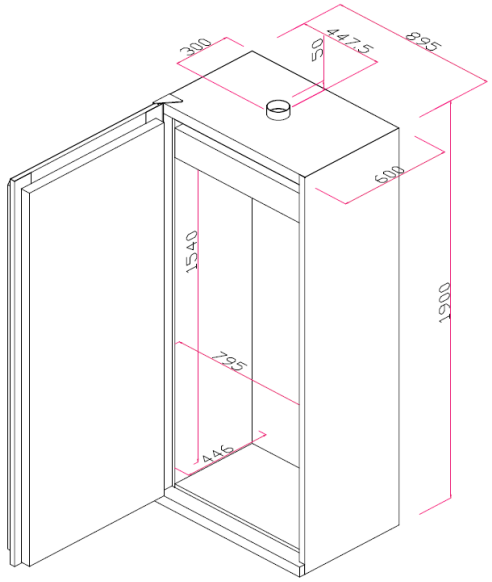
• Sparkproof hinge
• 3cm thermo-dilating gasket.
• 3 stainless steel tray shelves (16L≃ capacity), certified 80Kg capacity.
Size: 794x420x39h mm, adjustable in height with stainless steel pins on a painted steel rack.
• Painted steel bottom tank with support grid.
Dimension: 794x445x100h mm (45L≃ capacity).
• "Earth" terminal to prevent electrostatic charges.
• Weight: 275Kg
• Dimensions
External: 895x600x1950h mm
Internal: 796x446x1540h mm

Technical drawing



Image

Annex 2: Spill Standard Operating Procedure

Sterling Chemical Malta

OPERATIONAL INSTRUCTIONS TO FOLLOW IN CASE OF SPILL, RELEASE OR CONTACT WITH DANGEROUS SUBSTANCES

HISTORY UPDATES

Date	Revision	Paragraph	Description change
07/01/2019	00	-	First issue document
14/05/2019	01	-	New production department, new laboratory
16/06/2020	02	-	New offices, Micronization - Distillation room - Update of the company logo - Update of the names of the emergency coordinators and deputy emergency coordinator
05/05/2021	03	-	Change TCP name
07/12/2021	04	6	Inserting a new paragraph

Document code:	Written by:	Verified by:	Approved by:
WI_8.2.5	**HSE**	**TCP**	**Direction**
Page1of 7	Andrea Caneponi	Andrea Caneponi	Roberto Tumbiolo

1. Scope

Sterling Chemical Malta, with a view to a company policy aimed at guaranteeing the protection of health and safety in the workplace, has drawn up this procedure in order to define the operating procedures to be followed in the event of an accidental spill of dangerous substances.

2. Recipients

The recipients of this procedure are all operators of the Sterling Chemical Malta company involved in the handling and use of dangerous chemicals.

3. Operating mode in the case of small spills

In the event of a spillage of small quantities of dangerous chemical substances (in the order of a few liters maximum), follow the instructions below:

- Warn all those present and remove those who are not part of the emergency management;
- Identify the substance;
- Wear personal protective equipment, based on the type of substance spilled;
- Stop all drains into the sewer;
- Mark and prohibit the area subject to spill with red and white striped tape or with an indication of "non-accessibility";
- Ensure adequate ventilation of the workplace by opening all doors to favor natural ventilation and the dispersion of any dangerous vapors present in the air;
- Absorb the spill with the absorbent materials of the anti-spreading kit (sand, cloths, collection sausages, etc.); in the case of pharmacologically active powders, collect it manually using a suitable shovel and spatula and, if required by the safety data sheet, moisten the powders or use damp cloths;
- Collect the absorbent material and place it in approved waste collection containers;
- Clean the area completely by reclaiming it with abundant water and, if necessary, divert the drains into temporary storage tanks for subsequent classification;

- Restore all previously interrupted discharges;
- At the end of the operations proceed with the undressing and disposal of the disposable protective devices used;
- Report the spill, the causes and the manner of occurrence to the HSE Office for the management of any Non-Conformity / Accident.

4. Operating mode in the case of large spills

4.1. Emergency detection

Anyone who detects a spill of quantities of dangerous chemicals exceeding a few liters must follow the instructions below:

- Warn all those present and remove those who are not part of the emergency management;
- Notify the Emergency Coordinator and the Department Manager indicating the location of the spill and, if possible, the substance spilled.

4.2. Emergency Coordinator

The Emergency Coordinator, once warned of the emergency in progress, must:

- Go to the place of the emergency, identify the substance and, after wearing the appropriate PPE, check and assess, in collaboration with the Deputy Emergency Coordinator and the Department Manager, the causes of the spill and the resulting danger;
- Alert, through the Deputy Coordinator, the emergency team;
- If necessary, give the order to evacuate the affected building and adjacent buildings deemed at risk, directly or by appointing an emergency team member;
- Coordinate the emergency team in the operations necessary for the containment, elimination of the spill and subsequent reclamation of the area;
- Make arrangements for the immediate assistance of injured personnel;
- Coordinate the evacuation procedure and after making sure that everyone has gone out, through communication from the building evacuation managers, reach the collection point;
- Make or have the Front Desk Operators do the appeal of those present using the visitor register and the data provided by the attendance management software;
- Warn the personnel at the end of emergency meeting point.

Behavior during the night:

- During the night the emergency coordinator is the Shift Supervisor of the Production department.

4.3. Deputy Emergency Coordinator

The Deputy Emergency Coordinator, once warned of the emergency in progress, must

- Go to the place of the emergency, identify the substance and, after wearing the appropriate PPE, check and assess, in collaboration with the Coordinator and the Department Manager, the causes of the spill and the resulting danger;
- Make yourself available to the Emergency Coordinator by carrying out the tasks delegated to him;
- If requested by the Emergency Coordinator, gather the emergency team indicating the protective devices to be used;
- In case of evacuation, request the list of workers present and deliver it to the coordinator for the appeal;
- Replace the Emergency Coordinator in his absence.

4.4. Department Manager

The Head of the department involved in the spill, once warned of the emergency in progress, must:

- Go to the place of the emergency and, after wearing the appropriate PPE, check and assess, in collaboration with the Emergency Coordinator, the causes of the spill and the resulting danger;
- Remain at the disposal of the Emergency Coordinator to collaborate in the management of the emergency.

4.5. Emergency Team

Each emergency team member, once alerted by the Emergency Coordinator or his Deputy, must:

- Prepare for emergency management by following the instructions of the Coordinator or his Deputy;
- Prepare the necessary spill protection devices near the spill site;

- Stop all drains into the sewer if necessary;
- If the spill derives from the breakdown of a system, stop the leak by closing any valves / pumps located upstream and downstream of the section concerned;
- Mark and prohibit the area subject to spill with red and white striped tape or with an indication of "non-accessibility";
- Ensure adequate ventilation of the work areas by opening all doors to favor natural ventilation and the dispersion of any dangerous vapors present in the air and by activating all the suction / ventilation devices available near the spill site;
- Absorb the spill with the absorbent materials of the anti-spreading kit (sand, cloths, collection sausages). In the case of pharmacologically active powders, proceed to collect them manually using a suitable shovel and spatula and, if required by the safety data sheet, moisten the powders or use damp cloths;
- Collect the absorbent material and place it in approved waste collection containers;
- Clean the area completely by reclaiming it with abundant water and, if necessary, divert the drains into temporary storage tanks for subsequent classification;
- Restore all previously interrupted drains;
- At the end of the operations proceed with the undressing and disposal of the disposable protective devices used.

5. Operating mode in case of accidental contact or inhalation

In the event that accidental contact of an operator with dangerous chemicals occurs during the spill, it is necessary to proceed as follows.

5.1. Reporting the accident

<u>If the injured employee is able to act personally, he must:</u>

- Notify a department colleague immediately;
- Undress immediately by removing all contaminated clothing (in case of accidental contact);
- Wash the affected area using a shower, eye wash or eye kit available (in case of accidental contact);

- Immediately move away from the contaminated area and, if possible, move to fresh air (in case of inhalation).

The ward colleague must immediately notify the Emergency Coordinator and the Ward Manager before providing help to the injured person, indicating, if possible, the substance he came into contact with or inhaled.

If the injured employee is unable to act personally:

The person closest to the injured person must:

- Immediately contact the Emergency Coordinator and the Department Manager describing what happened and indicating, if possible, the substance with which he came into contact or inhaled;
- Equip yourself with adequate protection devices;
- Remove the injured person from the accident area, if possible, taking him to a safe area;
- Undress the injured person by eliminating all contaminated clothing (in case of accidental contact);
- Wash the affected area using a shower, eye wash or eye kit available (in case of accidental contact).

5.2. Coordinator and Deputy Coordinator of the Emergency

The Emergency Coordinator goes to the place where the accident occurred and evaluates in collaboration with the Deputy Coordinator whether to alert the First Aid staff of the Emergency Team. If necessary, call 112 as described below and assess with the emergency room the conditions of the injured person and the methods of assistance (ambulance intervention, accompanying the injured person to an emergency room or other medical facility):

SANITARY EMERGENCY **☎(0) 112**	Communicate the following message: " Here is the Sterling Chemical Malta Company, HF51 Hal-Far Industriale Estate Birzebbugia; your intervention is required for assistance to a person who has come into contact with / inhaled the substance ... .. I am...; the telephone number is 20908700 " " Here is the Sterling Chemical Malta Company, HF51 Hal-Far Industrial Estate Birzebbugia; your intervention is required for assistance to a person who came into contact / inhaled the substance ... .. I am ...; the phone number is 20908700 "

	DO NOT HANG UP until the interlocutor has repeated the address !!!

5.3. Deputy Emergency Coordinator

The Deputy Emergency Coordinator must:

- Obtain or request the safety data sheet of the substance concerned, checking in point 4 the first aid activities to be implemented. The safety data sheet must be kept and delivered to any medical center to which the injured person is accompanied;
- He goes to the place where the accident occurred and evaluates in collaboration with the Coordinator whether to alert the First Aid staff of the Emergency Team;
- Alert the First Aid officers of the Emergency Team.

5.4. Emergency Team

The First Aid staff of the Emergency Team implement the measures provided for in the safety data sheet of the substance.

For accidental contact or serious inhalation, the First Aid staff implement measures for the specific type of injury (safety position, airway control, breathing control, circulation control, artificial respiration, heart massage, etc. .) in accordance with the provisions of WI_8.2.12- “Operating instructions to be followed in the event of an accident or illness”.

6. Operating mode in case of anomalous spillage from plants in the utilities area

By utilities area we mean the technical areas in which the equipment serving the production lines are installed and since access to this area is limited, the operating instructions are addressed to users of the utilities area (known internally as "Utilities clean Malta1- Malta2).

6.1. Personnel authorized to enter the utilities area

The authorized staff who have the task of daily inspecting the equipment is characterized by the staff of the maintenance department and the operators of the production department.

The inspection aims to check the equipment; they must ensure that they are working properly, otherwise, they are obliged to report any problems encountered during the inspection.

6.2. Equipment present in the utilities area

Equipments present in the area:
- Compressed air system
- Vacuum pumps
- Abatement section for cold water condensation
- Automation system of production lines
-Production service pipes (compressed air system, vacuum, softened water)
-Glycol water cooling / heating system

6.3. Reporting of malfunctions and/or spills

The staff referred to in point 6.1 is required to report any malfunction to the maintenance / engineering department, involving the HSE department, with the opening of Near misses in the event of spills.

6.4. Actions of the HSE department

The HSE department must verify the nature of the problem, the substance spilled, the quantity and the methods of containment.
If it is verified that the spill has been contained by the channels or that it needs to be conveyed to the latter, the HSE department will promptly notify the competent authorities of the incident and assign the right EWC code for the correct disposal of the wastewater present in the collection tanks.

en-sure monitoring

Annex 3: Specifications of the RO Unit

ELGA VEOLIA

PURELAB® Chorus 2
Innovation and Flexibility

Lab Water Purification Solutions for your Research Needs

Type II+ Water

Liters per day: 1 - 120

>15 MΩ.cm

Key Features

- ✓ Tap to Type II
- ✓ Fully re-circulating
- ✓ Integrated filtration
- ✓ Multiple dispensing

Ideally suited for:

- Electrochemistry
- Cell cultures
- Spectrophotometry
- Feed to ultrapure water
- Media / buffer preparation
- General chemistry

Flexible. Configurable. Simple.

One complete solution for the laboratory

PURELAB Chorus 2+ (RO/EDI/UV) features our patented recirculating EDI technology: the only EDI system on the market that is able to fully recirculate to maintain >15 MΩ.cm.

The PURELAB Chorus 2+ provides additional bacteria and inorganic quality for sensitive analytical and life science applications above that of basic laboratory work. With its simple design and ease of use, water can be dispensed from the system or from a choice of additional Halo Dispensers.

Fully Recirculating EDI

ELGA's patented fully recirculated EDI provides a constant supply of high purity that guarantees a minimum of 15 MΩ.cm water at all times.

Ideal for High Volume Labs

A cost-effective solution for laboratories requiring higher output volumes thanks to the incorporated EDI technology.

Single System Solution

Perfect single system solution for analytical and life science applications requiring >15 MΩ.cm.

Reduced Maintenance Times

Quick and easy replacement of consumables to reduce maintenance times.

Space Saving Design

Designed to be modular and stackable to save space, whether wall-mounted or under the bench.

Data Capture

Data capture via USB for system performance validation and software updates.

Halo Dispense Solutions

The modular nature of PURELAB Chorus 2+ means that your dispense solutions sit independently from the unit. You can even have the Halo Dispenser installed in an adjacent laboratory. With Halo Dispenser you have the ultimate flexibility.

Halo Dispenser	Halo Advanced Dispenser	Halo Flexible Dispenser
Fixed	Fixed	Flexible
✓ Variable flow rate dispense ✓ Drop-by-drop control ✓ Locked dispense	✓ Purity monitoring to point-of-use ✓ Auto volume dispense	✓ Flexible handset

Clear Display

Prioritized information displayed at all times (system status, alarm) for absolute confidence as you dispense.

Multiple Positioning

Position the dispenser independent from the water purification system. Optimize your lab space.

Flexible Dispensing

- ✓ Variable flow
- ✓ Auto-volume dispense
- ✓ Hands free
- ✓ Locked dispense
- ✓ Hand-held dispensing

Reservoir Solutions

Our unique range of storage solutions are designed to maintain optimum purity of stored water and provide effective protection against airborne contaminants. They are designed to accommodate PURELAB Chorus water purification systems by maximizing the space in a single integral, compact unit or to sit independently to suit the layout of your laboratory.

Dispense Tap

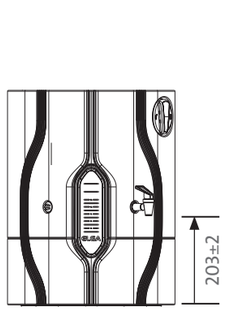
Positioned to minimize accidental operation or damage (choice of positions).

Advanced vent filtration

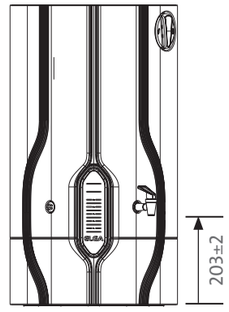
Prevents the ingress of airborne bacteria, particulates, organic vapours and CO_2.

Hygienic Overflow

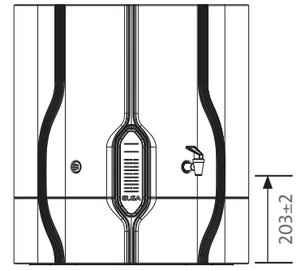
Hygienic overflow in the unlikely event of water system malfunction.



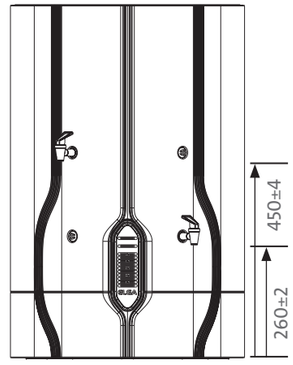
Capacity: 15 liters
Dimensions (mm):
470 (h) x 376 (w) x 340 (d)
Flow Rate: 6 l/min



Capacity: 30 liters
Dimensions (mm):
660 (h) x 376 (w) x 340 (d)
Flow Rate: 8 l/min

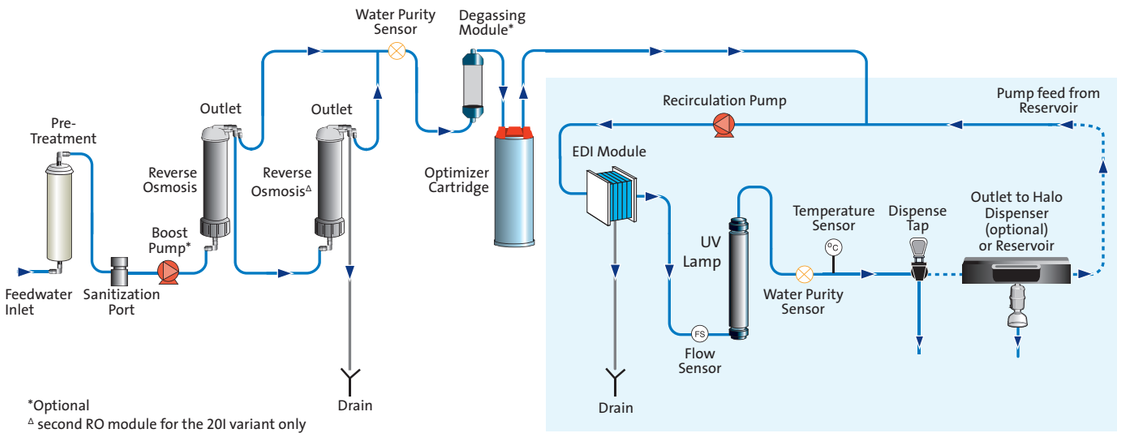


Capacity: 60 liters
Dimensions (mm):
570 (h) x 532 (w) x 522 (d)
Flow Rate: 10 l/min



Capacity: 100 liters
Dimensions (mm):
806 (h) x 532 (w) x 522 (d)
Flow Rate: 10 l/min

Process Flow PURELAB Chorus 2+ (RO/EDI/UV)



Specifications

TREATED WATER SPECIFICATIONS

APPLICATION	PURELAB Chorus 2+ (RO/EDI/UV)	
Nominal output at 15°C	10 l/hr*	20 l/hr*
Nominal daily output	220 l/day	440 l/day
Inorganics @25°C	1 to >15 MΩ.cm	
Organics (MW>200 Dalton)	>99% rejection	
Total organic carbon (TOC)	<30 ppb	
Bacteria	<0.1 CFU/ml◊	
pH	Effectively neutral	
Particles	>99% rejection	

* Standard conditions are 4 bar inlet pressure at 15°C, fed with potable water and a clean pre-treatment cartridge. Refer to flow tables outside these conditions. ◊ With POU filter fitted

FEEDWATER REQUIREMENT

Source	Potable mains water supply	
Fouling index (max)	<10	
Conductivity	<1400 µS/cm	
Free Chlorine	0.5 ppm max	
Heavy Metals (max)	0.05 ppm	
Silica	30 ppm	
Temperature	1-35°C	
Flowrate (maximum requirement)	100 l/hr (27 USG)	
Drain requirements	80 l/hr (21 USG)	
Feedwater pressure	4.0 bar (60 psi) min; 6 bar (90 psi) max* With boost pump: flooded suction (min) to 2.0 bar (30 psi) max	

*Fit LA652 Regulator where feedwater pressure exceeds specified limits

Dimensions	Height 679mm, Width 376mm, Depth 353mm	
Weight (with boost pump)	21 kg (46 lbs)	22 kg (49 lbs)
Weight	18 kg (40 lbs)	19kg (42 lbs)

Type II+ water

Liters per day: 1 - 100

>15 MΩ.cm

Key Features

- ✓ Tap-to-Type II
- ✓ Fully re-circulating
- ✓ Integrated filtration
- ✓ Multiple dispensing

Ideally suited for:

- Electrochemistry
- Spectrophotometry
- Feed to ultrapure water
- Media / buffer preparation
- General chemistry

Flexible. Configurable. Simple.

One complete solution for the laboratory

PURELAB Chorus 2+ (RO/DI/UV) provides tap to 15 MΩ.cm pure water for laboratories requiring up to 100 liters per day and is able to fully recirculate to maintain 15 MΩ.cm.

The PURELAB Chorus 2+ provides additional bacteria and inorganic quality for sensitive analytical and life science applications above that of basic laboratory work. With its simple design and ease of use, water can be dispensed from the system or from a choice of additional Halo Dispensers.

Fully Recirculating

In addition to simple composite vent filtration, the PURELAB Chorus 2+ is the only fully recirculating Type II+ pure water system on the market, maintaining consistent peak water purity at 15MΩ.cm.

Configuration

Ability to configure multiple systems to increase flow rate and save space through stackable solutions that can be wall mounted, on or under the bench.

Simplicity

Simple to install, operate and maintain, with a clear indication of water purity. It is also simple to replace consumables, reducing maintenance time.

Data Capture

Data capture via USB for system performance validation and software updates.

Dispense

Choose from three different Halo Dispense solutions to allow additional dispense points, even in adjacent labs.

Halo Dispense Solutions

The modular nature of PURELAB Chorus 2+ means that your dispense solutions sit independently from the unit. You can even have the Halo Dispenser installed in an adjacent laboratory. With Halo Dispenser you have the ultimate flexibility.

Clear Display

Prioritized information displayed at all times (system status, alarm) for absolute confidence as you dispense.

Multiple Positioning

Position the dispenser independent from the water purification system. Optimize your lab space.

Flexible Dispensing

- ✓ Variable flow
- ✓ Auto-volume dispense
- ✓ Hands free
- ✓ Locked dispense
- ✓ Hand-held dispensing

Reservoir Solutions

Our unique range of storage solutions are designed to maintain optimum purity of stored water and provide effective protection against airborne contaminants. They are designed to accommodate PURELAB Chorus water purification systems by maximizing the space in a single integral, compact unit or to sit independently to suit the layout of your laboratory.

Dispense Tap

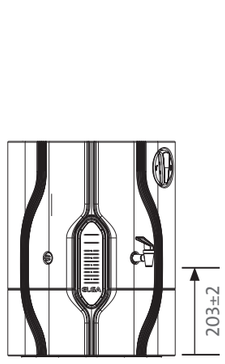
Positioned to minimize accidental operation or damage (choice of positions).

Advanced vent filtration

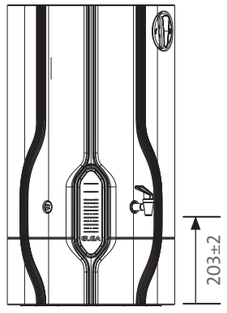
Prevents the ingress of airborne bacteria, particulates, organic vapours and CO_2.

Hygienic Overflow

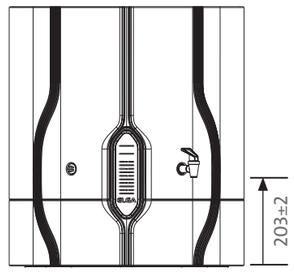
Hygienic overflow in the unlikely event of water system malfunction.



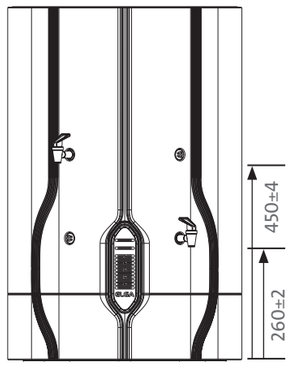
Capacity: 15 liters
Dimensions (mm):
470 (h) x 376 (w) x 340 (d)
Flow Rate: 6 l/min



Capacity: 30 liters
Dimensions (mm):
660 (h) x 376 (w) x 340 (d)
Flow Rate: 8 l/min

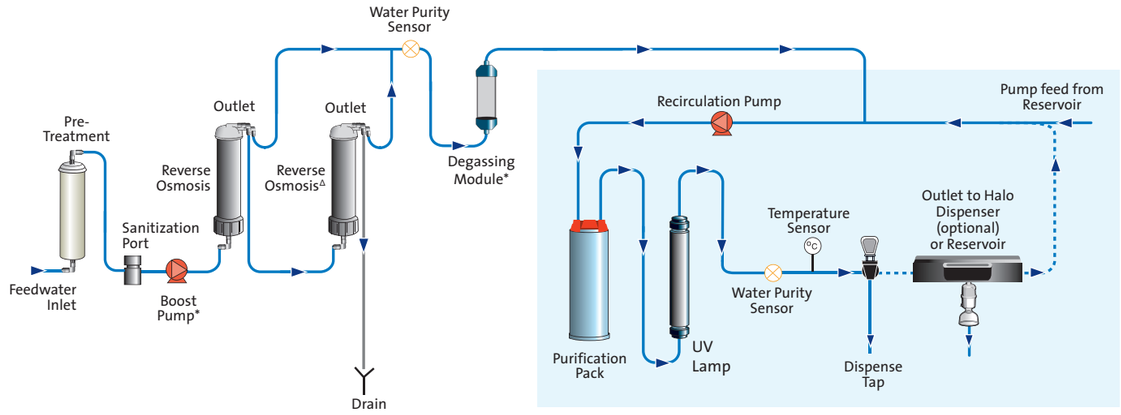


Capacity: 60 liters
Dimensions (mm):
570 (h) x 532 (w) x 522 (d)
Flow Rate: 10 l/min



Capacity: 100 liters
Dimensions (mm):
806 (h) x 532 (w) x 522 (d)
Flow Rate: 10 l/min

Process Flow PURELAB Chorus 2+ (RO/DI/UV)



*Optional
△ second RO module for the 20l variant only

Specifications

APPLICATION	PURELAB Chorus 2+ (RO/DI/UV)	
TREATED WATER SPECIFICATIONS		
Nominal output at 15°C	10 l/hr*	20 l/hr*
Nominal daily output	240 l/day	480 l/day
Inorganics @25°C	1 to >15 MΩ.cm	
Organics (MW>200 Dalton)	>99% rejection	
Total organic carbon (TOC)	<30 ppb	
Bacteria	<0.1 CFU/ml◊	
pH	Effectively neutral	
Particles	>99% rejection	
Purification pack capacity	Liters to 15 MΩ.cm = 74,700/(µS/cm + (2.3 x ppm CO_2))	
* Standard conditions are 4 bar inlet pressure at 15°C, fed with potable water and a clean pre-treatment cartridge. Refer to flow tables outside these conditions. ◊ With POU filter fitted		
FEEDWATER REQUIREMENT		
Source	Potable mains water supply	
Fouling index (max)	<10	
Conductivity	<2000 µS/cm	
Free Chlorine	0.5 ppm max	
Heavy Metals (max)	0.05 ppm	
Silica	30 ppm	
Temperature	1-35°C	
Flowrate (maximum requirement)	100 l/hr (27 USG)	
Drain requirements	80 l/hr (21 USG)	
Feedwater pressure	4.0 bar (60 psi) min; 6 bar (90 psi) max*	
	With boost pump: flooded suction (min) to 2.0 bar (30 psi) max	
*Fit LA652 Regulator where feedwater pressure exceeds specified limits		
Dimensions	Height 679mm, Width 376mm, Depth 353mm	
Weight (with boost pump)	17 kg (37 lbs)	18 kg (40 lbs)
Weight	15 kg (33 lbs)	16kg (35 lbs)

PURELAB Chorus 2 (RO/DI)

Type II

Liters per day: 10 - 480

10 MΩ.cm

Key Features

- ✓ Easy configurability
- ✓ Modular

Ideally suited for:

- Stills Replacement
- Buffer Preparation
- pH solution Preparation
- Washing / Rinsing
- Autoclaves
- General Chemistry
- Hydroponics
- Steam Generators
- Sterilizer Feed
- Feed to Type I polishers

Modular. Flexible. Reliable.

Reliable delivery of Type II water purity

When Type II water is all you need, then PURELAB Chorus 2 (RO/DI) is the reliable solution with the flexibility to suit your requirements.

Range of storage reservoirs designed to maintain optimum purity of stored purified water in a choice of 15, 30, 60 and 100 liter capacities.

Model shown is PURELAB Chorus 2 with 15l reservoir

Deionization

The Reverse Osmosis feed contains optimized resin mixes to maximize consumables capacity.

Simplicity

Simple to install, operate and maintain with a clear indication of water purity.

Economical

Optional CO_2 removal from the purified water (post RO) increasing the life of downstream consumables.

Option to reduce water consumption for low hardness feed waters.

Modular

Multiple PURELAB Chorus 2 units can feed into one reservoir and systems can be expanded post-installation. As such, the cost of future upgrades is minimized. Duplex systems also guarantee maximum uptime.

The LabWater Specialists

ELGA is an integral part of Veolia, the global leader in optimized resource management. Veolia has a worldwide team of over 200,000 people and is renowned for its capabilities in providing water, waste and energy management solutions that contribute to the sustainable development of communities and industries.

The ELGA team focuses exclusively on water and its purification. It continually contributes to the unique technical and scientific applications and expertise developed for over 75 years. We are experienced in meeting the challenges that arise during the development, installation and servicing of single point-of-use water purification systems as well as large projects involving consultation with architects, consultants and clients.

Commitment to Sustainability

The ELGA products are designed to have the lowest possible impact on the environment at all stages: manufacture, in service and at end of life.

We can calculate the carbon value of all our products throughout their lifetime and we make this information available to our customers and partners.

Visit: www.elgalabwater.com/sc for more details.

Contact us:

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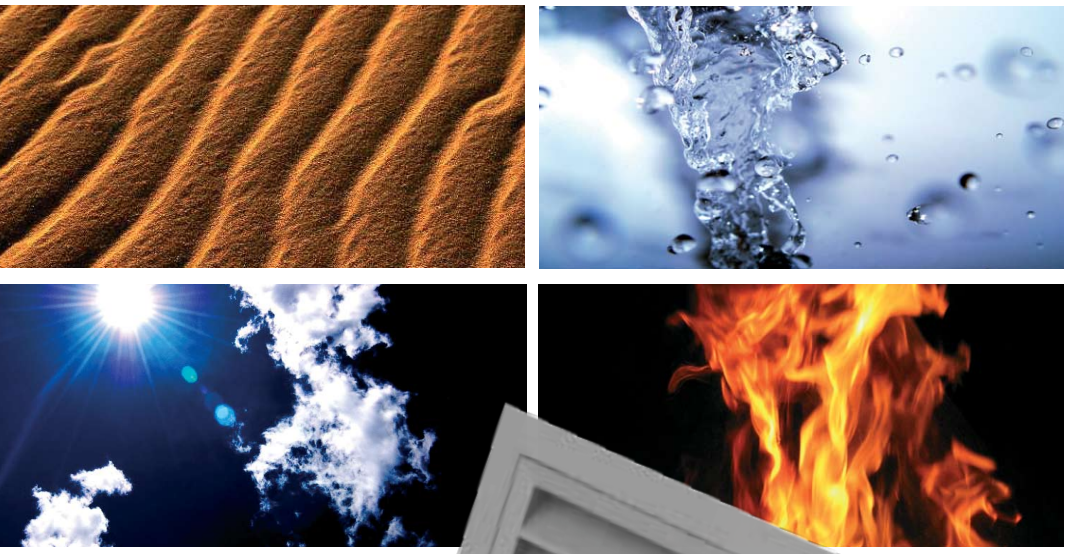
High Wycombe, Buckinghamshire HP11 1JU
+44 (0) 1628 897 000
sales.watertech@veolia.com
www.veoliawatertechnologies.co.uk

Annex 4: Specifications of the Fabric Filter

tecno-ventil
components for air-conditioning systems

1-7.0-04.00-E-02/07



AFA/M - Return air grilles with inclined fins and filter

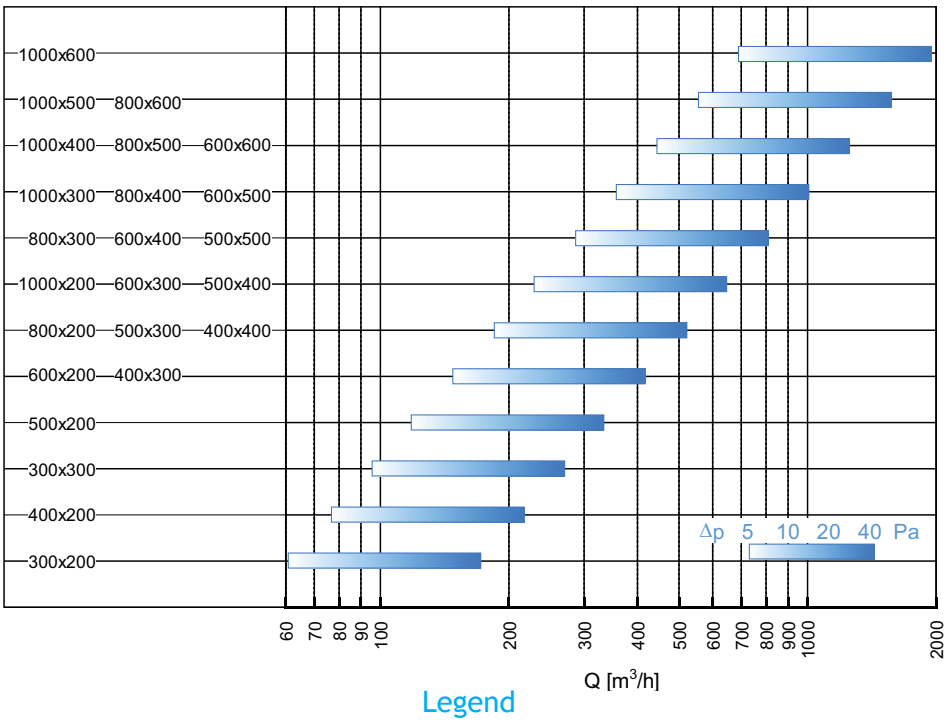
AFA/M Return air grilles with inclined fins and filter

Versions

- *AFA/M (alluminio estruso)*

The AFA/M series of return air grilles with fixed horizontally inclined fins with a pitch of 25 mm complete with filtering unit and “push-push” closing system have been designed to be installed in the interior of buildings for the return or the circulation of air, for small or medium airflow rates. The special shape of the fins also allows their use externally for the collection of fresh air, ventilation or the expulsion of stale air. The opening/closing click system is easy and compact to use by pushing the central part of the grille, which opens around the knuckle joints while the external counter frame hold steady. The AFA/M occurs without outstanding knobs and the strength of the system allows also a ceiling installation without risks of accidental release.

Quick reference selection table

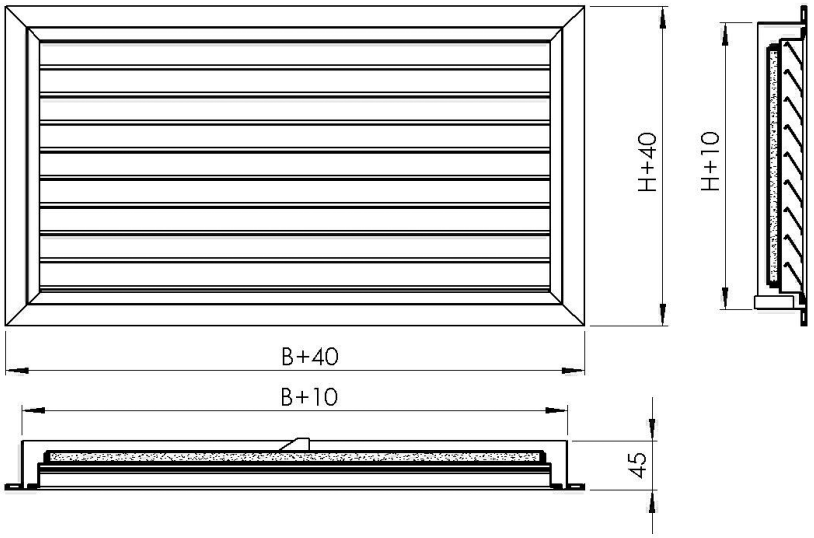


Legend

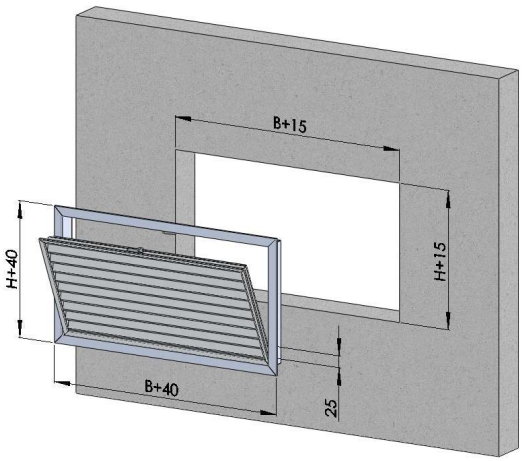
Q [m³/h] o [l/s]	return air flow rate
BxH [mm]	nominal dimensions of the grille
Δp [Pa]	pressure loss

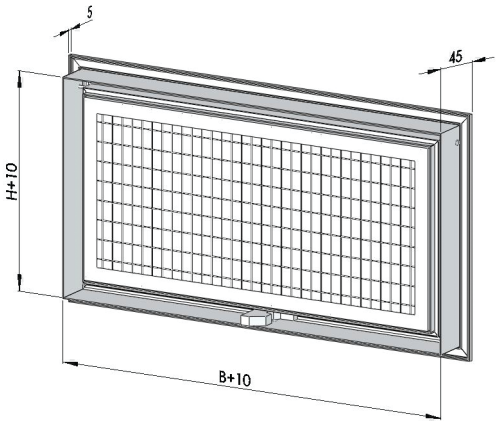
Dimensions

Section Dimensions



3D Dimensions





Construction

Standard construction of, the AFA/M series of grilles involves the use of natural anodised extruded aluminium.

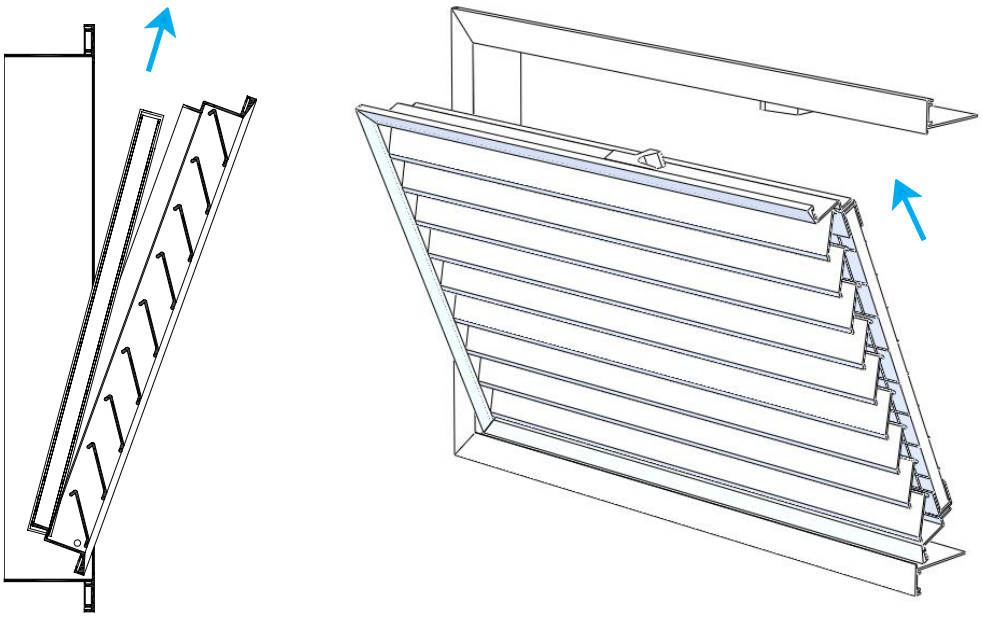
Standard dimensions:

- For B from a minimum of 300 mm to a maximum of 1000 mm in increments of 50 mm
- For H from a minimum of 200 mm to a maximum of 600 mm in increments of 50 mm

For non-standard sizes please contact our technical office

VER. 18/02/10

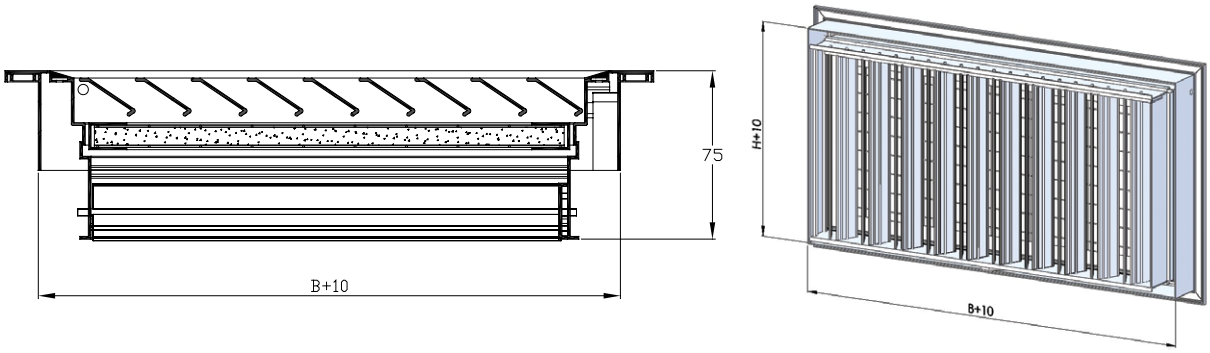
Extraction of filter and opening



The opening/closing click system push-push type lets to open easily and quickly the central part of the grille, which rotates around the knuckle joints while the external counter frame hold steady, allowing an easier and compact extraction of the filter for the maintenance, the lot without knobs or other outstanding or visible parts.

Accessories

SC - opposed blade regulating damper



AFA/M with a counter-moving damper and fins parallel to the short side, made entirely of aluminium, operable by means of a screw-driver from the front part of the grille; on request it is possible to install either a proportional or an on/off servomotor.

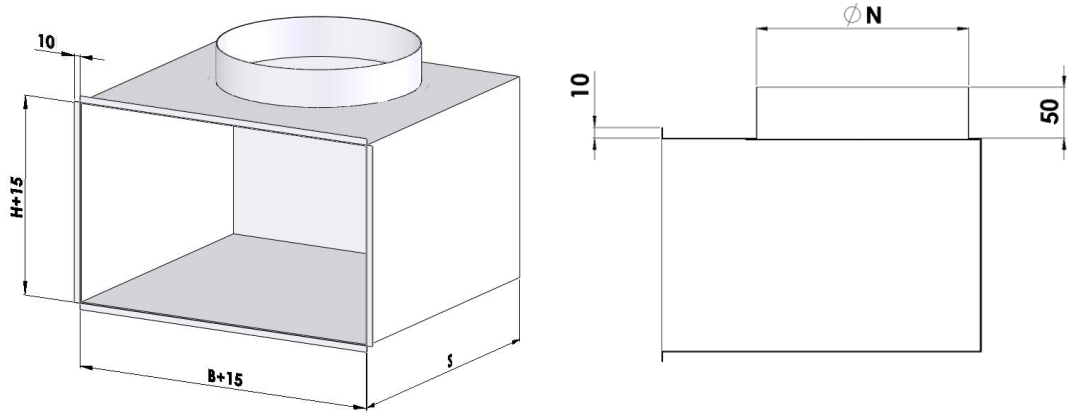
Counterframes

CTC: counterframe for fitting onto ducts, made of Sendzimir zinc plated steel, (for the dimensions please see the “Fixing systems” section).

CTM: counterframe for fitting onto walls, made of Sendzimir zinc plated steel, (for the dimensions please see the “Fixing systems” section).

N.B. The sizes of the standard counterframes (CTC and CTM) must be (B+15)x(H+15)

PS1-PSI1 plenum boxes

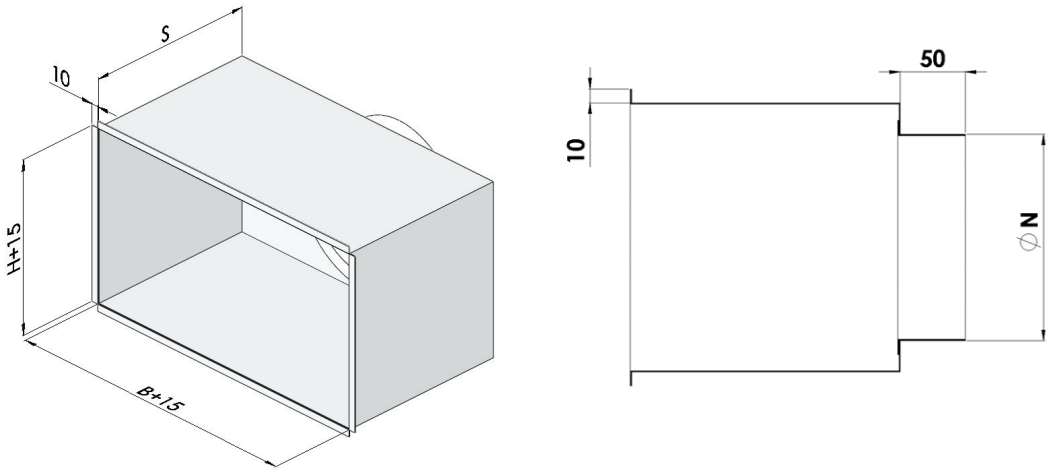


PS1-Standard plenum box made of Sendzimir zinc plated steel with side connection.

PSI1-Plenum box insulated with class 1 certified material (Ministerial Decree 26-6-1984 Article 8) made of Sendzimir zinc plated steel with side connection.

N.B. The sizes of the standard plenum boxes PS1 and PSI1 for the grilles with filter holders (AFA/M, BMQA/M, ...) must be (B+15)x(H+15)

PS2-PSI2 plenum boxes



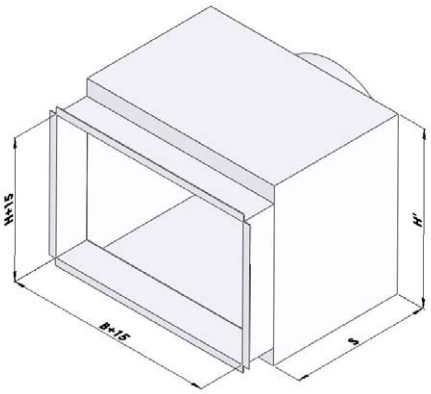
PS2-Standard plenum box made of Sendzimir zinc plated steel with rear connection.

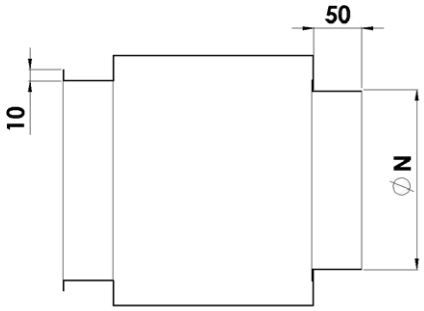
PSI2-Plenum box insulated with class 1 certified material (Ministerial Decree 26-6-1984 Article 8) made of Sendzimir zinc plated steel with rear connection.

N.B. The sizes of the standard plenum boxes PS2 and PSI2 for the grilles with filter holders (AFA/M, BMQA/M, ...) must be (B+15)x(H+15)

VER. 18/02/10

PS2M-PSI2M plenum boxes





PS2M-Standard plenum box made of Sendzimir zinc plated steel with rear connection.

PSI2M-Plenum box insulated with class 1 certified material (Ministerial Decree 26-6-1984 Article 8) made of Sendzimir zinc plated steel with rear connection.

N.B. The sizes of the standard plenum boxes PS2M and PSI2M for the grilles with filter holders (AFA/M, BMQA/M, ...) must be (B+15)x(H+15)

Plenum box dimensions

PS1 - PS2M

ØN	100	160	200	250	315	350	400
S	200	260	300	350	415	450	500
H'	150	210	250	300	365	400	450
BxH	200x100	300x100	500x100	800x100	800x150	900x200	900x300
	250x100	350x100	600x100	900x100	900x150	1000x200	1000x300
		400x100	300x150	1000x100	1000x150	500x300	800x400
		200x150	350x150	500x150	600x200	600x300	
		250x150	400x150	600x150	700x200	700x300	
		200x200	250x200	700x150	800x200	800x300	
			300x200	400x200	400x300	500x400	
				500x200		600x400	

PS2

ØN	100	125	160	250	No. connections
S	200	200	200	200	
BXH	200x100	300x150	250x200	400x300	1
	250x100	350x150	300x200	500x300	
		400x150	400x200		
	300x100	500x150	500x200		2
	350x100	600x150	600x200		
	400x100		700x200		
	500x100		800x200		
	600x100				
	700x100	700x150			3
	800x100	800x150			
	900x100				
	1000x100				
		900x150			4
		1000x150			

Technical data

Effective outlet area

The effective outlet area is a notional area that, once the velocity of the air is known, makes it possible to arrive at the rate of flow that is actually passing through the grille. The measurement is carried out with an instrument that measures the velocity of the air at various points between the fins. The formula that links the various parameters is as follows:

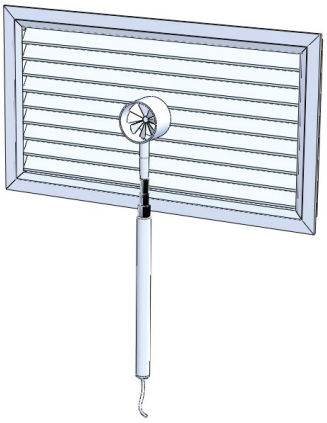
$$Q = v_k \times S \times 3600$$

where

Q = supply air flow rate [m^3/h]

V_k = velocity relating to S [m/s]

S = effective outlet area [m^2]



H/B	300	400	500	600	800	1000
200	• 0,035	• 0,048	• 0,06	• 0,073	0,098	0,123
300	0,055	• 0,074	• 0,094	• 0,114	• 0,153	• 0,192
400	0,074	0,101	• 0,128	• 0,154	0,207	0,260
500	0,094	0,128	• 0,161	• 0,195	0,262	0,329
600	0,114	0,154	0,195	0,235	0,316	0,397

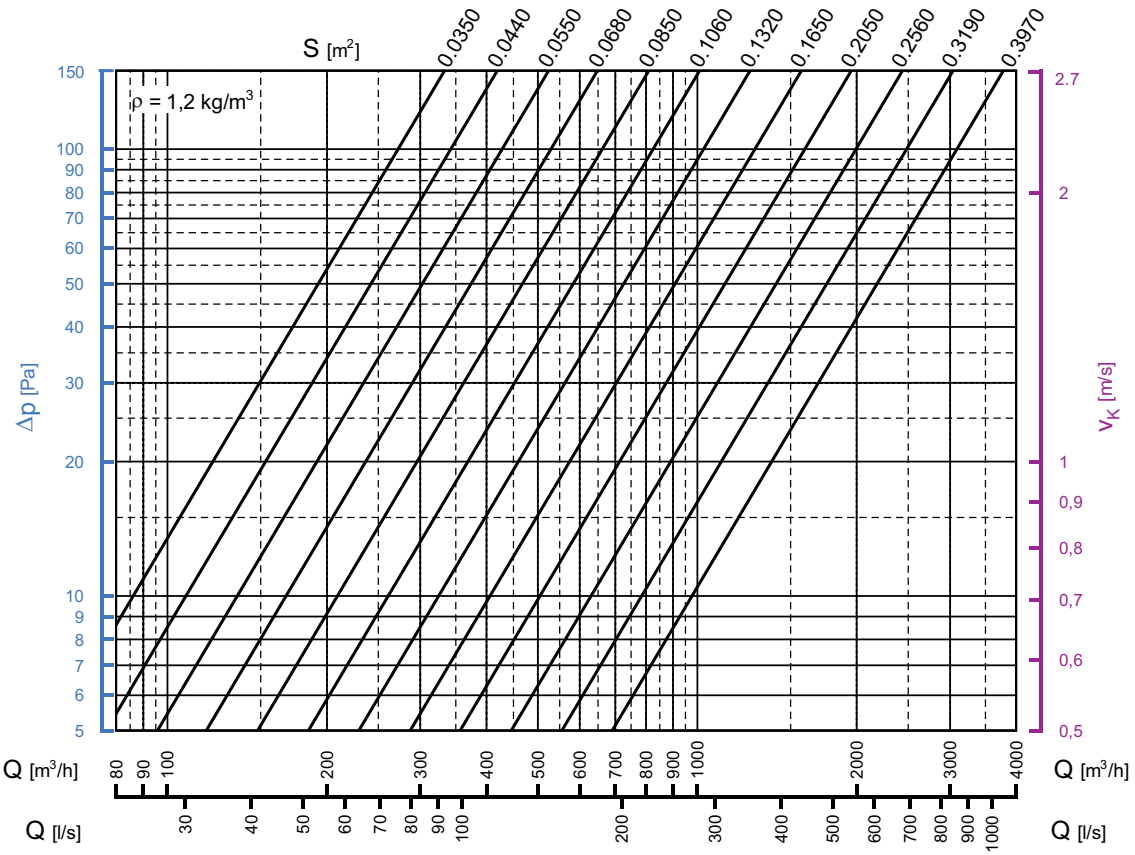
• Standard sizes available from stock

Weights (kg)

H/B	300	400	500	600	800	1000
200	0,8	1,0	1,2	1,3	1,7	2,0
300	1,0	1,3	1,5	1,7	2,1	2,6
400	1,3	1,5	1,8	2	2,6	3,1
500	1,5	1,8	2,1	2,4	3,0	3,6
600	1,7	2,0	2,4	2,7	3,4	4,1

VER. 18/02/10

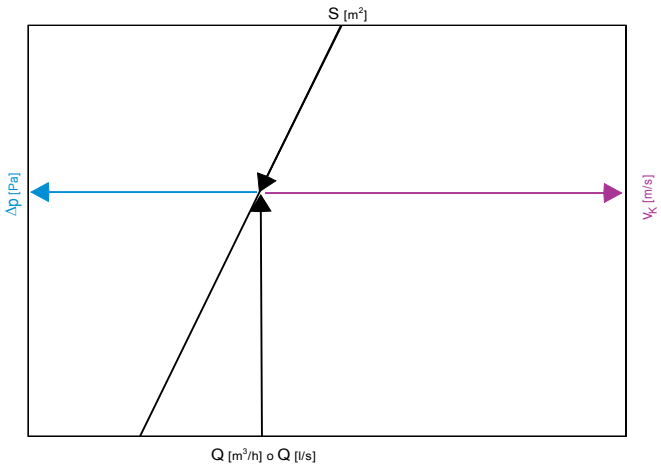
Pressure loss



Legend

Q [m³/h]	supply air flow rate
S [m²]	effective outlet area
v_k [m/s]	velocity relating to the effective outlet area S
Δp [Pa]	total pressure loss

Graphical operating chart

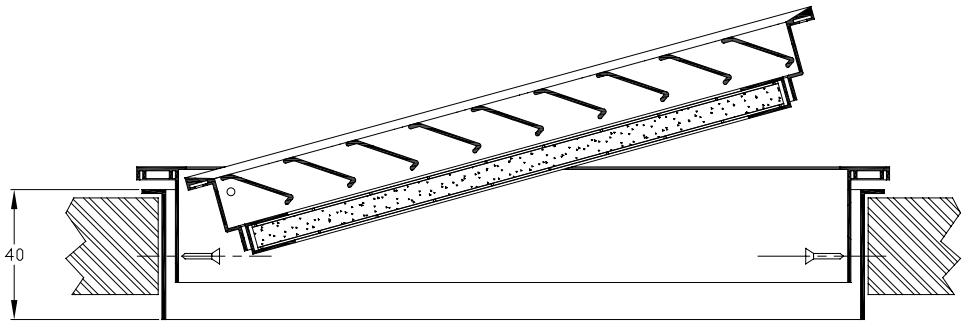


Fixing systems

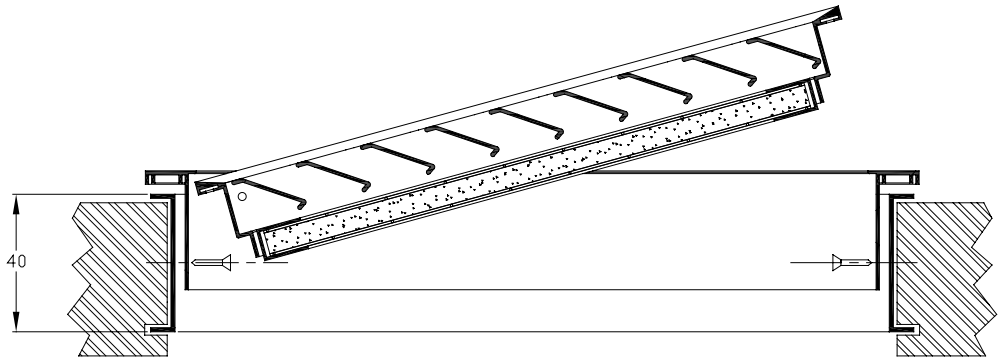
Type of fixing

Fixing of AFA/M grilles is carried out by means of screws into the intern counterframe.

CTC- Fixing with screws



CTM- Fixing with screws



Installazione

Installation on rectangular ducting:

1-Make a hole in the ducting size (B+15) (H+15)

2-Insert into the hole in the ducting a counterframe of the same size as the hole and secure it with screws or rivets

3-Secure the grille with screws

Wall installation with a plenum box:

1-Make a hole in the wall size (B+15) (H+15)

2-Embed the plenum box flush with the wall

3-Secure the grille with screws

tecno-ventil
componenti per impianti di climatizzazione

tecno-ventil s.p.a.
Via Parma, 2
26016 Spino d'Adda (CR)
Tel. +39 0373.980456
Fax +39 0373.980681
www.tecnoventil.com
info@tecnoventil.com

Annex 5: HEPA Filter Specification Sheets

EMCEL Filters Limited
Blatchford Road | Horsham | West Sussex | United Kingdom | RH13 5RA
Tel: (01403) 253215 | Fax: (01403) 259881
Email: info@emcelfilters.co.uk | Web: www.emcelfilters.co.uk

CERTIFICATE OF CONFORMITY

Batch No. 47235.01

Customer:	Nuova Guseo s.r.l.
Order No:	1372
Drawing No:	E2234-40 Gr135 Issue 1
Description:	Cylindrical Leaf Seal HEPA Filter
Customer Ref:	CFE-H14-197D0300L-/RIF.CO.L59/CE (2 off) CFE-H14-197D0300L-/RIF.CO.L70/CE (3 off)
Serial No:	47235-01-01 to 47235-01-05
Quantity:	5 off

have been tested and/or inspected in accordance with the conditions and requirements of the contract or Purchase Order and unless otherwise noted conform in all respects to the specification(s) and drawing(s) relevant thereto.

Signed:

Print Name: Mr J D Robson

Authorised by:

Print Name: Mr R Clark

Date: 09 February 2018

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CERTIFICATE OF CONFORMITY

Batch No. 47235.03

Customer:	Nuova Guseo s.r.l.
Order No:	1372
Drawing No:	E2234-40 Gr134 Issue 1
Description:	Cylindrical Leaf Seal HEPA Filter
Customer Ref:	CFE-H14-236D0375L-/RIF.CO.L59/CE (1 off) CFE-H14-236D0375L-/RIF.CO.L70/CE (1 off)
Serial No:	47235-03-01 to 47235-03-02
Quantity:	2 off

have been tested and/or inspected in accordance with the conditions and requirements of the contract or Purchase Order and unless otherwise noted conform in all respects to the specification(s) and drawing(s) relevant thereto.

Signed:

Print Name: Mr J D Robson

Authorised by:

Print Name: Mr R Clark

Date: 09 February 2018

EMCEL Filters Limited
Blatchford Road | Horsham | West Sussex | United Kingdom | RH13 5RA
Tel: (01403) 253215 | Fax: (01403) 259881
Email: info@emcelfilters.co.uk | Web: www.emcelfilters.co.uk

CERTIFICATE OF TEST

Customer: Nuova Guseo s.r.l.

This is to certify that the item manufactured to your

Order No: 1372

Drawing No: E2234-40 Gr135 Issue 1

Product Description: Cylindrical Leaf Seal HEPA Filter

EMCEL Batch No: 47235.01

Serial No: 47235-01-02

Has been volumetrically tested to BS EN ISO 14644 Part 3 using an aerosol of Ondina oil

Aerosol Airflow Test Rate	74 cfm
Type Of Aerosol	Thermally generated poly dispersed ondina el oil
Challenge	32 µg/l
Penetration	0.0031 %
Efficiency	99.9969 %
Tested By	A. Macias
Date of Test	08/02/18
Instrument No	Smoke Generator P636, Photometer P685
Required Efficiency	99.995 %
Pass/Fail	PASS

Signed

Mr J D Robson
Quality Assurance Manager

Original to customer, copy to be retained by EMCEL Filters Limited. Details of results will be filed by batch number and held for 3 years.

EMCEL Filters Limited is proud to be affiliated with:

EMCEL Filters Limited
Blatchford Road | Horsham | West Sussex | United Kingdom | RH13 5RA
Tel: (01403) 253215 | Fax: (01403) 259881
Email: info@emcelfilters.co.uk | Web: www.emcelfilters.co.uk

CERTIFICATE OF TEST

Customer: Nuova Guseo s.r.l.

This is to certify that the item manufactured to your

Order No: 1372

Drawing No: E2234-40 Gr135 Issue 1

Product Description: Cylindrical Leaf Seal HEPA Filter

EMCEL Batch No: 47235.01

Serial No: 47235-01-01

Has been volumetrically tested to BS EN ISO 14644 Part 3 using an aerosol of Ondina oil

Aerosol Airflow Test Rate	74 cfm
Type Of Aerosol	Thermally generated poly dispersed ondina el oil
Challenge	34 µg/l
Penetration	0.0022 %
Efficiency	99.9978 %
Tested By	A. Macias
Date of Test	08/02/18
Instrument No	Smoke Generator P636, Photometer P685
Required Efficiency	99.995 %
Pass/Fail	PASS

Signed

Mr J D Robson
Quality Assurance Manager

Original to customer, copy to be retained by EMCEL Filters Limited. Details of results will be filed by batch number and held for 3 years.

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CERTIFICATE OF TEST

Customer: Nuova Guseo s.r.l.

This is to certify that the item manufactured to your

Order No: 1372

Drawing No: E2234-40 Gr134 Issue 1

Product Description: Cylindrical Leaf Seal HEPA Filter

EMCEL Batch No: 47235.03

Serial No: 47235-03-01

Has been volumetrically tested to BS EN ISO 14644 Part 3 using an aerosol of Ondina oil

Aerosol Airflow Test Rate	160 cfm
Type Of Aerosol	Thermally generated poly dispersed ondina el oil
Challenge	46 µg/l
Penetration	0.0037 %
Efficiency	99.9963 %
Tested By	A. Macias
Date of Test	08/02/18
Instrument No	Smoke Generator P636, Photometer P685
Required Efficiency	99.995 %
Pass/Fail	PASS

Signed

Mr J D Robson
Quality Assurance Manager

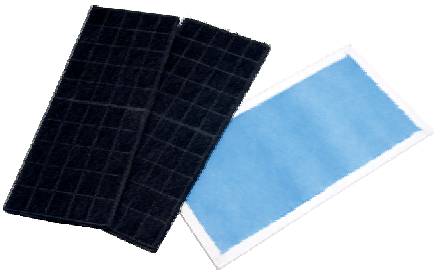
Original to customer, copy to be retained by EMCEL Filters Limited. Details of results will be filed by batch number and held for 3 years.

EMCEL Filters Limited is proud to be affiliated with:

Annex 6: Carbon Filter Specification Sheet

PROJECTCARBO

Indice



PROJECTCARBO

La manipolazione di sostanze tossico-nocive implica la necessità di assicurare il contenimento di eventuali emissioni in ambiente, sia nel laboratorio che in atmosfera. Le normative GLP (Good Laboratory Practice) ed in generale quelle di tutela del personale nei luoghi di lavoro, pongono dei precisi limiti all'emissione di sostanze inquinanti.

I cassonetti PROJECTCARBO, grazie all'impiego di filtri a carbone attivo, consentono di purificare gli ambienti di lavoro da acidi, solventi ed altre sostanze nocive alla salute ed alla sicurezza dell'uomo.

Il loro utilizzo permette di proteggere sia il personale nei luoghi di lavoro che gli ambienti, ottenendo emissioni fumi pulite, con riferimento alle varie normative di sicurezza ambientale.

I cassonetti PROJECTCARBO, realizzati interamente in PVC, sono completi di un pre-filtro che trattiene la polvere ed allunga la vita delle lastre. Questa precauzione garantisce un notevole risparmio economico in quanto evita il precoce intasamento dei pori del carbone attivo. I cassonetti possono essere installati sia in posizione orizzontale che in posizione verticale, all'interno o all'esterno degli ambienti di lavoro.

La particolare disposizione delle lastre di carbone migliora l'efficienza dei filtri e riduce le perdite di carico totali. La possibilità di sovrapporre o affiancare più cassonetti permette di aumentare le portate migliorando il rendimento e quindi la quantità di sostanze tossiche assorbite.

La sostituzione delle lastre di carbone è semplice e non richiede particolari D.P.I. (Dispositivi di Protezione Individuale), la semplicità è dovuta anche al particolare rivestimento delle lastre che trattiene la micropolvere rilasciata dai granuli di carbone.

Esempio di installazione di un cassonetto PROJECTCARBO con elettroaspiratore

The manipulation of toxic and harmful substances implies the need to ensure containment of any emissions into the environment, both in the laboratory and in the atmosphere. GPL regulations (Good Laboratory Practice) and general rules of workers' protection give precise limits to the polluting emissions.

PROJECTCARBO filter boxes, through the use of activated carbon filters, help purify the workplace from: acids, solvents and other substances harmful to health and human safety. Their use allows to protect both the workers and the environment, getting clean smoke emissions, with reference to various standards of environmental safety.

PROJECTCARBO filter boxes are made entirely of PVC and they are equipped with a pre-filter that traps dust and extends the life of the plates. This precaution ensures significant cost savings because it avoids the premature pores clogging of the activated carbon.

The filter boxes can be installed both horizontally and vertically, inside or outside the workplace. The special charcoal plates arrangement improves the efficiency of the filters and reduces the total pressure loss.

The possibility of overlapping or putting side by side multiple filter boxes allows to increase the flow, improving the efficiency and therefore the quantity of absorbed toxic substances. The charcoal plates replacement is simple and does not require particular DPI (personal protective equipment): the simplicity is due also to the particular coating which restrains the micro-powder released from the granules of coal.

Esempio di installazione di un cassonetto PROJECTCARBO con elettroaspiratore

Carboni attivi

Activated Charcoal

Granuli carbone attivo

Lastre carbone attivo

La filtrazione dell'aria mediante carboni attivati è un processo di depurazione largamente utilizzato in quasi tutti i settori produttivi.

Il processo di adsorbimento permette di trattenere le sostanze inquinanti sulla superficie dEi granuli di carbone impregnati di specifiche sostanze chimiche.

La specifica sostanza agisce come un solvente ed elimina le sostanze inquinanti dall'aria filtrata.

PROJECT PLAST vanta un'esperienza decennale nella scelta e nel dimensionamento delle batterie filtranti a carbone attivo.

E' infatti fondamentale installare il numero di batterie filtranti in relazione alla portata d'aria ed anche al tipo di sostanza inquinante che si desidera eliminare.

The air filtration through activated charcoal is a purification process widely used in almost all industries.

The adsorption process allows to retain any pollutants on the charcoal granules impregnated with specific chemicals.

The specific substance acts as a solvent and eliminates the pollutants from the filtered air.

PROJECT PLAST has many years of experience in the selection and sizing of activated charcoal filtering batteries.

It is essential to install the number of filter packs in relation both to the air flow and to the type of pollutant that needs to be removed.

A	SC	RZ	RS	RA	RK	RN	PUR
Acetaldeide	☹				☺		☺
Acetica, anidride	☺						
Acetico, acido	😐						
Acetilene	☹			☺	☺		☺
Aceto, odore di	☺			☺			
Acetone	😐						
Aceto nitrile	☹						
Acido bromidrico				☺			
Acido cianidrico					☺		
Acido cloridrico				☺			
Acido fluoridrico				☺			
Acido formico	☹				☺		
Acido fosforico				☺			
Acido iodidrico				☺			
Acido lattico	☺						
Acido nitrico				☺			
Acido palmitico	☺						
Acido propionico	☺						
Acido solforico				☺			
Acido urico	☺						
Acido valerico	☺						
Acrilico, acido	☺						
Acrilonitrile	☺						
Acroleina	😐				☺		
Adesivi	☺						☺
Alcool metilico	😐						
Aldeide valerica	☺						
Allile, cloruro	☺						
Amile acetato	☺						
Amilico, alcol	☺						
Amilico, etere	☺						
Ammine	☹					☺	
Ammoniaca						☺	☺
Anidride solforica				☺			
Anidride solforosa				☺			☺
Anilina	☺					☺	☺
Antisettici	☺						
Asfalto, vapori di	☺						
Azoto ossidi di	☹			😐			

B	SC	RZ	RS	RA	RK	RN	PUR
Benzene	☺						
Benzina, vapori di	☺						
Bromo	☺						
Butadiene	😐						
Butano	☹						
Butanone	☺						
Butil acetato	☺						
Butil alcool	☺						
Butilcellosolve	☺						
Butilcloruro	☺						
Butilene	☹						
Butiletere	☺						
Butirrica, aldeide	😐						
Butirrico, acido	☺						

C	SC	RZ	RS	RA	RK	RN	PUR
Canfora	☺						
Caprilico, acido	☺						
Carbolico, acido	☺						☺
Carbonica, anidride	☹						
Carbonio monossido							
Carbonio tetracloruro	☺						
Carbonio, solfuro	☺						
Carta macero, odore di	☺						☺
Catrame, odore di	☺						☺
Cellosolve acetato	☺						
Cibo, aroma di	☺						☺
Cicloesano	☺						
Cicloesanolo	☺						
Cicloesanone	☺						
Cicloesene	☺						
Cloro	😐						
Clorobenzene	☺						
Clorobutadiene	☺						
Cloroformio	☺						
Cloronitropropano	☺						
Cloropicrina	☺						
Cloruro di metilene	☺						
Combustibili liquidi	☺						
Combustione odori	😐						☺
Corpo, odore del	☺						☺
Creosoto	☺						
Cresolo	☺						
Cucina, odori di	☺						☺

☺ Alta capacità di adsorbimento.
1 Kg di carbone attivo adsorbe la sostanza in misura dal 20 al 50% del proprio peso. Mediamente il 30%

😐 Media capacità di adsorbimento.
1 Kg di carbone attivo adsorbe la sostanza in misura dal 10 al 25% del proprio peso. Mediamente il 15%

☹ Moderata capacità di adsorbimento.
Può esssere sufficiente in condizioni particolari.

La presente lista ha carattere puramente indicativo e prescinde dalle condizioni operative: temperatura, pressione concentrazione, velocità del flusso e portata.

D	SC	RZ	RS	RA	RK	RN	PUR
Decano	☺						
Detergenti	☺						
Dibromometano	☺						
Diciclopentadiene	☺						
Dicloro tetrafluoromet.	☺						
Diclorobenzene	☺						
Diclorodifluorometano	😐						
Dicloroetano	☺						
Dicloroetilene	☺						
Dicloroetiletere	☺						
Dicloromonofluorom.	☺						
Dicloro-nitroetano	☺						
Dicloropropano	☺						
Dietil chetone	☺						
Dimetil anilina	☺						
Dimetilsolfato	☺						
Dimetilsolfuro	😐	☺					
Diossano	☺						
Dipropilchetone	☺						

E							
Epicloridrina	☺						
Eptano	☺						
Eptilene	☺						
Esano	😐						
Esene	😐						
Esino	😐						
Etano							
Etere etilico	😐						
Etil benzene	☺						
Etil mercaptano		☺					
Etil silicato	☺						
Etile acetato	☺						
Etile acrilato	☺						
Etile bromuro	☺						
Etile cloruro	😐						
Etile formiato	😐						
Etilen cloridrina	☺						
Etilene							
Etilene dicloruro	☺						☺
Etilene ossido	☹						
Etilico, alcool	😐						

F	SC	RZ	RS	RA	RK	RN	PUR
Fenolo	☺						
Fertilizzanti	☺						
Foqna, odore di	😐						☺
Formaldeide	☹	☺			☺		☺
Fosgene	😐						
Freon 11	☺						
Freon 113	☺						
Freon 12	☺						
Frutta matura, odore	☹						☺
Frutta, essenze	☺						☺
Fumi di combustione	😐						

G							
Gas tossici	😐				☺		
Gasolio, vapori di	☺						
Gomma, odore di	😐						☺
Grassi lubrificanti	☺						

I							
Idrogeno							
Idrogeno seleniato		☺					
Idrogeno solforato		☺					☺
Inchiostri, odore di	☺						☺
Iodio	☺						
Iodoformio	☺						
Isopropile acetato	☺						
Isopropilico alcool	☺						
Isopropile cloruro	☺						
Isopropile etere	☺						

K							
Kerosene	☺						
Kripto	☺						

L							
Limone, essenza	☺						☺
Liquori, odori di	☺						☺
Lisolo	☺						

La presente lista ha carattere puramente indicativo e prescinde dalle condizioni operative: temperatura, pressione concentrazione, velocità del flusso e portata.

M

	SC	RZ	RS	RA	RK	RN	PUR
Macello, odore di	😐						☺
Mentolo	☺						☺
Mercaptani	☺						☺
Mercurio, vapori di			☺				
Mesitile ossido	☺						
Metano							
Metil cellosolve	☺						
Metil cellosolve acet.	☺						
Metil cicloesano	☺						
Metil cicloesanolo	☺						
Metil cicloesanone	☺						
Metil cloroformio	☺						
Metil etere	😐						
Metil glicole	☺						
Metil mercaptano		☺					
Metil-butil chetone	☺						
Metile acetato	😐						
Metile acrilato	☺						
Metile bromuro	😐						
Metile cloruro	😐						
Metile formiato	😐						
Metil-etil chetone	☺						
Metil-isobutil chetone	☺						
Metilmetacri. estere	☺						
Monoclorobenzene	☺						
Monofluoro tricl.met.	☺						

N

Nafta	☺						
Naftalene	☺						
Nicotina	☺						☺
Nitrobenzene	☺						
Nitroetano	☺						
Nitroglicerina	☺						
Nitrometano	😐						
Nitropropano	☺						
Nitrotoluene	☺						
Nonano	☺						

O

Oli lubrificanti	☺						
Ospedale, odore di	☺						☺
Ottana	☺						
Ottene	☺						
Ozono	☺						

P

	SC	RZ	RS	RA	RK	RN	PUR
Para-dicloro benzene	☺						
Pentano	😐						
Pentanone	☺						
Pentilene	😐		☺				
Pentino	😐						
Percloroetilene	☺						
Pesce, odore di	☺						☺
Pesticidi	☺						
Propano	☹						
Propil acetato	☺						
Propil alcool	☺						
Propil etere	☺						
Propil mercaptano	😐	☺					
Propile cloruro	☺						
Propionaldeide	😐						

S

Sangue, odore di	😐						☺
Sigarette, fumo di	☺						☺
Stirene monomero	☺						

T

Tiofene	☺						
Toluen di-isocianato	☺						
Toluene	☺						
Trementina	☺						
Tricloro etilene	☺						
Tricloroetano	☺						

U

Urea	☺						

V

Vernice, vapori di	☺						
Vinile acetato	☺						
Vinile cloruro monom.	☺						

X

Xeno	☺						
Xilene	☺						

Cassonetti per filtri

I cassonetti per le batterie filtranti sono realizzati in PVC, materiale in grado di resistere agli agenti chimici ed atmosferici.

Sono costruiti in diverse misure per contenere il numero di batterie filtranti necessarie in relazione alla portata d'aria.

Il pre-filtro installato all'ingresso trattiene la polvere, prolungando la vita dei filtri a carbone attivo.

I flussi areodinamici dei cassonetti sono stati ottimizzati per ridurre le perdite di carico.

Filter box

The filter boxes are made of PVC, a material capable of withstanding the chemical and atmospheric agents.

The are manufactured in different sizes to accommodate the necessary number of filtering batteries in relation to the air flow.

The pre-filter installed at the inlet the traps dust to extend to the life of the activated carbon filters.

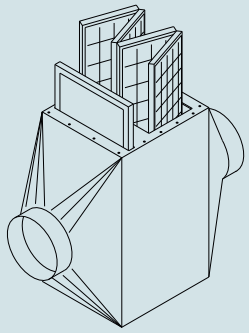
The aerodynamic flows of filter boxes have been optimized to reduce the load losses.

Cassonetti completo di lastre a carbone attivo e prefiltro antipolvere opzionale.

Cassonetto 04 — 600 mc/h — Filter Box 04

Codice / Item

Acidi / Acids PCPR04
Solventi / Solvent PCPN04



Dimensioni / Dimensions

750x320x590 mm
Ø 200 mm

Cassonetto filtri a carboni attivi, realizzato interamente in PVC bianco, idoneo per portate fino a 600 mc/h.

Il codice comprende:

n. 1 cassonetto
n. 4 filtri carbone attivo

Accessori a richiesta:

- prefiltro antipolvere PFP004
- Kit supporti per cassonetto PCPSPC4

Filter box for activated charcoal, interely made of white PVC, suitable for airflows until 600 mc/h.

The item contains:

n. 1 filter box
n. 4 activated charcoal

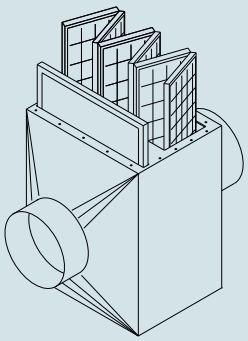
Accessories on request:

- dustproof prefilter PFP004
- filter Box support KIT PCPSPC4

Cassonetto 06 — 900 mc/h — Filter Box 06

Codice / Item

Acidi / Acids PCPR06
Solventi / Solvent PCPN06



Dimensioni / Dimensions

750x470x590 mm
Ø 250 mm

Cassonetto filtri a carboni attivi, realizzato interamente in PVC bianco, idoneo per portate fino a 900 mc/h.

Il codice comprende:

n. 1 cassonetto
n. 6 filtri carbone attivo

Accessori a richiesta:

- prefiltro antipolvere PFP006
- Kit supporti per cassonetto PCPSPC6

Filter box for activated charcoal, interely made of white PVC, suitable for airflows until 900 mc/h.

The item contains:

n. 1 filter box
n. 6 activated charcoal

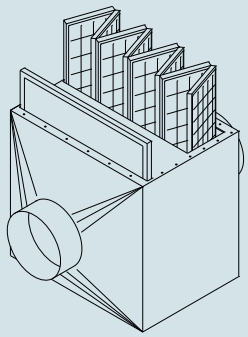
Accessories on request:

- dustproof prefilter PFP006
- filter Box support KIT PCPSPC6

Cassonetto 08 — 1200 mc/h — Filter Box 08

Codice / Item

Acidi / Acids PCPR08
Solventi / Solvent PCPN08



Dimensioni / Dimensions

850x620x590 mm
Ø 250 mm

Cassonetto filtri a carboni attivi, realizzato interamente in PVC bianco, idoneo per portate fino a 1200 mc/h.

Il codice comprende:

n. 1 cassonetto
n. 8 filtri carbone attivo

Accessori a richiesta:

- prefiltro antipolvere PFP008
- Kit supporti per cassonetto PCPSPC8

Filter box for activated charcoal, interely made of white PVC, suitable for airflows until 1200 mc/h.

The item contains:

n. 1 filter box
n. 8 activated charcoal

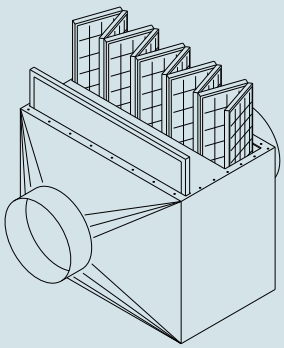
Accessories on request:

- dustproof prefilter PFP008
- filter Box support KIT PCPSPC8

Cassonetto 10 — 1500 mc/h — Filter Box 10

Codice / Item

Acidi / Acids PCPR10
Solventi / Solvent PCPN10



Dimensioni / Dimensions

950x770x590 mm
Ø 315 mm

Cassonetto filtri a carboni attivi, realizzato interamente in PVC bianco, idoneo per portate fino a 1500 mc/h.

Il codice comprende:

n. 1 cassonetto
n. 10 filtri carbone attivo

Accessori a richiesta:

- prefiltro antipolvere PFP010
- Kit supporti per cassonetto PCPSPC10

Filter box for activated charcoal, interely made of white PVC, suitable for airflows until 1500 mc/h.

The item contains:

n. 1 filter box
n. 10 activated charcoal

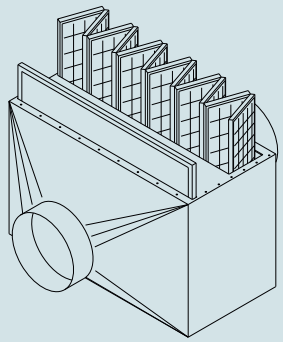
Accessories on request:

- dustproof prefilter PFP010
- filter Box support KIT PCPSPC10

Cassonetto 12 | 1800 mc/h | Filter Box 12

Codice / Item

Acidi / Acids PCPR12
Solventi / Solvent PCPN12



Dimensioni / Dimensions

1050x920x590 mm
Ø 315 mm

Cassonetto filtri a carboni attivi, realizzato interamente in PVC bianco, idoneo per portate fino a 1800 mc/h.

Il codice comprende:

n. 1 cassonetto
n. 12 filtri carbone attivo

Accessori a richiesta:

- prefiltro antipolvere PFP012
- Kit supporti per cassonetto PCPSPC12

Filter box for activated charcoal, interely made of white PVC, suitable for airflows until 1800 mc/h.

The item contains:

n. 1 filter box
n. 12 activated charcoal

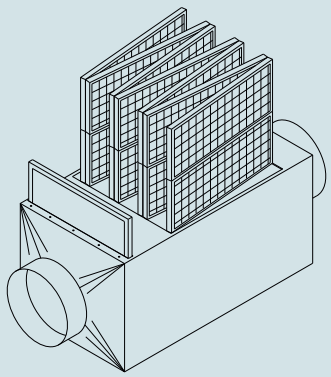
Accessories on request:

- dustproof prefilter PFP012
- filter Box support KIT PCPSPC12

Cassonetto 14 | 2100 mc/h | Filter Box 14

Codice / Item

Acidi / Acids PCPR14
Solventi / Solvent PCPN14



Dimensioni / Dimensions

1350x545x490 mm
Ø 315 mm

Cassonetto filtri a carboni attivi, realizzato interamente in PVC bianco, idoneo per portate fino a 2100 mc/h.

Il codice comprende:

n. 1 cassonetto
n. 14 filtri carbone attivo

Accessori a richiesta:

- prefiltro antipolvere PFP014
- Kit supporti per cassonetto PCPSPC14

Filter box for activated charcoal, interely made of white PVC, suitable for airflows until 2100 mc/h.

The item contains:

n. 1 filter box
n. 14 activated charcoal

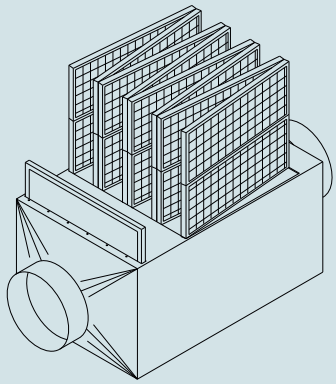
Accessories on request:

- dustproof prefilter PFP014
- filter Box support KIT PCPSPC14

Cassonetto 16 — 2400 mc/h — Filter Box 16

Codice / Item

Acidi / Acids PCPR16
Solventi / Solvent PCPN16



Dimensioni / Dimensions

1350x620x490 mm
Ø 315 mm

Cassonetto filtri a carboni attivi, realizzato interamente in PVC bianco, idoneo per portate fino a 2400 mc/h.

Il codice comprende:

n. 1 cassonetto
n. 16 filtri carbone attivo

Accessori a richiesta:

- prefiltro antipolvere PFP016
- Kit supporti per cassonetto PCPSPC16

Filter box for activated charcoal, interely made of white PVC, suitable for airflows until 2400 mc/h.

The item contains:

n. 1 filter box
n. 16 activated charcoal

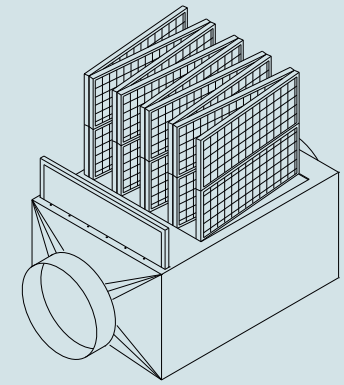
Accessories on request:

- dustproof prefilter PFP016
- filter Box support KIT PCPSPC16

Cassonetto 18 — 2700 mc/h — Filter Box 18

Codice / Item

Acidi / Acids PCPR18
Solventi / Solvent PCPN18



Dimensioni / Dimensions

1350x695x490 mm
Ø 400 mm

Cassonetto filtri a carboni attivi, realizzato interamente in PVC bianco, idoneo per portate fino a 900 mc/h.

Il codice comprende:

n. 1 cassonetto
n. 18 filtri carbone attivo

Accessori a richiesta:

- prefiltro antipolvere PFP018
- Kit supporti per cassonetto PCPSPC18

Filter box for activated charcoal, interely made of white PVC, suitable for airflows until 900 mc/h.

The item contains:

n. 1 filter box
n. 18 activated charcoal

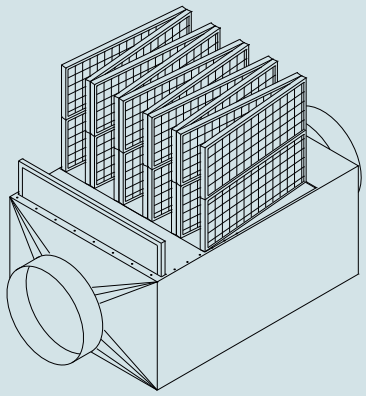
Accessories on request:

- dustproof prefilter PFP018
- filter Box support KIT PCPSPC18

Cassonetto 20 — 3000 mc/h — Filter Box 20

Codice / Item

Acidi / Acids PCPR20
Solventi / Solvent PCPN20



Dimensioni / Dimensions

1450x770x490 mm
Ø 400 mm

Cassonetto filtri a carboni attivi, realizzato interamente in PVC bianco, idoneo per portate fino a 3000 mc/h.

Il codice comprende:

n. 1 cassonetto
n. 20 filtri carbone attivo

Accessori a richiesta:

- prefiltro antipolvere PFP020
- Kit supporti per cassonetto PCPSPC20

Filter box for activated charcoal, interely made of white PVC, suitable for airflows until 3000 mc/h.

The item contains:

n. 1 filter box
n. 20 activated charcoal

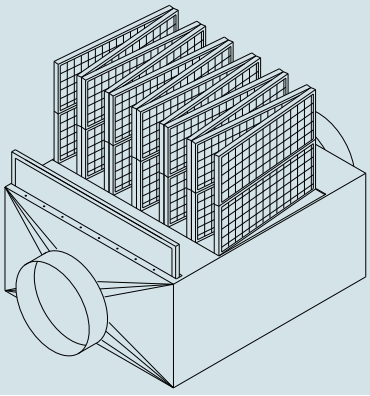
Accessories on request:

- dustproof prefilter PFP020
- filter Box support KIT PCPSPC20

Cassonetto 24 — 3600 mc/h — Filter Box 24

Codice / Item

Acidi / Acids PCPR24
Solventi / Solvent PCPN24



Dimensioni / Dimensions

1450x920x490 mm
Ø 400 mm

Cassonetto filtri a carboni attivi, realizzato interamente in PVC bianco, idoneo per portate fino a 3600 mc/h.

Il codice comprende:

n. 1 cassonetto
n. 6 filtri carbone attivo

Accessori a richiesta:

- prefiltro antipolvere PFP024
- Kit supporti per cassonetto PCPSPC24

Filter box for activated charcoal, interely made of white PVC, suitable for airflows until 3600 mc/h.

The item contains:

n. 1 filter box
n. 6 activated charcoal

Accessories on request:

- dustproof prefilter PFP024
- filter Box support KIT PCPSPC24

Cassonetti doppia azione

I cassonetti con doppia batteria filtrante permettono di ridurre le emissioni inquinanti utilizzando due diverse tipologie di batterie.

Grazie a questa duplice opzione è possibile installare filtri con diversi agenti adsorbenti aumentando quindi l'efficacia dell'abbattimento.

Ad esempio, è quindi possibile installare batterie filtranti per vapori acidi nel primo stadio e vapori di mercurio nel secondo.

Alternativamente è possibile applicare un filtro assoluto ed eliminare successivamente possibili residui di solventi.

Opzionalmente è possibile installare un pre-filtro antipolvere per ridurre l'intasamento dei pori dei carboni.

Filter box double action

The filter boxes with dual filtering battery can reduce emissions by using two different types of barrier.

Thanks to this double option it is possible to install filters with different adsorbents and to increase the efficiency.

For example, it is possible to install filtering batteries for acid vapours in the first stage and mercury vapours in the second one.

Alternatively, it is possible to apply a HEPA filter and then remove any possible residues of solvents.

Moreover, there is even the possibility to install a pre-filter to reduce pores clogging of the activated carbon.

Cassonetto PROJECTCARBO con doppia barriera filtrante e prefiltro opzionale

Cassonetti per rischio chimico e batteriologico

Particolare attenzione meritano i cassonetti per filtrazioni combinate: filtri HEPA + carboni attivi.

I filtri HEPA trattengono sia la polvere che i microrganismi. La filtrazione avviene attraverso un processo definibile come «setaccio»; le particelle di dimensioni superiori alle maglie del filtro rimangono bloccate.

La successiva filtrazione di tipo «chimico» riduce l'emissione di inquinanti grazie all'abbattimento ottenuto tramite le sostanze adsorbenti (vedere tabella pag. 7), di cui i filtri sono impregnati.

Al fine di garantire la massima sicurezza durante la manutenzione, i cassonetti possono essere dotati di alloggiamento per il BAG-IN / BAG-OUT.

Filter boxes for combined filtration needs special attention: HEPA filters + activated charcoal.

HEPA filters retain dust and micro-organisms. Filtering is performed through a process called "sieve". The particles which are larger than the filter mesh are blocked.

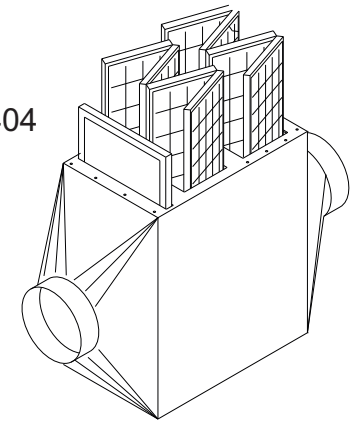
The following chemical filtration reduces the emission of pollutants. It is due to obtained with adsorbents (see table on p. 7) in the filters.

In order to ensure maximum safety during maintenance, filter boxes can be equipped with retainer for the BAG-IN / OUT-BAG.

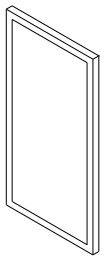
Cassonetto con filtri assoluti e con carbone attivato.

Cassonetto 04	600 mc/h	Filter Box 04
Codice / Item	Cassonetto filtri a carboni attivi, realizzato interamente in PVC bianco, idoneo per portate fino a 600 mc/h. Il codice comprende:	Filter box for activated charcoal, interely made of white PVC, suitable for airflows until 600 mc/h. The item contains:
Acidi + Solventi / Acids + Solvents PCPRN0404	n. 1 cassonetto n. 4 batterie filtranti per acidi n. 4 batterie filtranti per solventi	n. 1 filter box n. 4 activated charcoal for acids n. 4 activated charcoal for solvents
Assoluto + Acidi / HEPA + Acids PCPAR0404	n. 1 cassonetto n. 1 filtro assoluto (600 mc/h) n. 4 batterie filtranti per acidi	n. 1 filter box n. 1 hepa filter (600 mc/h) n. 4 activated charcoal for acids
Assoluto + Solventi/Acids + Solvents PCPAN0404	n. 1 cassonetto n. 1 filtro assoluto (600 mc/h) n. 4 batterie filtranti per solventi	n. 1 filter box n. 1 hepa filter (600 mc/h) n. 4 activated charcoal for solvents
Dimensioni / Dimensions PCPRN0404 1050x320x590 mm Ø 200 mm	Accessori a richiesta: - prefiltro antipolvere PCF0004 - supporto BAG IN / BAG OUT PCPSBG4 - Kit supporti per cassonetto PCPSPC4	Accessories on request: - dustproof prefilter PCF0004 - BAG IN / BAG OUT support PCPSBG4 - Filter Box support KIT PCPSPC4

PCPRN0404



Prefilto antipolvere
Dustproof prefilter

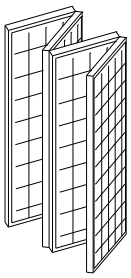


(optional)

Cod. PFP004

+

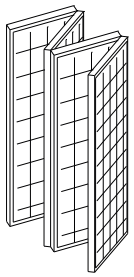
Filtri carbone attivo
Activated charcoal filters



Filtri PLSCN x 4 pz.

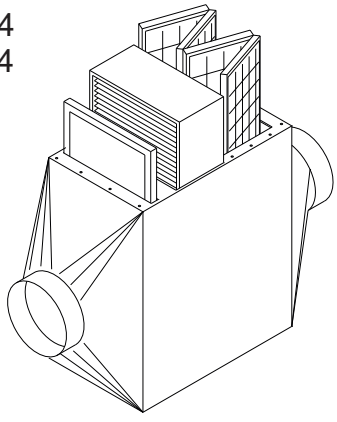
+

Filtri carbone attivo
Activated charcoal filters

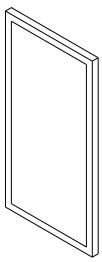


Filtri PLRAR x 4 pz.

PCPAR0404
PCPAN0404



Prefilto antipolvere
Dustproof prefilter

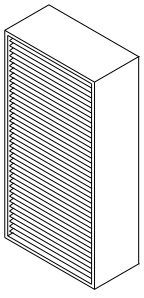


(optional)

Cod. PFP004

+

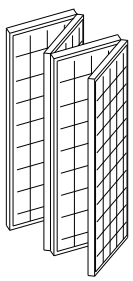
Filtro assoluto
HEPA filter



Cod. PFA0004

+

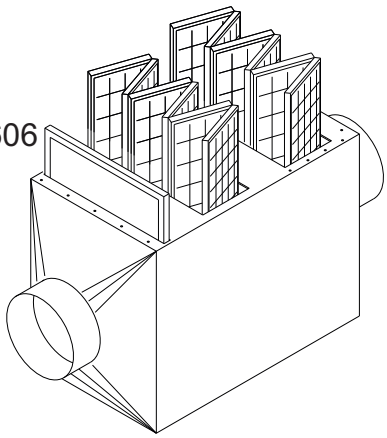
Filtri carbone attivo
Activated charcoal filters



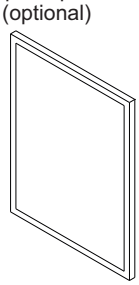
Cod. PLSCN x 4pz.
Cod. PLRAR x 4pz.

Cassonetto 06	900 mc/h	Filter Box 06
Codice / Item	Cassonetto filtri a carboni attivi, realizzato interamente in PVC bianco, idoneo per portate fino a 900 mc/h. Il codice comprende:	Filter box for activated charcoal, interely made of white PVC, suitable for airflows until 900 mc/h. The item contains:
Acidi + Solventi / Acids + Solvents PCPRN0606	n. 1 cassonetto n. 6 batterie filtranti per acidi n. 6 batterie filtranti per solventi	n. 1 filter box n. 6 activated charcoal for acids n. 6 activated charcoal for solvents
Assoluto + Acidi / HEPA + Acids PCPAR0606	n. 1 cassonetto n. 1 filtro assoluto (900 mc/h) n. 6 batterie filtranti per acidi	n. 1 filter box n. 1 hepa filter (900 mc/h) n. 6 activated charcoal for acids
Assoluto + Solventi/Acids + Solvents PCPAN0606	n. 1 cassonetto n. 1 filtro assoluto (900 mc/h) n. 6 batterie filtranti per solventi	n. 1 filter box n. 1 hepa filter (900 mc/h) n. 6 activated charcoal for solvents
Dimensioni / Dimensions PCPRN0606 1050x470x590 mm Ø 250 mm	Accessori a richiesta: - prefiltro antipolvere PCF0006 - supporto BAG IN / BAG OUT PCPSBG6 - Kit supporti per cassonetto PCPSPC6	Accessories on request: - dustproof prefilter PCF0006 - BAG IN / BAG OUT support PCPSBG6 - Filter Box support KIT PCPSPC6

PCPRN0606

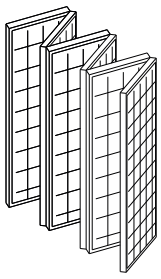


Prefilto antipolvere
Dustproof prefilter
(optional)



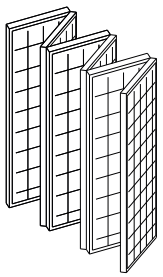
Cod. PFP006

Filtri carbone attivo
Activated charcoal filters



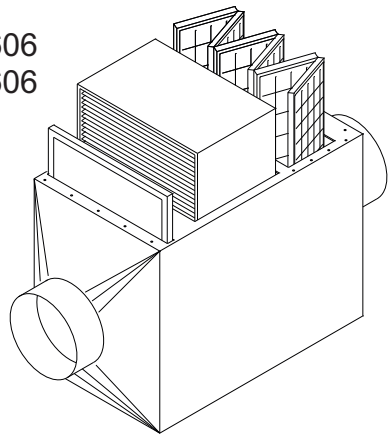
Filtri PLSCN x 6 pz.

Filtri carbone attivo
Activated charcoal filters

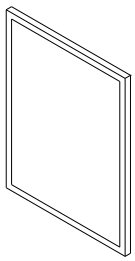


Filtri PLRAR x 6 pz.

PCPAR0606
PCPAN0606

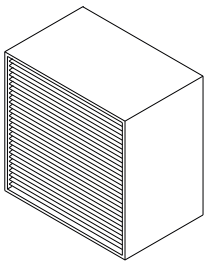


Prefilto antipolvere
Dustproof prefilter
(optional)



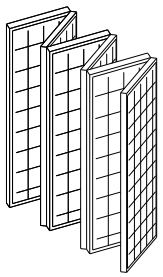
Cod. PFP006

Filtro assoluto
HEPA filter



Cod. PFA0006

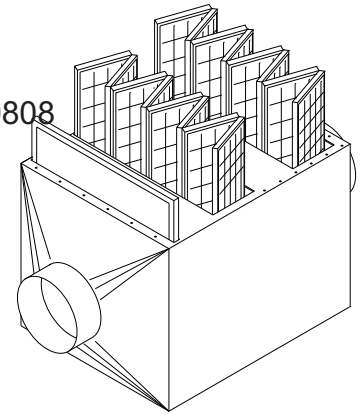
Filtri carbone attivo
Activated charcoal filters



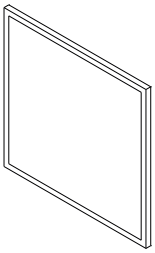
Cod. PLSCN x 6pz.
Cod. PLRAR x 6pz.

Cassonetto 08	1200 mc/h	Filter Box 08
Codice / Item	Cassonetto filtri a carboni attivi, realizzato interamente in PVC bianco, idoneo per portate fino a 1200 mc/h. Il codice comprende:	Filter box for activated charcoal, interely made of white PVC, suitable for airflows until 1200 mc/h. The item contains:
Acidi + Solventi / Acids + Solvents PCPRN0808	n. 1 cassonetto n. 8 batterie filtranti per acidi n. 8 batterie filtranti per solventi	n. 1 filter box n. 8 activated charcoal for acids n. 8 activated charcoal for solvents
Assoluto + Acidi / HEPA + Acids PCPAR0808	n. 1 cassonetto n. 1 filtro assoluto (1200 mc/h) n. 8 batterie filtranti per acidi	n. 1 filter box n. 1 hepa filter (1200 mc/h) n. 8 activated charcoal for acids
Assoluto + Solventi/Acids + Solvents PCPAN0808	n. 1 cassonetto n. 1 filtro assoluto (1200 mc/h) n. 8 batterie filtranti per solventi	n. 1 filter box n. 1 hepa filter (1200 mc/h) n. 8 activated charcoal for solvents
Dimensioni / Dimensions PCPRN0808 1150x620x590 mm Ø 250 mm	Accessori a richiesta: - prefiltro antipolvere PCF0008 - supporto BAG IN / BAG OUT PCPSBG8 - Kit supporti per cassonetto PCPSPC8	Accessories on request: - dustproof prefilter PCF0008 - BAG IN / BAG OUT support PCPSBG8 - Filter Box support KIT PCPSPC8

PCPRN0808

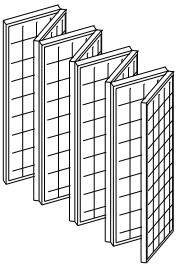


Prefilto antipolvere
Dustproof prefilter
(optional)



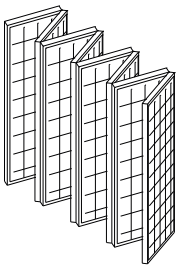
Cod. PFP008

Filtri carbone attivo
Activated charcoal filters



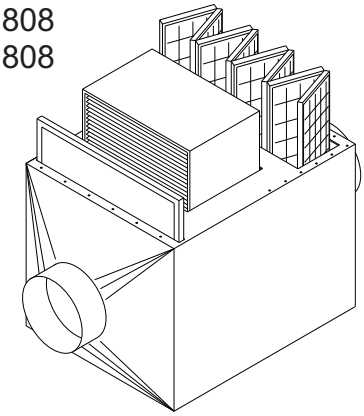
Filtri PLSCN x 8 pz.

Filtri carbone attivo
Activated charcoal filters

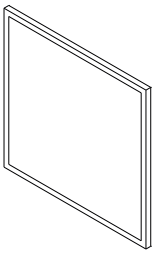


Filtri PLRAR x 8 pz.

PCPAR0808
PCPAN0808

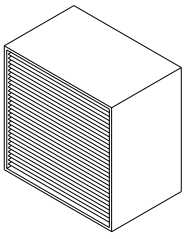


Prefilto antipolvere
Dustproof prefilter
(optional)



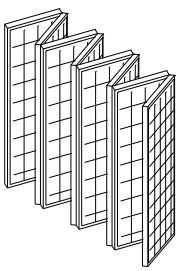
Cod. PFP008

Filtro assoluto
HEPA filter



Cod. PFA0008

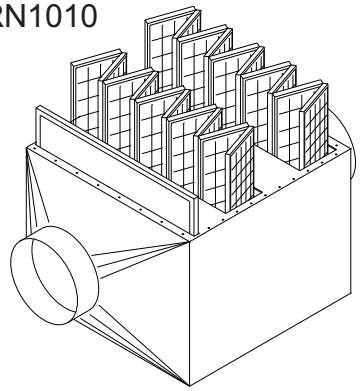
Filtri carbone attivo
Activated charcoal filters



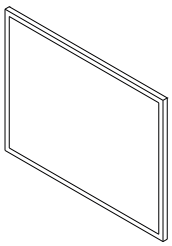
Cod. PLSCN x 8pz.
Cod. PLRAR x 8pz.

Cassonetto 10	1500 mc/h	Filter Box 10
Codice / Item	Cassonetto filtri a carboni attivi, realizzato interamente in PVC bianco, idoneo per portate fino a 1500 mc/h. Il codice comprende:	Filter box for activated charcoal, interely made of white PVC, suitable for airflows until 1500 mc/h. The item contains:
Acidi + Solventi / Acids + Solvents PCPRN0606	n. 1 cassonetto n. 10 batterie filtranti per acidi n. 10 batterie filtranti per solventi	n. 1 filter box n. 10 activated charcoal for acids n. 10 activated charcoal for solvents
Assoluto + Acidi / HEPA + Acids PCPAR0606	n. 1 cassonetto n. 1 filtro assoluto (1500 mc/h) n. 10 batterie filtranti per acidi	n. 1 filter box n. 1 hepa filter (1500 mc/h) n. 10 activated charcoal for acids
Assoluto + Solventi/Acids + Solvents PCPAN0606	n. 1 cassonetto n. 1 filtro assoluto (1500 mc/h) n. 10 batterie filtranti per solventi	n. 1 filter box n. 1 hepa filter (1500 mc/h) n. 10 activated charcoal for solvents
Dimensioni / Dimensions **PCPRN1010** **1250x770x590 mm** Ø 315 mm	Accessori a richiesta: - prefiltro antipolvere PCF0010 - supporto BAG IN / BAG OUT PCPSBG10 - Kit supporti per cassonetto PCPSPC10	Accessories on request: - dustproof prefilter PCF0010 - BAG IN / BAG OUT support PCPSBG10 - Filter Box support KIT PCPSPC10

PCPRN1010

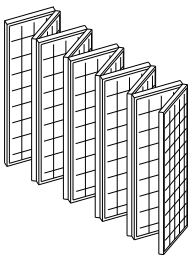


Prefilto antipolvere
Dustproof prefilter
(optional)



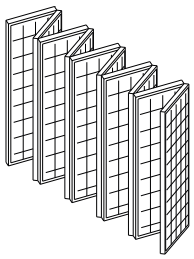
Cod. PFP010

Filtri carbone attivo
Activated charcoal filters



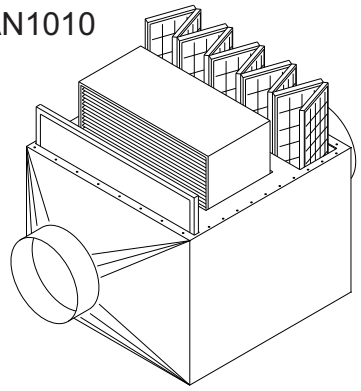
Filtri PLSCN x 10 pz.

Filtri carbone attivo
Activated charcoal filters

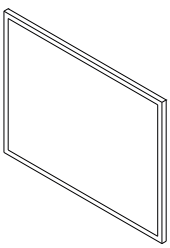


Filtri PLRAR x 10 pz.

PCPAR1010
PCPAN1010

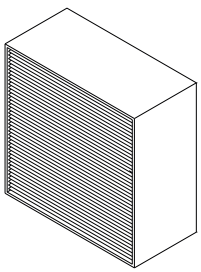


Prefilto antipolvere
Dustproof prefilter
(optional)



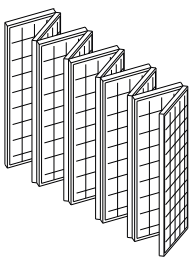
Cod. PFP010

Filtro assoluto
HEPA filter



Cod. PFA0010

Filtri carbone attivo
Activated charcoal filters



Cod. PLSCN x 10pz.
Cod. PLRAR x 10pz.

Sistemi aspiranti e filtranti

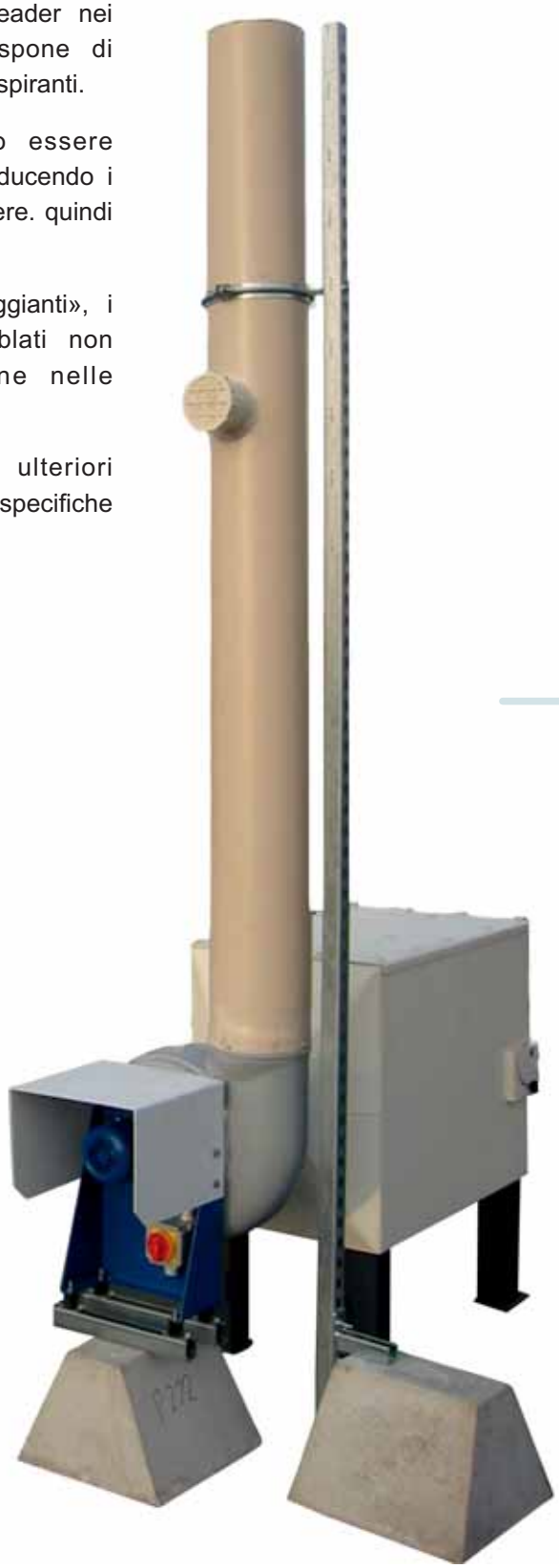
Aspirants and filters systems

La Project Plast, azienda leader nei sistemi di aspirazione, dispone di un'ampia gamma di soluzioni aspiranti.

Alcune soluzioni possono essere preassemblate in fabbrica, riducendo i tempi di installazione in cantiere. quindi ridotti, con notevoli vantaggi.

Grazie ai basamenti «galleggianti», i gruppi aspiranti preassemblati non richiedono predisposizione nelle pavimentazioni di supporto.

Possono essere studiate ulteriori soluzioni in relazione alle specifiche esigenze del cliente.



Sistema aspirante composto da cassonetto filtri ed elettroventilatore installato su base autoportante.

Project Plast, a leader in vacuum systems, offers a wide range of aspirating solutions.

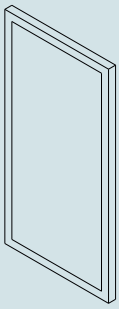
Some of these can be pre-assembled at the factory cutting down the installation time in site.

Thanks to the "floating" bases, the pre-assembled aspirating groups do not require any preparation of the floor support.

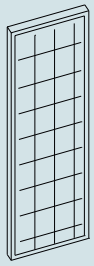
Other solutions may be found according to specific requirements or needs.

Prefiltri e carboni attivi

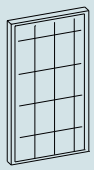
Prefiltri per tutti i cassonetti

	Codice	Descrizione	Dimensioni	Filtrazione
	PFP004	Prefiltro per cassonetto a 4 lastre	577x295 mm	POLVERE
	PFP006	Prefiltro per cassonetto a 6 lastre	577x445 mm	
	PFP008	Prefiltro per cassonetto a 8 lastre	577x595 mm	
	PFP010	Prefiltro per cassonetto a 10 lastre	577x745 mm	
	PFP012	Prefiltro per cassonetto a 12 lastre	577x895 mm	
	PFP014	Prefiltro per cassonetto a 14 lastre	467x520 mm	
	PFP016	Prefiltro per cassonetto a 16 lastre	467x595 mm	
	PFP018	Prefiltro per cassonetto a 18 lastre	467x670 mm	
	PFP020	Prefiltro per cassonetto a 20 lastre	467x745 mm	
	PFP022	Prefiltro per cassonetto a 22 lastre	467x895 mm	
	PFP024	Prefiltro per cassonetto a 24 lastre	467x1120 mm	

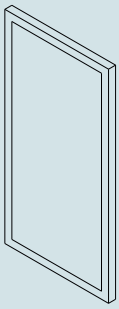
Batterie filtranti CARBONE ATTIVO

	Codice	Descrizione	Dimensioni	Filtrazione
	PLSCN	Batterie filtranti 1 lastra	580x235 mm	SOLVENTI
	PLRAR			ACIDI
	PLAL0			ODORI
	PLRKF			FORMALDEIDE
	PLNP0			RADIO ISOT.
	PLRSA			MERCURIO

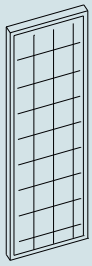
Batterie filtranti CARBONE ATTIVO

	Codice	Descrizione	Dimensioni	Filtrazione
	PLCN5	Batterie filtranti ½ lastra	290x235 mm	SOLVENTI
	PLCR5			ACIDI

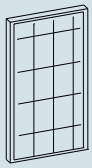
Prefilter for all filter box

	Code	Description	Dimensions	Filtration
	PFP004	Dustproof prefilter for filter box 04 slab	577x295 mm	DUST
	PFP006	Dustproof prefilter for filter box 06 slab	577x445 mm	
	PFP008	Dustproof prefilter for filter box 08 slab	577x595 mm	
	PFP010	Dustproof prefilter for filter box 10 slab	577x745 mm	
	PFP012	Dustproof prefilter for filter box 12 slab	577x895 mm	
	PFP014	Dustproof prefilter for filter box 14 slab	467x520 mm	
	PFP016	Dustproof prefilter for filter box 16 slab	467x595 mm	
	PFP018	Dustproof prefilter for filter box 18 slab	467x670 mm	
	PFP020	Dustproof prefilter for filter box 20 slab	467x745 mm	
	PFP022	Dustproof prefilter for filter box 22 slab	467x895 mm	
	PFP024	Dustproof prefilter for filter box 24 slab	467x1120 mm	

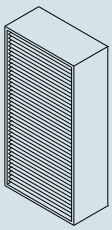
ACTIVATED CHOARCOAL filtering batteries

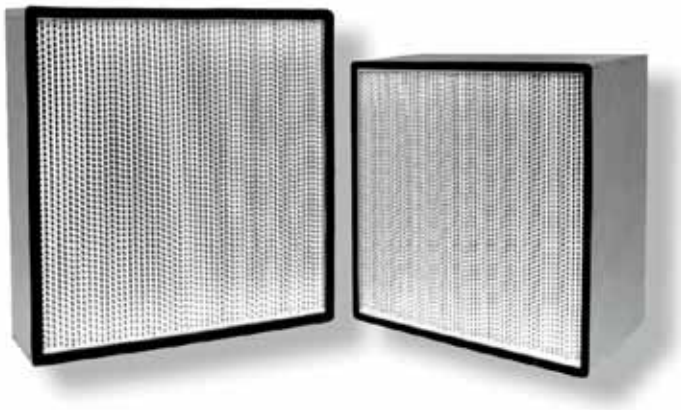
	Code	Description	Dimensions	Filtration
	PLSCN	Filter activated choarcoal 1 slab	580x235 mm	SOLVENTS
	PLRAR			ACID
	PLAL0			SMELLS
	PLRKF			FORMALD.
	PLNP0			RADIO ISOTOP.
	PLRSA			MERCURY

ACTIVATED CHOARCOAL filtering batteries

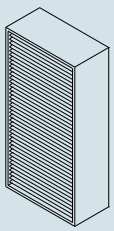
	Code	Description	Dimensions	Filtration
	PLCN5	Filter activated choarcoal 1/2 slab	290x235 mm	SOLVENTS
	PLCR5			ACIDS

Filtri assoluti HEPA

	Codice	Descrizione	Dimensioni	Filtrazione
	PFA0004	Filtro HEPA, classe H14, eff. 99,999%, 300 mc/h	305x610 mm	ASSOLUTA
	PFA0006	Filtro HEPA, classe H14, eff. 99,999%, 600 mc/h	595x595 mm	
	PFA0008	Filtro HEPA, classe H14, eff. 99,999%, 600 mc/h	457x457 mm	
	PFA0010	Filtro HEPA, classe H14, eff. 99,999%, 1500 mc/h	610x610 mm	



HEPA Filters

	Item	Description	Dimensions	Filtration
	PFA0004	Filter HEPA, class H14, eff. 99,999%, 300 mc/h	305x610 mm	ABSOLUTE
	PFA0006	Filter HEPA, class H14, eff. 99,999%, 600 mc/h	595x595 mm	
	PFA0008	Filter HEPA, class H14, eff. 99,999%, 600 mc/h	457x457 mm	
	PFA0010	Filter HEPA, class H14, eff. 99,999%, 1500 mc/h	610x610 mm	

ProjectPlast S.r.l. - Via delle Industrie, 20 - 26010 - Chieve (CR) - Tel. 0373.234723 - Fax 0373.236490 - www.projectplast.it

Catalogo Cassonetti e Filtri 16042013 R1d

Annex 7: Decomissioning and Cessation Plan

Annex B.2.10-A1

Decommissioning and cessation plan

Rev.02

Summary

1. Introduction

The plan aims to identify potential forms of environmental impact caused by building and equipment decommissioning. This annex aims to highlight the potential impact of the buildings and plants phasing out stage forming resources which are functional to the Sterling Chemical Malta LTD's IPPC activity.
Specifically, the study of the potential impact determined by the decommissioning phase is divided into three distinct parts:

1. Estimated useful lives of buildings and equipment;
2. Identification of potential environmental impact of phenomena associated with the phasing out stage;
3. Decommissioning and phasing out of the plant
4. The treatment of potential waste.
5. Investigations and possible remediation
6. Conclusion.

2. Estimate of the useful life of the IPPC

Key element in the definition of the possible issues of environmental impact on the area of interest due to the phasing out stage of the plant is the definition of the useful life.
On the basis of current knowledge about the technologies used in the production of fine organic chemicals and pharmaceutical chemistry it is believed that the plant may have a time horizon of useful life of at least twenty years. This value is consistent with the term generally used in the investment plan of this type of plant. It should be noted, however, that the maintenance activities that may be required during the year to ensure the efficiency of the activity, also refer to the process of replacement of parts most subject to wear or damage (heat exchangers, pumps vacuum, reactors, flue gas treatment system parts, etc.) At the end of the life of the production, which is the heart of the company production system, it is still possible to assume that the area and the structures within contained can be converted by a mission of the new company forming part of the same active branch (chemical manufacturing, chemical and pharmaceutical industries) exploiting knowledge and operational bases of new concept defined from technologies not currently available on an industrial scale or only at experimentation stage. This plan will take into account the possible developments of the system in the coming years as the construction of a new flammable raw materials storage and a temporary storage of waste, and a warehouse in which to conduct laboratory and office activities as well as the storage of not flammable raw materials. The two future structures will be connected to the main activity that takes place in the building B1, and in particular the storage of flammable raw materials will be physically connected to the production through the underground pipelines that will lead the main solvents used in the production process from the silos in which will be stored in the flammable storage at different supply lines and production.

3. Potential sources of pollution

The potential sources of impact related to a decommissioning and subsequent phasing out stage of the plant, are strongly related to the possibility that the same plant will become a dumping ground for all of the material pertaining to the activity and that its structure is left unattended at the mercy of time. A summary of the possible sources of pollution are the following:

1. Plant parts, tanks, pipes and other metallic material or plastic material contaminated by pollutant either above ground and underground;
2. Demolition of buildings with mixed construction material (glass, iron, plastic, concrete, wood, etc. ..);
3. Potential and groundwater contamination from leaking structures utilised for storage of hazardous liquids/chemicals

4. Decommissioning and phasing out of the plant

The phase of decommissioning and phasing out, will be subcontracted to one or more specialized companies equipped with all the necessary requirements to ensure maximum safety and protection of the environment and health during the operations on the site. The decommissioning phase includes a series of activities planned in the Phasing out Environmental Plan in preparation for the phase of demolition and removal of the implants. The activities planned in the decommissioning activity will allow the suspension of the system in conditions of maximum security.
The following activities will provide:

- Removal of chemicals, lubricating oils, fuels and the specific substances contained in equipment, piping and tanks of the plant;
- Reclamation of equipment, piping and storage tanks to remove any residue of substances;

For the next phase of demolition will be identified in advance the types of waste generated by various operations, estimating the amount, and establishing the procedures for the disposal and the final destination. All demolition operations will be carried out by applying organizational, operational and management that ensure the minimization of all related impacts (e.g., the formation of dust, noise, traffic, etc. ..).
The activities planned during the demolition are as follows:

- Dismantling of the restored mechanical components of the plant;
- Dismantling of the electrical components;
- Removal of the insulations;
- Demolition of buildings and structures;
- Removal of waste materials in accordance with the regulations;

The following describes in detail the techniques used to achieve the decommissioning and phasing out of the plant.

4.1 Decommissioning

The suspension of the plant, will result in the implementation of all the necessary procedures in order to allow the subsequent phasing out operations. The parts of the plant that during the year have contained specific substances such as bioliquid, lubricants, chemicals, flammable liquids and fuels, will be treated by performing the following tasks:

- ✓ discharge of the substances at the time of the suspension period;
- ✓ remediation to remove any residue of the product;

Prior to the emptying phases of equipment installation, it must be carried out necessary checks in order to determine the possible presence of hazardous atmospheres and ensure the conditions to carry out the emptying of the components in total safety. This activity will be performed by introducing into the components specific probes to detect the possible presence of hazardous substances. Of course, the operation will be carried out using non-sparking tools.

The remediation of the components and systems lines will be carried out through special flushing fluid to perform specific function of the substances to be removed:

- ✓ the washing of oils and combustible substances will be carried out with steam or hot water;
- ✓ the washing of flammable substances will be carried out only with cold water;
- ✓ the washing of chemicals may be performed with cold water possibly with added surfactants or with neutralizing substances;

For parts of the system affected by liquids, cleaning will be carried out through the combined cisterns Canal Jet type, by inserting high pressure reaction probes in the pipes and equipment and arranged to collect the waste in the tanker. For storage tanks of liquid fuels, will be carried out the emptying and washing with cold water, after which there will be the flushing with nitrogen gas. The gas will be injected at the base of the tank and extracted from the top of the same through an outlet pipe connected to an active carbon filter. The flushing will help removing any residue or pockets of gas that will be absorbed by the active carbon filter. At the end of this activity will be carried out a purge air.

In order to verify the absence of hazardous gases and reclamation of equipment and lines, the following tasks will be performed:

- ✓ execution of targeted openings on the pipes and components for the introduction of probes for testing of gas free;
- ✓ check on the inner walls of the pipes and components to verify the removal of any substance within contained;

The certificate of free gas will confirm the reclamation of the plant equipment and will enable the next phase of demolition.

4.2 Decommissioning of the plant

4.2.1 Remediation from insulating materials

Once the remediation of the tanks, lines and system components is done, there will be the remediation of such insulating materials. The project will be executed in accordance with the laws and regulations of national and local, as well as the requirements that the organization of local control put in place. The intervention of insulation removal will be carried out before the decommissioning operations, but it may coexist within the plant areas in decommissioning phase (on plants already insulated-removal) and areas undergoing insulation removal. The removal of the insulations from pipework and plant components, can be made either in work or in a dedicated area.

The insulation work will be mainly implemented for the following parts of the plant:

- ✓ components and valve bodies;
- ✓ pipes that grow to a height of up to 10 m above the ground level, easily reachable by small temporary works or hydraulic platforms with limited height growth;

In case the insulation is made up of cups based Vetronite material, the insulation removal will be performed in work and small in size in order to optimize the removal activities.
In case the insulation is made from glass wool/mineral fibrous, the insulation removal will be performed in work using appropriate devices such as the enclosure of the area around the equipment, the use of "glove bags" for small components or pipe sections, the use of mixed

techniques (cutting of pipes using components or "glove bags" on the sectioning points, removal of cut parts and insulation removal in confined area).
The confinement of the areas will be carried out through the tube-joint structures covered with polyethylene sheeting in accordance with local regulations. If required by the standard, the confinement will be maintained in depression.
The personnel access will be done through a decontamination unit of the staff directly related to the confinement. The size of the area will be defined on the base of the specific needs of bulk materials to be insulation removed. Prior to the removal of the fibrous material, the coating itself will be sprayed, with the encapsulating product, with the use of manual or electric airless pump at low pressure.
The removal of material will be used only by hand using manual equipment such as a spatula or scraper. The removed material will be immediately bagged in special polythene bags from 15-20 l, closed on the spot. The bags are then placed inside the big bag with liner and labeled in accordance with the law and transported by truck in reported area waiting to be sent to the final destination.
The insulation removal personnel will wear specific PPE against inhalation or contact of mineral fibers such as Tyvek suit and mask with filter type P3. The operations of donning and doffing of PPE will be made in specific Personal Decontamination Unit (PDU) in three stages consisting of uncontaminated area, shower room/air lock, contaminated area.

4.2.2 Demolition of the plants and buildings

To preserve the environment from the impacts it has also been chosen a type of selective demolition, in case the company decides to restructure, extend or convert the plant, so as to improve the recycling solution of the material and/or return to the supplier. Another fundamental aspect is the possibility of controlling on the place of production of the waste their actual composition, in such a way as to confer to a treatment plant an effectively inert material and separated from substances that can affect the recovery process itself. In the interests of recycling, demolition material becomes more valuable the more it is selected: therefore, a practice of selective demolition involves a by-product of greater value. This technique of disposal involves three stages of work:

A. Recover the equipment and facilities required;
B. Remove anything that can be dismantled;
C. Finally, demolish the structure.

While the first two steps are manual, the last phase of demolition is mechanical and requires the use of specific equipment. The success of that business recovery and recycling of demolition material is guaranteed if:

- ✓ all the dismantled demolition products are separately placed on the site in order to maximize the recycling;
- ✓ any possible damage to the environment is minimized;
- ✓ the movement of the machinery and vehicles is performed with special care to avoid any disturbance to the surrounding environment;
- ✓ the temporary accumulations of waste present on the site will be left clean and tidy.

In this case the cost of demolition for the company is more than 20% compared to traditional techniques, however, this loss will turn back because it will be possible, for example, to recycle many materials for reuse in new projects or other buildings, sometimes it is also possible to sell recyclable waste, in good condition and not dangerous, the acquiring more prestige in the international arena being a company with a green heart. In addition, all recycling technologies

that will be present in 20 years (expected time horizon) will be extremely varied and will enable a wider choice of service providers. So, compared to a more economic expenditure for the activation of the demolition, it will have greater gains in the future. For some materials, such as glass and metals, recycling technologies already exist, in this case, the recycling is a simple pre-treatment. For other materials (plastic and composite materials), however, the recycling technologies may vary depending on the composition of the specific material. In the end, for hazardous materials such as asbestos, specific treatments arerequired. The best experiences of selective demolition successfully carried out in the world, suggest the most effective method to follow, that is separate and then store the materials operating the demolition in four stages:

- ✓ Hazardous materials and components: To avoid causing pollution and to protect the operators of the site from the risk of improperly handling hazardous substances, first of all it is essential to check if in the building there are materials and hazardous components (e.g. switches containing PCBs, HFC etc..). Once these materials have been identified and located, the next step is cleaning up the building, removing them and then disposing in accordance with the procedures prescribed by specific regulations.
- ✓ reusable components: after cleaning up the hazardous materials, there is the dismantling of all those elements that can be reused. In many cases, bricks, tiles, beams, railings and parapets, windows etc.., if removed with care and without being damaged, can be reused. Reused as they are or, after simple treatments (cleaning, review of the functioning, repair, painting) that fit them to a new use;
- ✓ recyclable materials: once removed hazardous materials and reusable components, it is possible to continue the work demolishing parts of the building made of recyclable materials or aggregates. Recyclable means that these materials, once subjected to appropriate treatments can be used to produce new materials, functions and uses even different from those of the original residue. For example, fragments and debris of bricks or concrete, whether or not mixed, as a result of crushing, mixing, sieving or other treatments they are suitable materials for the construction of embankments, refillings, foundations. Or wood residues that once shredded, dried and glued in industrial plants can be transformed into suitable panels of shaving.
- ✓ non-recyclable waste: all that's left after the selection is the set of materials that technically or economically (or for the possible presence of foreign elements or heterogeneous) can not be exploited. Materials which then have to be sent for disposal.

The complete decommissioning of the plant, will result in the demolition of all the works above ground and all the underground works.

The main facilities and buildings to be demolished will be:

- ✓ Main building production/workshop/office;
- ✓ Outdoor storage of raw materials and flammable wastes;
- ✓ Steam generator and boiler;
- ✓ Underground tanks to collect water for washing and service utilities and laboratories;
- ✓ Line flue gas treatment (activated carbon filters and scrubbers);
- ✓ Chimneys;
- ✓ Removing the LPG tank and pipes to them connected.

The demolitions will be conducted with the best technology available at the time of the work and in compliance with applicable regulations and good technique. The demolition will be grouped as follows:

- ✓ Demolition of storage tanks;

- ✓ Demolition of buildings;
- ✓ Demolition of the plant above ground;
- ✓ Demolition of underground works.

In the following are indicated the techniques with which to date can be executed the demolition of the plant.

4.2.2.1 Demolition of tanks and major silos storage

In this case, reference is made to the LPG tank used to supply the boilers and the tank of liquid nitrogen. There will be demolished proceeding sequentially and following for each storage structure, the following activities:

- ✓ Removing the perlite insulation;
- ✓ Demolition of the roof;
- ✓ Demolition of cloaks and containment of the fund;
- ✓ Demolizione della platea di base e delle teste di palo fino al piano spiccato.

4.2.2.1.1 Removing the perlite insulation;

The pearlite present in the cavity of the tanks has powdery consistency and will be removed with the aid of cyclone suction through the following steps:

- ✓ opening hole 200-250 mm in the lower part of the tank;
- ✓ connection through the cyclone suction nozzle and hose;
- ✓ intake of perlite and accumulation in a reservoir for subsequent transfer directly to big bags;
- ✓ repetition of the above operations along the entire circumference of the tank;

4.2.2.1.2 Demolition of the roof;

The demolition of the roof will be preceded by the removal of accessory components such as valve bodies and pipes that will be harnessed and cut hot to be subsequently lowered to the ground via the aerial platform.
The demolition of the metal roof, will be conducted with small radio-controlled excavator (quintals 100-150) kept at the workload by crane.
The excavator will be remotely operated by radio control from operator stands on the aerial platform. The operator of the platform and the crane, as well as in visual contact, may communicate via two-way radios.
The excavator will be harnessed and raised to the height of the roof of the tank. The body of the excavator will be placed on the roof to stabilize the camera during the subsequent stages of work, but the weight of the vehicle will be fully supported by the crane, not going to weigh on the roof structure to be demolished.
The demolition will begin removing a section of the roof plate of the tank, until a complete opening. The resulting material will be conveyed inside the tank, in order to avoid risks of falling material from the top to the areas with the presence of operators.
We will proceed to demolish progressively areas of the roof, until the complete demolition of the roof. The technique described will not have workers exposed to the risk of burial. Any unexpected collapse of the structure will remain confined within the structure of the tank.

4.2.2.1.3 Demolition cloaks and bottom tanks

The demolition will be carried out with small crawler excavator (800 to 1.000 quintals) arm equipped with special hydraulic demolition shears and metal. With the shears it will be open

a gap in the mantles of the tank (external and internal), for a width of about 2 mt, starting from the top and up to about half the height, with horizontal cuts spaced not more than 2 mt (so as to create pieces mantle of amplitude up to 4 m2). The cutting sequence will be:

- ✓ execution of two vertical cuts to a maximum height of 1.5 mt, and spaced approximately 1 mt;
- ✓ bending sector cut towards the inside of the tank;
- ✓ execution of the horizontal cut about 1 mt below the free top edge;

It will then proceed to remove another area of the tank, taking care to gradually lower the mantles on the whole circumference and for free edge heights. Once removed all the cloak, it will remove the metal bottom, always with excavator equipped with shears, raising portions of the bottom plate and metal cutting with shears

4.2.2.1.4 Demolition base stall

As a last step of the removal of the tanks the further step is the demolition of the base stalls and the pilings until the grade plane. The demolition will be carried out with crawler excavator medium-sized (300-500 quintals), equipped with a hammer.
To the resulting material will be removed the iron with an excavator equipped with crusher.
In order to minimize the generation of dust during the whole phase of demolition of the reinforced concrete portions, it is necessary to proceed to bathe the affected parts with water.

4.2.2.2 Aboveground plant demolition

In general, the major components of plant such as boiler, flue gas line, condenser, turbine, pumps, valves and various machinery, once reclaimed will be insulation-removed in work and then scrapped in work. The piping will be demolished either after insulation removal in work or after removal of pipe portions to be insulation-removed subsequently in a dedicated area, as described above. The components and piping insulation-removed will be demolished with excavators equipped with shears or cuts through hot if the thickness exceeds 15 mm. The pumps and valves will be demolished with cuts through hot. The piping will be sheared for traits, from support to support, by sectioning the first in correspondence with a support, and then sectioned and chucked at the ends and bent towards the ground, finally perform the cutting at the closest support, where the pipe has been bent. Once on the ground, the pipes will be reduced volumetrically still with shears. Similarly, we will work to reduce volumetrically pipes insulation-removed off, in a dedicated area. Once pulled down the tubes, we will proceed to destroy the structures of the rack, in a similar way.

The stands will be demolished with excavator equipped with a hammer. The chimneys and vents shall be removed with the aid of cranes of adequate capacity, catering to breech every single chimney at the top. We will proceed to hot-dissect the column starting from the top and then lift the trunk and place it horizontally on the ground for subsequent volume reduction conducted with excavator equipped with hydraulic shears.

4.2.2.3 Demolition of buildings

After performing the decommissioning of plants above ground, in the buildings to be demolished must be previously performed the task of strip-out aimed at the removal of all equipment and furniture to optimize the management of waste materials.
The removal will be conducted by opening one or more gates in a wall of the concerned building, by excavator equipped with hammer in an amplitude such as to allow access of a

foklift or the arm of a telescopic handler. The individual equipment (electrical panels, various components) or furnishings will be removed manually or with the aid of manual lifting equipment (manual winches, hoist trolley) and approached the opening created, where they will be harnessed to the lifting and transport and to remove them outside the building, where they will be further dissected, separating the materials by type. The demolition will be carried out in a sequence that does not make at any stage labile or unstable residual structures. This includes:

- ✓ identify the structural frames that are bracing to be demolished for the last, if a structure has more chassis bracing, it is required to move in order to always leave for last a braced frame.
- ✓ disconnect a structural frame at a time, demolishing the floors connecting orthogonally at the framework of the same proceeding in the demolition of the disconnected frame; operations will be repeated advancing from one side of the head towards the opposite;

In case of presence of foreign scale external metal (as the foot irons), these have to be demolished before proceeding with the demolition of the building or, at least, before the demolition of the structural portion of a building to which they are adjacent. The demolition of exterior stairways shall be carried out by hydraulic shears, first removing the galleries, then disconnecting the higher ramp stairs in the upper attachment point, then applying a force to fold the ramp down and then disconnecting the lower point of attack .

In the case of the metal structure that forms the roof of the storage of flammable materials, they will be removed by excavator of demolition special arm of adequate length and hydraulic shears for thicknesses up to 15 mm. The demolition will proceed in an orthogonal direction to the supporting frames of the structure, so as to maintain a stable portion of residual structure during the advancement of the demolition. The demolition will be performed for each span of the shed proceeding from the top downwards, with the following sequence:

- ✓ demolition of the purlins so as to release the truss;
- ✓ Once released the truss from the purlins, we will proceed with the demolition of the truss itself, sectioned before at one end, then turned to the ground (always with the aid of the shear) and sectioned at the other end;
- ✓ demolition of the head beam and walling that connects the head of the columns to those of the closest inner frame; each beam will be sheared to an extreme, then chucked with the shears and bent towards the ground, finally sheared to the bent extreme, procuring the total disconnection;
- ✓ demolition of the freed columns which will be chucked on the top and bent towards the ground, and then cut with shears to the foot, and if the thickness of the carpentry will be higher than the one sectionable with the shears, it shall execute a hot cutting with oxy-propane torch

4.2.2.4 Demolition of underground works

The demolition of the undergroud works such as fire hoses, basements and foundations of the demolished components, tunnels cable paths, will be removed and made a dig around the work to be demolished, with excavator equipped with bucket. Once brought into the open, the work will be demolished with excavator equipped with an hydraulic hammer.
The excavation will be closed in site with the soil. The slab of reinforced concrete built on the bottom of the tanks of the bioliquid will be broken with medium-sized (250-300 quintals) crawler excavator equipped with a hammer, creating large blocks that will be raised by the second medium-sized excavator equipped with bucket, reduced volumetrically and iron-removed from third medium-sized excavator equipped with crusher.

The material removed, demolished and iron-removed will gradually be removed from the site and evacuated to an area for temporary storage before being transferred at final destination.

This is a delicate operation because one of the tanks or not under pressure basin) contains or has contained hazardous waste in the past (European Waste Code 070701*). So, before the demolition will be carried out with a remediation certification by the company called to do the work.

4.2.2.5 Demolition of bund containment

Please note that it will be used the system for procedures described in paragraphs 4.2.2 and section 4.2.2.2 and 4.2.2.3. also for the BUND and the secondary containment systems in use for the External Flammable Warehouse.

4.2.3 Decommissioning and remove underground tank and pipeline

Qui si possono presentare due casi:

A) The property is then sold in this case proceeds through a decommissioning plan with safety of underground tanks and elements connected to it
B) The property will be demolished because unsold then in this case will be removal of the underground tanks.

If it is decided to remove the underground tanks, Sterling will necessarily outsource the work. The companies that will offer the service also will be submitted to the judgment of the MEPA.

4.2.3.1 Decommissioning

In case of decommissioning operations to be carried out to ensure the safety and protection of the environment are summarized as follows:

- Verifying the integrity of tanks and pipeline;
- Sewage removal and cleaning tank;
- Repair Insulation and protective sheath;
- Closing and inerting each pipeline by nitrogen flow

4.2.3.2 Decommissioning and Remove

The procedure that will be implemented will include the following steps:

- Verifying the integrity of the tank;
- Sewage removal and cleaning tank;
- Remove the tank and pipeline;
- Samples thoroughly excavated and the walls;
- Sampling early in the neighboring areas to compare with the samples in the area of decommissioning;
- Disposal all wastes product;
- Filling the trench with certified material and repair the condition of the premises;
-

5. Type of potentially present waste

5.1 Wastes from the plant, pipes, tanks

The demolition of existing facilities will result in the production of the following types of materials classified according to the European Waste Code

Identification types	Waste code	Potential reuse	Potential recycling
Iron demolition of metal structures, pipe racks, steel structures, piping, tanks, machinery and equipment, except electric motors and other electro-equipment	170405	70 %	70%
Power cables	170411	0%	80%
Electrical equipment	160214	0%	90%
Components removed from electrical equipments	160216	0%	80%
Piping, insulation materials and systems	170604 o 170603* (if fibrous materials)	0%	0%
Waste engine oils and gear lubrication	130206	0%	0%
absorbents, filter materials (including oil filters not otherwise specified), wiping cloths, protective clothing contaminated with hazardous	150202*	0%	0%
packaging containing residues of or contaminated by dangerous substances	150110*	50%	50%
tanks for liquid gas	160116	0%	0%
glass, plastic and wood containing or contaminated with dangerous substances	170204*	60%	50%
metal waste contaminated with dangerous substances	170409*	60%	80%
cables containing oil, coal tar or other dangerous substances	170410*	0%	0%
Concrete	170101	0%	0%
mixtures of, or separate fractions of concrete, bricks, tiles and ceramics containing dangerous substances	170106*	0%	0%
soil and stones containing dangerous substances	170503*	0%	0%
other construction and demolition wastes (including mixed wastes) containing dangerous substances	170903*	90%	10%
mixed construction and demolition wastes other than those mentioned in 17 09 01, 17 09 02 and 17 09 03	170904	90%	10%
other construction and demolition waste	170900	50 %	50 %

Table 1 Identification types of waste.

In addition to the types mentioned above there will be other minor waste, which will be labeled with appropriate EWC code and managed according to the regulations.
Except in the case of inert materials and land to be allocated to on-site reuse, the materials resulting from the insulation removal and demolition, once broken down and reduced in size, will be sent for disposal in the shortest possible time, thus avoiding excessive accumulation of material within the yard. The chosen main destination is the recovery of these materials even after a thorough clean-up. As seen from the order of execution, the dismantling of the plant will be the first as to create storage areas covered and paved such as to prevent the release of toxic substances into the environment. If this is not possible, the waste will be adequately covered by waterproofing sheets in order to prevent the destructive and destabilizing action. The effects in the environment that can generate a type of waste as described in Table 1 is as diverse as it is tied to the last type of chemical plant with which the plant parts, actually waste, they have been in contact. Particular attention should be placed in the waste of electrical and electronic equipment because they may contain substances such as heavy metals, brominated flame retardants, halogenated substances, substances harmful to the ozone. Many of these substances represent a potential danger to the environment if they are not handled or properly disposed. The activities of **treatment** provide various stages:

- ✓ safety measures or remediation, or removal of hazardous components
- ✓ removal of sub-assemblies and preliminary separation of materials
- ✓ mechanical processing for the recovery of materials.

The waste processes of recycling and treatment of the electrical and lighting allow**to recover significant quantities of material equal to about 90% of the entire product**, thus thinking in a subsequent re-entry into the market. In particular the **glass** which is at present the material with the greatest commercial potential, being able to be reused in the construction industry (**glass wool and insulation**), in the field of vitrification of **tiles** and in the future also in the production of the lamps themselves. From the different equipment, in addition, it is also possible to get iron, aluminum, copper and plastics. At the time of decommissioning of the plant, it will be compulsory the operation for the collection of such equipment because there may be the presence of mercury in modern light bulbs. The presence of mercury within the light sources varies according to the type of lamp: linear fluorescent lamps contain between 3 to 30 mg of mercury, the compact fluorescent between 5 and 10 mg, while the high-intensity discharge lamps between 20 and 50 mg of mercury. The danger of this metal is recognized by numerous studies. The separate collection of waste of the light sources avoids that they are treated as equals as the municipal solid waste. This reduces the pollution from mercury emissions, for the health of people and the environment in general.

5.2 Mixed construction and demolition wastes

The exact breakdown of the demolition waste is a fundamental for the correct design of the different phases of treatment. It is important to note that the presence of impurities in the feed material recovery facility (gypsum, asphalt, wood, rubber, plastic, etc.) limits the use opportunities after the treatment and/or influences the choice of technology recycling to be taken. The removal of hazardous materials is of paramount importance in order to achieve, by the process of demolition, no contaminated materials that can be easily sent for recycling. Some substances released during the demolition may in fact not only contaminate other wastes from C&D, but also penetrate into the atmosphere or into the ground, as well as expose to risk the workers performing the demolition. In a process of correct demolition, then, the potentially hazardous materials must be removed first, for two main reasons:

1. as long as the materials are recognizable and can be manually removed, the risks for the workers will be lower;

2. the removal of materials containing hazardous substances allows to have C&D waste not contaminated by harmful substances, then more easily recycled and due to the type of non-hazardous waste, with the regulatory benefits that entails.

The materials and products used in the building industry can emit highly toxic compounds (carcinogenic or allergenic), irritating compounds and compounds with unknown toxic properties. In general, the materials and building products may release the following pollutants:

- ✓ pollutants of physical nature: radon and decay products;
- ✓ volatile and semi-volatile organic compounds, in particular formaldehyde, aromatic organic solvents, and pesticides;
- ✓ organic pollutants: mushrooms, molds, bacteria;
- ✓ natural and man-made mineral fibers: glass wool, rock wool.

The types of hazards that may occur in the waste from C&D are summarized in Table 2

	Waste	Example
1	Some waste from construction and demolition the material used are dangerous because they contain a high proportion of materials deemed to be hazardous.	tar, paint residues and conservative, adhesives, bonding agents and certain types of plastic
2	Some materials become hazardous as a result of the long persistence in the environment in which they find themselves.	Surface reaction between building materials in origin non-hazardous and chemicals transported by the pollution
3	Some waste from construction and demolition become dangerous under certain conditions.	The wood when treated with epoxy resin and subsequently burned can emit toxic gases in the air
4	Some waste from construction and demolition become dangerous if contaminated with hazardous materials are left and/or mixed into them.	Cans of lead-based paint spilled on a pile of rubble that make the latter a hazardous waste

Table 2 types of hazardous in construction and demolition waste.

In Table 3 are summarized the hazardous or potentially dangerous that it is possible to encounter as a result of demolition, construction at the site of HAL FAR. The following is the analysis of the main components that can be found in hazardous waste from C&D

Product/Material	Potentially hazardous components	Characteristic virtually hazardous	Treatments and/or options of disposal
Paints	Lead, chromium, vanadium, solvents	Flammable, toxic	If connected to the possible low impact substrate, in the form of high-impact product. Toxic fumes when burned
Cement Additives	Hydrocarbon solvents	Flammable	Return to supplier, recycle, remove for special disposal
Waterproofing, inserts	Solvents and Bitumen	Flammable, toxic	Return to supplier, recycle, remove for special disposal; Treat before disposing
Stickers	Solvents, bitumen	Flammable, toxic, irritant	Return to supplier, recycle, remove for special disposal; Treat before disposing; Look for less hazardous alternative products
Sealants	Solvents, isocyanates	Flammable, toxic	Return to supplier, recycle, remove for special disposal; Treat before disposing; Look for less hazardous alternative products; Use water
Treated wood	Respirable fibers	Toxic, eco-toxic, flammable	Recycling; Low impact for components

			Hazardous related to wood; Production toxic fumes and residue incineration
Mineral fibers	Respirable fibers	Irritating to the skin and lungs	Remove for special disposal
Resin/filler	Isocyanates/anhydrous	Toxic, irritating	Return to supplier, recycle, remove for special disposal
Paving asphalt	Tar, asphalt, solvents	Flammable, toxic	Recycle if treated and low hazard. If there are solvents and if the hazard is high, separate for disposal
Plasterboard	Possible source of hydrogen sulfur	Flammable, toxic	Return to supplier, recycle, remove for special disposal
Concrete, bricks, tiles and ceramics	Solvents	Toxic, Irritant, Eco-toxic	Return to supplier, recycle, remove for special disposal

Table 3 Potentially hazardous elements in waste from construction and demolition.

It is obvious that the first solution to reduce if not eliminate the environmental impact following the cessation of construction and possibly a demolition of the entire structure or only partially in the case of industrial restructuring is to adopt at the time of the realization of the work a clear choice on the quality of the materials. So far it has been like this since they were introduced some constraints in the choise of the materials in the design and research and development start-up:

1. Absence of lead in the entire structure, either including the number of supply pipes of the raw materials (installations) than the delivery of elements to the whole structure (for example, the sewerage plants or thermal water and steam conduction);
2. Elimination of the treated wood as a building material;
3. Minimization of mastics and glues species in the activities of structural repair;
4. Restriction of the use of paints especially in the activities of ordinary and extraordinary post-construction maintenance.

5.3 Creating an uncontrolled landfill

During the process of decomposition of the waste, is formed a slightly acid (pH 5,6-6) percolate containing nitrates, sulfates, chlorides, nitrites, various and heavy metals. Not to mention the high bacterial load, among the others, streptococcus and e-coli. **Percolate** is a liquid that predominantly draws from the water inlet into the mass of the waste or from the decomposition of the same. The percolate produced by landfills of municipal solid waste is a wastewater with a more or less high content of organic and inorganic pollutants, arising from the physico-chemical and biological processes within the landfill. The percolate may contain several hazardous pollutants, not excluding heavy metals. Its characteristics are mainly these: the color is brown, variable depending on the concentration, the consistency may be more or less viscous while its smell, definable as "stagnant", anyway unpleasant. It is sufficient a tiny drop to infest any environment. These waters percolating into the soil layers are subject to purification processes related to the phenomenon of ion exchange and absorption. As a result there are the creation of high rates of soil pollution and what is not filtered arrives directly into the groundwater, polluting them. The pollution comes back to the man when using the aquifer for domestic needs or indirectly (remembering that the man is at the top of the food chain) for example irrigating the fields for agricultural use.

The quantitative characterizations are influenced by the contributions of water from the outside and the hydrogeological characteristics of the area of location. Storms, solar radiation, temperature, wind conditions, the presence of surface water bodies are the major factors in the formation of the percolate. The quality depends essentially on the physical-chemical characteristics of the waste (nature of the organic compose, nutrient availability, presence of toxic substances, the initial moisture, metal

content, and these characteristics in turn depend on the type of the deposited material, from the level of the applied separate collection, to any applied pre-treatment, by the mode of deposition in landfills) and by the maintaining, within the area, of a certain degree of moisture (water balance, which depends on the type of surface coverage, capacity and permeability of absorption by the rejection, possible recirculation of percolate, method of extraction of the same). The quality of the percolate suffers, also, in time, variations that follow the evolution of the biological processes that occur within the rejection.

The percolate is one of the main problems related to the management of an uncontrolled discharge, in relation to the environmental risks that it involves. For this reason it is necessary to prevent the formation of particulate removing all the waste that generate it. The company will endeavor to do so in order that none of the equipment or accessories can remain unattended outside, but each element must be reclaimed, disposed, recovered or recycled in the most environmentally friendly way possible.

5.4 Characterisation of wastes

The destination of waste depend on the nature of the waste it can be try a recovery of the same by executing a reclamation or a disposal. On these decisions, in addition to the type of waste, it also affects the possibility of reusing of the same (strongly related to age, and years of operation) and their marketability on the market. All the equipments that have been in direct contact with dangerous substances must still be reclaimed. The destination options of this waste are:

- Recovery
- Recycling
- Disposal

Yet it is impossible at this time to define what it will be the possible target but that disposal options will be explored at the time of site closure. To note that waste sampling methodology will be in line with EN 14899. Samples are to be analyzed by laboratories that have proven experience in waste testing and preferably ISO17025 certified. Land samples shall beanalyzed according to EN13137, EN13657 (or EN13656) and EN12506 and information on both the organic and inorganic constituents in the samples shall be provided. Classification of the nature of the waste is to be carried out according to SL504.37, the waste regulations and commission decision 2000/532/EC.

6 Restoring the initial conditions of the site

At the completion of the demolition will be drawn up an "Application Site Report (ASR)", as required by EC Directive 96/91 on integrated pollution prevention and control (IPPC), which will aim to:

- ✓ Identify, through the site characterization, the environmental conditions, in the light of the history of the plant's production;
- ✓ Identify each substance in the seabed or subsoil, whose presence can be traced to the activities of the plant;
- ✓ Identify and implement suitable measures to restore the initial conditions of the site.

The detailed and definitive characterization plan will be drawn at the time of decommissioning of the plant, particularly in view of the historical evolution of the activities of the plant.

The main activity of recovery will be made by backfilling the main excavations due to the works of demolition and partially remodeling of the site which will be agreed with Entity of authority and control, upon disposal. The fillings and restorations will be done with excavators of medium and large size, with buckets and by trucks for the transport of the materials. The filling will be carried out in layers. The quality and size of carry-over of land will be defined with entity of authority and control. The modelling of the site will be conducted with the blades.

The environmental matrix that will be more closely associated with the work of disposal is the soil and subsoil (with aquifers that in the case of the establishment in question is present in subsurface geography). Before proceeding with the remodeling of the possibly negotiated land with the entities of authorization there shall be a snapshot of the state of soil for the assessment of any criticals due to pollutants released from the materials stored or used in the area. This "snapshot" will be carried out through:

a) Environmental surveys such as:

- ✓ Continuous core drilling rotary and percussion drilling on three levels of depth 1 meters, 8 meters and 15 meters;
- ✓ Positioning the soil cores in core boxes;
- ✓ Picking and packing the soil samples, samples that will be taken (to date pursuant to Legislative Decree no. 152/2006 Annex 2, Title V Part IV) are at least three per survey: the first from 0 to 1 m from ground level, the second in the meter which includes the capillary fringe, the third in the intermediate zone between the two samples. In the case the stratigraphy of the perforations shows horizons with evidence of contamination, it will be necessary to proceed to the taking of soil samples representing these horizons;

b) Terebration of piezometers such as:

- ✓ Continuous core drilling with rotary and percussion drilling depth of at least 6 meters;
- ✓ Installation pipes piezometric blind and slotted, the depth of the piezometrics will still affect at least the base of the first identified aquifer and still pushed for at least 5 meters inside the aquifer itself. The instrumentation will be retractable so as to ensure the sealing surface and states that can guarantee the delivery of potential pollutants;
- ✓ Purging and sampling in order to create a story that can provide information on the health status of the area; it will also be used the the existing well on the property to collect additional samples of underground water (after purging the well); during sampling it will always be in any case carried out to determine which - quantitative water, such as relief depth of the water, determination of the main physical-chemical parameters (pH, temperature, redox potential, electrical conductivity, dissolved oxygen), execution of hydro tests, analysis of the head space (not saturated).

After this preliminary analysis of the cognitive environmental situation at time zero and the relative chemical and geotechnical analysis (in particular, in addition to the chemical compounds used in the company - chemical analysis, the geotechnical analysis will focus on the water content, the particle size, density, permeability for each soil sample representative of the lithologies encountered in the subsurface. The particle size determinations in fact provide essential information to provide what is described in the stratigraphy compiled by the competent technician, they provide important input parameters for site-specific risk analysis). It will be possible to develop a conceptual model of the final site, organizing the information collected in order to determine the effects of the activity on the site and then identifying:

1. The sources of present and past contamination;
2. The dominant features of the environment with which the site interacts (shallow aquifer type, deep of the main aquifer, proximity of the river, weather and climate characteristics) related to the concentration of any contaminants acceptable for their particular solubility, volatility, biodegradability and bioavailability;
3. Detected any anomalies it is necessary to proceed to the remediation of the site through the below described activities

6.1 Remediation of the site in case of contamination

In case of disposal and contamination of the site there will be performed the following tasks for cleaning up:

- ✓ Excavation, removal and backfill near the "spots of contaminated soil" and where there are not detected potential sources of pollution (underground pipes);
- ✓ Reclamation plant and equipment - particularly the storage silos of the solvents used in the manufacturing process and process waste must be cleaned and disposed of with the best available techniques;
- ✓ Analysis for waste approval: In particular, there will be performed the acceptance tests of the waste produced during the decommissioning of the site, operations involving the control of the EWC code to verify that it is authorized to dispose from the regional lists;
- ✓ Waste management and disposal will have to refer only to authorized dealers by the legislation in force;
- ✓ Restoring brownfields to frame in the context in which it is immersed. In fact, the restoration of the areas means taking advantage of the existing infrastructure and reconverting the productive capacity but restoring the environmental best possible quality.

In such cases, the analysis must be repeated for the confirmation of the correct soil remediation and restoration of the original conditions.

7. Conclusion

At the time of the demolition, sale or disposal, it will be possible to make an assessment on the health state of the environment (with particular reference to soil and groundwater) being able to analyze the matrices and compare them with those of neighboring environments.

Although assessment will need to be carried out at the time of demolition, the results of this assessment will need to be compared with levels measured towards the beginning of operations. In this regard a land and groundwater risk assessment will need to be carried out at the earliest so as to assess whether a baseline report and monitoring strategy will need to be established. Through this evaluation it will be determined the need to create a starting profile on the physic - chemical state of the soil. Times and methods will be decided in accordance with the MEPA directions and the business needs. The same section of the project description will be updated with this indication.

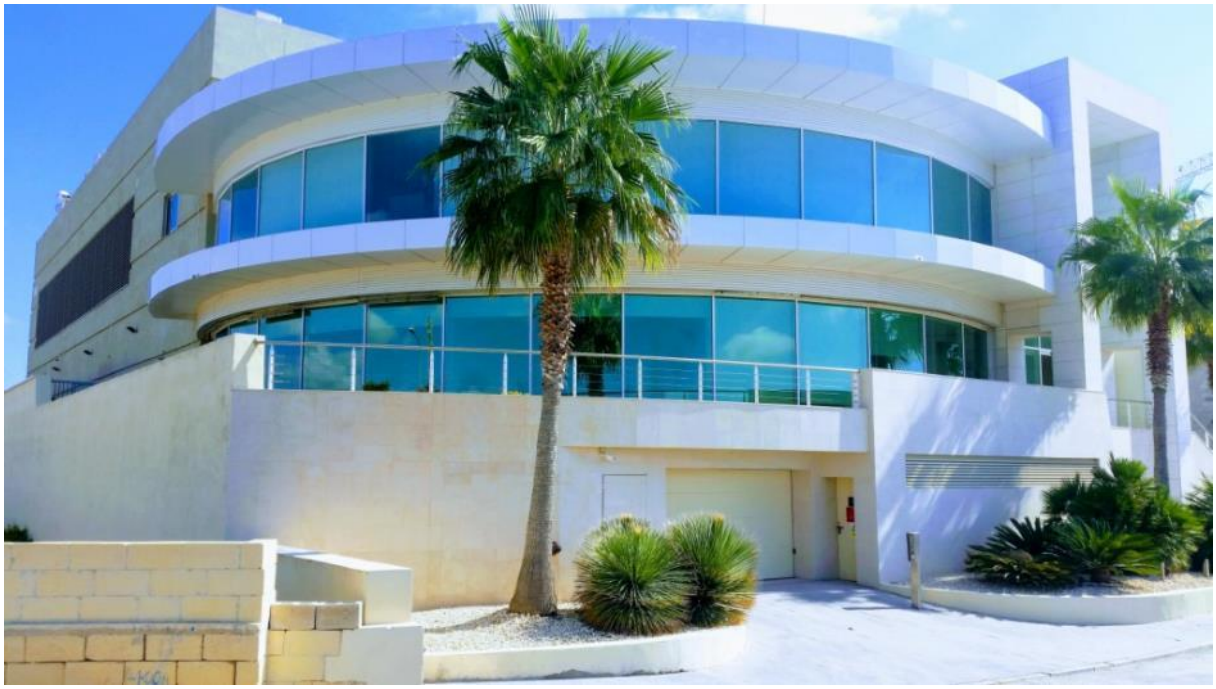
In this regard Sterling will refer to make particular reference to EC Guidance 2014/C 136/03 concerning baseline reports under Article 22(2) of Directive 2010/75/EU on industrial emissions.

Annex 8: Emissions to Air Monitoring Programme Method Statement

IP 0001/23

EMISSIONS TO AIR MONITORING PROGRAMME AT STERLING CHEMICAL (MALTA) LTD

METHOD STATEMENT



Version 3 (May 2024)

Report Reference:

En-Sure Ltd, 2024. IP 0001/23 Emissions to Air Monitoring Programme at Sterling Chemical (Malta) Ltd. Method Statement (Version number: 3). San Gwann, May 2024; v + 13 + 3 Appendices.

THIS IS A DIGITAL COPY OF THE REPORT

RESPECT THE ENVIRONMENT – KEEP IT DIGITAL

Quality Assurance

IP 0001/23: Emissions to Air Monitoring Programme at Sterling Chemical (Malta) Ltd
Method Statement
May 2024

Report for: Sterling Chemical (Malta) Ltd

Revision Schedule

Rev	Date	Details	Prepared by	Reviewed by	Approved by
00	April 2024	Submission to Client	**Collette Lynch** Environmental Consultant	**Rachel Xuereb** Director	**Adrian Mallia** Managing Director
01	April 2024	Updates to Methodology	**Collette Lynch** Environmental Consultant	**Rachel Xuereb** Director	**Adrian Mallia** Managing Director
02	May 2024	Removal of NOx monitoring, inclusion of monitoring of emission points EM3A-3C and other minor updates	**Collette Lynch** Environmental Consultant	**Rachel Xuereb** Director	**Adrian Mallia** Managing Director

File ref: N:_Active Projects\Air Quality\ES_STG018 - Sterling Emissions to Air Monitoring Programme Method Statement\Method Statement\Sterling Chemical Emissions to Air Monitoring Programme Method Statement_FNL_V3.docx

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Email: info@ensure.com.mt
Web: www.ensure.com.mt

CONTENTS

FIGURES

TABLES

APPENDICES

MONITORING PROPOSAL

Introduction

1. En-Sure Ltd was commissioned by Sterling Chemical (Malta) Ltd to prepare an Emissions to Air Monitoring Programme Method Statement for its pharmaceutical facility at Hal Far, as requested by the Environment and Resources Authority (ERA) as part of Integrated Pollution Prevention and Control (IPPC) permit renewal and variation application IP 0001/23.

2. The facility, hereinafter referred to as the "Scheme", comprises a factory for the manufacture of Active Pharmaceutical Ingredients. The site is located at HF-50 – HF-52 Hal Far Industrial Estate (**Figure 1**).

3. The Scheme currently operates under IPPC permit IP 0004/21, which is due to expire in May 2024.

4. In September 2023, as requested by ERA, a comparative assessment was undertaken to determine the Scheme's compliance against *Commission Implementing Decision (EU) 2022/2427 establishing the best available techniques (BAT) conclusions, under Directive 2010/75/EU of the European Parliament and of the Council on industrial emissions, for common waste gas management and treatment systems in the chemical sector,* herein referred to as the "WGC (BAT) Conclusions".

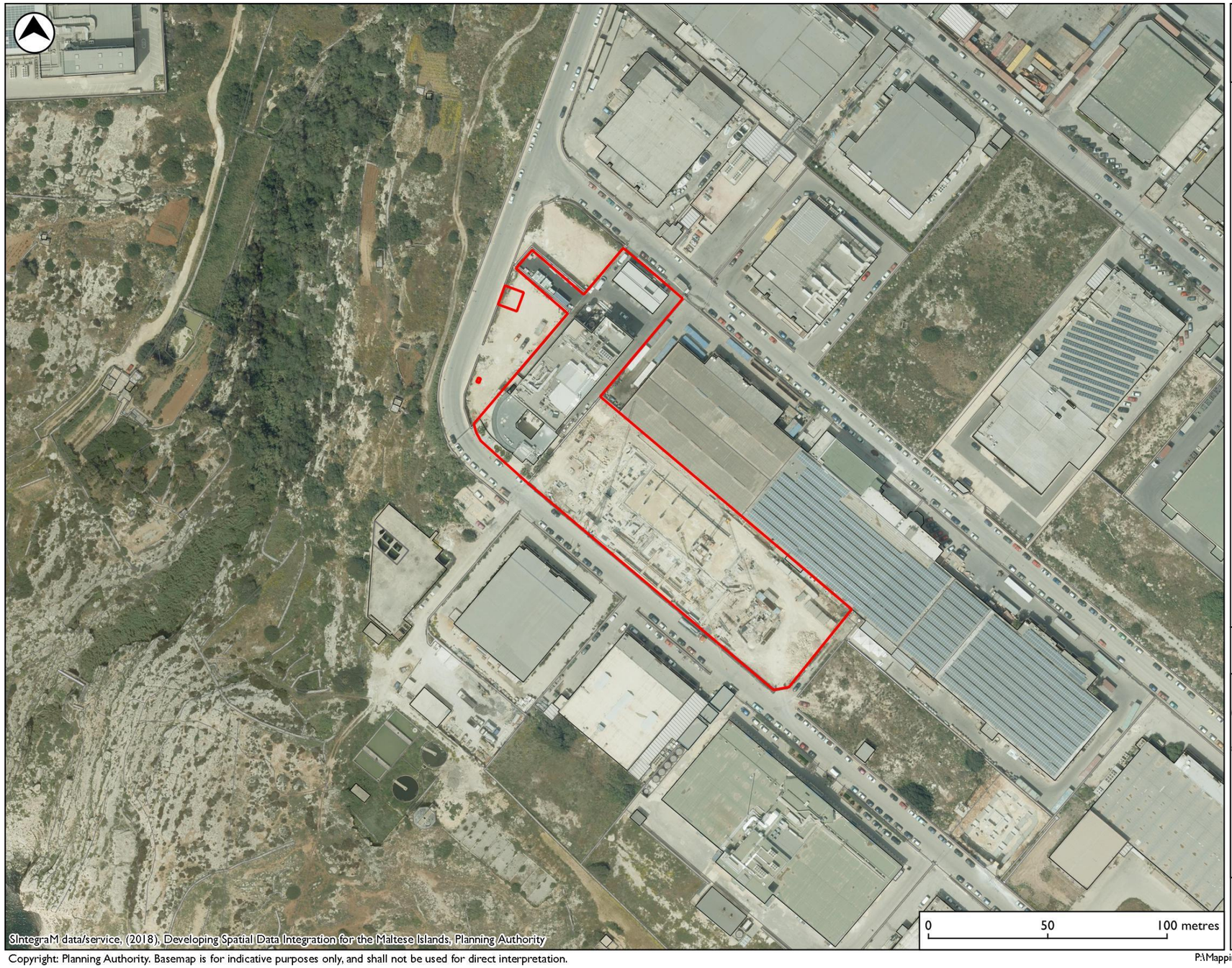
5. A key part of the BAT assessment was the establishment of a channelled and diffuse emissions to air inventory of all waste gases generated at the Scheme. A copy of the submitted inventory has been included in **Appendix 1**.

6. The inventory identified a number of relevant waste emissions that are not currently monitored as part of the existing Emission to Air Monitoring Programme at the Scheme. This Method Statement outlines the proposed updated Emissions to Air Monitoring Programme at the Scheme and will form part of renewal and variation IPPC application IP 0001/23, which is currently being processed by ERA.

Terms of Reference

7. The specified terms of reference (ToR) are in accordance with the WGC (BAT) Conclusions, specifically, BAT provides the specific monitoring obligations, encompassing the substances to be monitored, thresholds, recognised monitoring standards, and monitoring frequencies. A copy of the WGC (BAT) Conclusions has been included in **Appendix 2**.

Figure 1: Location of the Scheme site

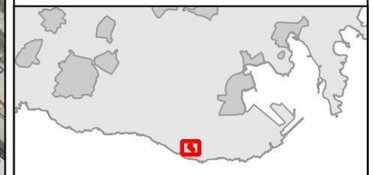


Location of site

Legend

Site boundary

Sterling IPPC Micronisation Variation



Map by:

en-sure monitoring

Client: Sterling Chemical Ltd
Ref: ES_STG013
Date: 1 / 2022

SIntegraM data/service, (2018), Developing Spatial Data Integration for the Maltese Islands, Planning Authority

P:\Mapping\En-Sure\IPPC\ES_STG013 - Sterling Chemical Malta Ltd

Current Emissions to Air Monitoring Requirements

8. **Table 1** includes the Scheme's current emission to air points, approved as per IP 0004/21, in addition to the current abatement measures applied at each point. Those emission points denoted with an asterisk are subject to the current emissions to air monitoring requirements.

9. **Figure 2** provides the locations of each emission point listed in **Table 1** in addition to the locations of each HEPA filter.

Table 1: Emissions to Air Points

Ref.	Source	Abatement
Existing points as per IP 0004/21		
EM1*	Production area	HEPA filters (HF4, HF5, HF6), carbon filter, heat exchanger, scrubber
	Weighing room	
	Finished goods area (clean rooms)	
	Microniser	
EM2	HVAC (General ventilation and air-conditioning) – HF 51 block	Fabric filter
EM3A*	HVAC Production Line 2 clean rooms	HEPA filter (HF1)
EM3B*	HVAC Production Line 1 clean rooms	HEPA filter (HF2)
EM3C*	Micronisation plant clean rooms	HEPA filter (HF3)
EM4A*	Laboratories	Fume Hood Extraction vent
EMAB*	Laboratories	Fume Hood Extraction vent
EM4C*	QC lab fume hoods	Carbon filter
EM4D*	QC lab fume hoods	Carbon filter
EM4E*	QC lab fume hoods	Carbon filter
EM5	Boiler	Stack
EM6	Boiler	Stack
EM7	Cooling Tower	Cooling tower stack
EM8A *	AMS (Quality Control) lab fume hoods	Carbon filter
EM8B *	AMS (Quality Control) lab fume hoods	Carbon filter
EM8C *	AMS (Quality Control) lab fume hoods	Carbon filter
EM8D *	AMS (Quality Control) lab cabinet and localised hoods	Carbon filter
EM10A*	R&D laboratory	Fume Hood Extraction vent
EM10B*	R&D lab fume hoods	Carbon filter
EM10C *	R&D lab fume hoods	Carbon filter
EM10D *	R&D lab fume hoods	Carbon filter
EM11*	Micronization laboratory	Fume Hood Extraction vent
EM12	Cold rooms	Vent
EM13A*	Production area	Heat exchanger, carbon filer, Scrubber
EM13B*	Production area	Scrubber backup fan
EM14	General ventilation	HVAC
EM15	HVAC Production Line 7 clean rooms	HEPA filter (HF7)
EM16	Laboratory	Fume Hood Extraction vent
EM17	Laboratory	Fume Hood Extraction vent
EM18	Laboratory	Fume Hood Extraction vent
EM19	Laboratory	Fume Hood Extraction vent
EM20	Laboratory	Fume Hood Extraction vent
EM21	Laboratory	Fume Hood Extraction vent
EM22	22-MR Warehouse	None
EM23	(Proposed) nitrogen output from microniser	HEPA filters HF4, HF5, HF6
EM24	(Proposed) Ventilation system of fire safety cabinet	Carbon filter

EM25	Emergency diesel-fuelled fire pump	None

10. **Table 2** includes the current emissions to air monitoring requirements, to include the parameters to be monitored from each emission point, the frequency that the monitoring should be carried out and the emission limit values. **Figure 2** shows the emissions points.

Table 2: Current Emissions to Air Monitoring Requirements

Parameter	Emissions Point Reference	Emission Limit Value	Frequency[1]
TVOCs (Total Organic Carbon)	EM1, EM13	20 mg/Nm^3	Annually
	EM4A, EM4B, EM4C, EM4D, EM4E, EM8A, EM8B, EM8C, EM8D, EM10A EM10B, EM10C, EM10D, EM11		Every four years
VOCs carrying Hazardous Statements H340, H350, H350i, H360D or H360F[2]	EM1, EM13	2 mg/Nm^3	Annually
Halogenated VOCs carrying Hazardous Statements H341 or H351[3] [4]	EM1, EM13	20 mg/Nm^3	Annually
Total Particulate Matter	EM1, EM13, EM3A, EM3B, EM3C	<1 mg/Nm^3	Annually
	EM4A, EM4B, EM4C, EM4D, EM4E, EM8A, EM8B, EM8C, EM8D, EM10A EM10B, EM10C, EM10D, EM11		Every four years
HCl	EM1, EM13	7.5 mg/Nm^3	Annually
HBr	EM1, EM13	<1 mg/Nm^3	Annually

11. It is noted that certain emission sources, such as, the general heating and ventilation system in non-production areas, some of the clean rooms and cold rooms, several laboratories, excluding the Quality Control (QC) and Research and Development (R&D) laboratories and the waste warehouse are not subject to emissions to air monitoring due to the relatively small risk for a potential release of pollutants, and / or the relatively low quantities of raw materials handled in such an area. All such activities have previously been evaluated within a Land and Groundwater Risk Assessment.

[1] In the instances where monitoring is required ever four years, this is subject to compliance with the emission limit values, otherwise, monitoring shall be carried out annually.
[2] Where the mass flow of the sum of the compounds is greater or equal to 10 g/hour.
[3] Where the mass flow of the sum of the compounds causing the labelling is greater than or equal to 100 g/hour
[4] The emission limit value refers to the mass sum of the individual compounds.

12. Additionally, the two LPG boilers do not exceed the 1 MW_{TH} threshold in order to qualify as a Medium Combustion Plant, thus eliminating the necessity for emissions to air monitoring to be carried out.

13. The Waste Gas Inventory (**Appendix 1**) includes all raw materials used at the Scheme. The main liquids in use in the QC and the R&D laboratories, allowing for potential sources of VOC emissions, are primarily organic solvents, while some are acids (both inorganic and organic), and alkalis. Some of the solvents used i.e. dimethylformamide and dichloromethane, carry those hazardous statements, to include: H340, H350, H350i, H360D or H360F and for the halogenated VOCs: H341 or H351, which reduces the emission limit level for that individual compound (see **Table 2**).

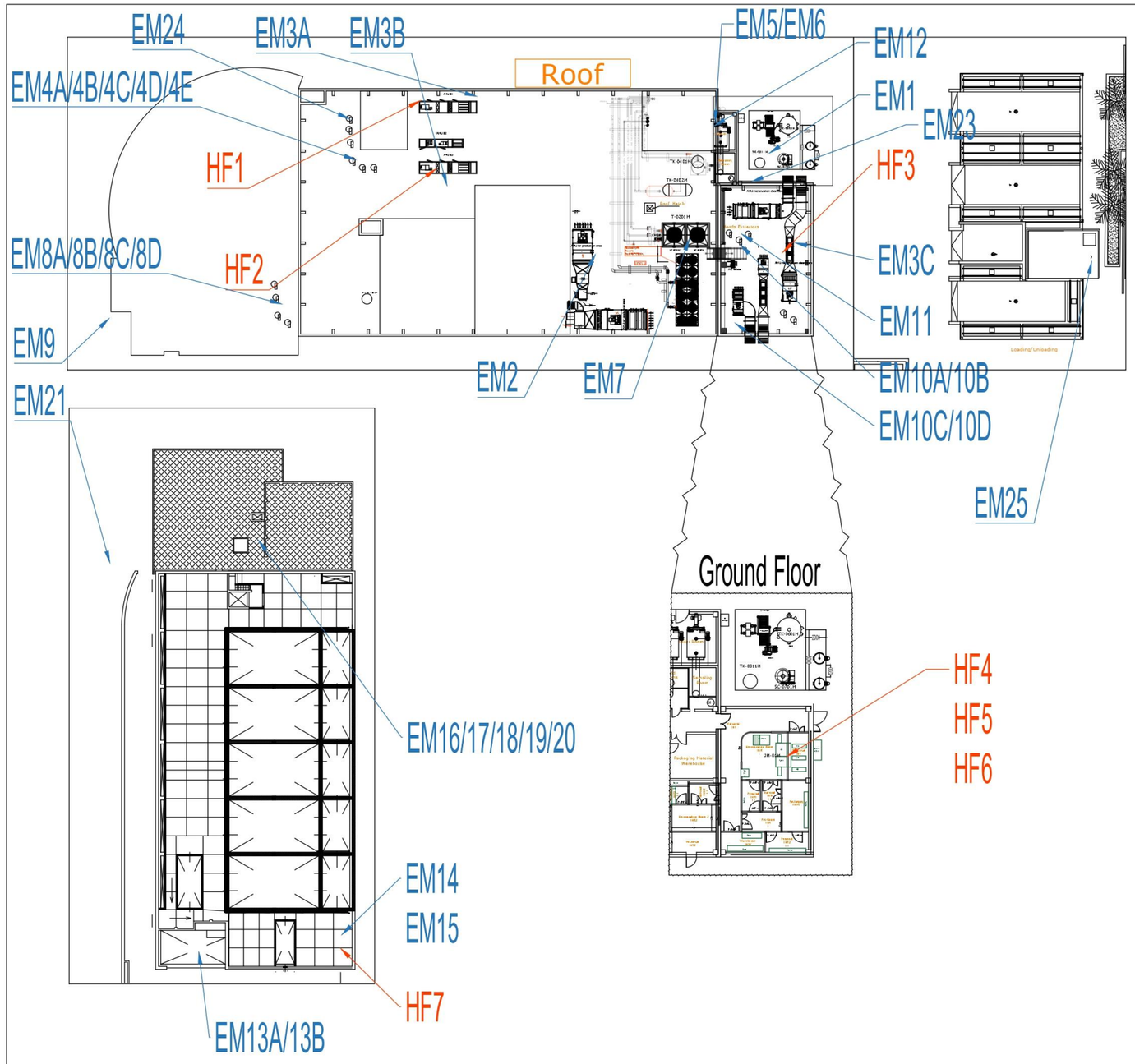
14. Whilst the annual monitoring of TVOCs (Total Organic Carbon) is required to be carried out for the two emission points connected to the scrubber, EM1 and EM13, volatile organic compounds (VOCs), in the form of raw materials are used in very small quantities in the QC laboratories, the R&D laboratories and the Micronisation Laboratory – i.e., the sources of emission points EM4A-E, EM8A-D, EM10A-D and EM11; therefore, monitoring of TVOCs from said emission points has been reduced to once every four years. Additionally, since the amount of those specific raw materials carrying the aforementioned hazardous statements are used in very small quantities (far lower than the applicable threshold of 10 g/h and 100 g/h respectively), the specific monitoring for these substances is not required for sources EM4A-E, EM8A-D, EM10A-D and EM11.

15. Likewise, particulate matter (PM) is required to be monitored on an annual basis from the two scrubbers (EM1 and EM13), in addition to the heating and ventilation system linked to the production areas and micronisation clean room (EM3A-3C). However, due to the low quantities of raw materials used in the laboratories, such monitoring has been reduced to once every four years for emission points EM4A-E, EM8A-D, EM10A-D and EM11.

16. There are four existing emergency fire pumps installed at the Scheme Site, one of which is diesel operated with the remaining pumps connected to mains electricity. In the event of a fire, the fire pumps facilitate the supply of water from the rainwater reservoir to the hose reels. In which case, the operation of the diesel-fuelled pump would result in an emission to air (combustion by-products), and therefore, has been assigned emission point **EM25** (**Figure 2**).

17. Since the potential occurrence of a fire breaking, that further to which warrants the use of the hose reels, is considered low, emission point EM25 will not be included in the Emissions to Air Monitoring Programme.

Figure 2: Emission points to air and location of HEPA filters



Malta1	Column1	Malta2	Column2
Emission Point Ref.	Source	Emission Point Ref.	Source
EM1	Scrubber	EM13A/13B	Scrubber
EM2	HVAC P1 (general ventilation)	EM14	HVAC P4 (general ventilation)
EM3A	HVAC Line 2 (HEPA)	EM15	HVAC Line 7 (HEPA)
EM3B	HVAC Line 1 (HEPA)	EM22	22 MR Ventilation Warehouse
EM3C	UTA-JM002M		
EM23	Micronizer Nitrogen Exhaust		
EM4A/4D	QC1 Lab Fume Hoods	EM16/17/18/19/20	Future Fume Hoods
EM4B	QC1/QC2 Lab Cabinet		
EM4C/4E	QC2 Lab Fume Hoods		
EM24	QC1 Lab Reagent Fire Cabinet		
EM5	Boiler 1		
EM6	Boiler 2		
EM7	Cooling Tower		
EM8A/8B/8C	AMS Lab Fume Hoods		
EM8D	AMS Lab Cabinet and Localized Hoods	EM21	Sewage
EM9	Sewage		
EM10A/10B/10C/10D	R&D Lab Fume Hoods		
EM11	R&D Sink Hood		
EM12	Cold room		
EM23	Nitrogen Micronizer Exhaust		
EM25	Emergency Fire Diesel Pump		

Sterling ID	ERA Filter Item	Location	Type
AHU1	HF1	Roof Malta1	Supply and Exhaust Air Handling Unit for Production Line 2
AHU3	HF2	Roof Malta1	Supply and Exhaust Air Handling Unit for Production Line 1
UTA-JM002M	HF3	Roof Micro	Supply and Exhaust Air Handling Unit for Micronization
CH01	HF4	Micro Clean Room	Extraction System Micronizer
CH02	HF5	Micro Clean Room	Extraction System Micronizer
CH03	HF6	Micro Clean Room	Extraction System Micronizer
UTA-HVAC-0702M	HF7	Roof Malta2	Supply and Exhaust Air Handling Unit for Production Line 7

REV. REV.	DATE DATE	DESCRIZIONE DESCRIPTION	DISEG. DWN.	CONTR. CHK.	APPROV. APPR.
14	03/05/2024	New Emission points Micronizer, Diesel Pump	AN		
13	09/08/2022	Lab Reagent Cabinets	AN		
12	05/10/2021	Steam Boiler Malta1 Design	AN		
11	23/07/2020	Substitution Chiller +5, Overflow tank placement	AN		
10	13/10/2020	Emission as per IPPC permit, New carbon filters	AN		
9	17/12/2019	LPG tanks removal	AN		
8	16/07/2019	HEPA Malta2, Sampling Room, SAS 1P, AMS	AN		
7	30/01/2019	HEPA Filters for ERA	AN		
6	21/08/2018	DU-01M Distillation Unit, VP-0821M, C-0502M and TK-1001M	MCM		
5	23/06/2017	New Reactor in line 1, Micro building	AN		
4	10/11/2016	Cold Rooms Installation, new reactors in line 2, pilot reactors relocation	RV		
3	04/06/2015	Flammable Warehouse extension - As built	RV		
2	23/02/2015	Installation of Line 1 - As built	RV		
1	08/10/2014	Revision for new equipments	RV		
0	19/06/2014	First Emission	RV		

STERLING MALTA

Sterling Chemical Malta Ltd
HF51 – Hal Far Industrial Estate
Birżebbuġa – BBG3000 MALTA

DIS. N. / DWG. N.: DGN_03_2014
Scala: / Scale:
N°Fogli: 1
Foglio: 1 / 1

OGGETTO - OBJECT
Equipments Layout - Emission and HEPA Filters

DATA: / DATE: 19/06/2014
DISEGNATORE / COMPILER: RV

Monitoring Proposal

15. As mentioned, in September 2023, Sterling Chemical (Malta) were requested by ERA to carry out a comparative assessment in order to establish compliance against the WGC (BAT) Conclusions, which are to be implemented by all facilities within the chemical sector by 6th December 2026.

16. BAT 2 of the Conclusions (**Appendix 2**) requires the setting out of a Waste Gas Inventory of channelled and diffuse emissions to air that are generated at the Scheme. The final Waste Gas Inventory can be seen in **Appendix 1**.

17. Currently, two Active Pharmaceutical Ingredient (API) products are manufactured at the Scheme, and in compliance with BAT 2, all raw materials used in their production were listed, in addition to noting additional details, such as the state of the material – i.e., liquid, gas or solid, the subsequent content of the emission and the abatement that is applied to eliminate or reduce such an emission being released into the atmosphere.

18. In addition to documenting the waste gas emissions generated during the manufacturing of the APIs as a direct result of using specific raw materials, all side reactions (by-products) were included in the inventory, in addition to the emissions generated from furnace process heaters such as the two LPG fuelled boilers.

19. The final list of waste gasses generated at the Scheme was then compared against the list of relevant substances identified in BAT 8 of the WGC (BAT) Conclusions, which require to be monitored at specified frequencies in accordance with EN Standards (where required).

20. The following list includes all newly identified emissions to air generated at the Scheme, which in addition to the existing parameters displayed in **Table 2** are required to be monitored in accordance with the WGC (BAT) Conclusions:

- Gaseous Fluorides (HF);
- Sulphur dioxide (SO_2);
- Carbon monoxide (CO);
- Ammonia (NH_3);
- Toulene;
- Other carcinogenic, mutagenic or toxic for reproduction (CRM) substances, to include:
    - Dimethylformamide;

- Tetrahydrofuran; and
- Methyl Isobutyl Ketone.

21. Further to the determination of the above additional monitoring requirements, an evaluation was conducted on the substances encompassed within the existing air emissions monitoring programme to ensure compliance with the WGC (BAT) Conclusions.

22. Taking into consideration both the additional substances required to be monitored with the WGC (BAT) Conclusions and the substances already monitored within the Scheme, adjustments have been made, as necessary, to ensure alignment with the WGC (BAT) Conclusions. The updated Emissions to Air Monitoring Programme, as outlined in **Table 3**, reflects the proposed amendments.

Table 3: Proposed Emissions to Air Monitoring Proposal

Parameter	Emissions Point Reference	Emission Limit Value	Frequency[5]	Standard	Method
TVOCs (Total Organic Carbon)	EM1, EM13	20 mg C/Nm^3	Annually	EN 12619: 2013	In situ sampling and analysis
	EM4A, EM4B, EM4C, EM4D, EM4E, EM8A, EM8B, EM8C, EM8D, EM10A EM10B, EM10C, EM10D, EM11		Every four years		
Toulene	EM1, EM13	1 mg/Nm^3	Every six months	CEN / TS 13649:2015	Laboratory analysis
Dichloromethane	EM1, EM13	1 mg/Nm^3	Every six months	CEN / TS 13649:2015	Laboratory analysis
Dimethylformamide[6]	EM1, EM13	2 mg/Nm^3	Every six months	NIOSH 2004:1994	Laboratory analysis
Tetrahydrofuran[7]	EM1, EM13	10 mg/Nm^3	Every six months	CEN / TS 13649:2015	Laboratory analysis
Methyl Isobutyl[7]	EM1, EM13	10 mg/Nm^3	Every six months	CEN / TS 13649:2015	Laboratory analysis
Total Particulate Matter (Dust)	EM1, EM13, EM3A, EM3B, EM3C, EM15	<1 mg/Nm^3	Annually[8]	EN 13284-1: 2017	Laboratory analysis
	EM4A, EM4B, EM4C, EM4D, EM4E, EM8A, EM8B, EM8C, EM8D, EM10A EM10B, EM10C, EM10D, EM11, EM23		Every four years		Laboratory analysis
Gaseous Chlorides (HCl)	EM1, EM13	7.5 mg/Nm^3	Annually	EN 1911	Laboratory analysis
Gaseous Fluorides (HF)	EM1, EM13	<1 mg/Nm^3	Annually	ISO 15713:2006	Laboratory analysis
Sulphur Dioxide (SO_2)	EM1, EM13	<150 mg/Nm^3	Every six months	EN 14791: 2017	Laboratory analysis
Ammonia (NH_3)	EM1, EM13	10 mg/Nm^3	Every six months	EN 21877	Laboratory analysis
Carbon monoxide (CO)	EM1, EM13	No limits apply	Annually	EN 15058: 2017	In situ sampling and analysis

Note: Items marked in blue are new emissions that will be monitored

[5] In the instances where monitoring is required ever four years, this is subject to compliance with the emission limit values, otherwise, monitoring shall be carried out annually.
[6] A substance classified under ' *CMR substances other than CMR substances covered elsewhere in this table'* i.e. a CMR 1A and 1B substance – i.e. VOCs carrying Hazardous Statements H340, H350, H350i, H360D or H360F[6]
[7] A substance classified under ' *CMR substances other than CMR substances covered elsewhere in this table'* i.e. Classified as a CMR substance – i.e. VOCs carrying Hazardous Statements H341 or H351
[8] The mass flow of PM being emitted from emission point EM23, post HEPA filer, is 0.000003 kg/h. Calculations have been based on the worst-case scenario.

23. There are no proposed changes to the emission limit value or frequency of monitoring for Total Volatile Organic Carbon (TVOC). Whilst the WGC (BAT) Conclusions state that monitoring should occur once every six months, there is a concession that monitoring may be reduced to once a year or once every three years if emission levels are proven to be sufficiently stable. There has been a rolling average of 7.65 mg/Nm^3 from emission point EM1 and an average of 5.65 mg/Nm^3 from emission point EM13 over the last three years, it is therefore being proposed that the frequency of the monitoring remains at once a year.

24. It is being proposed that the monitoring of the various laboratory emission points - i.e., EM4A-E, EM8A-D, EM10A-D and EM11 will remain at once every four years.

25. Previously, only those VOCs carrying hazard statements H351 and H651 that were halogenated required to be monitored; however, the WGC (BAT) Conclusions require for all substances classified as carcinogenic, mutagenic or toxic for reproduction (CMR) under Category 2 to be monitored; therefore, both tetrahydrofuran and methyl isobutyl have been added to the emissions to air monitoring programme, where the permitted emission limit level is 10 mg/Nm^3. The frequency of the monitoring is required once every six months.

26. Dimethylformamide is a CMR substance of Category 1A and 1B, and will be monitored once every 6 months. The WGC (BAT) Conclusions state an emission limit level of <1-5 mg/Nm^3; however, it is being proposed that the emission limit of 2 mg/Nm^3 will remain.

27. Toluene and Dichloromethane are two specific VOCs that require monitoring, where an emission limit value of 1 mg/Nm^3 is to be achieved. Monitoring will take place once every six months.

28. As mentioned, since the amount of those specific raw materials carrying the relevant hazardous statements are used in very small quantities, it is not being proposed that tetrahydrofuran, methyl isobutyl, dimethylformamide, toluene and dichloromethane are to be monitored for emission points i.e., EM4A-E, EM8A-D, EM10A-D and EM11.

29. Total Particulate Matter (Dust) will continue to be monitored on an annual basis for emission points EM1, EM13 and EM3A-3C, where an emission limit value of 1 mg/Nm^3 is to be achieved. Total Particulate Matter will also continue to be monitored for emission points EM4A-E, EM8A-D, EM10A-D and EM11 once every four years.

30. Furthermore, it was noted that monitoring for emission point EM15 (HVAC system for the clean rooms in Production Line 7) was not included in the current programme. The sources of emissions for EM15 are the same as emission points EM3A and EM3B (HVAC for production line 1 and 2) – diffuse particulate matter

emissions channelled through the HVAC system. Emissions from EM15 are treated with a HEPA filter (HF7) (**Figure 2**). The annual monitoring of PM from EM15 has been added to the programme.

31. The monitoring proposal for the new emission point being added to the micronisation plant (EM23) is based on the nature of substances that could be emitted from the hopper of the microniser (primarily dust, because some dry powder may be carried with the nitrogen being released from the facility). The mass flow of PM being emitted from emission point EM23 is 0.000003kg/h and this has been calculated based on a worst-case scenario and takes into consideration the 99.95% efficiency of HEPA filters. It is noted that solvents are only used during the cleaning of the plant, and as noted, during cleaning, VOC emissions will continue to be treated in the scrubber and emitted from emission point EM1.

32. Gaseous Chlorides (HCl) will continue to be monitored on an annual basis, again for just emission points EM1 and EM13.

33. Gaseous Fluorides (HF) are generated at the facility and therefore they are being added on to the emissions to air monitoring programme for annual monitoring, with an emission limit value of 1 mg/Nm^3.

34. The monitoring of Sulphur Dioxide (SO_2) is proposed to be carried out initially once every six months with a view to reducing to an annual basis after three years should levels be stable.

35. It is noted that for emissions of less than 50 g/h of HF and NH_3 and below 500 g/h for SO_2, the BAT-AEL emission limit levels do not apply.

36. Ammonia (NH_3) will be reintroduced into the emissions to air monitoring programme on account of the fact that it is indeed emitted at the Scheme. Monitoring will take place once every six months for the first three years, with a view to reducing the monitoring to annually if levels remain stable.

37. Whilst Carbon monoxide (CO) is required to be monitored the WGC (BAT) Conclusions do not specify an emission limit value. Again, monitoring of CO will take place once every six months; however, if levels are indeed stable, this will be reduced to annual.

38. The proposed emissions to air monitoring programme does not include the monitoring of Hydrobromic Acid (HBr). HBr is not used or generated at the Scheme and therefore does not require to be kept in the programme.

39. No monitoring is being proposed for the emission point EM24, which facilitates the ventilation system of the fire safety cabinet. Only in the event of a spill inside the cabinet will there be an emission of VOCs to air, which are abated by a carbon filter.

40. As mention, no monitoring is being proposed for emission point EM25, the diesel operated emergency fire pump, since only in the event of a fire will there be a generation of emissions to air.

The Laboratory

41. The laboratory engaged to carry out the collection of samples and analysis is the ISO/IEC 17025:2017 accredited Sun Lab Group Ltd and their partners Laboratori C.A.D.A. A copy of both accreditation certificates and scope schedules has been included in **Appendix 3**. Sun Lab Group are also ERA approved monitors of channelled emissions to air.

42. **Table 3** (above) includes the standards to be used for each individual substance, in addition to details on whether the analysis will be conducted *in-situ* or in a laboratory. Measurements will be carried out at the maximum anticipated emission level during typical operational circumstances. All equipment used will be calibrated prior to measuring.

Appendix 1: Inventory of Waste Gasses

Product	Process	Stage	Step	Substance	Chemical Formula	Type of substance	State	Relevant Hazardous properties	Classificaltion as waste gas (emission)	Source of Emission	Condenser	Adsorbtion	Wet Scrubber
Cabozantinib	Loading	0.1	CBZ 1 WET	2,6-Dimethylpyridine	C7H9N	Raw material	Liquid	H226, H302, H315, H319	VOC	Channelled emission	*	*	*
Cabozantinib	Loading	0.2	CBZ 1 WET	4-CHLORO-6,7-Dimethoxyquinoline	C11H10ClNO2	Reagent	Liquid	H315, H319, H335	VOC	Channelled emission			
Cabozantinib	Loading	0.3	CBZ 1 WET	4-Nitrophenol	$C_6H_5NO_3$	Reagent	Liquid	H301, H312, H332, H373	VOC	Channelled emission			
Cabozantinib	Loading	0.4	CBZ 1 WET	Methanol	CH3OH	Raw material (solvent)	Liquid	H225, H301, H302, H305, H311, H331, H370	VOC	Channelled emission	*	*	*
Cabozantinib	Loading	0.5	CBZ 1 WET	Potassium Carbonate	K2CO3	Raw material	Solid	H302, H315, H319, H335	Non-hazardous	Channelled emission			
Cabozantinib	Loading	0.6	CBZ 1 WET	Softened water	H2O	Raw material	Liquid	None		Channelled emission			
Cabozantinib	Side Reaction	0.7	CBZ 1 WET	CO2	CO2	Side product	Gas	None	CO2	Channelled emission	*	*	*
Cabozantinib	Cleaning	0.8	CBZ 1 WET	Acetone	(CH3)2CO	Raw material (solvent)	Liquid	H225, H319, H336	VOC	Channelled emission	*	*	*
Cabozantinib	Loading	0.9	CBZ 1 WET	Softened water	H2O	Raw material	Liquid	None		Channelled emission			
Cabozantinib	Filtration / wash	1	CBZ 1 WET	Dichloromethane	CH_2Cl_2	Raw material (solvent)	Liquid	H351, H315, H319, H335 & H336	CRM Cat 2 (Halogenated) VOC	Channelled emission	*	*	*
Cabozantinib	Final intermediate	1.1	CBZ 1 WET	CBZ 1 WET		Reagent (intermediate)	Solid		VOC / PM	Channelled emission	*	*	*
Cabozantinib	Loading	2	CBZ 2 WET	Cabozantinib 1 Dried	NH3	Reagent (intermediate)	Solid		VOC / PM	Channelled emission	*	*	*
Cabozantinib	Loading	2.1	CBZ 2 WET	Methanol	CH3OH	Raw material (solvent)	Liquid	H225, H301, H302, H305, H311, H331, H370	VOC	Channelled emission	*	*	*
Cabozantinib	Loading	2.2	CBZ 2 WET	Zinc	Zn	Raw material	Solid	None	PM	Channelled emission		*	
Cabozantinib	Loading	2.3	CBZ 2 WET	Ammonium Chloride	ClH4N	Raw material	Liquid	H302, H319	NH3	Channelled emission	*		*
Cabozantinib	Reaction	2.4	CBZ 2 WET	NH3	NH3	Side product	Gas	H280, H314, H331, H410	NH3	Channelled emission	*		*
Cabozantinib	Filitration	2.5	CBZ 2 WET	Methanol	CH3OH	Raw material (solvent)	Liquid	H225, H301, H302, H305, H311, H331, H370	VOC	Channelled emission	*	*	*
Cabozantinib	Heating	2.6	CBZ 2 WET	Sodium Bicarbonate	NaHCO3	Raw material	Solid	H319	None hazardous PM	Channelled emission			
Cabozantinib	Side Reaction	2.7	CBZ 2 WET	CO2	CO2	Side product	Gas	None	CO2	Channelled emission	*	*	*
Cabozantinib	Cleaning	2.8	CBZ 2 WET	Acetone	(CH3)2CO	Raw material (solvent)	Liquid	H225, H319, H336	VOC	Channelled emission	*	*	*
Cabozantinib	Filtration / wash	2.9	CBZ 2 WET	Sulphuric Acid 96%	H_2O_4S	Raw material	Liquid	H314	Inorganic Acid	Channelled emission			*
Cabozantinib	Final intermediate	3	CBZ 2 WET	Cabozantinib 2 Wet			Solid		VOC / PM	Channelled emission	*	*	*

Cabozantinib	Loading	4	CBZ 2-1st	Cabozantinib 2 Dried		Reagent (intermediate)	Solid		VOC / PM	Channelled emission	*	*	*
Cabozantinib	Loading	4.1	CBZ 2-1st	Dimethyl sulfoxide (DMSO)	C2H6OS	Raw material (solvent)	Liquid	H227	VOC	Channelled emission	*	*	*
Cabozantinib	Loading	4.2	CBZ 2-1st	Hydrochloric Acid	HCl	Raw material (solvent)	Liquid	H290, H314, H335	HCl	Channelled emission			*
Cabozantinib	Loading	4.3	CBZ 2-1st	Methanol	CH3OH	Raw material (solvent)	Liquid	H225, H301, H302, H305, H311, H331, H370	VOC	Channelled emission	*	*	*
Cabozantinib	Loading	4.4	CBZ 2-1st	Sodium Hydroxide 30%	NaOH	Raw material	Liquid	H290, H302, H314	PM	Channelled emission	*	*	*
Cabozantinib	Side Reaction	4.5	CBZ 2-1st	CO2	CO2	Side product	Gas	None	CO2	Channelled emission	*	*	*
Cabozantinib	Cleaning	4.6	CBZ 2-1st	Acetone	(CH3)2CO	Raw material (solvent)	Liquid	H225, H319, H336	VOC	Channelled emission	*	*	*
Cabozantinib	Filtration / wash	4.7	CBZ 2-1st	Sulphuric Acid 96%	H_2O_4S	Raw material (solvent)	Liquid	H314	Inorganic Acid	Channelled emission			*
Cabozantinib	Filtration / wash	4.8	CBZ 2-1st	Dichloromethane	CH_2Cl_2	Raw material (solvent)	Liquid	H351, H315, H319, H335 & H336	CRM Cat 2 (Halogenated) VOC	Channelled emission	*	*	*
Cabozantinib	Final intermediate	4.9	CBZ 2-1st	Cabozantinib 2 Purified		Reagent (intermediate)	Solid		VOC / PM	Channelled emission	*	*	*
Cabozantinib	Loading	5	CBZ 3 WET	4-Fluoroaniline	FC6H4NH2	Reagent	Liquid	H302, H312, H314, H315, H317, H319, H332, H372, H373, H410, H411	VOC & HF (TBC)	Channelled emission	*	*	*
Cabozantinib	Loading	5.1	CBZ 3 WET	Cyclopropane-1,1-dicarboxylic Acid	C6 H8 O4	Reagent	Liquid	H302, H315, H319, H335	VOC	Channelled emission			
Cabozantinib	Loading	5.2	CBZ 3 WET	Isopropyl Acetate	C5H10O2	Raw material (solvent)	Liquid	H225, H319, H336	VOC	Channelled emission	*	*	*
Cabozantinib	Loading	5.3	CBZ 3 WET	N-Hexane	C6H14	Raw material (solvent)	Liquid	H225, H302, H305, H315, H336, H361fd, H373, H411	CRM Cat 2 (Non-halogenated) VOC	Channelled emission	*	*	*
Cabozantinib	Loading	5.4	CBZ 3 WET	Sodium Chloride	NaCl	Raw material	Solid	H303, H319	None hazardous PM	Channelled emission			
Cabozantinib	Side Reaction	5.5	CBZ 3 WET	SO2	SO2	Side product	Gas	None	SO2	Channelled emission			*
Cabozantinib	Loading	5.6	CBZ 3 WET	Sodium Hydroxide	NaOH	Raw material	Solid	H290, H302, H314	None hazardous PM	Channelled emission			
Cabozantinib	Loading	5.7	CBZ 3 WET	Tetrahydrofuran	C_4H_8O	Raw material (solvent)	Liquid	H225, H302, H319, H335, H336, H351	CRM Cat 2 (Non-halogenated) VOC	Channelled emission	*	*	*
Cabozantinib	Loading	5.8	CBZ 3 WET	Tetrahydrofuran Anhydrous	C_4H_8O	Raw material (solvent)	Liquid	H225, H302, H319, H335, H336, H351	CRM Cat 2 (Non-halogenated) VOC	Channelled emission	*	*	*
Cabozantinib	Loading	5.9	CBZ 3 WET	Thionyl chloride	SOCl2	Raw material	Liquid	H302, H314, H331	VOC	Channelled emission	*	*	*
Cabozantinib	Cleaning	6	CBZ 3 WET	Acetone	(CH3)2CO	Raw material (solvent)	Liquid	H225, H319, H336	VOC	Channelled emission	*	*	*
Cabozantinib	Final intermediate	6.1	CBZ 3 WET	Cabozantinib 3 Wet		Reagent (intermediate)	Solid	H302, H315, H319, H36OFD, H362, H335, H373	VOC / PM	Channelled emission	*	*	*
Cabozantinib	Loading	7	CBZ 3-1st P	Cabozantinib 3 Dried		Reagent (intermediate)	Solid		VOC / PM	Channelled emission	*	*	*

Cabozantinib	Loading	7.1	CBZ 3-1st P	Methanol	CH3OH	Raw material (solvent)	Liquid	H225, H301, H302, H305, H311, H331, H370	VOC	Channelled emission	*	*	*
Cabozantinib	Loading	7.2	CBZ 3-1st P	Purified water	H2O	Raw material (solvent)	Liquid	Non-hazardous	Non-hazardous	Channelled emission			
Cabozantinib	Filtration / wash	7.3	CBZ 3-1st P	Tetrahydrofuran	C_4H_8O	Raw material (solvent)	Liquid	H225, H302, H319, H335, H336, H351	CRM Cat 2 (Non-halogenated) VOC	Channelled emission	*	*	*
Cabozantinib	Cleaning	7.4	CBZ 3-1st P	Acetone	(CH3)2CO	Raw material (solvent)	Liquid	H225, H319, H336	VOC	Channelled emission	*	*	*
Cabozantinib	Final intermediate	7.5	CBZ 3-1st P	Cabozantinib 3-1PS		Reagent (intermediate)	Solid		VOC / PM	Channelled emission	*	*	*
Cabozantinib	Loading	8	CBZ 3-2nd	Cabozantinib 3-1PS		Reagent (intermediate)	Solid		VOC / PM	Channelled emission	*	*	*
Cabozantinib	Loading	8.1	CBZ 3-2nd	Methanol	CH3OH	Raw material (solvent)	Liquid	H225, H301, H302, H305, H311, H331, H370	VOC	Channelled emission	*	*	*
Cabozantinib	Loading	8.2	CBZ 3-2nd	Purified water	H2O	Raw material (solvent)	Liquid	Non-hazardous	Non-hazardous	Channelled emission			
Cabozantinib	Cleaning	8.3	CBZ 3-2nd	Acetone	(CH3)2CO	Raw material (solvent)	Liquid	H225, H319, H336	VOC	Channelled emission	*	*	*
Cabozantinib	Final intermediate	8.4	CBZ 3-2nd	Cabozantinib 3-2nd Purified Dried		Reagent (intermediate)	Solid		VOC / PM	Channelled emission	*	*	*
Cabozantinib	Loading	9	CBZ 5 WET	Tetrahydrofuran Anhydrous	C_4H_8O	Raw material (solvent)	Liquid	H225, H302, H319, H335, H336, H351	CRM Cat 2 (Non-halogenated) VOC	Channelled emission	*	*	*
Cabozantinib	Loading	9.1	CBZ 5 WET	Cabozantinib 3-2nd Purified Dried		Reagent (intermediate)	Solid		VOC / PM	Channelled emission	*	*	*
Cabozantinib	Cleaning	9.2	CBZ 5 WET	Dimethylformamide Anhydrous	HCON(CH3)2	Raw material (solvent)	Liquid	H226, H312, H332, H319, H360D	CRM Cat. 1 VOC	Channelled emission	*	*	*
Cabozantinib	Cleaning	9.3	CBZ 5 WET	Tetrahydrofuran Anhydrous	C_4H_8O	Raw material (solvent)	Liquid	H225, H302, H319, H335, H336, H351	CRM Cat 2 (Non-halogenated) VOC	Channelled emission	*	*	*
Cabozantinib	Loading	9.4	CBZ 5 WET	Oxalyl Chloride	C2O2Cl2	Raw material	Liquid	H314, H331[3]	VOC	Channelled emission	*	*	*
Cabozantinib	Reaction	9.5	CBZ 5 WET	CO	CO	Side product	Gas	H220, H331, H360, H372, H420	CO & CRM Cat. 1 VOC	Channelled emission	*	*	*
Cabozantinib	Side Reaction	9.6	CBZ 5 WET	CO2	CO2	Side product	Gas	None	CO2	Channelled emission	*	*	*
Cabozantinib	Loading	9.7	CBZ 5 WET	Tetrahydrofuran Anhydrous	C_4H_8O	Raw material (solvent)	Liquid	H225, H302, H319, H335, H336, H351	CRM Cat 2 (Non-halogenated) VOC	Channelled emission	*	*	*
Cabozantinib	Loading	9.8	CBZ 5 WET	Cabozantinib 2-1st Purified Dried		Reagent (intermediate)	Solid		VOC / PM	Channelled emission	*	*	*
Cabozantinib	Loading	10	CBZ 5 WET	Tetrahydrofuran Anhydrous	C_4H_8O	Raw material (solvent)	Liquid	H225, H302, H319, H335, H336, H351	CRM Cat 2 (Non-halogenated) VOC	Channelled emission	*	*	*
Cabozantinib	Loading	10.1	CBZ 5 WET	Potassium Carbonate	K2CO3	Raw material	Solid	H302, H315, H319, H335	Non-hazardous	Channelled emission			
Cabozantinib	Loading	10.2	CBZ 5 WET	Purified Water	H2O	Raw material (solvent)	Liquid	Non-hazardous	Non-hazardous	Channelled emission			
Cabozantinib	Loading	10.3	CBZ 5 WET	Tetrahydrofuran Anhydrous	C_4H_8O	Raw material (solvent)	Liquid	H225, H302, H319, H335, H336, H351	CRM Cat 2 (Non-halogenated) VOC	Channelled emission	*	*	*

Cabozantinib	Filtration / wash	10.4	CBZ 5 WET	Dimethyl sulfoxide (DMSO)	C2H6OS	Raw material (solvent)	Liquid	H227	VOC	Channelled emission	*	*	*
Cabozantinib	Cleaning	10.5	CBZ 5 WET	Acetone	(CH3)2CO	Raw material (solvent)	Liquid	H225, H319, H336	VOC	Channelled emission	*	*	*
Cabozantinib	Loading	10.6	CBZ 5 WET	Tetrahydrofuran	C_4H_8O	Raw material (solvent)	Liquid	H225, H302, H319, H335, H336, H351	CRM Cat 2 (Non-halogenated) VOC	Channelled emission	*	*	*
Cabozantinib	Final intermediate	10.7	CBZ 5 WET	Cabozantinib 5 Wet		Reagent (intermediate)	Solid	H302, H315, H319, H36OFD, H362, H335, H373	VOC / PM	Channelled emission	*	*	*
Cabozantinib	Loading	11	CBZ 5-1st PURIFIED WET	Cabozantinib 5 Dried		Reagent (intermediate)	Solid		VOC / PM	Channelled emission	*	*	*
Cabozantinib	Loading	11.1	CBZ 5-1st PURIFIED WET	Dimethyl sulfoxide (DMSO)	C2H6OS	Raw material (solvent)	Liquid	H227	VOC	Channelled emission	*	*	*
Cabozantinib	Loading	11.2	CBZ 5-1st PURIFIED WET	Acetonitrile	C2H3N	Raw material (solvent)	Liquid	H225, H302, H312, H319, H332	VOC	Channelled emission	*	*	*
Cabozantinib	Loading	11.3	CBZ 5-1st PURIFIED WET	Malic Acid	C4H6O5	Raw material	Liquid	None	Organic Acid	Channelled emission			*
Cabozantinib	Loading	11.4	CBZ 5-1st PURIFIED WET	Acetonitrile	C2H3N	Raw material (solvent)	Liquid	H225, H302, H312, H319, H332	VOC	Channelled emission	*	*	*
Cabozantinib	Loading	11.5	CBZ 5-1st PURIFIED WET	Purified Water	H2O	Raw material (solvent)	Liquid	Non-hazardous	Non-hazardous	Channelled emission			
Cabozantinib	Loading	11.6	CBZ 5-1st PURIFIED WET	Cabozantinib 5-Salt-1st Purified Wet		Reagent (intermediate)	Solid		VOC / PM	Channelled emission	*	*	*
Cabozantinib	Loading	11.7	CBZ 5-1st PURIFIED WET	Purified Water	H2O	Raw material (solvent)	Liquid	Non-hazardous	Non-hazardous	Channelled emission			
Cabozantinib	Loading	11.8	CBZ 5-1st PURIFIED WET	Dimethyl sulfoxide (DMSO)	C2H6OS	Raw material (solvent)	Liquid	H227	VOC	Channelled emission	*	*	*
Cabozantinib	Loading	11.9	CBZ 5-1st PURIFIED WET	Acetonitrile	C2H3N	Raw material (solvent)	Liquid	H225, H302, H312, H319, H332	VOC	Channelled emission	*	*	*
Cabozantinib	Loading	12	CBZ 5-1st PURIFIED WET	Sodium Bicarbonate	NaHCO3	Raw material	Solid	H319	None hazardous PM	Channelled emission			
Cabozantinib	Loading	12.1	CBZ 5-1st PURIFIED WET	Softened water	H2O	Raw material (solvent)	Liquid	Non-hazardous	Non-hazardous	Channelled emission			
Cabozantinib	Side Reaction	12.2	CBZ 5-1st PURIFIED WET	CO2	CO2	Side product	Gas	None	CO2	Channelled emission	*	*	*
Cabozantinib	Loading	12.3	CBZ 5-1st PURIFIED WET	Sodium Bicarbonate	NaHCO3	Raw material	Solid	H319	None hazardous PM	Channelled emission			
Cabozantinib	Loading	12.4	CBZ 5-1st PURIFIED WET	Softened water	H2O	Raw material (solvent)	Liquid	Non-hazardous	Non-hazardous	Channelled emission			
Cabozantinib	Cleaning	12.5	CBZ 5-1st PURIFIED WET	Acetone	(CH3)2CO	Raw material (solvent)	Liquid	H225, H319, H336	VOC	Channelled emission	*	*	*
Cabozantinib	Loading	12.6	CBZ 5-1st PURIFIED WET	Cabozantinib 5-1st		Reagent (intermediate)	Solid		VOC / PM	Channelled emission	*	*	*
Cabozantinib	Loading	12.7	CBZ 5-2nd PURIFIED WET	Cabozantinib 5-1st Purified Dried		Reagent (intermediate)	Solid		VOC / PM	Channelled emission	*	*	*
Cabozantinib	Loading	12.8	CBZ 5-2nd PURIFIED WET	Dimethyl sulfoxide (DMSO)	C2H6OS	Raw material (solvent)	Liquid	H227	VOC	Channelled emission	*	*	*

Cabozantinib	Loading	12.9	CBZ 5-2nd PURIFIED WET	Acetonitrile	C2H3N	Raw material (solvent)	Liquid	H225, H302, H312, H319, H332	VOC	Channelled emission	*	*	*
Cabozantinib	Loading	13	CBZ 5-2nd PURIFIED WET	Malic Acid	C4H6O5	Raw material	Liquid	None	Organic Acid	Channelled emission			*
Cabozantinib	Loading	13.1	CBZ 5-2nd PURIFIED WET	Acetonitrile	C2H3N	Raw material (solvent)	Liquid	H225, H302, H312, H319, H332	VOC	Channelled emission	*	*	*
Cabozantinib	Loading	13.2	CBZ 5-2nd PURIFIED WET	Purified Water	H2O	Raw material (solvent)	Liquid	Non-hazardous	Non-hazardous	Channelled emission			
Cabozantinib	Loading	13.3	CBZ 5-2nd PURIFIED WET	Cabozantinib 5-Salt-1st		Reagent (intermediate)	Solid		VOC / PM	Channelled emission	*	*	*
Cabozantinib	Loading	13.4	CBZ 5-2nd PURIFIED WET	Purified Water	H2O	Raw material (solvent)	Liquid	Non-hazardous	Non-hazardous	Channelled emission			
Cabozantinib	Loading	13.5	CBZ 5-2nd PURIFIED WET	Acetonitrile	C2H3N	Raw material (solvent)	Liquid	H225, H302, H312, H319, H332	VOC	Channelled emission	*	*	*
Cabozantinib	Loading	13.6	CBZ 5-2nd PURIFIED WET	Dimethyl sulfoxide (DMSO)	C2H6OS	Raw material (solvent)	Liquid	H227	VOC	Channelled emission	*	*	*
Cabozantinib	Loading	13.7	CBZ 5-2nd PURIFIED WET	Sodium Bicarbonate	NaHCO3	Raw material	Solid	H319	None hazardous PM	Channelled emission			
Cabozantinib	Loading	13.8	CBZ 5-2nd PURIFIED WET	Softened water	H2O	Raw material (solvent)	Liquid	Non-hazardous	Non-hazardous	Channelled emission			
Cabozantinib	Side Reaction	13.9	CBZ 5-2nd PURIFIED WET	CO2	CO2	Side product	Gas	None	CO2	Channelled emission	*	*	*
Cabozantinib	Loading	14	CBZ 5-2nd PURIFIED WET	Sodium Bicarbonate	NaHCO3	Raw material	Solid	H319	None hazardous PM	Channelled emission			
Cabozantinib	Loading	14.1	CBZ 5-2nd PURIFIED WET	Softened water	H2O	Raw material (solvent)	Liquid	Non-hazardous	Non-hazardous	Channelled emission			
Cabozantinib	Loading	14.2	CBZ 5-2nd PURIFIED WET	Purified Water	H2O	Raw material (solvent)	Liquid	Non-hazardous	Non-hazardous	Channelled emission			
Cabozantinib	Loading	14.3	CBZ 5-2nd PURIFIED WET	Cabozantinib 5-Salt-1st		Reagent (intermediate)	Solid		VOC / PM	Channelled emission	*	*	*
Cabozantinib	Wash	14.4	CBZ 5-2nd PURIFIED WET	Purified Water	H2O	Raw material (solvent)	Liquid	Non-hazardous	Non-hazardous	Channelled emission			
Cabozantinib	Cleaning	14.5	CBZ 5-2nd PURIFIED WET	Acetone	(CH3)2CO	Raw material (solvent)	Liquid	H225, H319, H336	VOC	Channelled emission	*	*	*
Cabozantinib	Final intermediate	14.6	CBZ 5-2nd PURIFIED WET	Cabozantinib 5-2nd Purified Dried		Reagent (intermediate)	Solid		VOC / PM	Channelled emission	*	*	*
Cabozantinib	Loading	15	CBZ 6 WET	Methyl Isobutyl Ketone (MIBK)	C6H12O	Raw material (solvent)	Liquid	H225, H319, H332, H335, H351	CRM Cat 2 (Non-halogenated) VOC	Channelled emission	*	*	*
Cabozantinib	Loading	15.1	CBZ 6 WET	Cabozantinib 5-2nd Purified Dried		Reagent (intermediate)	Solid		VOC / PM	Channelled emission	*	*	*
Cabozantinib	Loading	15.2	CBZ 6 WET	Tetrahydrofuran	C_4H_8O	Raw material (solvent)	Liquid	H225, H302, H319, H335, H336, H351	CRM Cat 2 (Non-halogenated) VOC	Channelled emission	*	*	*
Cabozantinib	Loading	15.3	CBZ 6 WET	Methyl Isobutyl Ketone (MIBK)	C6H12O	Raw material (solvent)	Liquid	H225, H319, H332, H335, H351	CRM Cat 2 (Non-halogenated) VOC	Channelled emission	*	*	*
Cabozantinib	Loading	15.4	CBZ 6 WET	Malic Acid	C4H6O5	Raw material	Liquid	None	Organic Acid	Channelled emission			*

Cabozantinib	Loading	15.5	CBZ 6 WET	Purified Water	H2O	Raw material (solvent)	Liquid	Non-hazardous	Non-hazardous	Channelled emission			
Cabozantinib	Loading	15.6	CBZ 6 WET	Methyl Isobutyl Ketone (MIBK)	C6H12O	Raw material (solvent)	Liquid	H225, H319, H332, H335, H351	CRM Cat 2 (Non-halogenated) VOC	Channelled emission	*	*	*
Cabozantinib	Cleaning	15.7	CBZ 6 WET	Acetone	(CH3)2CO	Raw material (solvent)	Liquid	H225, H319, H336	VOC	Channelled emission	*	*	*
Cabozantinib	Filtration / wash	15.8	CBZ 6 WET	Dimethyl sulfoxide (DMSO)	C2H6OS	Raw material (solvent)	Liquid	H227	VOC	Channelled emission	*	*	*
Cabozantinib	Loading	15.9	CBZ 6 WET	Cabozantinib 6 Wet		Reagent (intermediate)	Liquid	H225, H302, H319, H335, H336, H351	CRM Cat 2 (Non-halogenated) VOC	Channelled emission	*	*	*
Cabozantinib	Final API			Cabozantinib	C32H30FN3O10	API	Solid	H302, H315, H319, H36OFD, H362, H335, H373	VOC / PM	Channelled emission	*	*	*
Dutasteride	Loading	0.1	DT-GU	Dichloromethane for Dutasteri	CH_2Cl_2	Raw material (solvent)	Liquid	H351, H315, H319, H335 & H336	CRM Cat 2 (Halogenated) VOC	Channelled emission	*	*	*
Dutasteride	Loading	0.2	DT-GU	DT-Acid (1)		Reagent	Liquid		VOC	Channelled emission			
Dutasteride	Loading	0.3	DT-GU	Thionyl chloride	SOCl2	Reagent	Liquid	H302, H314, H331	VOC	Channelled emission	*	*	*
Dutasteride	Loading	0.4	DT-GU	Dichloromethane for Dutasteri	CH_2Cl_2	Raw material (solvent)	Liquid	H351, H315, H319, H335 & H336	CRM Cat 2 (Halogenated) VOC	Channelled emission	*	*	*
Dutasteride	Side Reaction	0.5	DT-GU	SO2	SO2	Side product	Gas	H331, H314, H280	SO2	Channelled emission			*
Dutasteride	Side Reaction	0.6	DT-GU	Hydrochloric Acid	HCl	Side product	Gas	H290, H314, H335	HCl	Channelled emission			*
Dutasteride	Loading	0.7	DT-GU	Toluene for Dutasteride	C_7H_8	Raw material (solvent)	Liquid	H225, H304, H315, H336, H361d, H373	CRM Cat 2 (Non-halogenated) VOC	Channelled emission	*	*	*
Dutasteride	Loading	0.8	DT-GU	2,5-Bis-(Trifluoromethyl)-	C8 H5 F6 N	Reagent	Liquid	H302, H312, H315, H319, H332, H335	VOC & HF (TBC)	Channelled emission	*	*	*
Dutasteride	Loading	0.9	DT-GU	Toluene for Dutasteride	C_7H_8	Raw material (solvent)	Liquid	H225, H304, H315, H336, H361d, H373	CRM Cat 2 (Non-halogenated) VOC	Channelled emission	*	*	*
Dutasteride	Side Reaction	1	DT-GU	Hydrochloric Acid	HCl	Side product	Gas	H290, H314, H335	HCl	Channelled emission			*
Dutasteride	Loading	1.1	DT-GU	Ethyl Acetate	CH3COOC2H5	Raw material (solvent)	Liquid	H225, H319	VOC	Channelled emission	*	*	*
Dutasteride	Loading	1.2	DT-GU	Softened water	H2O	Raw material (solvent)	Liquid	None		Channelled emission			
Dutasteride	Loading	1.3	DT-GU	Sodium Hydroxide	NaOH	Raw material	Solid	H290, H302, H314	None hazardous PM	Channelled emission			
Dutasteride	Loading	1.4	DT-GU	Ethyl Acetate	CH3COOC2H5	Raw material (solvent)	Liquid	H225, H319	VOC	Channelled emission	*	*	*
Dutasteride	Loading	1.5	DT-GU	Ethanol		Raw material (solvent)	Liquid		VOC	Channelled emission	*	*	*
Dutasteride	Loading	1.6	DT-GU	Softened water	H2O	Raw material (solvent)	Liquid	None		Channelled emission			
Dutasteride	Loading	1.8	DT-GU	Toluene	C_7H_8	Raw material (solvent)	Liquid	H225, H304, H315, H336, H361d, H373	CRM Cat 2 (Non-halogenated) VOC	Channelled emission	*	*	*

Dutasteride	Loading	1.9	DT-GU	Dichloromethane	CH_2Cl_2	Raw material (solvent)	Liquid	H351, H315, H319, H335 & H336	CRM Cat 2 (Halogenated) VOC	Channelled emission	*	*	*
Dutasteride	Loading	2	DT-GU	Methanol	CH3OH	Raw material (solvent)	Liquid	H225, H301, H302, H305, H311, H331, H370	VOC	Channelled emission	*	*	*
Dutasteride	Loading	2.1	DT-GU	Sodium Hydroxide	NaOH	Raw material	Liquid	H290, H302, H314	PM	Channelled emission	*	*	*
Dutasteride	Loading	2.2	DT-GU	80% Acetic Acid	CH3COOH	Raw material (solvent)	Liquid	H226, H314, H315, H318 & H319	VOC	Channelled emission	*	*	*
Dutasteride	Loading	2.3	DT-GU	Softened water	H2O	Raw material (solvent)	Liquid	None		Channelled emission			
Dutasteride		2.4	DT-GU	1, Hydroxy Benzotriazole(HOB	C6H5N3O	Reagent	Solid	H203	PM	Channelled emission	*	*	*
Dutasteride	Cleaning	2.5	DT-GU	Acetone	(CH3)2CO	Raw material (solvent)	Liquid	H225, H319, H336	VOC	Channelled emission	*	*	*
Dutasteride		2.6	DT-GU	Exair TMA		Raw material	Liquid		VOC	Channelled emission	*	*	*
Dutasteride		2.7	DT-GU	N,N-Dimethylformamide	HCON(CH3)2	Raw material (solvent)	Liquid	H226, H312, H332, H319, H360D	CRM Cat. 1 VOC	Channelled emission	*	*	*
Dutasteride	Loading	2.8	DT-GU	Sodium Chloride	NaCl	Raw material	Solid	H319	None hazardous PM	Channelled emission			
Dutasteride	Final intermediate	2.9	DT-GU	DT-GU	C27 H30 F6N2 O2	Reagent (intermediate)	Solid	H351, H360FD, H410	1) CRM Cat 2 (halogenated) VOC 2) CRM 1 VOC 3) PM	Channelled emission	*	*	*
Dutasteride	Drying	3	DT-GS	DT-GU		Reagent	Solid			Channelled emission			
Dutasteride	Final intermediate	3.1	DT-GS	DT-GU	C27 H30 F6N2 O2	Reagent (intermediate)	Solid	H351, H360FD, H410	1) CRM Cat 2 (halogenated) VOC 2) CRM 1 VOC 3) PM	Channelled emission	*	*	*
Dutasteride	Cleaning	4	DT-1PS	Acetone	(CH3)2CO	Raw material (solvent)	Liquid	H225, H319, H336	VOC	Channelled emission	*	*	*
Dutasteride	Purification	4.1	DT-1PS	Activated Charcoal	C	Raw material	Solid	H252	PM	Channelled emission			
Dutasteride	Loading	4.2	DT-1PS	Ethanol		Raw material (solvent)	Liquid		VOC	Channelled emission	*	*	*
Dutasteride	Loading	4.3	DT-1PS	Purified Water	H2O	Raw material (solvent)	Liquid	Non-hazardous	Non-hazardous	Channelled emission			
Dutasteride	Loading	4.6	DT-1PS	DT GS	C27 H30 F6N2 O2	Reagent (intermediate)	Solid	H351, H360FD, H410	1) CRM Cat 2 (halogenated) VOC 2) CRM 1 VOC 3) PM	Channelled emission	*	*	*
Dutasteride	Loading	5.1	DT-2PS	DT-1PS	C27 H30 F6N2 O2	Reagent (intermediate)	Solid	H351, H360FD, H410	1) CRM Cat 2 (halogenated) VOC 2) CRM 1 VOC 3) PM	Channelled emission	*	*	*
Dutasteride	Loading	5.2	DT-2PS	Ethanol		Raw material (solvent)	Liquid		VOC	Channelled emission	*	*	*
Dutasteride	Loading	5.3	DT-2PS	Purified Water	H2O	Raw material (solvent)	Liquid	Non-hazardous	Non-hazardous	Channelled emission			
Dutasteride	Cleaning	5.4	DT-2PS	Acetone	(CH3)2CO	Raw material (solvent)	Liquid	H225, H319, H336	VOC	Channelled emission	*	*	*
Dutasteride	Loading	6.1	DT-3PS	DT-2PS	C27 H30 F6N2 O2	Reagent (intermediate)	Solid	H351, H360FD, H410	1) CRM Cat 2 (halogenated) VOC 2) CRM 1 VOC 3) PM	Channelled emission	*	*	*

Dutasteride	Loading	6.2	DT-3PS	Dichloromethane	CH_2Cl_2	Raw material (solvent)	Liquid	H351, H315, H319, H335 & H336	CRM Cat 2 (Halogenated) VOC	Channelled emission	*	*	*
Dutasteride	Loading	6.3	DT-3PS	Ethyl Acetate	CH3COOC2H5	Raw material (solvent)	Liquid	H225, H319	VOC	Channelled emission	*	*	*
Dutasteride	Cleaning	6.4	DT-3PS	Diethyl Ether	C4H10O	Raw material (solvent)	Liquid	H315,H319,H335	VOC	Channelled emission	*	*	*
Dutasteride	Cleaning	6.5	DT-3PS	Acetone	(CH3)2CO	Raw material (solvent)	Liquid	H225, H319, H336	VOC	Channelled emission	*	*	*
Dutasteride	Loading	7.1	DT-4PS	Acetone (Benzene Content less than 0	(CH3)2CO	Raw material (solvent)	Liquid	H225, H319, H336	VOC	Channelled emission	*	*	*
Dutasteride	Loading	7.2	DT-4PS	Activated Charcoal	C	Raw material	Solid	H252	PM	Channelled emission			
Dutasteride	Loading	7.3	DT-4PS	DT-3PS	C27 H30 F6N2 O2	Reagent (intermediate)	Solid	H351, H360FD, H410	1) CRM Cat 2 (halogenated) VOC 2) CRM 1 VOC 3) PM	Channelled emission	*	*	*
Dutasteride	Cleaning	7.4	DT-4PS	Acetone	(CH3)2CO	Raw material (solvent)	Liquid	H225, H319, H336	VOC	Channelled emission	*	*	*
Dutasteride	Cleaning	8	DT-5PS	Acetone	(CH3)2CO	Raw material (solvent)	Liquid	H225, H319, H336	VOC	Channelled emission	*	*	*
Dutasteride	Loading	8.1	DT-5PS	DT-4PS	C27 H30 F6N2 O2	Reagent (intermediate)	Solid	H351, H360FD, H410	1) CRM Cat 2 (halogenated) VOC 2) CRM 1 VOC 3) PM	Channelled emission	*	*	*
Dutasteride	Loading	8.2	DT-5PS	Isopropyl Acetate	C5H10O2	Raw material (solvent)	Liquid	H225, H319, H336	VOC	Channelled emission	*	*	*
Dutasteride	Final API	8.3	DT-5PS	Dutasteride	C27 H30 F6N2 O2	API	Solid	H351, H360FD, H410	1) CRM Cat 2 (halogenated) VOC 2) CRM 1 VOC 3) PM	Channelled emission	*	*	*

Appendix 2: The WGC (BAT) Conclusions

COMMISSION IMPLEMENTING DECISION (EU) 2022/2427

of 6 December 2022

establishing the best available techniques (BAT) conclusions, under Directive 2010/75/EU of the European Parliament and of the Council on industrial emissions, for common waste gas management and treatment systems in the chemical sector

(notified under document C(2022) 8788)

(Text with EEA relevance)

THE EUROPEAN COMMISSION,

Having regard to the Treaty on the Functioning of the European Union,

Having regard to Directive 2010/75/EU of the European Parliament and of the Council of 24 November 2010 on industrial emissions (integrated pollution prevention and control) ([1]), and in particular Article 13(5) thereof,

Whereas:

(1) Best available techniques (BAT) conclusions are the reference for setting permit conditions for installations covered by Chapter II of Directive 2010/75/EU and competent authorities should set emission limit values which ensure that, under normal operating conditions, emissions do not exceed the emission levels associated with the best available techniques as laid down in the BAT conclusions.

(2) In accordance with Article 13(4) of Directive 2010/75/EU, the forum composed of representatives of Member States, the industries concerned and non-governmental organisations promoting environmental protection, established by Commission Decision of 16 May 2011 ([2]), provided the Commission on 11 May 2022 with its opinion on the proposed content of the BAT reference document for common waste gas management and treatment systems in the chemical sector. That opinion is publicly available ([3]).

(3) The BAT conclusions set out in the Annex to this Decision take into account the opinion of the forum on the proposed content of the BAT reference document. They contain the key elements of the BAT reference document.

(4) The measures provided for in this Decision are in accordance with the opinion of the Committee established by Article 75(1) of Directive 2010/75/EU,

HAS ADOPTED THIS DECISION:

Article 1

The best available techniques (BAT) conclusions for the common waste gas management and treatment systems in the chemical sector, as set out in the Annex, are adopted.

Article 2

This Decision is addressed to the Member States.

([1]) OJ L 334, 17.12.2010, p. 17.

([2]) Commission Decision of 16 May 2011 establishing a forum for the exchange of information pursuant to Article 13 of Directive 2010/75/EU on industrial emissions (OJ C 146, 17.5.2011, p. 3).

([3]) https://circabc.europa.eu/ui/group/06f33a94-9829-4eee-b187-21bb783a0fbf/library/acce74d3-4314-43f8-937b-9bbc594a16ef?p=1&n=10&sort=modified_DESC

Done at Brussels, 6 December 2022.

For the Commission
Virginijus SINKEVIČIUS
Member of the Commission

ANNEX

1. Best Available Techniques (BAT) conclusions for Common Waste Gas Management and Treatment Systems in the Chemical Sector

SCOPE

These BAT conclusions concern the following activity specified in Annex I to Directive 2010/75/EU: 4. Chemical industry (i.e. all production processes included in the categories of activities listed in points 4.1 to 4.6 of Annex I, unless specified otherwise).

More specifically, these BAT conclusions focus on emissions to air from the aforementioned activity.

These BAT conclusions do not address the following:

1. Emissions to air from the production of chlorine, hydrogen, and sodium/potassium hydroxide by the electrolysis of brine. This is covered by the BAT conclusions for the Production of Chlor-alkali (CAK).
2. Channelled emissions to air from the production of the following chemicals in continuous processes where the total production capacity of those chemicals exceeds 20 kt/yr:
   - lower olefins using the steam cracking process;
   - formaldehyde;
   - ethylene oxide and ethylene glycols;
   - phenol from cumene;
   - dinitrotoluene from toluene, toluene diamine from dinitrotoluene, toluene diisocyanate from toluene diamine, methylene diphenyl diamine from aniline, methylene diphenyl diisocyanate from methylene diphenyl diamine;
   - ethylene dichloride (EDC) and vinyl chloride monomer (VCM);
   - hydrogen peroxide.

   This is covered by the BAT conclusions for the Production of Large Volume Organic Chemicals (LVOC).

   However, channelled emissions to air of nitrogen oxides (NO_x) and carbon monoxide (CO) from thermal treatment of waste gases originating from the aforementioned production processes are included in the scope of these BAT conclusions.
3. Emissions to air from the production of the following inorganic chemicals:
   - ammonia;
   - ammonium nitrate;
   - calcium ammonium nitrate;
   - calcium carbide;
   - calcium chloride;
   - calcium nitrate;
   - carbon black;
   - ferrous chloride;
   - ferrous sulphate (i.e. copperas and related products, such as chloro-sulphates);
   - hydrofluoric acid;
   - inorganic phosphates;
   - nitric acid;
   - nitrogen-, phosphorus- or potassium-based fertilisers (simple or compound fertilisers);
   - phosphoric acid;
   - precipitated calcium carbonate;
   - sodium carbonate (i.e. soda ash);
   - sodium chlorate;

— sodium silicate;

— sulphuric acid;

— synthetic amorphous silica;

— titanium dioxide and related products;

— urea;

— urea-ammonium nitrate.

This may be covered by the BAT conclusions for the Production of Large Volume Inorganic Chemicals (LVIC).

4. Emissions to air from steam reforming as well as from the physical purification and reconcentration of spent sulphuric acid, provided that these processes are directly associated with a production process listed under the aforementioned points 2 or 3.

5. Emissions to air from the production of magnesium oxide using the dry process route. This may be covered by the BAT conclusions for the Production of Cement, Lime and Magnesium Oxide (CLM).

6. Emissions to air from the following:

— Combustion units other than process furnaces/heaters. This may be covered by the BAT conclusions for Large Combustion Plants (LCP), the BAT conclusions for the Refining of Mineral Oil and Gas (REF) and/or by Directive (EU) 2015/2193 of the European Parliament and of the Council ([1]).

— Process furnaces/heaters with a total rated thermal input below 1 MW.

— Process furnaces/heaters used in lower olefins, ethylene dichloride and/or vinyl chloride monomer production referred to in point 2 above. This is covered by the BAT conclusions for the production of Large Volume Organic Chemicals (LVOC).

7. Emissions to air from waste incineration plants. This may be covered by the BAT conclusions for Waste Incineration (WI).

8. Emissions to air from the storage, transfer and handling of liquids, liquefied gases and solids, where these are not directly associated with the activity specified in Annex I to Directive 2010/75/EU: 4. Chemical industry. This may be covered by the BAT conclusions for Emissions from Storage (EFS).

However, emissions to air from the storage, transfer and handling of liquids, liquefied gases and solids are included in the scope of these BAT conclusions provided that these processes are directly associated with the chemical production process specified in the scope of these BAT conclusions.

9. Emissions to air from indirect cooling systems. This may be covered by the BAT conclusions for Industrial Cooling Systems (ICS).

Other BAT conclusions which are complementary for the activities covered by these BAT conclusions include Common Waste Water and Waste Gas Treatment/Management Systems in the Chemical Sector (CWW).

Other BAT conclusions and reference documents which could be relevant for the activities covered by these BAT conclusions are the following:

— Production of Chlor-alkali (CAK);

— Manufacture of Large Volume Inorganic Chemicals – Ammonia, Acids and Fertilisers (LVIC-AAF);

— Manufacture of Large Volume Inorganic Chemicals – Solids and Others Industry (LVIC-S);

— Production of Large Volume Organic Chemicals (LVOC);

— Manufacture of Organic Fine Chemicals (OFC);

— Production of Polymers (POL);

— Production of Speciality Inorganic Chemicals (SIC);

([1]) Directive (EU) 2015/2193 of the European Parliament and of the Council of 25 November 2015 on the limitation of emissions of certain pollutants into the air from medium combustion plants (OJ L 313, 28.11.2015, p. 1).

— Refining of Mineral Oil and Gas (REF);

— Economics and Cross-media Effects (ECM);

— Emissions from Storage (EFS);

— Energy Efficiency (ENE);

— Industrial Cooling Systems (ICS);

— Large Combustion Plants (LCP);

— Monitoring of Emissions to Air and Water from IED installations (ROM);

— Waste Incineration (WI);

— Waste Treatment (WT).

These BAT conclusions apply without prejudice to other relevant legislation, e.g. on the registration, evaluation, authorisation and restriction of chemicals (REACH) or on classification, labelling and packaging of substances and mixtures (CLP).

DEFINITIONS

For the purposes of these BAT conclusions, the following definitions apply:

General terms	
Term used	Definition
Channelled emissions to air	Emissions of pollutants to air through an emission point such as a stack.
Combustion unit	Any technical apparatus in which fuels are oxidised in order to use the heat thus generated. Combustion units include boilers, engines, turbines and process furnaces/heaters, but do not include thermal or catalytic oxidisers.
Complex inorganic pigments	A stable crystal lattice of different metal cations. The most important host-lattices are rutile, spinel, zircon, and haematite/corundum, but other stable structures exist.
Continuous measurement	Measurement using an automated measuring system permanently installed on site.
Continuous process	A process in which the raw materials are fed continuously into the reactor with the reaction products then fed into connected downstream separation and/or recovery units.
Diffuse emissions	Non-channelled emissions to air. Diffuse emissions include fugitive and non-fugitive emissions.
Emissions to air	Generic term for emissions of pollutants to air including both channelled and diffuse emissions.
Ethanolamines	Collective term for monoethanolamine, diethanolamine and triethanolamine, or mixtures thereof.
Ethylene glycols	Collective term for monoethylene glycol, diethylene glycol and triethylene glycol, or mixtures thereof.
Existing plant	A plant that is not a new plant.
Existing process furnace/heater	A process furnace/heater that is not a new process furnace/heater.
Flue-gas	The exhaust gas exiting a combustion unit.

General terms	
Term used	Definition
Fugitive emissions	Non-channelled emissions to air caused by loss of tightness of equipment which is designed or assembled to be tight. Fugitive emissions can arise from: — moving equipment, such as agitators, compressors, pumps, valves (manual and automatic); — static equipment, such as flanges and other connections, open-ended lines, sampling points.
Lower olefins	Collective term for ethylene, propylene, butylene and butadiene, or mixtures thereof.
Major plant upgrade	A major change in the design or technology of a plant with major adjustments or replacements of the process and/or abatement units and associated equipment.
Mass flow	The mass of a given substance or parameter which is emitted over a defined period of time.
New plant	A plant first permitted on the site of the installation following the publication of these BAT conclusions or a complete replacement of a plant following the publication of these BAT conclusions.
New process furnace/heater	A process furnace/heater in a plant first permitted following the publication of these BAT conclusions or a complete replacement of a process furnace/heater following the publication of these BAT conclusions.
Non-fugitive emissions	Diffuse emissions other than fugitive emissions. Non-fugitive emissions may arise from, for example, atmospheric vents, bulk storage, loading/unloading systems, vessels and tanks (on opening), open gutters, sampling systems, tank venting, waste, sewers and water treatment plants.
NO_X precursors	Nitrogen-containing compounds (e.g. acrylonitrile, ammonia, nitrous gases, nitrogen-containing organic compounds) in the input to thermal or catalytic oxidation that lead to NO_X emissions. Elemental nitrogen is not included.
Operational constraint	Limitation or restriction connected, for example, to: — substances used (e.g. substances that cannot be substituted, very corrosive substances); — operating conditions (e.g. very high temperature or pressure); — the functioning of the plant; — resource availability (e.g. availability of spare parts when replacing a piece of equipment, availability of qualified manpower); — expected environmental benefits (e.g. giving priority to maintenance, repair or replacement actions with the highest environmental benefit).
Periodic measurement	Measurement at specified time intervals using manual or automated methods.
Polymer grade	For each type of polymer, there are different product qualities (i.e. grades) which vary in structure and molecular mass, and are optimised for specific applications. In the case of polyolefins, these may vary regarding the use of co-polymers such as EVA. In the case of PVC, they may vary in the average length of the polymer chain and in the porosity of the particles.

General terms	
Term used	Definition
Process furnace/heater	Process furnaces or heaters are: — combustion units used for the treatment of objects or feed material through direct contact, e.g. in drying processes or chemical reactors; or — combustion units whose radiant and/or conductive heat is transferred to objects or feed material through a solid wall without using an intermediary heat transfer fluid, e.g. furnaces or reactors heating a process stream used in the (petro-)chemical industry. As a consequence of the application of good energy recovery practices, some of the process furnaces/heaters may have an associated steam/electricity generation system. This is an integral design feature of the process furnace/heater that cannot be considered in isolation.
Process off-gas	The gas leaving a process which is further treated for recovery and/or abatement.
Solvent	Organic solvent as defined in Article 3(46) of Directive 2010/75/EU.
Solvent consumption	Consumption of solvent as defined in Article 57(9) of Directive 2010/75/EU.
Solvent input	The total quantity of organic solvents used as defined in Part 7 of Annex VII to Directive 2010/75/EU.
Solvent mass balance	A mass balance exercise conducted at least on an annual basis according to Part 7 of Annex VII to Directive 2010/75/EU.
Thermal treatment	Treatment of waste gases using thermal or catalytic oxidation.
Total emissions	The sum of channelled and diffuse emissions.
Valid hourly (or half-hourly) average	An hourly (or half-hourly) average is considered valid when there is no maintenance or malfunction of the automated measuring system.

Substances/Parameters	
Term used	Definition
Cl_2	Elemental chlorine.
CO	Carbon monoxide.
CS_2	Carbon disulphide.
Dust	Total particulate matter (in air). Unless specified otherwise, dust includes $PM_{2,5}$ and PM_{10}.
EDC	Ethylene dichloride (1,2-Dichloroethane).
HCl	Hydrogen chloride.
HCN	Hydrogen cyanide.
HF	Hydrogen fluoride.
H_2S	Hydrogen sulphide.
NH_3	Ammonia.
Ni	Nickel.

Substances/Parameters	
Term used	Definition
N_2O	Dinitrogen oxide (also referred to as nitrous oxide).
NO_X	The sum of nitrogen monoxide (NO) and nitrogen dioxide (NO_2), expressed as NO_2.
Pb	Lead.
PCDD/F	Polychlorinated dibenzo-*p*-dioxins and -furans.
$PM_{2,5}$	Particulate matter which passes through a size-selective inlet with a 50 % efficiency cut-off at 2,5 μm aerodynamic diameter as defined in Directive 2008/50/EC of the European Parliament and of the Council ([1]).
PM_{10}	Particulate matter which passes through a size-selective inlet with a 50 % efficiency cut-off at 10 μm aerodynamic diameter as defined in Directive 2008/50/EC.
SO_2	Sulphur dioxide.
SO_X	The sum of sulphur dioxide (SO_2), sulphur trioxide (SO_3), and sulphuric acid aerosols, expressed as SO_2.
TVOC	Total volatile organic carbon, expressed as C.
VCM	Vinyl chloride monomer.
VOC	Volatile organic compound as defined in Article 3(45) of Directive 2010/75/EU.

([1]) Directive 2008/50/EC of the European Parliament and of the Council of 21 May 2008 on ambient air quality and cleaner air for Europe (OJ L 152, 11.6.2008, p. 1).

ACRONYMS

For the purposes of these BAT conclusions, the following acronyms apply:

Acronym	Definition
CLP	Regulation (EC) No 1272/2008 of the European Parliament and of the Council ([1]) on classification, labelling and packaging of substances and mixtures.
CMR	Carcinogenic, mutagenic or toxic for reproduction.
CMR 1A	CMR substance of category 1A as defined in Regulation (EC) No 1272/2008 as amended, i. e. carrying the hazard statements H340, H350, H360.
CMR 1B	CMR substance of category 1B as defined in Regulation (EC) No 1272/2008 as amended, i. e. carrying the hazard statements H340, H350, H360.
CMR 2	CMR substance of category 2 as defined in Regulation (EC) No 1272/2008 as amended, i.e. carrying the hazard statements H341, H351, H361.
DIAL	Differential absorption LIDAR.
EMS	Environmental Management System.
EPS	Expandable polystyrene.
E-PVC	PVC produced by emulsion polymerisation.
EVA	Ethylene-vinyl acetate.
GPPS	General-purpose polystyrene.
HDPE	High-density polyethylene.

Acronym	Definition
HEAF	High-efficiency air filter.
HEPA	High-efficiency particle air.
HIPS	High-impact polystyrene.
IED	Directive 2010/75/EU on industrial emissions.
I-TEQ	International toxic equivalent – derived by using the equivalence factors in Part 2 of Annex VI to Directive 2010/75/EU.
LDAR	Leak detection and repair.
LDPE	Low-density polyethylene.
LIDAR	Light detection and ranging.
LLDPE	Linear low-density polyethylene.
OGI	Optical gas imaging.
OTNOC	Other than normal operating conditions.
PP	Polypropylene.
PVC	Polyvinyl chloride.
REACH	Regulation (EC) No 1907/2006 of the European Parliament and of the Council ([2]) concerning the registration, evaluation, authorisation and restriction of chemicals.
SCR	Selective catalytic reduction.
SNCR	Selective non-catalytic reduction.
SOF	Solar occultation flux.
S-PVC	PVC produced by suspension polymerisation.
ULPA	Ultra-low penetration air.

([1]) Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No 1907/2006 (OJ L 353, 31.12.2008, p. 1).

([2]) Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1999/45/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC (OJ L 396, 30.12.2006, p. 1).

GENERAL CONSIDERATIONS

Best Available Techniques

The techniques listed and described in these BAT conclusions are neither prescriptive nor exhaustive. Other techniques may be used that ensure at least an equivalent level of environmental protection.

Unless otherwise stated, the BAT conclusions are generally applicable.

Emission levels associated with the best available techniques (BAT-AELs) and indicative emission levels for channelled emissions to air

The BAT-AELs and the indicative emission levels for channelled emissions to air given in these BAT conclusions refer to values of concentration, expressed as mass of emitted substance per volume of waste gas under standard conditions (dry gas at a temperature of 273,15 K, and a pressure of 101,3 kPa) and expressed in the unit mg/Nm^3, µg/Nm^3 or ng I-TEQ/Nm^3.

The reference oxygen levels used to express BAT-AELs and indicative emission levels in these BAT conclusions are shown in the table below.

Source of emissions	Reference oxygen level (O_R)
Process furnace/heater using indirect heating	3 dry vol-%
All other sources	No correction for the oxygen level

For the cases where a reference oxygen level is given, the equation for calculating the emission concentration at the reference oxygen level is:

$$E_R = \frac{21 - O_R}{21 - O_M} \times E_M$$

where:

E_R: emission concentration at the reference oxygen level O_R;

O_R: reference oxygen level in vol-%;

E_M: measured emission concentration;

O_M: measured oxygen level in vol-%.

The equation above does not apply if the process furnace(s)/heater(s) use(s) oxygen-enriched air or pure oxygen or when additional air intake for safety reasons brings the oxygen level in the waste gas very close to 21 vol-%. In this case, the emission concentration at the reference oxygen level of 3 dry vol-% is calculated differently.

For averaging periods of BAT-AELs and indicative emission levels for channelled emissions to air, the following definitions apply.

Type of measurement	Averaging period	Definition
Continuous	Daily average	Average over a period of 1 day based on valid hourly or half-hourly averages.
Periodic	Average over the sampling period	Average value of three consecutive samplings/measurements of at least 30 minutes each ([1]).

([1]) For any parameter where, due to sampling or analytical limitations and/or due to operational conditions (e.g. batch processes), a 30-minute sampling/measurement and/or an average of three consecutive samplings/measurements is inappropriate, a more representative sampling/measurement procedure may be employed. For PCDD/F, one sampling period of 6 to 8 hours is used.

For the purpose of calculating the mass flows in relation to BAT 11 (Table 1.1), BAT 14 (Table 1.3), BAT 18 (Table 1.6), BAT 29 (Table 1.9) and BAT 36 (Table 1.15), where waste gases with similar characteristics, e.g. containing the same (type of) substances/parameters, and discharged through two or more separate stacks could, in the judgement of the competent authority, be discharged through a common stack, these stacks shall be considered as a single stack.

BAT-AELs for diffuse VOC emissions to air

For diffuse VOC emissions from the use of solvents or the reuse of recovered solvents, the BAT-AELs in these BAT conclusions are given as a percentage of the solvent input, calculated on an annual basis according to Part 7 of Annex VII to Directive 2010/75/EU.

BAT-AELs for total emissions to air for the production of polymers or synthetic rubbers

Production of polyolefins or synthetic rubbers

For total emissions to air of VOCs from the production of polyolefins or synthetic rubbers, the BAT-AELs in these BAT conclusions are given as specific emission loads calculated on an annual basis by dividing the total VOC emissions by a sector-dependent production rate, expressed in the unit g C/kg of product.

Production of PVC

For total emissions to air of VCM from the production of PVC, the BAT-AELs in these BAT conclusions are given as specific emission loads calculated on an annual basis by dividing the total VCM emissions by a sector-dependent production rate, expressed in the unit g/kg of product.

For the purpose of calculating specific emission loads, total emissions include the VCM concentration in the PVC.

Production of viscose

For the production of viscose, the BAT-AEL in these BAT conclusions is given as a specific emission load calculated on an annual basis by dividing the total S emissions by the production rate of staple fibres or casing, expressed in the unit g S/kg of product.

1.1. *General BAT conclusions*

1.1.1. Environmental management systems

BAT 1. In order to improve the overall environmental performance, BAT is to elaborate and implement an environmental management system (EMS) that incorporates all of the following features:

i. commitment, leadership, and accountability of the management, including senior management, for the implementation of an effective EMS;

ii. an analysis that includes the determination of the organisation's context, the identification of the needs and expectations of interested parties, the identification of characteristics of the installation that are associated with possible risks for the environment (or human health) as well as of the applicable legal requirements relating to the environment;

iii. development of an environmental policy that includes the continuous improvement of the environmental performance of the installation;

iv. establishing objectives and performance indicators in relation to significant environmental aspects, including safeguarding compliance with applicable legal requirements;

v. planning and implementing the necessary procedures and actions (including corrective and preventive actions where needed), to achieve the environmental objectives and avoid environmental risks;

vi. determination of structures, roles and responsibilities in relation to environmental aspects and objectives and provision of the financial and human resources needed;

vii. ensuring the necessary competence and awareness of staff whose work may affect the environmental performance of the installation (e.g. by providing information and training);

viii. internal and external communication;

ix. fostering employee involvement in good environmental management practices;

x. establishing and maintaining a management manual and written procedures to control activities with significant environmental impact as well as relevant records;

xi. effective operational planning and process control;

xii. implementation of appropriate maintenance programmes;

xiii. emergency preparedness and response protocols, including the prevention and/or mitigation of the adverse (environmental) impacts of emergency situations;

xiv. when (re)designing a (new) installation or a part thereof, consideration of its environmental impacts throughout its life, which includes construction, maintenance, operation and decommissioning;

xv. implementation of a monitoring and measurement programme; if necessary, information can be found in the Reference Report on Monitoring of Emissions to Air and Water from IED Installations;

xvi. application of sectoral benchmarking on a regular basis;

xvii. periodic independent (as far as practicable) internal auditing and periodic independent external auditing in order to assess the environmental performance and to determine whether or not the EMS conforms to planned arrangements and has been properly implemented and maintained;

xviii. evaluation of causes of nonconformities, implementation of corrective actions in response to nonconformities, review of the effectiveness of corrective actions, and determination of whether similar nonconformities exist or could potentially occur;

xix. periodic review, by senior management, of the EMS and its continuing suitability, adequacy and effectiveness;

xx. following and taking into account the development of cleaner techniques.

Specifically for the chemical sector, BAT is also to incorporate the following features in the EMS:

xxi. an inventory of channelled and diffuse emissions to air (see BAT 2);

xxii. an OTNOC management plan for emissions to air (see BAT 3);

xxiii. an integrated waste gas management and treatment strategy for channelled emissions to air (see BAT 4);

xxiv. a management system for diffuse VOC emissions to air (see BAT 19);

xxv. a chemicals management system that includes an inventory of the hazardous substances and substances of very high concern used in the process(es); the potential for substitution of the substances that are listed in this inventory, focusing on those substances other than raw materials, is analysed periodically (e. g. annually) in order to identify possible new available and safer alternatives, with no or lower environmental impacts.

Note

Regulation (EC) No 1221/2009 of the European Parliament and of the Council ([2]) establishes the European Union eco-management and audit scheme (EMAS), which is an example of an EMS consistent with this BAT.

Applicability

The level of detail and the degree of formalisation of the EMS will generally be related to the nature, scale and complexity of the installation, and the range of environmental impacts it may have.

([2]) Regulation (EC) No 1221/2009 of the European Parliament and of the Council of 25 November 2009 on the voluntary participation by organisations in a Community eco-management and audit scheme (EMAS), repealing Regulation (EC) No 761/2001 and Commission Decisions 2001/681/EC and 2006/193/EC (OJ L 342, 22.12.2009, p. 1).

BAT 2. In order to facilitate the reduction of emissions to air, BAT is to establish, maintain and regularly review (including when a substantial change occurs) an inventory of channelled and diffuse emissions to air, as part of the environmental management system (see BAT 1), that incorporates all of the following features:

i. information, as comprehensive as is reasonably possible, about the chemical production process(es), including:

   a. chemical reaction equations, also showing side products;

   b. simplified process flow sheets that show the origin of the emissions;

ii. information, as comprehensive as is reasonably possible, about channelled emissions to air, such as:

   a. emission point(s);

   b. average values and variability of flow and temperature;

   c. average concentration and mass flow values of relevant substances/parameters and their variability (e.g. TVOC, CO, NO_X, SO_X, Cl_2, HCl);

   d. presence of other substances that may affect the waste gas treatment system(s) or plant safety (e.g. oxygen, nitrogen, water vapour, dust);

   e. techniques used to prevent and/or reduce channelled emissions to air;

   f. flammability, lower and higher explosive limits, reactivity;

   g. monitoring methods (see BAT 8);

   h. presence of substances classified as CMR 1A, CMR 1B or CMR 2; the presence of such substances may for example be assessed according to the criteria of Regulation (EC) No 1272/2008 on classification, labelling and packaging (CLP).

iii. information, as comprehensive as is reasonably possible, about diffuse emissions to air, such as:

   a. identification of the emission source(s);

   b. characteristics of each emission source (e.g. fugitive or non-fugitive; static or moving; accessibility of the emission source; included in an LDAR programme or not);

   c. the characteristics of the gas or liquid in contact with the emission source(s), including:

      1. physical state;

      2. vapour pressure of the substance(s) in the liquid, pressure of the gas;

      3. temperature;

      4. composition (by weight for liquids or by volume for gases);

      5. hazardous properties of the substance(s) or mixtures, including substances or mixtures classified as CMR 1A, CMR 1B or CMR 2;

   d. techniques used to prevent and/or reduce diffuse emissions to air;

   e. monitoring (see BAT 20, BAT 21 and BAT 22).

Note for diffuse emissions

The information about diffuse emissions to air is particularly relevant for activities using large amounts of organic substances or mixtures (e.g. production of pharmaceuticals, production of large volumes of organic chemicals or of polymers).

The information about fugitive emissions covers all emission sources in contact with organic substances with a vapour pressure greater than 0,3 kPa at 293,15 K.

Sources of fugitive emissions connected to pipes whose diameter is small (e.g. smaller than 12,7 mm, i.e. 0,5 inch) may be excluded from the inventory.

Equipment operated under subatmospheric pressure may be excluded from the inventory.

Applicability

The level of detail and the degree of formalisation of the inventory will generally be related to the nature, scale and complexity of the installation, and the range of environmental impacts it may have.

1.1.2. **Other than normal operating conditions (OTNOC)**

BAT 3. In order to reduce the frequency of the occurrence of OTNOC and to reduce emissions to air during OTNOC, BAT is to set up and implement a risk-based OTNOC management plan as part of the environmental management system (see BAT 1) that includes all of the following features:

i. identification of potential OTNOC (e.g. failure of equipment critical to the control of channelled emissions to air, or equipment critical to the prevention of accidents or incidents that could lead to emissions to air ('critical equipment')), of their root causes and of their potential consequences;

ii. appropriate design of critical equipment (e.g. equipment modularity and compartmentalisation, backup systems, techniques to obviate the need to bypass waste gas treatment during start-up and shutdown, high-integrity equipment, etc.);

iii. set-up and implementation of a preventive maintenance plan for critical equipment (see BAT 1 xii.);

iv. monitoring (i.e. estimating or, where this is possible, measuring) and recording of emissions and associated circumstances during OTNOC;

v. periodic assessment of the emissions occurring during OTNOC (e.g. frequency of events, duration, amount of pollutants emitted as recorded in point iv.) and implementation of corrective actions if necessary;

vi. regular review and update of the list of identified OTNOC under point i. following the periodic assessment of point v.;

vii. regular testing of backup systems.

1.1.3. **Channelled emissions to air**

1.1.3.1. *General techniques*

BAT 4. In order to reduce channelled emissions to air, BAT is to use an integrated waste gas management and treatment strategy that includes, in order of priority, process-integrated recovery and abatement techniques.

Description

The integrated waste gas management and treatment strategy is based on the inventory in BAT 2. It takes into account factors such as greenhouse gas emissions and the consumption or reuse of energy, water and materials associated with the use of the different techniques.

BAT 5. In order to facilitate the recovery of materials and the reduction of channelled emissions to air, as well as to increase energy efficiency, BAT is to combine waste gas streams with similar characteristics, thus minimising the number of emission points.

Description

The combined treatment of waste gases with similar characteristics ensures more effective and efficient treatment compared to the separate treatment of individual waste gas streams. The combination of waste gases is carried out considering plant safety (e.g. avoiding concentrations close to the lower/upper explosive limit), technical (e.g. compatibility of the individual waste gas streams, concentration of the substances concerned), environmental (e.g. maximising recovery of materials or pollutant abatement) and economic factors (e.g. distance between different production units).

Care is taken that the combination of waste gases does not lead to the dilution of emissions.

BAT 6. In order to reduce channelled emissions to air, BAT is to ensure that the waste gas treatment systems are appropriately designed (e.g. considering the maximum flow rate and pollutant concentrations), operated within their design ranges, and maintained (through preventive, corrective, regular and unplanned maintenance) so as to ensure optimal availability, effectiveness and efficiency of the equipment.

1.1.3.2. *Monitoring*

BAT 7. BAT is to continuously monitor key process parameters (e.g. waste gas flow and temperature) of waste gas streams being sent to pretreatment and/or final treatment.

BAT 8. BAT is to monitor channelled emissions to air with at least the frequency given below and in accordance with EN standards. If EN standards are not available, BAT is to use ISO, national or other international standards that ensure the provision of data of an equivalent scientific quality.

Substance/ Parameter [1]	Process(es)/ Source(s)	Emission points	Standard(s) [2]	Minimum monitoring frequency	Monitoring associated with
Ammonia (NH_3)	Use of SCR/SNCR	Any stack	EN 21877	Once every 6 months [3] [4]	BAT 17
	All other processes/ sources				BAT 18
Benzene	All processes/ sources	Any stack	No EN standard available	Once every 6 months [3]	BAT 11
1,3-Butadiene	All processes/ sources	Any stack	No EN standard available	Once every 6 months [3]	BAT 11

Substance/ Parameter ([1])	Process(es)/ Source(s)	Emission points	Standard(s) ([2])	Minimum monitoring frequency	Monitoring associated with
Carbon monoxide (CO)	Thermal treatment	Any stack with a CO mass flow of ≥ 2 kg/h	Generic EN standards ([5])	Continuous	BAT 16
		Any stack with a CO mass flow of < 2 kg/h	EN 15058	Once every 6 months ([3]) ([4])	
	Process furnaces/ heaters	Any stack with a CO mass flow of ≥ 2 kg/h	Generic EN standards ([5])	Continuous ([6])	BAT 36
		Any stack with a CO mass flow of < 2 kg/h	EN 15058	Once every 6 months ([3]) ([4])	
	All other processes/ sources	Any stack with a CO mass flow of ≥ 2 kg/h	Generic EN standards ([5])	Continuous	BAT 18
		Any stack with a CO mass flow of < 2 kg/h	EN 15058	Once every year ([3]) ([7])	
Chloromethane	All processes/ sources	Any stack	No EN standard available	Once every 6 months ([3])	BAT 11
CMR substances other than CMR substances covered elsewhere in this table ([12])	All other processes/ sources	Any stack	No EN standard available	Once every 6 months ([3])	BAT 11
Dichloromethane	All processes/ sources	Any stack	No EN standard available	Once every 6 months ([3])	BAT 11

Substance/ Parameter ([1])	Process(es)/ Source(s)	Emission points	Standard(s) ([2])	Minimum monitoring frequency	Monitoring associated with
Dust	All processes/ sources	Any stack with dust mass flow ≥ 3 kg/h	Generic EN standards ([5]), EN 13284-1 and EN 13284-2	Continuous ([8])	BAT 14
		Any stack with dust mass flow < 3 kg/h	EN 13284-1	Once every year ([3]) ([7])	
Elemental chlorine (Cl_2)	All processes/ sources	Any stack	No EN standard available	Once every year ([3]) ([7])	BAT 18
Ethylene dichloride (EDC)	All processes/ sources	Any stack	No EN standard available	Once every 6 months ([3])	BAT 11
Ethylene oxide	All processes/ sources	Any stack	No EN standard available	Once every 6 months ([3])	BAT 11
Formaldehyde	All processes/ sources	Any stack	EN standard under development	Once every 6 months ([3])	BAT 11
Gaseous chlorides	All processes/ sources	Any stack	EN 1911	Once every year ([3]) ([7])	BAT 18
Gaseous fluorides	All processes/ sources	Any stack	No EN standard available	Once every year ([3]) ([7])	BAT 18
Hydrogen cyanide (HCN)	All processes/ sources	Any stack	No EN standard available	Once every year ([3]) ([7])	BAT 18
Lead and its compounds	All processes/ sources	Any stack	EN 14385	Once every 6 months ([3]) ([9])	BAT 14

Substance/ Parameter (1)	Process(es)/ Source(s)	Emission points	Standard(s) (2)	Minimum monitoring frequency	Monitoring associated with
Nickel and its compounds	All processes/ sources	Any stack	EN 14385	Once every 6 months (3) (9)	BAT 14
Nitrous oxide (N_2O)	All processes/ sources	Any stack	EN ISO 21258	Once every year (3) (7)	–
Nitrogen oxides (NO_X)	Thermal treatment	Any stack with a NO_X mass flow of ≥ 2,5 kg/h	Generic EN standards (5)	Continuous	BAT 16
		Any stack with a NO_X mass flow of < 2,5 kg/h	EN 14792	Once every 6 months (3) (4)	
	Process furnaces/ heaters	Any stack with a NO_X mass flow of ≥ 2,5 kg/h	Generic EN standards (5)	Continuous (6)	BAT 36
		Any stack with a NO_X mass flow of < 2,5 kg/h	EN 14792	Once every 6 months (3) (4)	
	All other processes/ sources	Any stack with a NO_X mass flow of ≥ 2,5 kg/h	Generic EN standards (5)	Continuous	BAT 18
		Any stack with a NO_X mass flow of < 2,5 kg/h	EN 14792	Once every 6 months (3) (4)	
PCDD/F	Thermal treatment	Any stack	EN 1948-1, EN 1948-2, EN 1948-3	Once every 6 months (3) (9)	BAT 12
$PM_{2,5}$ and PM_{10}	All processes/ sources	Any stack	EN ISO 23210	Once every year (3) (7)	BAT 14
Propylene oxide	All processes/ sources	Any stack	No EN standard available	Once every 6 months (3)	BAT 11

Substance/ Parameter (1)	Process(es)/ Source(s)	Emission points	Standard(s) (2)	Minimum monitoring frequency	Monitoring associated with
Sulphur dioxide (SO_2)	Thermal treatment	Any stack with a SO_2 mass flow of ≥ 2,5 kg/h	Generic EN standards (5)	Continuous	BAT 16
		Any stack with a SO_2 mass flow of < 2,5 kg/h	EN 14791	Once every 6 months (3) (4)	
	Process furnaces/ heaters	Any stack with a SO_2 mass flow of ≥ 2,5 kg/h	Generic EN standards (5)	Continuous (6)	BAT 18, BAT 36
		Any stack with a SO_2 mass flow of < 2,5 kg/h	EN 14791	Once every 6 months (3) (4)	
	All other processes/ sources	Any stack with a SO_2 mass flow of ≥ 2,5 kg/h	Generic EN standards (5)	Continuous	BAT 18
		Any stack with a SO_2 mass flow of < 2,5 kg/h	EN 14791	Once every 6 months (3) (4)	
Tetrachloromethane	All processes/ sources	Any stack	No EN standard available	Once every 6 months (3)	BAT 11
Toluene	All processes/ sources	Any stack	No EN standard available	Once every 6 months (3)	BAT 11
Trichloromethane	All processes/ sources	Any stack	No EN standard available	Once every 6 months (3)	BAT 11

Substance/ Parameter ([1])	Process(es)/ Source(s)	Emission points	Standard(s) ([2])	Minimum monitoring frequency	Monitoring associated with
Total volatile organic carbon (TVOC)	Production of polyolefins ([10])	Any stack with a TVOC mass flow of ≥ 2 kg C/h	Generic EN standards ([5])	Continuous	BAT 11, BAT 25
		Any stack with a TVOC mass flow of < 2 kg C/h	EN 12619	Once every 6 months ([3]) ([4])	
	Production of synthetic rubbers ([11])	Any stack with a TVOC mass flow of ≥ 2 kg C/h	Generic EN standards ([5])	Continuous	BAT 11, BAT 32
		Any stack with a TVOC mass flow of < 2 kg C/h	EN 12619	Once every 6 months ([3]) ([4])	
	All other processes/ sources	Any stack with a TVOC mass flow of ≥ 2 kg C/h	Generic EN standards ([5])	Continuous	BAT 11
		Any stack with a TVOC mass flow of < 2 kg C/h	EN 12619	Once every 6 months ([3]) ([4])	

([1]) The monitoring only applies when the substance/parameter concerned is identified as relevant in the waste gas stream based on the inventory given in BAT 2.

([2]) Measurements are carried out according to EN 15259.

([3]) To the extent possible, the measurements are carried out at the highest expected emission state under normal operating conditions.

([4]) The minimum monitoring frequency may be reduced to once every year or once every 3 years if the emission levels are proven to be sufficiently stable.

([5]) Generic EN standards for continuous measurements are EN 14181, EN 15267-1, EN 15267-2 and EN 15267-3.

([6]) In the case of process furnaces/heaters with a total rated thermal input of less than 100 MW operated less than 500 hours per year, the minimum monitoring frequency may be reduced to once every year.

([7]) The minimum monitoring frequency may be reduced to once every 3 years if the emission levels are proven to be sufficiently stable.

([8]) The minimum monitoring frequency may be reduced to once every 6 months if the emission levels are proven to be sufficiently stable.

([9]) The minimum monitoring frequency may be reduced to once every year if the emission levels are proven to be sufficiently stable.

([10]) In the case of the production of polyolefins, the monitoring of TVOC emissions from finishing steps (e.g. drying, blending) and from polymer storage may be complemented by the monitoring in BAT 24 if it provides a better representation of the TVOC emissions.

([11]) In the case of the production of synthetic rubbers, the monitoring of TVOC emissions from finishing steps (e.g. extrusion, drying, blending) and from synthetic rubber storage may be complemented by the monitoring in BAT 31 if it provides a better representation of the TVOC emissions.

([12]) i.e. other than benzene, 1,3-butadiene, chloromethane, dichloromethane, ethylene dichloride, ethylene oxide, formaldehyde, propylene oxide, tetrachloromethane, toluene, trichloromethane.

1.1.3.3. *Organic compounds*

BAT 9. In order to increase resource efficiency and to reduce the mass flow of organic compounds sent to the final waste gas treatment, BAT is to recover organic compounds from process off-gases by using one or a combination of the techniques given below and to reuse them.

Technique		Description
a.	Absorption (regenerative)	See Section 1.4.1.
b.	Adsorption (regenerative)	See Section 1.4.1.
c.	Condensation	See Section 1.4.1.

Applicability

Recovery may be restricted where the energy demand is excessive due to the low concentration of the compound(s) concerned in the process off-gas(es). Reuse may be restricted due to product quality specifications.

BAT 10. In order to increase energy efficiency and to reduce the mass flow of organic compounds sent to the final waste gas treatment, BAT is to send process off-gases with a sufficient calorific value to a combustion unit that is, if technically possible, combined with heat recovery. BAT 9 has priority over sending process off-gases to a combustion unit.

Description

Process off-gases with a high calorific value are burnt as a fuel in a combustion unit (gas engine, boiler, process heater or furnace) and the heat is recovered as steam or for electricity generation, or to provide heat to the process.

For process off-gases with low VOC concentrations (e.g. < 1 g/Nm^3), pre-concentration steps may be applied using adsorption (rotor or fixed bed, with activated carbon or zeolites), in order to increase the calorific value of the process off-gases.

Molecular sieves ('smoothers'), typically composed of zeolites, may be used to level down high variations (e.g. concentration peaks) of VOC concentrations in the process off-gases.

Applicability

Sending process off-gases to a combustion unit may be restricted due to the presence of contaminants or due to safety considerations.

BAT 11. In order to reduce channelled emissions to air of organic compounds, BAT is to use one or a combination of the techniques given below.

Technique		Description	Applicability
a.	Adsorption	See Section 1.4.1.	Generally applicable.
b.	Absorption	See Section 1.4.1.	Generally applicable.
c.	Catalytic oxidation	See Section 1.4.1.	Applicability may be restricted by the presence of catalyst poisons in the waste gases.
d.	Condensation	See Section 1.4.1.	Generally applicable.

e.	Thermal oxidation	See Section 1.4.1.	Applicability of recuperative and regenerative thermal oxidation to existing plants may be restricted by design and/or operational constraints. Applicability may be restricted where the energy demand is excessive due to the low concentration of the compound(s) concerned in the process off-gases.
f.	Bioprocesses	See Section 1.4.1.	Only applicable to the treatment of biodegradable compounds.

Table 1.1

BAT-associated emission levels (BAT-AELs) for channelled emissions to air of organic compounds

Substance/Parameter	BAT-AEL (mg/Nm³) (Daily average or average over the sampling period) (1)
Total volatile organic carbon (TVOC)	< 1-20 (2) (3) (4) (5)
Sum of VOCs classified as CMR 1A or 1B	< 1-5 (6)
Sum of VOCs classified as CMR 2	< 1-10 (7)
Benzene	< 0,5-1 (8)
1,3-Butadiene	< 0,5-1 (8)
Ethylene dichloride	< 0,5-1 (8)
Ethylene oxide	< 0,5-1 (8)
Propylene oxide	< 0,5-1 (8)
Formaldehyde	1-5 (8)
Chloromethane	< 0,5-1 (9) (10)
Dichloromethane	< 0,5-1 (9) (10)
Tetrachloromethane	< 0,5-1 (9) (10)
Toluene	< 0,5-1 (9) (11)
Trichloromethane	< 0,5-1 (9) (10)

(1) For activities listed under points 8 and 10, Part 1 of Annex VII of the IED, the BAT-AEL ranges apply to the extent that they lead to lower emission levels than the emission limit values in part 2 and 4 of Annex VII to the IED.
(2) TVOC is expressed in mg C/Nm³.
(3) In the case of polymer production, the BAT-AEL may not apply to emissions from the finishing steps (e.g. extrusion, drying, blending) and from polymer storage.
(4) The BAT-AEL does not apply to minor emissions (i.e. when the TVOC mass flow is below e.g. 100 g C/h) if no CMR substances are identified as relevant in the waste gas stream based on the inventory given in BAT 2.
(5) The upper end of the BAT-AEL range may be higher and up to 30 mg C/Nm³ when using techniques to recover materials (e.g. solvents, see BAT 9), if both of the following conditions are fulfilled:

— the presence of substances classified as CMR 1A/1B or CMR 2 is identified as not relevant (see BAT 2);
— the TVOC abatement efficiency of the waste gas treatment system is ≥ 95 %.

(6) The BAT-AEL does not apply to minor emissions (i.e. when the mass flow of the sum of the VOCs classified as CMR 1A or 1B is below e.g. 1 g/h).
(7) The BAT-AEL does not apply to minor emissions (i.e. when the mass flow of the sum of the VOCs classified as CMR 2 is below e.g. 50 g/h).
(8) The BAT-AEL does not apply to minor emissions (i.e. when the mass flow of the substance concerned is below e.g. 1 g/h).
(9) The BAT-AEL does not apply to minor emissions (i.e. when the mass flow of the substance concerned is below e.g. 50 g/h).
(10) The upper end of the BAT-AEL range may be higher and up to 15 mg/Nm³ when using techniques to recover materials (e.g. solvents, see BAT 9), if the abatement efficiency of the waste gas treatment system is ≥ 95 %.
(11) The upper end of the BAT-AEL range may be higher and up to 20 mg/Nm³ when using techniques to recover toluene (see BAT 9), if the abatement efficiency of the waste gas treatment system is ≥ 95 %.

The associated monitoring is given in BAT 8.

BAT 12. In order to reduce channelled emissions to air of PCDD/F from thermal treatment of waste gases containing chlorine and/or chlorinated compounds, BAT is to use techniques a. and b., and one or a combination of techniques c. to e., given below.

Technique		Description	Applicability
Specific techniques to reduce PCDD/F emissions			
a.	Optimised catalytic or thermal oxidation	See Section 1.4.1.	Generally applicable.
b.	Rapid waste-gas cooling	Rapid cooling of waste gases from temperatures above 400 °C to below 250 °C to prevent the *de novo* synthesis of PCDD/F.	Generally applicable.
c.	Adsorption using activated carbon	See Section 1.4.1.	Generally applicable.
d.	Absorption	See Section 1.4.1.	Generally applicable.
Other techniques not primarily used to reduce PCDD/F emissions			
e.	Selective catalytic reduction (SCR)	See Section 1.4.1. When SCR is used for NO_X abatement, an adequate catalyst surface of the SCR system also provides for the partial reduction of the emissions of PCDD/F.	Applicability to existing plants may be restricted by space availability and/or by the presence of catalyst poisons in the waste gases.

Table 1.2

BAT-associated emission level (BAT-AEL) for channelled emissions to air of PCDD/F from thermal treatment of waste gases containing chlorine and/or chlorinated compounds

Substance/Parameter	BAT-AEL (ng I-TEQ/Nm³) (Average over the sampling period)
PCDD/F	< 0,01-0,05

The associated monitoring is given in BAT 8.

1.1.3.4. *Dust (including PM_{10} and $PM_{2,5}$) and particulate-bound metals*

BAT 13. In order to increase resource efficiency and to reduce the mass flow of dust and particulate-bound metals sent to the final waste gas treatment, BAT is to recover materials from process off-gases by using one or a combination of the techniques given below and to reuse them.

Technique		Description
a.	Cyclone	See Section 1.4.1.
b.	Fabric filter	See Section 1.4.1.
c.	Absorption	See Section 1.4.1.

Applicability

Recovery may be restricted where the energy demand for dust purification or decontamination is excessive. Reuse may be restricted due to product quality specifications.

BAT 14. In order to reduce channelled emissions to air of dust and particulate-bound metals, BAT is to use one or a combination of the techniques given below.

Technique		Description	Applicability
a.	Absolute filter	See Section 1.4.1.	Applicability may be limited in the case of sticky dust or when the temperature of the waste gases is below the dew point.
b.	Absorption	See Section 1.4.1.	Generally applicable.
c.	Fabric filter	See Section 1.4.1.	Applicability may be limited in the case of sticky dust or when the temperature of the waste gases is below the dew point.
d.	High-efficiency air filter	See Section 1.4.1.	Generally applicable.
e.	Cyclone	See Section 1.4.1.	Generally applicable.
f.	Electrostatic precipitator	See Section 1.4.1.	Generally applicable.

Table 1.3

BAT-associated emission levels (BAT-AELs) for channelled emissions to air of dust, lead and nickel

Substance/Parameter	BAT-AEL (mg/Nm^3) (Daily average or average over the sampling period)
Dust	< 1-5 ([1]) ([2]) ([3]) ([4])
Lead and its compounds, expressed as Pb	< 0,01-0,1 ([5])
Nickel and its compounds, expressed as Ni	< 0,02-0,1 ([6])

(1) The upper end of the range is 20 mg/Nm³ when neither an absolute nor a fabric filter is applicable.
(2) The BAT-AEL does not apply to minor emissions (i.e. when the dust mass flow is below e.g. 50 g/h) if no CMR substances are identified as relevant in the dust based on the inventory given in BAT 2.
(3) In the case of the production of complex inorganic pigments using direct heating, and in the case of the drying step in the production of E-PVC, the upper end of the BAT-AEL range may be higher and up to 10 mg/Nm³.
(4) Dust emissions are expected to be towards the lower end of the BAT-AEL range (e.g. below 2,5 mg/Nm³) when the presence of substances classified as CMR 1A or 1B, or CMR 2 in the dust is identified as relevant (see BAT 2).
(5) The BAT-AEL does not apply to minor emissions (i.e. when the lead mass flow is below e.g. 0,1 g/h).
(6) The BAT-AEL does not apply to minor emissions (i.e. when the Ni mass flow is below e.g. 0,15 g/h).

The associated monitoring is given in BAT 8.

1.1.3.5. *Inorganic compounds*

BAT 15. In order to increase resource efficiency and to reduce the mass flow of inorganic compounds sent to the final waste gas treatment, BAT is to recover inorganic compounds from process off-gases by using absorption and to reuse them.

Description

See Section 1.4.1.

Applicability

Recovery may be restricted where the energy demand is excessive due to the low concentration of the compound(s) concerned in the process off-gas(es). Reuse may be restricted due to product quality specifications.

BAT 16. In order to reduce channelled emissions to air of CO, NO_X and SO_X from thermal treatment, BAT is to use technique c. and one or a combination of the other techniques given below.

Technique		Description	Main inorganic compounds targeted	Applicability
a.	Choice of fuel	See Section 1.4.1.	NO_X, SO_X	Generally applicable.
b.	Low-NO_X burner	See Section 1.4.1.	NO_X	Applicability to existing plants may be restricted by design and/or operational constraints.
c.	Optimisation of catalytic or thermal oxidation	See Section 1.4.1.	CO, NO_X	Generally applicable.
d.	Removal of high levels of NO_X precursors	Remove (if possible, for reuse) high levels of NO_X precursors prior to thermal or catalytic oxidation, e.g. by absorption, adsorption or condensation.	NO_X	Generally applicable.

e.	Absorption	See Section 1.4.1.	SO_X	Generally applicable.
f.	Selective catalytic reduction (SCR)	See Section 1.4.1.	NO_X	Applicability to existing plants may be restricted by space availability.
g.	Selective non-catalytic reduction (SNCR)	See Section 1.4.1.	NO_X	Applicability to existing plants may be restricted by the residence time needed for the reaction.

Table 1.4

BAT-associated emission levels (BAT-AELs) for channelled emissions to air of NO_X and indicative emission level for channelled emissions to air of CO from thermal treatment

Substance/Parameter	BAT-AEL (mg/Nm³) (Daily average or average over the sampling period)
Nitrogen oxides (NO_X) from catalytic oxidation	5-30 ([1])
Nitrogen oxides (NO_X) from thermal oxidation	5-130 ([2])
Carbon monoxide (CO)	No BAT-AEL ([3])

([1]) The upper end of the BAT-AEL range may be higher and up to 80 mg/Nm³ if the process off-gas(es) contain(s) high levels of NO_X precursors.
([2]) The upper end of the BAT-AEL range may be higher and up to 200 mg/Nm³ if the process off-gas(es) contain(s) high levels of NO_X precursors.
([3]) As an indication, the emission levels for carbon monoxide are 4-50 mg/Nm³, as a daily average or average over the sampling period.

The associated monitoring is given in BAT 8.

The BAT-AEL for channelled emissions to air of SO_2 is given in Table 1.6.

BAT 17. In order to reduce channelled emissions to air of ammonia from the use of selective catalytic reduction (SCR) or selective non-catalytic reduction (SNCR) for the abatement of NO_X emissions (ammonia slip), BAT is to optimise the design and/or operation of SCR or SNCR (e.g. optimised reagent to NO_X ratio, homogeneous reagent distribution and optimum size of the reagent drops).

Table 1.5

BAT-associated emission level (BAT-AEL) for channelled emissions to air of ammonia from the use of SCR or SNCR (ammonia slip)

Substance/Parameter	BAT-AEL (mg/Nm³) (Average over the sampling period)
Ammonia (NH_3) from SCR/SNCR	< 0,5-8 ([1])

([1]) The upper end of the BAT-AEL range may be higher and up to 40 mg/Nm³ in the case of process off-gases containing very high levels of NO_X (e.g. above 5 000 mg/Nm³) prior to treatment with SCR or SNCR.

The associated monitoring is given in BAT 8.

BAT 18. In order to reduce channelled emissions to air of inorganic compounds other than channelled emissions to air of ammonia from the use of selective catalytic reduction (SCR) or selective non-catalytic reduction (SNCR) for the abatement of NO_X emissions), channelled emissions to air of CO, NO_X and SO_X from the use of thermal treatment, and channelled emissions to air of NO_X from process furnaces/heaters, BAT is to use one or a combination of the techniques given below.

	Technique	Description	Main inorganic compounds targeted	Applicability
Specific techniques to reduce emissions to air of inorganic compounds				
a.	Absorption	See Section 1.4.1.	Cl_2, HCl, HCN, HF, NH_3, NO_X, SO_X	Generally applicable.
b.	Adsorption	See Section 1.4.1. For the removal of inorganic substances, the technique is often used in combination with a dust abatement technique (see BAT 14).	HCl, HF, NH_3, SO_X	Generally applicable.
c.	Selective catalytic reduction (SCR)	See Section 1.4.1.	NO_X	Applicability to existing plants may be restricted by space availability.
d.	Selective non-catalytic reduction (SNCR)	See Section 1.4.1.	NO_X	Applicability to existing plants may be restricted by the residence time needed for the reaction.
Other techniques not primarily used to reduce emissions to air of inorganic compounds				
e.	Catalytic oxidation	See Section 1.4.1.	NH_3	Applicability may be restricted by the presence of catalyst poisons in the waste gases.
f.	Thermal oxidation	See Section 1.4.1.	NH_3, HCN	Applicability of recuperative and regenerative thermal oxidation to existing plants may be restricted by design and/or operational constraints. The applicability may be restricted where the energy demand is excessive due to the low concentration of the compound(s) concerned in the process off-gases.

Table 1.6

BAT-associated emission levels (BAT-AELs) for channelled emissions to air of inorganic compounds

Substance/Parameter	BAT-AEL (mg/Nm^3) (Daily average or average over the sampling period)
Ammonia (NH_3)	2-10 (1) (2) (3)
Elemental chlorine (Cl_2)	< 0,5-2 (4) (5)
Gaseous fluorides, expressed as HF	≤ 1 (4)
Hydrogen cyanide (HCN)	< 0,1-1 (4)
Gaseous chlorides, expressed as HCl	1-10 (6)
Nitrogen oxides (NO_X)	10-150 (7) (8) (9) (10)
Sulphur oxides (SO_2)	< 3-150 (9) (11)

(1) The BAT-AEL does not apply to channelled emissions to air of ammonia from the use of SCR or SNCR (ammonia slip). This is covered by BAT 17.
(2) The BAT-AEL does not apply to minor emissions (i.e. when the NH_3 mass flow is below e.g. 50 g/h).
(3) In the case of the drying step in the production of E-PVC, the upper end of the BAT-AEL range may be higher and up to 20 mg/Nm^3, when the substitution of ammonium salts is not possible due to product quality specifications.
(4) The BAT-AEL does not apply to minor emissions (i.e. when the mass flow of the substance concerned is below e.g. 5 g/h).
(5) In the case of NO_X concentrations above 100 mg/Nm^3, the upper end of the BAT-AEL range may be higher and up to 3 mg/Nm^3 due to analytical interference
(6) The BAT-AEL does not apply to minor emissions (i.e. when the HCl mass flow is below e.g. 30 g/h).
(7) In the case of the production of explosives, the upper end of the BAT-AEL range may be higher and up to 220 mg/Nm^3 when regenerating or recovering nitric acid from the production process.
(8) The BAT-AEL does not apply to channelled emissions to air of NO_X from the use of catalytic or thermal oxidation (see BAT 16) or from process furnaces/heaters (see BAT 36).
(9) The BAT-AEL does not apply to minor emissions (i.e. when the mass flow of the substance concerned is below e.g. 500 g/h.
(10) In the case of the production of caprolactam, the upper end of the BAT-AEL range may be higher and up to 200 mg/Nm^3 in the case of process off-gases containing very high levels of NO_X (e.g. above 10 000 mg/Nm^3) prior to treatment with SCR or SNCR, when the abatement efficiency of the SCR or SNCR is ≥ 99 %.
(11) The BAT-AEL does not apply in the case of physical purification or reconcentration of spent sulphuric acid.

The associated monitoring is given in BAT 8.

1.1.4. Diffuse VOC emissions to air

1.1.4.1. *Management system for diffuse VOC emissions*

BAT 19. In order to prevent or, where that is not practicable, to reduce diffuse VOC emissions to air, BAT is to elaborate and implement a management system for diffuse VOC emissions, as part of the environmental management system (see BAT 1), that includes all of the following features:

i. Estimating the annual quantity of diffuse VOC emissions (see BAT 20).

ii. Monitoring diffuse VOC emissions from the use of solvents by compiling a solvent mass balance, if applicable (see BAT 21).

iii. Establishing and implementing a leak detection and repair (LDAR) programme for fugitive VOC emissions. The LDAR programme typically lasts from 1 to 5 years depending on the nature, scale and complexity of the plant (5 years may correspond to large plants with a high number of emission sources).

The LDAR programme includes all of the following features:

a. Listing of equipment identified as relevant fugitive VOC emission sources in the inventory of diffuse VOC emissions (see BAT 2).

b. Definition of criteria associated with the following:

— Leaky equipment. Typical criteria could be a leak threshold, above which equipment is considered leaky, and/or the visualisation of a leak with OGI cameras. This depends on the characteristics of the emission source (e.g. accessibility) and the hazardous properties of the emitted substance(s).

— Maintenance and/or repair actions to be carried out. A typical criterion could be a VOC concentration threshold triggering the maintenance or repair action (maintenance/repair threshold). The maintenance/repair threshold is generally equal to or higher than the leak threshold. This depends on the characteristics of the emission source (e.g. accessibility) and the hazardous properties of the emitted substance(s). For the first LDAR programme, it is generally not higher than 5 000 ppmv for VOCs other than VOCs classified as CMR 1A or 1B, and 1 000 ppmv for VOCs classified as CMR 1A or 1B. For subsequent LDAR programmes, the maintenance/repair threshold is lowered (see point vi. a.) and not higher than 1 000 ppmv for VOCs other than VOCs classified as CMR 1A or 1B, and 500 ppmv for VOCs classified as CMR 1A or 1B, targeting 100 ppmv.

c. Measuring fugitive VOC emissions from equipment listed under point iii. a. (see BAT 22).

d. Carrying out maintenance and/or repair actions (see BAT 23, techniques e. and f.), as soon as possible and where necessary according to the criteria defined in point iii. b. Maintenance and repair actions are prioritised according to the hazardous properties of the emitted substance(s), the significance of the emissions and/or operational constraints. The effectiveness of the maintenance and/or repair actions is verified according to point iii. c., leaving enough time after the intervention (e.g. 2 months).

e. Filling in the database mentioned in point v.

iv. Establishing and implementing a detection and reduction programme for non-fugitive VOC emissions that includes all of the following features:

a. Listing of equipment identified as relevant non-fugitive VOC emission sources in the inventory of diffuse VOC emissions (see BAT 2).

b. Monitoring non-fugitive VOC emissions from equipment listed under point iv. a. (see BAT 22).

c. Planning and implementing techniques to reduce non-fugitive VOC emissions (see BAT 23, techniques a., c. and g. to j.). The planning and implementation of the techniques are prioritised according to the hazardous properties of the emitted substance(s), the significance of the emissions and/or operational constraints.

d. Filling in the database mentioned in point v.

v. Establishing and maintaining a database, for diffuse VOC emissions sources that are identified in the inventory mentioned in BAT 2, for keeping record of:

a. equipment design specifications (including the date and description of any design changes);

b. the equipment maintenance, repair, upgrade, or replacement actions, performed or planned, and their date of implementation;

c. the equipment that could not be maintained, repaired, upgraded or replaced due to operational constraints;

d. the results of the measurements or monitoring, including the concentration(s) of the emitted substance(s), the calculated leak rate (as kg/year), the recording from OGI cameras (e.g. from the last LDAR programme) and the date of the measurements or monitoring;

e. the annual quantity of diffuse VOC emissions (as fugitive and non-fugitive emissions), including information on non-accessible sources and accessible sources not monitored during the year.

vi. Reviewing and updating the LDAR programme periodically. This may include the following:

a. lowering the leak and/or maintenance/repair thresholds (see point iii. b.);

b. reviewing the prioritisation of equipment to be monitored, giving higher priority to (the type of) equipment identified as leaky during the previous LDAR programme;

c. planning the maintenance, repair, upgrade or replacement of equipment that could not be performed during the previous LDAR programme due to operational constraints.

vii. Reviewing and updating the detection and reduction programme for non-fugitive VOC emissions. This may include the following:

a. monitoring non-fugitive VOC emissions from equipment where maintenance, repair, upgrade or replacement actions were implemented, in order to determine if those actions were successful;

b. planning the maintenance, repair, upgrade or replacement actions that could not be performed due to operational constraints.

Applicability

The features points iii., iv., vi., and vii. are only applicable to sources of diffuse VOC emissions for which monitoring according to BAT 22 is applicable.

The level of detail of the management system for diffuse VOC emissions will be proportionate to the nature, scale and complexity of the plant, and the range of environmental impacts it may have.

1.1.4.2. *Monitoring*

BAT 20. BAT is to estimate fugitive and non-fugitive VOC emissions to air separately at least once every year by using one or a combination of the techniques given below, as well as to determine the uncertainty of this estimation. The estimation distinguishes between VOCs classified as CMR 1A or 1B and VOCs that are not classified as CMR 1A or 1B.

Note

The estimation of the diffuse VOC emissions to air takes into account the results of the monitoring carried out according to BAT 21 and/or to BAT 22.

For the purpose of the estimation, channelled emissions may be counted as non-fugitive emissions when the inherent characteristics of the waste gas stream (e.g. low velocities, variability of the flow rate and concentration) do not allow an accurate measurement according to BAT 8.

The main sources of uncertainty of the estimation are identified, and corrective actions are implemented to reduce the uncertainty.

Technique		Description	Type of emissions
a.	Use of emission factors	See Section 1.4.2.	Fugitive and/or non-fugitive
b.	Use of a mass balance	Estimation based on the difference in the mass of the substance inputs to and outputs from the plant/production unit, taking into account the generation and destruction of the substance in the plant/production unit. A mass balance may also consist of measuring the concentration of VOCs in the product (e.g. raw material or solvent).	
c.	Use of thermodynamic models	Estimation using the laws of thermodynamics applied to equipment (e.g. tanks) or particular steps of a production process. The following data are generally used as input for the model: — chemical properties of the substance (e.g. vapour pressure, molecular mass); — process operating data (e.g. operating time, product quantity, ventilation); — characteristics of the emission source (e.g. tank diameter, colour, shape).	

BAT 21. BAT is to monitor diffuse VOC emissions from the use of solvents by compiling, at least once every year, a solvent mass balance of the solvent inputs and outputs of the plant, as defined in Part 7 of Annex VII to Directive 2010/75/EU and to minimise the uncertainty of the solvent mass balance data by using all of the techniques given below.

Technique		Description
a.	Full identification and quantification of the relevant solvent inputs and outputs, including the associated uncertainty	This includes: — identification and documentation of solvent inputs and outputs (e.g. channelled and diffuse emissions to air, emissions to water, solvent output in waste); — substantiated quantification of each relevant solvent input and output and recording of the methodology used (e.g. measurement, estimation by using emission factors, estimation based on operational parameters); — identification of the main sources of uncertainty of the aforementioned quantification, and implementation of corrective actions to reduce the uncertainty; — regular update of solvent input and output data.
b.	Implementation of a solvent tracking system	A solvent tracking system aims to keep control of both the used and unused quantities of solvents (e.g. by weighing unused quantities returned to storage from the application area).

c.	Monitoring of changes that may influence the uncertainty of the solvent mass balance data	Any change that could influence the uncertainty of the solvent mass balance data is recorded, such as: — malfunctions of the waste gas treatment system: the date and period of time are recorded; — changes that may influence air/gas flow rates (e.g. replacement of fans): the date and type of change are recorded.

Applicability

This BAT may not apply to the production of polyolefins, PVC or synthetic rubbers.

This BAT may not be applicable to plants whose total annual consumption of solvents is lower than 50 tonnes. The level of detail of the solvent mass balance will be proportionate to the nature, scale and complexity of the plant, and the range of environmental impacts it may have, as well as to the type and quantity of solvents used.

BAT 22. BAT is to monitor diffuse VOC emissions to air with at least the frequency given below and in accordance with EN standards. If EN standards are not available, BAT is to use ISO, national or other international standards that ensure the provision of data of an equivalent scientific quality.

Type of sources of diffuse VOC emissions ([1]) ([2])	Type of VOCs	Standard(s)	Minimum monitoring frequency
Sources of fugitive emissions	VOCs classified as CMR 1A or 1B	EN 15446 ([8])	Once every year ([3]) ([4]) ([5])
	VOCs not classified as CMR 1A or 1B		Once during the period covered by each LDAR programme (see BAT 19 point iii.) ([6])
Sources of non-fugitive emissions	VOCs classified as CMR 1A or 1B	EN 17628	Once every year
	VOCs not classified as CMR 1A or 1B		Once every year ([7])

([1]) The monitoring only applies to emission sources that are identified as relevant in the inventory given in BAT 2.
([2]) The monitoring does not apply to equipment operated under subatmospheric pressure.
([3]) In the case of inaccessible sources of fugitive VOC emissions (e.g. if the monitoring requires the removal of insulation or the use of scaffolding), the monitoring frequency may be reduced to once during the period covered by each LDAR programme (see BAT 19 point iii.).
([4]) For the production of PVC, the minimum monitoring frequency may be reduced to once every 5 years if the plant uses VCM gas detectors to continuously monitor VCM emissions in a way that allows an equivalent level of detection of VCM leaks.
([5]) In the case of high-integrity equipment (see BAT 23 b.) in contact with VOCs classified as CMR 1A or 1B, a lower minimum monitoring frequency may be adopted, but in any case at least once every 5 years.
([6]) In the case of high-integrity equipment (see BAT 23 b.) in contact with VOCs other than VOCs classified as CMR 1A or 1B, a lower minimum monitoring frequency may be adopted, but in any case at least once every 8 years.
([7]) The minimum monitoring frequency may be reduced to once every 5 years if non-fugitive emissions are quantified by using measurements.
([8]) This standard may be complemented by EN 17628.

Note

Optical gas imaging (OGI) is a useful complementary technique to the method EN 15446 ('sniffing') in order to identify sources of fugitive VOC emissions and is particularly relevant in the case of inaccessible sources (see Section 1.4.2.). This technique is described in EN 17628.

In the case of non-fugitive emissions, measurements may be complemented by the use of thermodynamic models.

Where large amounts (e.g. above 80 t/yr) of VOCs are used/consumed, the quantification of VOC emissions from the plant with tracer correlation (TC) or with optical absorption-based techniques, such as differential absorption light detection and ranging (DIAL) or solar occultation flux (SOF), is a useful complementary technique (see Section 1.4.2.). These techniques are described in EN 17628.

Applicability

BAT 22 only applies when the annual quantity of diffuse VOC emissions from the plant estimated according to BAT 20 is greater than the following:

For fugitive emissions:

— 1 tonne of VOCs per year in the case of VOCs classified as CMR 1A or 1B; or

— 5 tonnes of VOCs per year in the case of other VOCs.

For non-fugitive emissions:

— 1 tonne of VOCs per year in the case of VOCs classified as CMR 1A or 1B; or

— 5 tonnes of VOCs per year in the case of other VOCs.

1.1.4.3. *Prevention or reduction of diffuse VOC emissions*

BAT 23. In order to prevent or, where that is not practicable, to reduce diffuse VOC emissions to air, BAT is to use a combination of the techniques given below with the following order of priority.

Note

The use of techniques to prevent or, where that is not practicable, to reduce diffuse VOC emissions to air is prioritised according to the hazardous properties of the emitted substance(s) and/or the significance of the emissions.

Technique		Description	Type of emissions	Applicability
1. Prevention techniques				
a.	Limiting the number of emission sources	This includes: — minimising pipe lengths; — reducing the number of pipe connectors (e.g. flanges) and valves; — using welded fittings and connections; — using compressed air or gravity for material transfer.	Fugitive and non-fugitive emissions	Applicability may be restricted by operational constraints in the case of existing plants.

Technique		Description	Type of emissions	Applicability
b.	Use of high-integrity equipment	High-integrity equipment includes, but is not limited to: — bellow valves or double packing seals or equally effective equipment; — magnetically driven or canned pumps/compressors/agitators, or pumps/compressors/agitators using double seals and a liquid barrier; — certified high-quality gaskets (e.g. according to EN 13555) that are tightened according to technique e.; — closed sampling system. The use of high-integrity equipment is especially relevant to prevent or minimise: — emissions of CMR substances or substances with acute toxicity; and/or — emissions from equipment with high-leaking potential; and/or — leaks from processes operated at high pressures (e.g. between 300 bar and 2 000 bar). High-integrity equipment is selected, installed and maintained according to the type of process and the process operating conditions.	Fugitive emissions	Applicability may be restricted by operational constraints in the case of existing plants. Generally applicable to new plants and major plant upgrades.
c.	Collecting diffuse emissions and treating off-gases	Collecting diffuse VOC emissions (e.g. from compressor seals, vents and purge lines) and sending them to recovery (see BAT 9 and BAT 10) and/or abatement (see BAT 11).	Fugitive and non-fugitive emissions	Applicability may be restricted: — for existing plants; and/or — by safety concerns (e.g. avoiding concentrations close to the lower explosive limit).
2. Other techniques				
d.	Facilitating access and/or monitoring activities	To ease maintenance and/or monitoring activities, the access to potentially leaky equipment is facilitated, e.g. by installing platforms, and/or drones are used for monitoring.	Fugitive emissions	Applicability may be restricted by operational constraints in the case of existing plants.

Technique		Description	Type of emissions	Applicability
e.	Tightening	This includes: — tightening of gaskets by personnel that is qualified according to EN 1591-4 and using the designed gasket stress (e.g. calculated according to EN 1591-1); — installing tight caps on open ends; — using flanges selected and assembled according to EN 13555.	Fugitive emissions	Generally applicable.
f.	Replacement of leaky equipment and/or parts	This includes the replacement of: — gaskets; — sealing elements (e.g. tank lid); — packing material (e.g. valve stem packing material).	Fugitive emissions	Generally applicable.
g.	Reviewing and updating process design	This includes: — reducing the use of solvents and/or using solvents with lower volatility; — reducing the formation of side products containing VOCs; — lowering the operating temperature; — lowering the VOC content in the final product.	Non-fugitive emissions	Applicability may be restricted in the case of existing plants due to operational constraints.
h.	Reviewing and updating operating conditions	This includes: — reducing the frequency and duration of reactor and vessel openings; — preventing corrosion by lining or coating of equipment, by painting pipes (for external corrosion) and by using corrosion inhibitors for materials in contact with equipment.	Non-fugitive emissions	Generally applicable.

Technique		Description	Type of emissions	Applicability
i.	Using closed systems	This includes: — vapour balancing (see Section 1.4.3); — closed systems for solid/liquid and liquid/liquid phase separations; — closed systems for cleaning operations; — closed sewers and/or waste water treatment plants; — closed sampling systems; — closed storage areas. Off-gases from closed systems are sent to recovery (see BAT 9 and BAT 10) and/or abatement (see BAT 11).	Non-fugitive emissions	Applicability may be restricted by operational constraints in the case of existing plants and/or by safety concerns.
j.	Using techniques to minimise emissions from surfaces	This includes: — installing oil creaming systems on open surfaces; — periodically skimming open surfaces (e.g. removing floating matter); — installing anti-evaporation floating elements on open surfaces; — treating waste water streams to remove VOCs and send the VOCs to recovery (see BAT 9 and BAT 10) and/or abatement (see BAT 11); — installing floating roofs on tanks; — using fixed-roof tanks connected to a waste gas treatment.	Non-fugitive emissions	Applicability may be restricted by operational constraints in the case of existing plants.

1.1.4.4. *BAT conclusions for the use of solvents or the reuse of recovered solvents*

The emission levels for the use of solvents or the reuse of recovered solvents given below are associated with the general BAT conclusions given in Section 1.1 and Section 1.1.4.3.

Table 1.7

BAT-associated emission level (BAT-AEL) for diffuse VOC emissions to air from the use of solvents or the reuse of recovered solvents

Parameter	BAT-AEL (percentage of the solvent inputs) (yearly average) [1]
Diffuse VOC emissions	≤ 5 %

[1] The BAT-AEL does not apply to plants whose total annual consumption of solvents is lower than 50 tonnes.

The associated monitoring is given in BAT 20, BAT 21 and BAT 22.

1.2. ***Polymers and synthetic rubbers***

The BAT conclusions presented in this section apply to the production of certain polymers. They apply in addition to the general BAT conclusions given in Section 1.1.

1.2.1. **BAT conclusions for the production of polyolefins**

BAT 24. BAT is to monitor the TVOC concentration in polyolefin products, at least once every year for each representative polyolefin grade produced during the same year, in accordance with EN standards. If EN standards are not available, BAT is to use ISO, national or other international standards that ensure the provision of data of an equivalent scientific quality.

Polyolefin product	Standard(s)	Monitoring associated with
HDPE, LDPE, LLDPE	No EN standard available	BAT 20, BAT 25
PP		
EPS, GPPS, HIPS		

Note

The measurement samples are taken at the point of transition from the closed to the open system where the polyolefin comes into contact with the atmosphere.

The closed system refers to the part of the production process where the materials (e.g. reactants, solvents, suspension agents) are not in contact with the atmosphere. It includes the polymerisation steps, the reuse and recovery of materials.

The open system refers to the part of the production process where the polyolefins come into contact with the atmosphere. It includes the finishing steps (e.g. drying, blending) as well as the transfer, handling and storage of polyolefins.

When the transition point between the open and the closed system cannot be clearly identified, the measurement samples are taken at an appropriate point.

Applicability

Measurements do not apply to production processes only made up of a closed system.

BAT 25. In order to increase resource efficiency and to reduce emissions to air of organic compounds, BAT is to use all of the techniques given below, as far as applicable.

Technique		Description	Applicability
a.	Chemical agents with low boiling points	Solvents and suspension agents with low boiling points are used.	Applicability may be restricted by operational constraints.

Technique		Description	Applicability
b.	Lowering the VOC content in the polymer	The VOC content in the polymer is lowered, e.g. by using low-pressure separation, stripping or closed-loop nitrogen purge systems, devolatilisation extrusion (see Section 1.4.3). The techniques for lowering the VOC content depend on the type of polymer product and production process.	Devolatilisation extrusion may be restricted by product specifications for the production of HDPE, LDPE and LLDPE.
c.	Collection and treatment of process off-gases	Process off-gases arising from the use of technique b. as well as from the finishing step, e.g. extrusion and degassing silos, are collected and sent to recovery (see BAT 9 and BAT 10) and/or abatement (see BAT 11).	Applicability may be restricted by operational constraints and/or due to safety concerns (e.g. avoiding concentrations close to the lower/upper explosive limit).

Table 1.8

BAT-associated emission levels (BAT-AELs) for total emissions to air of VOCs from the production of polyolefins expressed as specific emission loads

Polyolefin product	Unit	BAT-AEL (Yearly average)
HDPE	g C per kg of polyolefins produced	0,3-1,0 ([1])
LDPE		0,1-1,4 ([2]) ([3])
LLDPE		0,1-0,8
PP		0,1-0,9 ([1])
GPPS and HIPS		< 0,1
EPS		< 0,6

([1]) The lower end of the BAT-AEL range is typically associated with the gas-phase polymerisation process.
([2]) The upper end of the BAT-AEL range may be higher and up to 2,7 g C/kg in the case of the production of EVA or other copolymers (e.g. ethyl acrylate copolymers).
([3]) The upper end of the BAT-AEL range may be higher and up to 4,7 g C/kg if both of the following conditions are met:

— thermal oxidation is not applicable;
— EVA or other copolymers (e.g. ethyl acrylate copolymers) are produced.

The associated monitoring is given in BAT 8, BAT 20, BAT 22 and BAT 24. The monitoring of TVOC emissions to air includes all emissions from the following process steps, where the emissions are identified as relevant in the inventory given in BAT 2: storage and handling of raw materials, polymerisation, recovery of materials and pollutant abatement, finishing of the polymer (e.g. extrusion, drying, blending) as well as the transfer, handling and storage of polymers.

1.2.2. BAT conclusions for the production of polyvinyl chloride (PVC)

BAT 26. BAT is to monitor channelled emissions to air with at least the frequency given below and in accordance with EN standards. If EN standards are not available, BAT is to use ISO, national or other international standards that ensure the provision of data of an equivalent scientific quality.

Substance	Emission points	Standard(s)	Minimum monitoring frequency ([1])	Monitoring associated with
VCM	Any stack with a VCM mass flow of ≥ 25 g/h	Generic EN standards ([2])	Continuous ([3])	BAT 29
	Any stack with a VCM mass flow of < 25 g/h	No EN standard available	Once every 6 months ([4]) ([5])	

([1]) The monitoring of VCM emissions from finishing steps (e.g. drying, blending) as well as from the transfer, handling and storage of PVC may be replaced by the monitoring in BAT 27.
([2]) Generic EN standards for continuous measurements are EN 14181, EN 15267-1, EN 15267-2 and EN 15267-3.
([3]) The minimum monitoring frequency may be reduced to once every 6 months if the emission levels are proven to be sufficiently stable.
([4]) To the extent possible, the measurements are carried out at the highest expected emission state under normal operating conditions.
([5]) The minimum monitoring frequency may be reduced to once every year if the emission levels are proven to be sufficiently stable.

BAT 27. BAT is to monitor the residual vinyl chloride monomer concentration in PVC slurry/latex, at least once every year for each representative PVC grade produced during the same year, in accordance with EN standards.

Substance	Standard(s)	Monitoring associated with
VCM	EN ISO 6401	BAT 30

Note

The samples of the PVC slurry/latex are taken at the point of transition from the closed to the open system where the PVC slurry/latex comes into contact with the atmosphere.

The closed system refers to the part of the production process where the PVC slurry/latex is not in contact with the atmosphere. It generally includes the polymerisation steps, the reuse and recovery of VCM.

The open system is the part of the system where the PVC slurry/latex comes into contact with the atmosphere. It includes the finishing steps (e.g. drying and blending) as well as the transfer, handling and storage of PVC.

BAT 28. In order to increase resource efficiency and to reduce the mass flow of organic compounds sent to the final waste gas treatment, BAT is to recover the vinyl chloride monomer from process off-gases by using one or a combination of the techniques given below, and to reuse the recovered monomer.

Technique		Description
a.	Absorption (regenerative)	See Section 1.4.1.
b.	Adsorption (regenerative)	See Section 1.4.1.
c.	Condensation	See Section 1.4.1.

Applicability

Recovery may be restricted where the energy demand is excessive due to the low concentration of the compound(s) concerned in the process off-gas(es).

BAT 29. In order to reduce channelled emissions to air of vinyl chloride monomer from the recovery of vinyl chloride monomer, BAT is to use one or a combination of the techniques given below.

	Technique	Description	Applicability
a.	Absorption	See Section 1.4.1.	Generally applicable
b.	Adsorption	See Section 1.4.1.	
c.	Condensation	See Section 1.4.1.	
d.	Thermal oxidation	See Section 1.4.1.	Applicability of recuperative and regenerative thermal oxidation to existing plants may be restricted by design and/or operational constraints. Applicability may be restricted where the energy demand is excessive due to the low concentration of the compound(s) concerned in the process off-gases.

Table 1.9

BAT-associated emission level (BAT-AEL) for channelled emissions to air of VCM from the recovery of VCM

Substance	BAT-AEL (mg/Nm^3) (Daily average or average over the sampling period)
VCM	< 0,5-1 ([1]) ([2])

([1]) The BAT-AEL does not apply to minor emissions (i.e. when the VCM mass flow is below e.g. 1 g/h).
([2]) The upper end of the BAT-AEL range may be higher and up to 5 mg/Nm^3 if both of the following conditions are met:

— thermal oxidation is not applicable;
— the plant is not directly associated to the production of EDC and VCM.

The associated monitoring is given in BAT 26.

BAT 30. In order to reduce emissions to air of vinyl chloride monomer, BAT is to use all of the techniques given below.

Technique		Description
a.	Appropriate VCM storage facilities	This includes: — storing VCM in refrigerated tanks at atmospheric pressure or in pressurised tanks at ambient temperature; — using refrigerated reflux condensers or connecting tanks for VCM recovery (see BAT 28) and/or abatement (see BAT 29).
b.	Vapour balancing	See Section 1.4.3.
c.	Minimisation of emissions of residual VCM from equipment	This includes: — reducing the frequency and duration of reactor openings; — venting off-gases from latex storage tanks and from connections to VCM recovery (see BAT 28) and/or abatement (see BAT 29) prior to opening the reactor; — flushing the reactor with inert gas prior to opening and venting off-gases to VCM recovery (see BAT 28) and/or abatement (see BAT 29); — draining the liquid content of the reactor to closed vessels prior to opening the reactor; — cleaning the reactor with water prior to opening and draining the water to the stripping system.
d.	Lowering the VCM content in the polymer by stripping	See Section 1.4.3.
e.	Collection and treatment of process off-gases	Process off-gases from the use of technique d. are collected and sent to VCM recovery (see BAT 28) and/or abatement (see BAT 29).

Table 1.10

BAT-associated emission levels (BAT-AELs) for total emissions to air of VCM from the production of PVC expressed as specific emission loads

PVC type	Unit	BAT-AEL (Yearly average)
S-PVC	g VCM per kg of PVC produced	0,01-0,045
E-PVC		0,25-0,3 ([1])

([1]) The upper end of the BAT-AEL range may be higher and up to 0,5 g VCM per kg of PVC produced if both of the following conditions are met:

— thermal oxidation is not applicable;
— the plant is not directly associated to the production of EDC and VCM.

The associated monitoring is given in BAT 20, BAT 22, BAT 26 and BAT 27. The monitoring of VCM emissions to air includes all emissions from the following process steps or equipment, where the emissions are identified as relevant in the inventory given in BAT 2: finishing, e.g. drying and blending; transfer, handling and storage; reactor openings; gasholders; waste water treatment plants; recovery and/or abatement of VCM.

Table 1.11

BAT-associated emission levels (BAT-AELs) for the VCM concentration in the PVC slurry/latex

PVC type	Unit	BAT-AEL (Yearly average)
S-PVC	g VCM per kg of PVC produced	0,01-0,03
E-PVC		0,2-0,4

The associated monitoring is given in BAT 27.

1.2.3. **BAT conclusions for the production of synthetic rubbers**

BAT 31. BAT is to monitor the TVOC concentration in synthetic rubbers, at least once every year for each representative synthetic rubber grade produced during the same year, in accordance with EN standards. If EN standards are not available, BAT is to use ISO, national or other international standards that ensure the provision of data of an equivalent scientific quality.

Substance/Parameter	Standard(s)	Monitoring associated with
VOCs	No EN standard available	BAT 32

Note

The samples are taken after lowering the VOC content in the polymer (see BAT 32 a.) where the synthetic rubber comes into contact with the atmosphere.

Applicability

Measurements do not apply to production processes only made up of a closed system.

BAT 32. In order to reduce emissions to air of organic compounds, BAT is to use one or a combination of the techniques given below.

	Technique	Description
a.	Lowering the VOC content in the polymer	The VOC content in the polymer is lowered by using stripping or devolatilisation extrusion (see Section 1.4.3).
b.	Collection and treatment of process off-gases	Process off-gases are collected and sent to recovery (see BAT 9 and BAT 10) and/or abatement (see BAT 11).

Table 1.12

BAT-associated emission level (BAT-AEL) for total emissions to air of VOC from the production of synthetic rubbers expressed as specific emission load

Substance/Parameter	Unit	BAT-AEL (Yearly average)
TVOC	g C per kg of synthetic rubber produced	0,2-4,2

The associated monitoring is given in BAT 8, BAT 20, BAT 22 and BAT 31. The monitoring of TVOC emissions to air includes all emissions from the following process steps, where the emissions are identified as relevant in the inventory given in BAT 2: storage of raw materials, polymerisation, recovery of materials and abatement techniques, finishing of the polymer (e.g. extrusion, drying, blending) as well as the transfer, handling and storage of synthetic rubbers.

1.2.4. BAT conclusions for the production of viscose using CS_2

BAT 33. BAT is to monitor channelled emissions to air with at least the frequency given below and in accordance with EN standards. If EN standards are not available, BAT is to use ISO, national or other international standards that ensure the provision of data of an equivalent scientific quality.

Substance ([1])	Emission points	Standard(s)	Minimum monitoring frequency	Monitoring associated with
Carbon disulphide (CS_2)	Any stack with a mass flow of ≥ 1 kg/h	Generic EN standards ([2])	Continuous ([3])	BAT 35
	Any stack with a mass flow of < 1 kg/h	No EN standard available	Once every year ([4])	
Hydrogen sulphide (H_2S)	Any stack with a mass flow of ≥ 50 g/h	Generic EN standards ([2])	Continuous ([3])	
	Any stack with a mass flow of < 50 g/h	No EN standard available	Once every year ([4])	

([1]) The monitoring only applies when the substance concerned is identified as relevant in the waste gas stream based on the inventory given in BAT 2.
([2]) Generic EN standards for continuous measurements are EN 14181, EN 15267-1, EN 15267-2 and EN 15267-3.
([3]) In the case of the production of casing, the minimum monitoring frequency may be reduced to once every month when continuous monitoring is not possible due to analytical interference.
([4]) To the extent possible, the measurements are carried out at the highest expected emission state under normal operating conditions.

BAT 34. In order to increase resource efficiency and to reduce the mass flow of CS_2 and H_2S sent to the final waste gas treatment, BAT is to recover CS_2 by using technique a. and/or technique b. or a combination of technique c. with technique(s) a. and/or b., given below and to reuse the CS_2, or, alternatively, to use technique d.

Technique		Main substance targeted	Description	Applicability
a.	Absorption (regenerative)	H_2S	See Section 1.4.1.	Generally applicable for the production of casing. For other products, applicability may be restricted where the energy demand is excessive due to high waste gas volume flows (above e.g. 120 000 Nm^3/h) or low H_2S concentration in the waste gas (below e.g. 0,5 g/Nm^3).

Technique		Main substance targeted	Description	Applicability
b.	Adsorption (regenerative)	H_2S, CS_2	See Section 1.4.1.	Applicability may be restricted where the energy demand for recovery is excessive if the concentration of CS_2 in the waste gas is below e.g. 5 g/Nm³.
c.	Condensation	H_2S, CS_2	See Section 1.4.1.	
d.	Production of sulphuric acid	H_2S, CS_2	Process off-gases containing CS_2 and H_2S are used to produce sulphuric acid.	Applicability may be restricted if the concentration of CS_2 and/or H_2S in the waste gas is below 5 g/Nm³.

BAT 35. In order to reduce channelled emissions to air of CS_2 and H_2S, BAT is to use one or a combination of the techniques given below.

Technique		Main substance targeted	Description	Applicability
a.	Absorption	H_2S	See Section 1.4.1.	Generally applicable.
b.	Bioprocesses	CS_2, H_2S	See Section 1.4.1.	Applicability may be restricted where the energy demand is excessive due to high waste gas volume flows (e.g. above 60 000 Nm³/h) or high CS_2 concentration in the waste gas (e.g. above 1 000 mg/Nm³) or too low H_2S concentration.
c.	Thermal oxidation	CS_2, H_2S	See Section 1.4.1.	Applicability of recuperative and regenerative thermal oxidation to existing plants may be restricted by design and/or operational constraints. Applicability may be restricted where the energy demand is excessive due to the low concentration of the compound(s) concerned in the process off-gases.

Table 1.13

BAT-associated emission levels (BAT-AELs) for channelled emissions to air of CS_2 and H_2S from the production of viscose using CS_2

Substance	BAT-AEL (mg/Nm³) (Daily average or average over the sampling period) ([1])
CS_2	5-400 ([2]) ([3])
H_2S	1-10 ([4])

(1) The BAT-AEL does not apply to the production of filament yarn.
(2) The upper end of the BAT-AEL range may be higher and up to 500 mg CS_2/Nm^3 if:
a) both of the following conditions are fulfilled:
— bioprocesses (see BAT 35 b) are not applicable;
— the CS_2 recovery efficiency (see BAT 34) is ≥ 97 %; or
b) CS_2 recovery is not applicable.
(3) The lower end of the BAT-AEL range can be achieved by using thermal oxidation or technique d. in BAT 34.
(4) The upper end of the BAT-AEL range may be higher and up to 30 mg/Nm^3, when the sum of H_2S and CS_2 (expressed as Total S) is close to the lower end of the BAT-AEL range in Table 1.14.

The associated monitoring is given in BAT 33.

Table 1.14

BAT-associated emission levels (BAT-AELs) for emissions to air of H_2S and CS_2 from the production of staple fibres and casing expressed as specific emission loads

Parameter	Process	Unit	BAT-AEL (Yearly average)
Sum of H_2S and CS_2 (expressed as Total S) (1)	Production of staple fibres	g Total S per kg of product	6-9
	Casing		120-250

(1) Emissions to air refer to channelled emissions only.

The associated monitoring is given in BAT 33.

1.3. ***Process furnaces/heaters***

The BAT conclusions presented in this section apply when process furnaces/heaters with a total rated thermal input equal to or greater than 1 MW are used in the production processes included in the scope of these BAT conclusions. They apply in addition to the general BAT conclusions given in Section 1.1.

Where the waste gases of two or more separate process furnaces/heaters are, or could, in the judgement of the competent authority, be discharged through a common stack, the capacities of all individual furnaces/heaters shall be added together for the purpose of calculating the total rated thermal input.

BAT 36. In order to prevent or, where that is not practicable, to reduce channelled emissions to air of CO, dust, NO_X and SO_X, BAT is to use technique c. and one or a combination of the other techniques given below.

Technique		Description	Main inorganic compounds targeted	Applicability
Primary techniques				
a.	Choice of fuel	See Section 1.4.1. This includes switching from liquid to gaseous fuels, taking into account the overall hydrocarbon balance.	NO_X, SO_X, dust	The switch from liquid to gaseous fuels may be restricted by the design of the burners in the case of existing process furnaces/heaters.

Technique		Description	Main inorganic compounds targeted	Applicability
b.	Low-NO_X burner	See Section 1.4.1.	NO_X	For existing process furnaces/ heaters, the applicability may be restricted by their design.
c.	Optimised combustion	See Section 1.4.1.	CO, NO_X	Generally applicable.
Secondary techniques				
d.	Absorption	See Section 1.4.1.	SO_X, dust	Applicability may be restricted for existing process furnaces/heaters by space availability.
e.	Fabric filter or absolute filter	See Section 1.4.1.	Dust	Not applicable when only combusting gaseous fuels.
f.	Selective catalytic reduction (SCR)	See Section 1.4.1.	NO_X	Applicability to existing process furnaces/heaters may be restricted by space availability.
g.	Selective non-catalytic reduction (SNCR)	See Section 1.4.1.	NO_X	Applicability to existing process furnaces/heaters may be restricted by the temperature window (800-1 100 °C) and the residence time needed for the reaction.

Table 1.15

BAT-associated emission level (BAT-AEL) for channelled NO_X emissions to air and indicative emission level for channelled CO emissions to air from process furnaces/heaters

Parameter	BAT-AEL (mg/Nm^3) (Daily average or average over the sampling period)
Nitrogen oxides (NO_X)	30-150 ([1]) ([2]) ([3])
Carbon monoxide (CO)	No BAT-AEL ([4])

([1]) In the case of the production of complex inorganic pigments, the upper end of the BAT-AEL range may be higher and up to 400 mg/Nm^3 when condition b) below is met, and up to 1 000 mg/Nm^3 when conditions a) and b) below are met:

a) the combustion temperature is higher than 1 000 C;
b) oxygen-enriched air or pure oxygen is used.

([2]) The BAT-AEL does not apply to minor emissions (i.e. when the NO_X mass flow is below e.g. 500 g/h).

([3]) The upper end of the BAT-AEL range may be higher and up to 200 mg/Nm^3 when direct heating is used.

([4]) As an indication, the emission levels for carbon monoxide are 4-50 mg/Nm^3, as a daily average or average over the sampling period.

The associated monitoring is given in BAT 8.

1.4. ***Description of techniques***

1.4.1. **Techniques to reduce channelled emissions to air**

Technique	Description
Absorption	The removal of gaseous or particulate pollutants from a process off-gas or waste gas stream via mass transfer to a suitable liquid, often water or an aqueous solution. It may involve a chemical reaction (e.g. in an acid or alkaline scrubber). In the case of regenerative absorption, the compounds may be recovered from the liquid.
Adsorption	The removal of pollutants from a process off-gas or waste gas stream by retention on a solid surface (activated carbon is typically used as the adsorbent). Adsorption may be regenerative or non-regenerative. In non-regenerative adsorption, the spent adsorbent is not regenerated but disposed of. In the case of regenerative adsorption, the adsorbate is subsequently desorbed, e.g. with steam (often on site), for reuse or disposal and the adsorbent is reused. For continuous operation, typically more than two adsorbers are operated in parallel, one of them in desorption mode.
Bioprocesses	Bioprocesses include the following: — Biofiltration: the waste gas stream is passed through a bed of organic material (such as peat, heather, compost, root wood, tree bark, peat, compost, softwood and different kinds of combinations) or some inert material (such as clay, activated carbon, and polyurethane), where it is biologically oxidised by naturally occurring microorganisms into carbon dioxide, water, inorganic salts and biomass. — Bioscrubbing: the removal of the pollutant compounds from a waste gas stream using a combination of wet scrubbing (absorption) and biodegradation under aerobic conditions. The scrubbing water contains a population of microorganisms suitable to oxidise biodegradable gaseous compounds. The absorbed pollutants are degraded in aerated sludge tanks. — Biotrickling: the removal of the pollutant compounds from a waste gas stream in a biological trickle-bed reactor. The pollutants are absorbed by the water phase and transported to the biofilm, where the biological transformation takes place.
Choice of fuel	The use of fuel (including support/auxiliary fuel) with a low content of potential pollution-generating compounds (e.g. low sulphur, ash, nitrogen, fluorine or chlorine content in the fuel).
Condensation	The removal of vapours of organic and inorganic compounds from a process off-gas or waste gas stream by reducing its temperature below its dew point so that the vapours liquefy. Depending on the operating temperature range required, different cooling media are used, e.g. water or brine. In cryogenic condensation, liquid nitrogen is used as a cooling medium.
Cyclone	Equipment for the removal of dust from a process off-gas or waste gas stream based on imparting centrifugal forces, usually within a conical chamber.

Technique	Description
Electrostatic precipitator	An electrostatic precipitator (ESP) is a particulate control device that uses electrical forces to move particles entrained within a waste gas stream onto collector plates. The entrained particles are given an electrical charge when they pass through a corona where gaseous ions flow. Electrodes in the centre of the flow lane are maintained at a high voltage and generate the electrical field that forces the particles to the collector walls. The pulsating DC voltage required is in the range of 20-100 kV.
Absolute filter	Absolute filters, also referred to as high-efficiency particle air (HEPA) filters or ultra-low penetration air (ULPA) filters, are constructed from glass cloth or fabrics of synthetic fibres through which gases are passed to remove particles. Absolute filters show higher efficiencies than fabric filters. The classification of HEPA and ULPA filters according to their performance is given in EN 1822-1.
High-efficiency air filter (HEAF)	A flat-bed filter in which aerosols combine into droplets. Highly viscous droplets remain on the filter fabric which contains the residues to be disposed of and separated into droplets, aerosols and dust. HEAFs are particularly suitable for treating highly viscous droplets.
Fabric filter	Fabric filters, often referred to as bag filters, are constructed from porous woven or felted fabric through which gases are passed to remove particles. The use of a fabric filter requires the selection of a fabric suitable for the characteristics of the waste gas and the maximum operating temperature.
Low-NO_X burner	The technique (including ultra-low-NO_X burner) is based on the principles of reducing peak flame temperatures. The air/fuel mixing reduces the availability of oxygen and reduces the peak flame temperature, thus retarding the conversion of fuel-bound nitrogen to NO_X and the formation of thermal NO_X, while maintaining high combustion efficiency. The design of ultra-low-NO_X burners includes (air/)fuel staging and exhaust/flue-gas recirculation.
Optimised combustion	Good design of the combustion chambers, burners and associated equipment/devices is combined with optimisation of combustion conditions (e.g. the temperature and residence time in the combustion zone, efficient mixing of the fuel and combustion air) and the regular planned maintenance of the combustion system according to suppliers' recommendations. Combustion conditions control is based on the continuous monitoring and automated control of appropriate combustion parameters (e.g. O_2, CO, fuel to air ratio, and unburnt substances).
Optimisation of catalytic or thermal oxidation	Optimisation of design and operation of catalytic or thermal oxidation to promote the oxidation of organic compounds including PCDD/F present in the waste gases, to prevent PCDD/F and the (re)formation of their precursors, as well as to reduce the generation of pollutants such as NO_X and CO.

Technique	Description
Catalytic oxidation	Abatement technique which oxidises combustible compounds in a waste gas stream with air or oxygen in a catalyst bed. The catalyst enables oxidation at lower temperatures and in smaller equipment compared to thermal oxidation. The typical oxidation temperature is between 200 °C and 600 °C. For process off-gases with low VOC concentrations (e.g. < 1 g/Nm^3), pre-concentration steps may be applied using adsorption (rotor or fixed bed, with activated carbon or zeolites). VOCs adsorbed in the concentrator are desorbed by using heated ambient air or heated waste gas, and the resulting volume flow with higher VOC concentration is directed to the oxidiser. Molecular sieves ('smoothers'), typically composed of zeolites, may be used before the concentrators or the oxidiser to level down high variations of VOC concentrations in the process off-gases.
Thermal oxidation	Abatement technique which oxidises combustible compounds in a waste gas stream by heating it with air or oxygen to above its auto-ignition point in a combustion chamber and maintaining it at a high temperature long enough to complete its combustion to carbon dioxide and water. The typical combustion temperature is between 800 °C and 1 000 °C. Several types of thermal oxidation are operated: — Straight thermal oxidation: thermal oxidation without energy recovery from the combustion. — Recuperative thermal oxidation: thermal oxidation using the heat of the waste gases by indirect heat transfer. — Regenerative thermal oxidation: thermal oxidation where the incoming waste gas stream is heated when passing through a ceramic-packed bed before entering the combustion chamber. The purified hot gases exit this chamber by passing through one (or more) ceramic-packed bed(s) (cooled by an incoming waste gas stream in an earlier combustion cycle). This reheated packed bed then begins a new combustion cycle by preheating a new incoming waste gas stream. For process off-gases with low VOC concentrations (e.g. < 1 g/Nm^3), pre-concentration steps may be applied using adsorption (rotor or fixed bed, with activated carbon or zeolites). VOCs adsorbed in the concentrator are desorbed by using heated ambient air or heated waste gas, and the resulting volume flow with higher VOC concentration is directed to the oxidiser. Molecular sieves ('smoothers'), typically composed of zeolites, may be used before the concentrators or the oxidiser to level down high variations of VOC concentrations in the process off-gases.
Selective catalytic reduction (SCR)	Selective reduction of nitrogen oxides with ammonia or urea in the presence of a catalyst. The technique is based on the reduction of NO_X to nitrogen in a catalytic bed by reaction with ammonia at an optimum operating temperature that is typically around 200– 450 °C. In general, ammonia is injected as an aqueous solution; the ammonia source can also be anhydrous ammonia or a urea solution. Several layers of catalyst may be applied. A higher NO_X reduction is achieved with the use of a larger catalyst surface, installed as one or more layers. 'In-duct' or 'slip' SCR combines SNCR with downstream SCR which reduces the ammonia slip from SNCR.
Selective non-catalytic reduction (SNCR)	Selective reduction of nitrogen oxides to nitrogen with ammonia or urea at high temperatures and without catalyst. The operating temperature window is maintained between 800 °C and 1 000 °C for optimal reaction.

1.4.2. **Techniques to monitor diffuse emissions to air**

Technique	Description
Differential absorption LIDAR (DIAL)	A laser-based technique using differential absorption LIDAR (light detection and ranging), which is the optical analogue of radio-wave-based RADAR. The technique relies on the back-scattering of laser beam pulses by atmospheric aerosols, and the analysis of the spectral properties of the returned light collected with a telescope.
Emission factor	Emission factors are numbers that can be multiplied by an activity rate (e.g. the production output), in order to estimate the emissions from the installation. Emission factors are generally derived through the testing of a population of similar process equipment or process steps. This information can be used to relate the quantity of material emitted to some general measure of the scale of activity. In the absence of other information, default emission factors (e.g. literature values) can be used to provide an estimate of the emissions. Emission factors are usually expressed as the mass of a substance emitted divided by the throughput of the process emitting the substance.
Leak Detection and Repair (LDAR) programme	A structured approach to reduce fugitive VOC emissions by detection and subsequent repair or replacement of leaking components. The LDAR programme consists of one or more campaigns. A campaign is usually conducted over 1 year, where a certain percentage of the pieces of equipment is monitored.
Optical gas imaging (OGI) methods	Optical gas imaging uses small lightweight hand-held or fixed cameras which enable the visualisation of gas leaks in real time, so that they appear as 'smoke' on a video recorder together with the image of the equipment concerned, to easily and rapidly locate significant VOC leaks. Active systems produce an image with a back-scattered infrared laser light reflected on the equipment and its surroundings. Passive systems are based on the natural infrared radiation of the equipment and its surroundings.
Solar occultation flux (SOF)	The technique is based on the recording and spectrometric Fourier Transform analysis of a broadband infrared or ultraviolet/visible sunlight spectrum along a given geographical itinerary, crossing the wind direction and cutting through VOC plumes.

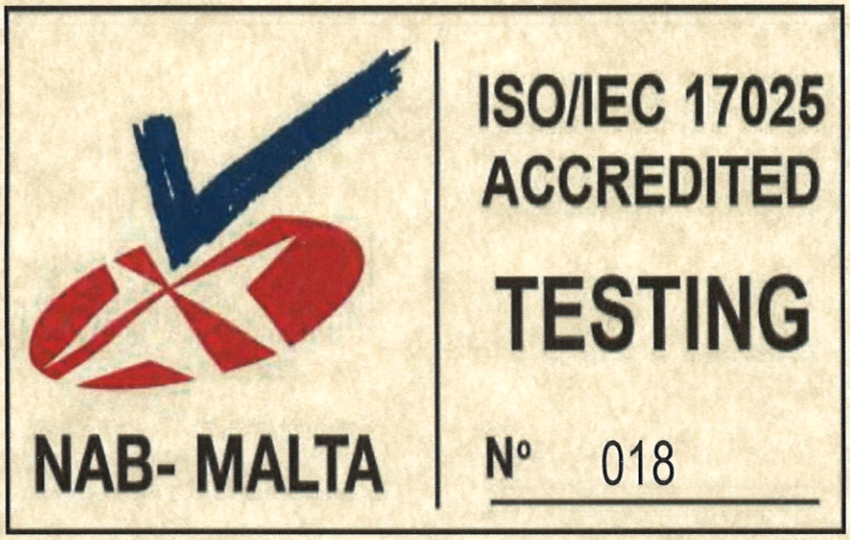
1.4.3. **Techniques to reduce diffuse emissions**

Technique	Description
Devolatilisation extrusion	When the concentrated rubber solution is further processed by extrusion, the solvent vapours (commonly cyclohexane, hexane, heptane, toluene, cyclopentane, isopentane or mixtures thereof) coming from the vent hole of the extruder are compressed and sent to recovery.
Stripping	VOCs contained in the polymer are transferred to the gaseous phase (e.g. by using steam). The removal efficiency may be optimised by a suitable combination of temperature, pressure and residence time and by maximising the ratio of free polymer surface to total polymer volume.
Vapour balancing	The vapour from a piece of receiving equipment (e.g. a tank) that is displaced during the transfer of a liquid and is returned to the delivery equipment from which the liquid is delivered.

Appendix 3: Laboratory Accreditation Scopes and Certificates

ACCREDITATION CERTIFICATE

— National Accreditation Board – Malta —



Sunlab Group Ltd

Life Sciences Park, San Gwann Industrial Estate,

San Gwann

is accredited by the National Accreditation Board – Malta to undertake testing as detailed in the Scope of Accreditation bearing the above accreditation registration number, in compliance with the International Standard

EN ISO/IEC 17025:2017

"General Requirements for the Competence of Testing and Calibration Laboratories"

This Certificate Must Only Be Read in Conjunction with the Annexed Scope of Accreditation which defines the tests for which the laboratory has been accredited.

This Accreditation shall remain in force subject to continuing compliance with NAB-MALTA accreditation criteria, EN ISO/IEC17025 and any further requirements specified by the National Accreditation Board.

Certificate Number **018/7** Initial Certificate issue date **21/07/2016**

Accredited Scope **Testing (as described in Scope of Accreditation dated 21/02/2024)**

Chairman – National Accreditation Board

Director - National Accreditation Board

NAB-MALTA is recognized by Legal Notice 306 of 2007 as the national body responsible for assessing and accrediting the competence of conformity assessment bodies in the field of calibration, testing, inspection, certification of management systems, products and personnel, and EMAS verifiers in line with EU Reg. 765(2008) Art. 4(1). NAB-MALTA is an EA-MLA signatory for testing, calibration and inspection.

This certificate remains the property of NAB-MALTA and shall be returned immediately upon request.

Organisations are subject to regular surveillance and are re-assessed every five years. To confirm the validity

Sunlab Group Ltd
Scope of Accreditation

Contact person	Carmelo Martini
Address	LS 2.0.12 - Sir Temi Buildings, Malta Life Sciences Park, San Gwann SGN 3000
Telephone	+35621381391
Company Reg. No.	C44052
Email	info@sunlabgroup.com
Website	www.sunlabgroup.com

ACCREDITATION INFORMATION - TESTING LABORATORY

Accreditation No.	018
Accreditation Certificate No.	018/7
Accredited according to	EN ISO/IEC 17025:2017
Accreditation Scope No.	S018/7
Date of issue of this Scope	Wednesday, 21 February 2024

TESTING LABORATORY

Laboratory Locations

Location Details	Activity	Location Code
Address Life Sciences Park, San Gwann Industrial Estate, San Gwann	Head Office	N/A

Site activities performed away from the locations listed above

Location Details	Activity	Location Code
Clients	Environmental Testing	B

Sunlab Group Ltd
Scope of Accreditation

Material/ Product/ Matrix Tested	Type of test, parameter/ component/ characteristic measured, range of measurement, equipment	Standard Specifications/ In-House Methods /Techniques	Loc. code
Environmental Monitoring - Ambient Air Quality			
Ambient Air Quality	Sampling for the determination of airborne asbestos fibres	DM 06/09/1994 SO n° 129 GU n° 220 20/09/1994 All.2	B
Ambient Air Quality	Sampling for the determination of particulate matter - PM10	EN 12341:2014 (excluding the following chapters and relative subclauses: 5.2, 6.2, 6.4, 6.5, 7.9, 7.10, 7.11)	B
Ambient Air Quality	Sampling for the determination of benzo[a]pyrene	EN 15549:2008 (excluding the following chapters and relative subclauses: 10, 11, 12, 13)	B
Ambient Air Quality (PM10 fraction of suspended particulate matter)	Sampling for the determination of Pb, Cd, As and Ni	EN 14902:2005 + EC 1-2008 (excluding the following chapters and relative subclauses: 9,10)	B
Ambient Air Quality (Filters)	Sampling for the determination of total particulate matter, total dusts	Internal Method IM-01-2015 Rev. 2	B
Ambient Air Quality	Sampling for the determination of particulate matter - PM2,5	EN 12341:2014 (excluding the following chapters and relative subclauses: 5.2, 6.2, 6.4, 6.5, 7.9, 7.10, 7.11)	B

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Sunlab Group Ltd
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Material/ Product/ Matrix Tested	Type of test, parameter/ component/ characteristic measured, range of measurement, equipment	Standard Specifications/ In-House Methods /Techniques	Loc. code
Environmental Monitoring - Other			
Liquid, granular, paste, coarse, monolithic and Waste	Sampling	UNI 10802:2013	B
Soils, land	Sampling	UNICHIM Manual n°196/2 2004 (only paragraph n°5 and 6)	B
Marine sediments	Sampling of marine sediments	ISO 5667-19:2004	B
Environmental Monitoring - Stack emissions			
Stack emissions (adsorbent solutions)	Sampling for the determination of ammonia	Unichim Method n°632:1984 (excluding the chapter n.7 and relative subclauses)	B
Stack emissions	Sampling for the determination of mass concentration of dusts	EN 13284-1:2017	B

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Material/ Product/ Matrix Tested	Type of test, parameter/ component/ characteristic measured, range of measurement, equipment	Standard Specifications/ In-House Methods /Techniques	Loc. code
Stack emissions	Sampling for the determination of hydrogen sulphide	Unichim Method n°634:1984	B
Stack emissions (vials)	Sampling for the determination of volatile organic compounds: acetone, toluene, hexane, penthane, o-xylene, m-pxylene, trichloroethylene, 1,1,1-trichloroethane, 4-metil-2-penthane, tetrachloroethylene, ethylacetate, 1-butanol, 2-butanone, dichloromethane, styrene, 2- butanol	CEN / TS 13649:2015 (excluding the chapter n.7 and relative subclauses)	B
Stack emissions	Determination of total organic carbon (TOC)	EN 12619:2013	B
Stack emissions	Determination of carbon oxide (CO), carbon dioxide (CO2), nitrogen monoxide (NO), nitrogen oxides (NOx), sulphur dioxide (SO2)	ISO 11042-1:1996	B
Stack emissions	Determination of oxygen	EN 14789:2017	B

Material/ Product/ Matrix Tested	Type of test, parameter/ component/ characteristic measured, range of measurement, equipment	Standard Specifications/ In-House Methods /Techniques	Loc. code
Stack emissions	Determination of water vapour	EN 14790:2017	B
Stack emissions	Determination of flow and velocity	EN ISO 16911-1:2013 Annex A	B
Stack emissions (filters and absorbent solutions)	Sampling for the determination of arsenic, cadmium, chromium, cobalt, copper, manganese, nickel, lead, antimony , thallium and vanadium	EN 14385:2004 (excluding the following chapters and relative subclauses: 8.7, 8.8 and Annexes D and E)	B
Stack emissions	Determination of the mass concentration of carbon monoxide (CO). Reference method: non-dispersive infrared spectrometry	EN 15058:2017	B
Stack emissions	Determination of mass concentration of nitrogen oxides (NOx). Reference method: chemiluminescence	EN 14792:2017	B
Stack emissions	Sampling for the determination of mass concentration of sulphur dioxide (SO_2)	EN 14791:2017 (excluding the following chapters and relative subclauses: 6.3 and 9)	B

Material/ Product/ Matrix Tested	Type of test, parameter/ component/ characteristic measured, range of measurement, equipment	Standard Specifications/ In-House Methods /Techniques	Loc. code
Stack emissions	Sampling for the determination of dioxins and furans	EN 1948-1:2006	B
Stack emissions	Sampling for the determination of polycyclic aromatic hydrocarbons (PAHs)	ISO 11338-1:2003	B
Stack emissions	Sampling for the determination of hydrochloric acid (HCl)	EN 1911:2010 (excluding the following chapters and relative subclauses: 6 and Annexes B, C and D)	B
Stack emissions	Sampling for the Determination of hydrochloric acid (HCl), Sampling for the Determination of hydrofluoric acid (HF)	DM 25/8/2000 All. 2	B
Environmental Monitoring - Water			
Water Treatment Works, Desalination Plants, Reservoirs, Ground waters, Domestic and Industrial Premises, Runoff water, waste waters and effluents, water intended for human consumption and salted waters	Determination of dissolved oxygen	EN ISO 5814:2013	B

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Sunlab Group Ltd
Scope of Accreditation

Material/ Product/ Matrix Tested	Type of test, parameter/ component/ characteristic measured, range of measurement, equipment	Standard Specifications/ In-House Methods /Techniques	Loc. code
Water Treatment Works, Desalination Plants, Reservoirs, Ground waters, Domestic and Industrial Premises, Runoff water, waste waters and effluents, and water intended for human consumption and water intended for human consumption	Determination of free active chlorine, total chlorine	APAT CNR IRSA 4080 Man 29 2003	B
Water Treatment Works, Desalination Plants, Reservoirs, Ground waters, Domestic and Industrial Premises, Runoff water, waste waters and effluents, and water intended for human consumption	Determination of temperature	APAT CNR IRSA 2100 Man 29 2003	B
Waste water, sea water, Superficial water, leachate, ground water and water intended for human consumption	Determination of conductivity	APAT CNR IRSA 2030 Man 29 2003	B
Water, water intended for human consumption, ground water, superficial water, waste water and liquid waste (landfill leachates, process water, wash water and drain water)	Sampling	APAT CNR IRSA 1030 Man 29 2003	B
Water, water intended for human consumption, ground water, superficial water, waste water and liquid waste (landfill leachates, process water, wash water and drain water)	Sampling	APAT CNR IRSA 6010 Man 29 2003	B

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Material/ Product/ Matrix Tested	Type of test, parameter/ component/ characteristic measured, range of measurement, equipment	Standard Specifications/ In-House Methods /Techniques	Loc. code
Water Treatment Works, Desalination Plants, Reservoirs, Ground waters, Domestic and Industrial Premises, Runoff water, waste waters and effluents, and water intended for human consumption	Determination of pH	APAT CNR IRSA 2060 Manual 29/2003	B
Water Treatment Works, Desalination Plants, Reservoirs, Ground waters, Domestic and Industrial Premises, Runoff water, waste waters and effluents, and water intended for human consumption	Determination of redox potential	APHA Standard Methods for the Examination of Water and Wastewater ed. 23rd 2017, 2580	B

END OF SCOPE

This scope of accreditation may be revised from time to time by NAB-MALTA. The most recent version of this scope may be found from the NAB-MALTA website. Nevertheless, as technical issues may hinder the immediate update of the website, and in case of any difficulty, contact the NAB-MALTA on +356 23952510 or by sending an email to 'info@nabmalta.org.mt'.

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CERTIFICATO DI ACCREDITAMENTO
Accreditation Certificate

ACCREDITAMENTO N. / *ACCREDITATION N.* **0439L** REV. **08**

EMESSO DA / *ISSUED BY* **DIPARTIMENTO LABORATORI DI PROVA**

SI DICHIARA CHE / *WE DECLARE THAT*

CHIMICA APPLICATA DEPURAZIONE ACQUE di GIGLIO FILIPPO & C. Snc

Sede/Headquarters:
Via Pio La Torre, 13 - AREA P.I.P. - 92013 Menfi AG

È CONFORME AI REQUISITI DELLA NORMA: UNI CEI EN ISO/IEC 17025:2018

MEETS THE REQUIREMENTS OF THE STANDARD: *ISO/IEC 17025:2017*

QUALE: **Laboratorio di Prova**

AS: ***Testing Laboratory***

Data di 1ª emissione *1st issue date*	Data di revisione *Review date*	Data di scadenza *Expiring date*
14-11-2002	**22-03-2023**	**05-02-2027**

L'accreditamento attesta la competenza tecnica, l'imparzialità e il costante e coerente funzionamento del Laboratorio relativamente al campo di accreditamento riportato nell'Elenco Prove allegato al presente certificato di accreditamento.
Il presente certificato non è da ritenersi valido se non accompagnato dagli Elenchi Prove, che possono variare nel tempo e può essere sospeso o revocato o ridotto in qualsiasi momento nel caso di inadempienza accertata da parte di ACCREDIA.
La vigenza dell'accreditamento può essere verificata sul sito web (www.accredia.it) o richiesta al Dipartimento di competenza.
I requisiti di sistema della ISO/IEC 17025 sono scritti in un linguaggio attinente alle attività di laboratorio e sono generalmente in accordo con i principi della norma ISO 9001 (si veda comunicato congiunto ISO-ILAC-IAF dell'Aprile 2017).
The accreditation attests competence, impartiality and consistent operation in performing laboratory activities, limited to the scope detailed in the attached Enclosure.
The present certificate is valid only if associated to the annexed Lists and can be suspended, withdrawn or reduced at any time in the event of non fulfilment as ascertained by ACCREDIA.
Confirmation of the validity of accreditation can be verified on the website (www.accredia.it) or by contacting the relevant Department.
The management system requirements in ISO/IEC 17025 are written in language relevant to laboratories operations and generally operate in accordance with the principles of ISO 9001 (refer joint ISO-ILAC-IAF Communiqué dated April 2017).

Il QRcode consente di accedere direttamente al sito www.accredia.it per verificare la validità del certificato di accreditamento rilasciato al CAB.
La data di revisione riportata sul certificato corrisponde alla data di aggiornamento / di delibera del pertinente Comitato Settoriale di Accreditamento. L'atto di delibera, firmato dal Presidente di ACCREDIA, è scaricabile dal sito www.accredia.it, sezione 'Documenti'
The QRcode links directly to the website www.accredia.it to check the validity of the accreditation certificate issued to the CAB.
The revision date shown on the certificate refers to the update / resolution date of the Sector Accreditation Committee. The Resolution, signed by the President of ACCREDIA, can be downloaded from the website www.accredia.it, 'Documents' section.

ACCREDIA è l'Ente Unico nazionale di accreditamento designato dal governo italiano, in applicazione del Regolamento Europeo 765/2008.
ACCREDIA is the sole national Accreditation Body, appointed by the Italian government in compliance with the application of REGULATION (EC) No 765/2008.

ACCREDIA - Dipartimento Laboratori di prova

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Tel. +39 06 8440991 | Fax +39 06 8841199
info@accredia.it | www.accredia.it | Partita IVA - Codice Fiscale 10566361001

CERTIFICATO DI ACCREDITAMENTO
Accreditation Certificate

ACCREDITAMENTO N. / *ACCREDITATION N.* **0439L** REV. **08**

EMESSO DA / ISSUED BY **DIPARTIMENTO LABORATORI DI PROVA**

CHIMICA APPLICATA DEPURAZIONE ACQUE di GIGLIO FILIPPO & C. Snc

Sedi operative/Branch Offices:

- Sede A: Via Pio La Torre, 13 - AREA P.I.P. - 92013 Menfi AG
- Sede B: C.da Piana del Signore - Strada Provinciale n. 82 - 93012 Gela CL

Mod. CA-01 rev. 05

ACCREDIA - Dipartimento Laboratori di prova

Sede operativa, legale e amministrativa: Via Guglielmo Saliceto, 7/9 | 00161 Roma - Italy
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CHIMICA APPLICATA DEPURAZIONE ACQUE di GIGLIO FILIPPO & C. Snc Via Pio La Torre, 13 - AREA P.I.P. 92013 Menfi AG	UNI CEI EN ISO/IEC 17025:2018
	Revisione: **67** Data: **29/02/2024**
	Sede **A** pag. **1** di **37**

ELENCO PROVE ACCREDITATE - CON CAMPO FISSO IN CATEGORIA: 0

Acque ad elevata trofia/High trofic waters, Acque profonde/Deep waters

Denominazione della prova / Campi di prova	*Metodo di prova*	*Tecnica di prova*	*O&I*
Clorofilla A, B, C/Chlorophyll A, B, C	APAT CNR IRSA 9020 Man 29 2003	Spettrofotometria UV-VIS	

Acque da destinare al consumo umano (1)/Water to be used for human consumption (1), Acque sotterranee (1)/Ground waters (1)

Denominazione della prova / Campi di prova	*Metodo di prova*	*Tecnica di prova*	*O&I*
Residuo Fisso a 180°C/Fixed solids at 180°C	Rapporti ISTISAN 2007/31 pag 65 Met ISS BFA032	Gravimetria	

Acque destinate al consumo umano (1)/Drinking waters (1), Acque di mare/Marine waters, Acque di scarico/Waste waters, Acque naturali/Natural waters, Rifiuti liquidi acquosi (1)/Aqueous liquid wastes (1)

Denominazione della prova / Campi di prova	*Metodo di prova*	*Tecnica di prova*	*O&I*
Fosforo come Ortofosfato solubile/Phosphorus as soluble orthophosphate	APAT CNR IRSA 4110 A1 Man 29 2003	Spettrofotometria UV-VIS	
Fosforo totale/Total phosphorus	APAT CNR IRSA 4110 A2 Man 29 2003	Spettrofotometria UV-VIS	

Acque destinate al consumo umano (1)/Drinking waters (1), Acque di mare/Marine waters, Acque di scarico/Waste waters, Acque superficiali/Surface waters, Rifiuti liquidi acquosi (1)/Aqueous liquid wastes (1)

Denominazione della prova / Campi di prova	*Metodo di prova*	*Tecnica di prova*	*O&I*
Idrocarburi totali/Total hydrocarbons	APAT CNR IRSA 5160 B2 Man 29 2003	Spettrofotometria IR	

Acque destinate al consumo umano (1)/Drinking waters (1), Acque di mare/Marine waters, Acque di scarico (1)/Waste water (1), Acque dolci/Fresh waters, Acque naturali/Natural waters, Rifiuti liquidi acquosi (1)/Aqueous liquid wastes (1)

Denominazione della prova / Campi di prova	*Metodo di prova*	*Tecnica di prova*	*O&I*
Azoto ammoniacale/Ammonium nitrogen	APAT CNR IRSA 4030 A1 Man 29 2003	Spettrofotometria UV-VIS	

Acque destinate al consumo umano (1)/Drinking waters (1), Acque di mare/Marine waters, Acque di scarico/Waste waters, Acque sotterranee/Ground waters, Acque superficiali/Surface waters, Rifiuti liquidi acquosi (1)/Aqueous liquid wastes (1)

Denominazione della prova / Campi di prova	*Metodo di prova*	*Tecnica di prova*	*O&I*
Conducibilità/Conductivity	APAT CNR IRSA 2030 Man 29 2003	Conduttimetria	

Acque destinate al consumo umano (1)/Drinking waters (1), Acque di piscina (1)/Swimming pool waters (1), Acque minerali naturali (1)/Natural mineral waters (1), Acque sotterranee/Ground waters, Acque superficiali/Surface waters

Denominazione della prova / Campi di prova	*Metodo di prova*	*Tecnica di prova*	*O&I*
Colore/Color	APAT CNR IRSA 2020 C Man 29 2003	Esame visivo	

Acque destinate al consumo umano (1)/Drinking waters (1), Acque di scarico/Waste waters, Acque naturali/Natural waters

Denominazione della prova / Campi di prova	*Metodo di prova*	*Tecnica di prova*	*O&I*
Cloro libero/Free chlorine	APAT CNR IRSA 4080 Man 29 2003	Spettrofotometria UV-VIS	

CHIMICA APPLICATA DEPURAZIONE ACQUE di GIGLIO FILIPPO & C. Snc Via Pio La Torre, 13 - AREA P.I.P. 92013 Menfi AG	UNI CEI EN ISO/IEC 17025:2018	
	Revisione: **67**	Data: **29/02/2024**
	Sede **A**	pag. **2** di **37**

Acque destinate al consumo umano (1)/Drinking waters (1), Acque di scarico/Waste waters, Acque naturali/Natural waters, Rifiuti liquidi acquosi (1)/Aqueous liquid wastes (1)

Denominazione della prova / Campi di prova	*Metodo di prova*	*Tecnica di prova*	*O&I*
1-2-3-4-6-7-8-eptaclorodibenzo-p-diossina (HpCDD)/1-2-3-4-6-7-8-heptachlorodibenzo-p-dioxin (HpCDD), 1-2-3-4-6-7-8-eptaclorodibenzofurano (HpCDF)/1-2-3-4-6-7-8-heptachlorodibenzofuran (HpCDF), 1-2-3-4-7-8-9-eptaclorodibenzofurano (HpCDF)/1-2-3-4-7-8-9-heptachlorodibenzofuran (HpCDF), 1-2-3-4-7-8-esaclorodibenzo-p-diossina (HxCDD)/1-2-3-4-7-8-hexachlorodibenzo-p-dioxin (HxCDD), 1-2-3-4-7-8-esaclorodibenzofurano (HxCDF)/1-2-3-4-7-8-hexachlorodibenzofuran (HxCDF), 1-2-3-6-7-8-esaclorodibenzo-p-diossina (HxCDD)/1-2-3-6-7-8-hexachlorodibenzo-p-dioxin (HxCDD), 1-2-3-6-7-8-esaclorodibenzofurano (HxCDF)/1-2-3-6-7-8-hexachlorodibenzofuran (HxCDF), 1-2-3-7-8-9-esaclorodibenzo-p-diossina (HxCDD)/1-2-3-7-8-9-hexachlorodibenzo-p-dioxin (HxCDD), 1-2-3-7-8-9-esaclorodibenzofurano (HxCDF)/1-2-3-7-8-9-hexachlorodibenzofuran (HxCDF), 1-2-3-7-8-pentaclorodibenzo-p-diossina (PeCDD)/1-2-3-7-8-pentachlorodibenzo-p-dioxin (PeCDD), 1-2-3-7-8-pentaclorodibenzofurano (PeCDF)/1-2-3-7-8-pentachlorodibenzofuran (PeCDF), 2-3-4-6-7-8-esaclorodibenzofurano (HxCDF)/2-3-4-6-7-8-hexachlorodibenzofuran (HxCDF), 2-3-4-7-8-pentaclorodibenzofurano (PeCDF)/2-3-4-7-8-pentachlorodibenzofuran (PeCDF), 2-3-7-8-tetraclorodibenzo-p-diossina (TCDD)/2-3-7-8-tetrachlorodibenzo-p-dioxin (TCDD), 2-3-7-8-tetraclorodibenzofurano (TCDF)/2-3-7-8-tetrachlorodibenzofuran (TCDF), Ottaclorodibenzo-p-diossina (OCDD)/Octachlorodibenzo-p-dioxin (OCDD), Ottaclorodibenzofurano (OCDF)/Octachlorodibenzofuran (OCDF)	EPA 1613B 1994	HRGC-HRMS	
Acidità/Acidity	APAT CNR IRSA 2010 Man 29 2003	Titrimetria	
Alcalinità P/P Alkalinity, Alcalinità totale/Total alkalinity, Alcalinità/Alkalinity, Bicarbonati/Bicarbonates, Carbonati/Carbonates, Idrossidi/Hydroxides	APAT CNR IRSA 2010 B Man 29 2003	Titrimetria	
Alcalinità/Alkalinity, Bicarbonati/Bicarbonates, Carbonati/Carbonates, Idrossidi/Hydroxides	APAT CNR IRSA 2010 A Man 29 2003	Titrimetria potenziometrica	
Azoto ammoniacale/Ammonium nitrogen	APAT CNR IRSA 4030 C Man 29 2003	Spettrofotometria UV-VIS	
Azoto ammoniacale/Ammonium nitrogen	APAT CNR IRSA 4030 C Man 29 2003	Titrimetria	
pH/pH	APAT CNR IRSA 2060 Man 29 2003	Potenziometria	
Solidi sospesi totali/Total suspended solids	APAT CNR IRSA 2090 B Man 29 2003	Gravimetria	

	Sommatoria di policlorodibenzodiossine/policlorodibenzofurani (PCDD/PCDF) come tossicità equivalente I-TEQ (da calcolo)/Sum of polychlorinated dibenzodioxins/polychlorinated dibenzofurans (PCDD/PCDF) as equivalent toxicity I-TEQ from I-TEF (calculation), Sommatoria di policlorodibenzodiossine/policlorodibenzofurani (PCDD/PCDF) come tossicità equivalente WHO-TEQ (2005) (da calcolo)/Sum of polychlorinated dibenzodioxins/polychlorinated dibenzofurans (PCDD/PCDF) as equivalent toxicity WHO-TEQ (2005) (calculation)	EPA 1613B 1994, NATO/CCMS I-TEF 1988, WHO-TEF 2005	Calcolo	

Acque destinate al consumo umano (1)/Drinking waters (1), Acque di scarico/Waste waters, Acque naturali/Natural waters, Acque trattate/Treated waters, Rifiuti liquidi acquosi (1)/Aqueous liquid wastes (1)

	Denominazione della prova / Campi di prova	*Metodo di prova*	*Tecnica di prova*	*O&I*
	Azoto nitrico/Nitric nitrogen	APAT CNR IRSA 4040 A1 Man 29 2003	Spettrofotometria UV-VIS	

Acque destinate al consumo umano (1)/Drinking waters (1), Acque di scarico/Waste waters, Acque sotterranee/Ground waters, Acque superficiali/Surface waters

	Denominazione della prova / Campi di prova	*Metodo di prova*	*Tecnica di prova*	*O&I*
	Idrocarburi estraibili C10-C40 espressi come n-esano/Extractable hydrocarbons C10-C40 expressed as n-hexan, Idrocarburi frazione estraibile (C10-C40)/Hydrocarbons extractable fraction (C10-C40)	ISPRA Man 123 2015 Met B	GC-FID	
	Idrocarburi frazione volatile (C6-C10) GRO/Hydrocarbons volatile fraction (C6-C10) GRO, Idrocarburi volatili espressi come n-esano/Volatile hydrocarbons expressed as n-hexan	ISPRA Man 123 2015 Met A	GC-FID	
	Idrocarburi totali espressi come n-esano/Total hydrocarbons expressed as n-hexan, Idrocarburi totali/Total hydrocarbons	ISPRA Man 123 2015	GC-FID	
*	Odore/Odour	APAT CNR IRSA 2050 Man 29 2003	Sensoriale	

Acque destinate al consumo umano (1)/Drinking waters (1), Acque di scarico/Waste waters, Acque sotterranee/Ground waters, Acque superficiali/Surface waters, Rifiuti liquidi acquosi (1)/Aqueous liquid wastes (1)

	Denominazione della prova / Campi di prova	*Metodo di prova*	*Tecnica di prova*	*O&I*
	Anioni/Anions : Cloruri/Chloride	APAT CNR IRSA 4090 A1 Man 29 2003	Titrimetria	
	Cianuri/Cyanides	APAT CNR IRSA 4070 Man 29 2003	Spettrofotometria UV-VIS	
	Indice di fenolo/Phenol index	UNI EN ISO 14402:2004	Continuous flow analysis CFA	

Acque destinate al consumo umano (1)/Drinking waters (1), Acque naturali non inquinate/Natural not polluted water

	Denominazione della prova / Campi di prova	*Metodo di prova*	*Tecnica di prova*	*O&I*
	Sapore/Flavour	APAT CNR IRSA 2080 Man 29 2003	Sensoriale	

Acque destinate al consumo umano/Drinking waters

	Denominazione della prova / Campi di prova	*Metodo di prova*	*Tecnica di prova*	*O&I*
	Batteri coliformi/Coliform bacteria, Escherichia coli/Escherichia coli	ISO 9308-1:2014/Amd 1:2016	Metodo colturale-conta	
	Clostridium perfringens (spore comprese)/Clostridium perfringens (spores included)	ISO 14189:2013	Metodo colturale-conta	
	Indice di aggressività (da calcolo)/Aggression index (calculation) (-7 - 5)	MPI-99-2022 Rev.2	Calcolo	
	Indice di Langelier/Langelier index (4,7-16,4)	MPI-98-2022 Rev.2	Calcolo	
	Stafilococchi patogeni/Pathogenic staphylococci	UNI 10678:1998	Metodo colturale-conta	

CHIMICA APPLICATA DEPURAZIONE ACQUE di GIGLIO FILIPPO & C. Snc Via Pio La Torre, 13 - AREA P.I.P. 92013 Menfi AG	UNI CEI EN ISO/IEC 17025:2018	
	Revisione: **67**	Data: **29/02/2024**
	Sede **A**	pag. **4** di **37**

Acque destinate al consumo umano/Drinking waters, Acque di mare/Marine waters, Acque di scarico/Waste waters, Acque sotterranee (1)/Ground waters (1), Acque superficiali/Surface waters

Denominazione della prova / Campi di prova	*Metodo di prova*	*Tecnica di prova*	*O&I*
Carbonio organico disciolto (DOC)/Dissolved organic carbon (DOC), Carbonio organico totale (TOC)/Total Organic Carbon (TOC)	UNI EN 1484:1999	Spettrofotometria IR	

Acque destinate al consumo umano/Drinking waters, Acque di piscina (1)/Swimming pool waters (1), Acque minerali naturali/Natural mineral waters, Acque naturali/Natural waters

Denominazione della prova / Campi di prova	*Metodo di prova*	*Tecnica di prova*	*O&I*
Microrganismi vitali a 22°C/Microorganisms at 22°C, Microrganismi vitali a 36°C/Microorganisms at 36°C	ISO 6222:1999	Metodo colturale-conta	

Acque destinate al consumo umano/Drinking waters, Acque di piscina (1)/Swimming pool waters (1), Acque di scarico/Waste waters, Acque minerali naturali (1)/Natural mineral waters (1), Acque naturali/Natural waters, Rifiuti liquidi acquosi (1)/Aqueous liquid wastes (1)

Denominazione della prova / Campi di prova	*Metodo di prova*	*Tecnica di prova*	*O&I*
Ammoniaca (da calcolo)/Ammonia (calculation), Azoto ammoniacale (da calcolo)/Ammonium nitrogen (calculation), Calcio/Calcium, Ione Ammonio/Ammonium ion, Magnesio/Magnesium, Potassio/Potassium, Rapporto di assorbimento del Sodio (SAR): indice di salinità (da calcolo)/Sodium Adsorption Ratio (SAR): salinity index (calculation), Sodio/Sodium	UNI EN ISO 14911:2001	IC	
Potenziale di ossidoriduzione/Oxidation-reduction potential	APHA Standard Methods for Examination of Water and Wastewater Ed 23rd 2017 2580 B	Potenziometria	

Acque destinate al consumo umano/Drinking waters, Acque di piscina/Swimming pool waters

Denominazione della prova / Campi di prova	*Metodo di prova*	*Tecnica di prova*	*O&I*
Legionella spp, Legionella pneumophila (sierogruppo 1 e sierogruppi 2-15)/Legionella spp, Legionella pneumophila (serogroup 1 and serogroup 2-15)	ISO 11731:2017	Metodo colturale + sieroagglutinazione al lattice	
Pseudomonas aeruginosa/Pseudomonas aeruginosa	UNI EN ISO 16266:2008	Metodo colturale-conta	

Acque destinate al consumo umano/Drinking waters, Acque di piscina/Swimming pool waters, Acque di scarico/Waste waters, Acque minerali naturali (1)/Natural mineral waters (1), Acque naturali/Natural waters, Rifiuti liquidi acquosi (1)/Aqueous liquid wastes (1)

Denominazione della prova / Campi di prova	*Metodo di prova*	*Tecnica di prova*	*O&I*
Colore/Color	APAT CNR IRSA 2020 A Man 29 2003	Esame visivo	

Acque destinate al consumo umano/Drinking waters, Acque di piscina/Swimming pool waters, Acque minerali naturali/Natural mineral waters, Acque sotterranee/Ground waters

Denominazione della prova / Campi di prova	*Metodo di prova*	*Tecnica di prova*	*O&I*
Indice di permanganato (Ossidabilità)/Permanganate index (Oxidability)	UNI EN ISO 8467:1997	Titrimetria	

Acque destinate al consumo umano/Drinking waters, Acque di piscina/Swimming pool waters, Acque pulite/Clean waters, Acque trattate/Treated waters

Denominazione della prova / Campi di prova	*Metodo di prova*	*Tecnica di prova*	*O&I*
Enterococchi intestinali/Intestinal enterococci	ISO 7899-2:2000	Metodo colturale-conta	

Acque destinate al consumo umano/Drinking waters, Acque di scarico/Waste waters, Acque marine/Littoral zone, Acque naturali/Natural waters

Denominazione della prova / Campi di prova	*Metodo di prova*	*Tecnica di prova*	*O&I*
Valutazione della tossicità acuta con batteri bioluminescenti: Vibrio fischeri/Acute toxicity test with bioluminescent bacteria: Vibrio fischeri	APAT CNR IRSA 8030 Man 29 2003 - escluso/except appendice C	Spettrofotometria UV-VIS	

Acque destinate al consumo umano/Drinking waters, Acque di scarico/Waste waters, Acque naturali/Natural waters

Denominazione della prova / Campi di prova	*Metodo di prova*	*Tecnica di prova*	*O&I*
Tensioattivi totali/Total surfactants (0.2 - 6 mg/l)	APAT CNR IRSA 5170 Man 29 2003 + MPI-164-2022 Rev.5	Spettrofotometria UV-VIS	

Acque destinate al consumo umano/Drinking waters, Acque di scarico/Waste waters, Acque naturali/Natural waters, Acque/Waters

Denominazione della prova / Campi di prova	*Metodo di prova*	*Tecnica di prova*	*O&I*
AMPA (metabolita Glifosato) /AMPA (Glyphosate metabolite), Glifosato/Glyphosate (0,025-0,3 µg/kg)	MPI-97-2022 Rev.3	LC-MS/MS	

Acque destinate al consumo umano/Drinking waters, Acque di scarico/Waste waters, Acque naturali/Natural waters, Rifiuti liquidi acquosi (1)/Aqueous liquid wastes (1)

Denominazione della prova / Campi di prova	*Metodo di prova*	*Tecnica di prova*	*O&I*
∗ 2-4-6-triclorofenolo/2-4-6-trichlorophenol, 2-4-diclorofenolo/2-4-dichlorophenol, 2-4-dimetilfenolo/2-4-dimethylphenol, 2-4-dinitrofenolo/2-4-dinitrophenol, 2-4-dinitrotoluene/2-4-dinitrotoluene, 2-6-dinitrotoluene/2-6-dinitrotoluene, 2-clorofenolo/2-chlorophenol, 2-nitrofenolo/2-nitrophenol, 4-6-dinitro-2-metilfenolo/4-6-dinitro-2-methylphenol, 4-cloro-3-metilfenolo (PCMC)/4-chloro-3-methilphenol (PCMC), 4-nitrofenolo/4-nitrophenol, Fenolo/Phenol, Pentaclorofenolo/Pentachlorophenol	APHA Standard Methods for Examination of Water and Wastewater Ed 23rd 2017 6410 B	GC-MS	
Cianuri liberi/Free cyanides, Cianuri totali/Total cyanides	MU 2251:08 - solo/only p.to 8.2.2	IC	
Cromato (da calcolo)/Chromate (calculation), Cromo esavalente (Cr VI)/Hexavalent Chromium (Cr VI)	EPA 7199 1996	IC	
PCB/PCB : Aroclor 1016/Aroclor 1016, Aroclor 1221/Aroclor 1221, Aroclor 1232/Aroclor 1232, Aroclor 1242/Aroclor 1242, Aroclor 1248/Aroclor 1248, Aroclor 1254/Aroclor 1254, Aroclor 1260/Aroclor 1260, Aroclor 5060/Aroclor 5060, Aroclor 5442/Aroclor 5442, Aroclor 5460/Aroclor 5460	EPA 3510C 1996, EPA 3620C 2014, EPA 8082A 2007	GC-ECD	
pH/pH	EPA 9040C 2004	Potenziometria	

Acque destinate al consumo umano/Drinking waters, Acque di scarico/Waste waters, Acque sotterranee (1)/Ground waters (1), Acque superficiali/Surface waters, Rifiuti liquidi acquosi (1)/Aqueous liquid wastes (1)

Denominazione della prova / Campi di prova	*Metodo di prova*	*Tecnica di prova*	*O&I*
Di-butilstagno (DBT)/Di-butyltin (DBT), Di-ottilstagno (DOT)/Di-octyltin (DOT), Mono-butilstagno (MBT)/Mono-butyltin (MBT), Mono-ottilstagno (MOT)/Mono-octyltin (MOT), Tetra-butilstagno (TTBT)/Tetra-butyltin (TTBT), Tri-butilstagno (TBT)/Tri-butyltin (TBT), Tri-cicloesilstagno (TCyT)/Tri-cyclohexyltin (TCyT), Tri-fenilstagno (TPhT)/Tri-phenyltin (TPhT)	UNI EN ISO 17353:2006	GC-MS	

Acque destinate al consumo umano/Drinking waters, Acque di scarico/Waste waters, Acque sotterranee/Ground waters, Acque superficiali/Surface waters

Denominazione della prova / Campi di prova	*Metodo di prova*	*Tecnica di prova*	*O&I*
Pesticidi/Pesticides : Alaclor/Alachlor, Ametrina/Ametryne, Atrazina/Atrazine, Cianazina/Cyanazine, Desmetrina/Desmethryn, Metolaclor/Metolachlor, Molinate/Molinate, Pendimetalin/Pendimethalin, Prometrina/Prometryn, Propazina/Propazine, Simazina/Simazine, Terbutilazina/Terbuthylazine, Terbutrina/Terbutryn	APAT CNR IRSA 5060 Man 29 2003	GC-MS	

Acque destinate al consumo umano/Drinking waters, Acque di scarico/Waste waters, Acque sotterranee/Ground waters, Acque superficiali/Surface waters, Rifiuti liquidi acquosi/Aqueous liquid wastes

Denominazione della prova / Campi di prova	*Metodo di prova*	*Tecnica di prova*	*O&I*

Ammoniaca (da calcolo)/Ammonia (calculation), Azoto ammoniacale (da calcolo)/Ammonium nitrogen (calculation), Azoto nitroso (da calcolo)/Nitrous nitrogen (calculation), Cloruri/Chloride, Fosforo (da fosfati)/Phosphorus (from Phosphate), Nitriti/Nitrite, Ortofosfati/Orthophosphates, Solfati/Sulphates	ISO 15923-1:2013	Spettrofotometria UV-VIS

Acque destinate al consumo umano/Drinking waters, Acque di scarico/Waste waters, Acque sotterranee/Ground waters, Acque superficiali/Surface waters, Rifiuti liquidi acquosi (1)/Aqueous liquid wastes (1)

Denominazione della prova / Campi di prova	*Metodo di prova*	*Tecnica di prova*	*O&I*
Anioni/Anions : Fluoruri/Fluoride	EPA 9214 1996	Potenziometria	
Azoto nitrico/Nitric nitrogen, Nitrati (da calcolo)/Nitrate (calculation)	ISO 13395:1996	Continuous flow analysis CFA	
IPA/PAH : Acenaftene/Acenaphthene, Acenaftilene/Acenaphthylene, Antracene/Anthracene, Benzo(a)antracene/Benzo(a)anthracene, Benzo(a)pirene/Benzo(a)pyrene, Benzo(b)fluorantene/Benzo(b)fluoranthene, Benzo(ghi)perilene/Benzo(ghi)perylene, Benzo(k)fluorantene/Benzo(k)fluoranthene, Crisene/Chrysene, Dibenzo(ah)antracene/Dibenzo(ah)anthracene, Fenantrene/Phenanthrene, Fluorantene/Fluoranthene, Fluorene/Fluorene, Indeno(1-2-3-cd)pirene/Indeno(1-2-3-cd)pyrene, Naftalene/Naphthalene, Pirene/Pyrene	APAT CNR IRSA 5080 Man 29 2003	HRGC-LRMS	
pH/pH	UNI EN ISO 10523:2012	Potenziometria	

Acque destinate al consumo umano/Drinking waters, Acque di scarico/Waste waters, Acque sotterranee/Ground waters, Acque superficiali/Surface waters, Acque trattate (1)/Treated waters (1), Rifiuti liquidi acquosi (1)/Aqueous liquid wastes (1)

Denominazione della prova / Campi di prova	*Metodo di prova*	*Tecnica di prova*	*O&I*
Cianuri liberi/Free cyanides, Cianuri totali/Total cyanides	UNI EN ISO 14403-2:2013	Continuous flow analysis CFA	

Acque destinate al consumo umano/Drinking waters, Acque di scarico/Waste waters, Acque superficiali/Surface waters

Denominazione della prova / Campi di prova	*Metodo di prova*	*Tecnica di prova*	*O&I*
Torbidità/Turbidity	APAT CNR IRSA 2110 Man 29 2003	Turbidimetria	

Acque destinate al consumo umano/Drinking waters, Acque industriali/Industrial waters, Acque naturali/Natural waters

Denominazione della prova / Campi di prova	*Metodo di prova*	*Tecnica di prova*	*O&I*
Durezza/Hardness	APAT CNR IRSA 2040 B Man 29 2003	Titrimetria complessometrica	

Acque destinate al consumo umano/Drinking waters, Acque sotterranee (1)/Ground waters (1)

Denominazione della prova / Campi di prova	*Metodo di prova*	*Tecnica di prova*	*O&I*
Amianto/Asbestos : Fibre di amianto/Asbestos fibers	ISS.EAA.000:2015	Microscopia elettronica: SEM	

Acque di fiume/River waters, Acque di lago/Lake waters, Acque di scarico anche sottoposte a trattamento/Waste waters also treated, Acque superficiali/Surface waters

Denominazione della prova / Campi di prova	*Metodo di prova*	*Tecnica di prova*	*O&I*
Coliformi fecali/Fecal coliforms	APAT CNR IRSA 7020 B Man 29 2003	Metodo colturale-conta	
Coliformi totali/Total coliforms	APAT CNR IRSA 7010 C Man 29 2003	Metodo colturale-conta	
Enterococchi/Enterococci, Streptococchi fecali/Intestinal streptococci	APAT CNR IRSA 7040 C Man 29 2003	Metodo colturale-conta	
Escherichia coli/Escherichia coli	APAT CNR IRSA 7030 F Man 29 2003	Metodo colturale-conta	

Microrganismi vitali a 22°C/Microorganisms at 22°C, Microrganismi vitali a 36°C/Microorganisms at 36°C	APAT CNR IRSA 7050 Man 29 2003	Metodo colturale-conta	
Salmonella spp/Salmonella spp	APAT CNR IRSA 7080 Man 29 2003	Metodo colturale - ricerca	
Spore di clostridium spp solfito riduttori/Spores of sulphite-reducing clostridium	APAT CNR IRSA 7060 B Man 29 2003	Metodo colturale-conta	

Acque di mare/Marine waters, Acque di scarico/Waste waters, Acque naturali/Natural waters, Rifiuti liquidi acquosi (1)/Aqueous liquid wastes (1)

Denominazione della prova / Campi di prova	*Metodo di prova*	*Tecnica di prova*	*O&I*
Azoto nitroso/Nitrous nitrogen	APAT CNR IRSA 4050 Man 29 2003	Spettrofotometria UV-VIS	

Acque di mare/Marine waters, Acque di scarico/Waste waters, Acque superficiali/Surface waters, Rifiuti liquidi acquosi (1)/Aqueous liquid wastes (1)

Denominazione della prova / Campi di prova	*Metodo di prova*	*Tecnica di prova*	*O&I*
Grassi e oli animali e vegetali (da calcolo)/Animal and vegetable fats and oils (calculation)	APAT CNR IRSA 5160 B1 + B2 Man 29 2003	Calcolo	
Sostanze oleose totali/Total oily substances	APAT CNR IRSA 5160 B1 Man 29 2003	Spettrofotometria IR	

Acque di mare/Marine waters, Acque salmastre/Brackish waters, Acque sotterranee/Ground waters, Acque superficiali/Surface waters, Eluati di sedimenti di acqua salmastra (1)/Eluates of brackish water sediments (1), Estratti acquosi (percolati, eluati ed elutriati) di suoli/Aqueous extracts (e.g. leachates, eluates, elutriates) of soil

Denominazione della prova / Campi di prova	*Metodo di prova*	*Tecnica di prova*	*O&I*
Valutazione della tossicità acuta con Artemia sp/Acute toxicity test with Artemia sp	APAT CNR IRSA 8060 Man 29 2003 - escluso/except Appendice B	Esame visivo	

Acque di mare/Marine waters, Elutriati/Elutriates

Denominazione della prova / Campi di prova	*Metodo di prova*	*Tecnica di prova*	*O&I*
Valutazione della tossicità acuta tramite saggio di inibizione della crescita di alghe marine con Phaeodactylum tricornutum/Acute Toxicity test with Algal growth inhibition test with Phaeodactylum tricornutum, Valutazione della tossicità acuta tramite saggio di inibizione della crescita di alghe marine con Skeletonema costatum/Acute Toxicity test withAlgal growth inhibition test with Skeletonema costatum, Valutazione della tossicità cronica tramite saggio di inibizione della crescita di alghe marine con Phaeodactylum tricornutum/Chronic Toxicity test with Algal growth inhibition test with Phaeodactylum tricornutum, Valutazione della tossicità cronica tramite saggio di inibizione della crescita di alghe marine con Skeletonema costatum/Chronic Toxicity test with Algal growth inhibition test with Skeletonema costatum	UNI EN ISO 10253:2017	Microscopia ottica	

Acque di processo (1)/Process waters (1), Acque di scarico/Waste waters, Acque dolci/Fresh waters, Rifiuti liquidi acquosi (1)/Aqueous liquid wastes (1)

Denominazione della prova / Campi di prova	*Metodo di prova*	*Tecnica di prova*	*O&I*
Solidi totali disciolti (TDS)/Total dissolved solids (TDS), Solidi totali disciolti a 103-105°C/Total dissolved solids dried at 103-105°C	APAT CNR IRSA 2090 A Man 29 2003	Gravimetria	

Acque di scarico/Waste waters

Denominazione della prova / Campi di prova	*Metodo di prova*	*Tecnica di prova*	*O&I*
Anioni/Anions : Fluoruri/Fluoride	APAT CNR IRSA 4100 B Man 29 2003	Potenziometria	

Materiali grossolani/Coarse materials	Legge n 319 10/05/1976 GU n 141 29/05/1976 Tab A p.to 5 + APAT CNR IRSA 2090 B Man 29 2003	Gravimetria

Acque di scarico/Waste waters, Acque dolci/Fresh waters, Rifiuti liquidi acquosi (1)/Aqueous liquid wastes (1)

Denominazione della prova / Campi di prova	*Metodo di prova*	*Tecnica di prova*	*O&I*
Solidi sedimentabili/Settleable solids	APAT CNR IRSA 2090 C Man 29 2003	Volumetria	

Acque di scarico/Waste waters, Acque naturali/Natural waters

Denominazione della prova / Campi di prova	*Metodo di prova*	*Tecnica di prova*	*O&I*
Aldeidi alifatiche/Aliphatic aldehyde	APAT CNR IRSA 5010 A Man 29 2003	Spettrofotometria UV-VIS	
Azoto Kjeldahl/Kjeldah nitrogen, Azoto organico/Organic nitrogen	APAT CNR IRSA 5030 Man 29 2003	Titrimetria	

Acque di scarico/Waste waters, Acque naturali/Natural waters, Rifiuti liquidi acquosi (1)/Aqueous liquid wastes (1)

Denominazione della prova / Campi di prova	*Metodo di prova*	*Tecnica di prova*	*O&I*
Anioni/Anions : Solfiti/Sulphites	APAT CNR IRSA 4150 A cap 7.1 Man 29 2003	Titrimetria	
Azoto nitrico/Nitric nitrogen	APAT CNR IRSA 4040 A2 Man 29 2003	Spettrofotometria UV-VIS	
Azoto totale/Total nitrogen	APAT CNR IRSA 4040 A1 + 4050 + 5030 Man 29 2003, APAT CNR IRSA 4040 A2 + 4050 + 5030 Man 29 2003	Calcolo	
Azoto totale/Total nitrogen	APAT CNR IRSA 5030 Man 29 2003 + ISO 15923-1:2013 + ISO 13395:1996	Calcolo	
Cromo esavalente (Cr VI)/Hexavalent Chromium (Cr VI) (> 2 microg/l)	APAT CNR IRSA 3150 C Man 29 2003	Spettrofotometria UV-VIS	
Idrocarburi alifatici C19-C36/Aliphatic hydrocarbons C19-C36, Idrocarburi alifatici C9-C18/Aliphatic hydrocarbons C9-C18, Idrocarburi aromatici C11-C22/Aromatic hydrocarbon C11-C22	MassDEP-EPH-2019-2.1	GC-FID	

PCB/PCB : 2-2-3-3-4-4-5-eptaclorobifenile (PCB 170)/2-2-3-3-4-4-5-heptachlorobiphenyl (PCB 170), 2-2-3-3-4-4-esaclorobifenile (PCB 128)/2-2-3-3-4-4-hexachlorobiphenyl (PCB 128), 2-2-3-3-4-5-6-eptaclorobifenile (PCB 177)/2-2-3-3-4-5-6-heptachlorbiphenyl (PCB 177), 2-2-3-4-4-5-5-eptaclorobifenile (PCB 180)/2-2-3-4-4-5-5-heptachlorobiphenyl (PCB 180), 2-2-3-4-4-5-6-eptaclorobifenile (PCB 183)/2-2-3-4-4-5-6-heptachlorbiphenyl (PCB 183), 2-2-3-4-4-5-esaclorobifenile (PCB 138)/2-2-3-4-4-5-hexachlorobiphenyl (PCB 138), 2-2-3-4-5-5-6-eptaclorobifenile (PCB 187)/2-2-3-4-5-5-6-heptachlorbiphenyl (PCB 187), 2-2-3-4-5-5-esaclorobifenile (PCB 146) /2-2-3-4-5-5-hexachlorobiphenyl (PCB 146), 2-2-3-4-5-6-esaclorobifenile (PCB 149)/2-2-3-4-5-6-hexachlorobiphenyl (PCB 149), 2-2-3-5-5-6-esaclorobifenile (PCB 151)/2-2-3-5-5-6-hexachlorobiphenyl (PCB 151), 2-2-3-5-6-pentaclorobifenile (PCB 95)/2-2-3-5-6-pentachlorobiphenyl (PCB 95), 2-2-4-4-5-5-esaclorobifenile (PCB 153)/2-2-4-4-5-5-hexachlorobiphenyl (PCB 153), 2-2-4-4-5-pentaclorobifenile (PCB 99)/2-2-4-4-5-pentachlorobiphenyl (PCB 99), 2-2-4-5-5-pentaclorobifenile (PCB 101)/2-2-4-5-5-pentachlorobiphenyl (PCB 101), 2-2-5-5-tetraclorobifenile (PCB 52)/2-2-5-5-tetrachlorobiphenyl (PCB 52), 2-3-3-4-4-5-5-eptaclorobifenile (PCB 189)/2-3-3-4-4-5-5-heptachlorbiphenyl (PCB 189), 2-3-3-4-4-5-esaclorobifenile (PCB 156)/2-3-3-4-4-5-hexachlorobiphenyl (PCB 156), 2-3-3-4-4-5-esaclorobifenile (PCB 157)/2-3-3-4-4-5-hexachlorobiphenyl (PCB 157), 2-3-3-4-4-pentaclorobifenile (PCB 105)/2-3-3-4-4-pentachlorobiphenyl (PCB 105), 2-3-3-4-6-pentaclorobifenile (PCB 110)/2-3-3-4-6-pentachlorobiphenyl (PCB 110), 2-3-4-4-5-5-esaclorobifenile (PCB 167)/2-3-4-4-5-5-hexachlorobiphenyl (PCB 167), 2-3-4-4-5-pentaclorobifenile (PCB 114)/2-3-4-4-5-pentachlorobiphenyl (PCB 114), 2-3-4-4-5-pentaclorobifenile (PCB 118)/2-3-4-4-5-pentachlorobiphenyl (PCB 118), 2-3-4-4-5-pentaclorobifenile (PCB 123)/2-3-4-4-5-pentachlorobiphenyl (PCB 123), 2-4-4-triclorobifenile (PCB 28)/2-4-4-trichlorobiphenyl (PCB 28), 2-4-6-triclorobifenile (PCB 30)/2-4-6-trichlorobiphenyl (PCB 30), 3-3-4-4-5-5-esaclorobifenile (PCB 169)/3-3-4-4-5-5-hexachlorobiphenyl (PCB 169), 3-3-4-4-5-pentaclorobifenile (PCB 126)/3-3-4-4-5-pentachlorobiphenyl (PCB 126), 3-3-4-4-tetraclorobifenile (PCB 77)/3-3-4-4-tetrachlorobiphenyl (PCB 77), 3-4-4-5-tetraclorobifenile (PCB 81)/3-4-4-5-tetrachlorobiphenyl (PCB 81)	EPA 1668C 2010	HRGC-HRMS
PCB/PCB : Sommatoria di policlorobifenili (PCB) come tossicità equivalente WHO-TEQ (2005) (da calcolo)/Sum of polychlorobiphenyl (PCB) as equivalent toxicity WHO-TEQ (2005) (calculation)	EPA 1668C 2010, WHO-TEF 2005	Calcolo
Richiesta biochimica di ossigeno (BOD5)/Biochemical Oxygen Demand (BOD5)	APHA Standard Methods for Examination of Water and Wastewater Ed 23rd 2017 5210 D	Potenziometria
Richiesta biochimica di ossigeno (BOD5)/Biochemical Oxygen Demand (BOD5)	APAT CNR IRSA 5120 B1 Man 29 2003	Titrimetria

Richiesta chimica di ossigeno (COD)/Chemical oxygen demand (COD)	APAT CNR IRSA 5130 Man 29 2003	Titrimetria

Acque di scarico/Waste waters, Acque naturali/Natural waters, Rifiuti liquidi acquosi/Aqueous liquid wastes

Denominazione della prova / Campi di prova	*Metodo di prova*	*Tecnica di prova*	*O&I*
Etilene/Ethene, Metano/Methane (>1 microgrammi/L)	MPI-252-2022 Rev.1	GC-FID	

Acque di scarico/Waste waters, Acque sotterranee/Ground waters, Acque superficiali/Surface waters

Denominazione della prova / Campi di prova	*Metodo di prova*	*Tecnica di prova*	*O&I*
Anioni/Anions : Solfuri/Sulphides	APAT CNR IRSA 4160 Man 29 2003	Titrimetria	

Acque di scarico/Waste waters, Acque sotterranee/Ground waters, Acque superficiali/Surface waters, Rifiuti liquidi acquosi (1)/Aqueous liquid wastes (1)

Denominazione della prova / Campi di prova	*Metodo di prova*	*Tecnica di prova*	*O&I*
Tensioattivi anionici/Anionic surfactants	APAT CNR IRSA 5170 Man 29 2003	Spettrofotometria UV-VIS	

Acque dolci (acque di superficie e di falda)/Fresh waters (surface and ground waters), Estratti acquosi ed eluati/Aqueous extracts and leachates

Denominazione della prova / Campi di prova	*Metodo di prova*	*Tecnica di prova*	*O&I*
Valutazione della tossicità acuta con Daphnia magna Straus (Cladocera, Crustacea)/Acute toxicity test with Daphnia magna Straus (Cladocera, Crustacea)	ISO 6341:2012 - escluso/except Allegato C	Esame visivo	

Acque dolci/Fresh waters, Effluenti industriali o fognari/Industrial or sewage effluents, Estratti acquosi/Aqueous extract

Denominazione della prova / Campi di prova	*Metodo di prova*	*Tecnica di prova*	*O&I*
Valutazione della tossicità cronica su Brachionus calyciflorus/Chronic toxicity test with Brachionus calyciflorus	ISO 20666:2008	Esame visivo	

Acque marine/Littoral zone, Effluenti industriali o fognari/Industrial or sewage effluents, Elutriati (1)/Elutriates (1), Estuarini/Estuarine

Denominazione della prova / Campi di prova	*Metodo di prova*	*Tecnica di prova*	*O&I*
Valutazione della tossicità acuta con Acartia tonsa/Acute lethal toxicity test with Acartia tonsa	ISO 14669:1999	Esame visivo	

Acque naturali/Natural waters, Eluati da test di cessione (1)/Eluates from leaching test (1)

Denominazione della prova / Campi di prova	*Metodo di prova*	*Tecnica di prova*	*O&I*
Valutazione della tossicità acuta con Daphnia magna - Accettabilità di un effluente/Acute Toxicity test with Daphnia magna - Effluent acceptability	APAT CNR IRSA 8020 B Man 29 2003 - escluso/except appendice 1	Esame visivo	

Acque naturali/Natural waters, Elutriati/Elutriates

Denominazione della prova / Campi di prova	*Metodo di prova*	*Tecnica di prova*	*O&I*
Valutazione della tossicità acuta con Daphnia magna/Acute Toxicity test with Daphnia magna	APAT CNR IRSA 8020 A Man 29 2003 - escluso/except appendice 1	Esame visivo	

Acque sotterranee/Ground waters, Rifiuti liquidi acquosi (1)/Aqueous liquid wastes (1)

Denominazione della prova / Campi di prova	*Metodo di prova*	*Tecnica di prova*	*O&I*
Perclorato/Perchlorate	EPA 6850 2007	HPLC-MS	

Acque superficiali di fiume/Surface river water

Denominazione della prova / Campi di prova	*Metodo di prova*	*Tecnica di prova*	*O&I*
Indice Multimetrico STAR di Intercalibrazione (STAR-ICMi) - macroinvertebrati/STAR Multimeter of Intercalibration (STAR-ICMi) - macroinvertebrates	ISPRA 2010 Man 111 2014 + ISPRA Man 107 2014	Microscopia ottica	

Acque superficiali fluenti/Surface water flowing

Denominazione della prova / Campi di prova	*Metodo di prova*	*Tecnica di prova*	*O&I*
Indice biotico esteso (IBE)/Extended biotic index (IBE)	APAT CNR IRSA 9010 Man 29 2003	Microscopia ottica	

Acque superficiali/Surface waters, Elutriati (1)/Elutriates (1), Sostanze solubili in acqua/Water solublesubstances

Denominazione della prova / Campi di prova	*Metodo di prova*	*Tecnica di prova*	*O&I*
Valutazione della tossicità con saggio di inibizione della crescita algale con Pseudokirchneriella subcapitata/Toxicity test with algal growth inhibition test with Pseudokirchneriella subcapitata	ISO 8692:2012	Spettrofotometria UV-VIS	

Alimenti con aw>0.95/Food with aw>0.95

Denominazione della prova / Campi di prova	*Metodo di prova*	*Tecnica di prova*	*O&I*
Lieviti/Yeasts, Muffe/Moulds	ISO 21527-1:2008	Metodo colturale-conta	

Alimenti/Food

Denominazione della prova / Campi di prova	*Metodo di prova*	*Tecnica di prova*	*O&I*
1-2-3-4-6-7-8-eptaclorodibenzo-p-diossina (HpCDD)/1-2-3-4-6-7-8-heptachlorodibenzo-p-dioxin (HpCDD), 1-2-3-4-6-7-8-eptaclorodibenzofurano (HpCDF)/1-2-3-4-6-7-8-heptachlorodibenzofuran (HpCDF), 1-2-3-4-7-8-9-eptaclorodibenzofurano (HpCDF)/1-2-3-4-7-8-9-heptachlorodibenzofuran (HpCDF), 1-2-3-4-7-8-esaclorodibenzo-p-diossina (HxCDD)/1-2-3-4-7-8-hexachlorodibenzo-p-dioxin (HxCDD), 1-2-3-4-7-8-esaclorodibenzofurano (HxCDF)/1-2-3-4-7-8-hexachlorodibenzofuran (HxCDF), 1-2-3-6-7-8-esaclorodibenzo-p-diossina (HxCDD)/1-2-3-6-7-8-hexachlorodibenzo-p-dioxin (HxCDD), 1-2-3-6-7-8-esaclorodibenzofurano (HxCDF)/1-2-3-6-7-8-hexachlorodibenzofuran (HxCDF), 1-2-3-7-8-9-esaclorodibenzo-p-diossina (HxCDD)/1-2-3-7-8-9-hexachlorodibenzo-p-dioxin (HxCDD), 1-2-3-7-8-9-esaclorodibenzofurano (HxCDF)/1-2-3-7-8-9-hexachlorodibenzofuran (HxCDF), 1-2-3-7-8-pentaclorodibenzo-p-diossina (PeCDD)/1-2-3-7-8-pentachlorodibenzo-p-dioxin (PeCDD), 1-2-3-7-8-pentaclorodibenzofurano (PeCDF)/1-2-3-7-8-pentachlorodibenzofuran (PeCDF), 2-3-4-6-7-8-esaclorodibenzofurano (HxCDF)/2-3-4-6-7-8-hexachlorodibenzofuran (HxCDF), 2-3-4-7-8-pentaclorodibenzofurano (PeCDF)/2-3-4-7-8-pentachlorodibenzofuran (PeCDF), 2-3-7-8-tetraclorodibenzo-p-diossina (TCDD)/2-3-7-8-tetrachlorodibenzo-p-dioxin (TCDD), 2-3-7-8-tetraclorodibenzofurano (TCDF)/2-3-7-8-tetrachlorodibenzofuran (TCDF), Ottaclorodibenzo-p-diossina (OCDD)/Octachlorodibenzo-p-dioxin (OCDD), Ottaclorodibenzofurano (OCDF)/Octachlorodibenzofuran (OCDF)	EPA 1613B 1994	HRGC-HRMS	
Clostridium perfringens/Clostridium perfringens	UNI EN ISO 7937:2005	Metodo colturale-conta	
Coliformi/Coliforms	ISO 4832:2006	Metodo colturale-conta	
Escherichia coli beta-glucuronidasi positiva/Beta-glucuronidase-positive Escherichia coli	ISO 16649-2:2001	Metodo colturale-conta	
Listeria monocytogenes/Listeria monocytogenes	UNI EN ISO 11290-1:2017	Metodo colturale - ricerca	

Sommatoria di policlorodibenzodiossine/policlorodibenzofurani (PCDD/PCDF) come tossicità equivalente WHO-TEQ (1998) (da calcolo)/Sum of polychlorinated dibenzodioxins/polychlorinated dibenzofurans (PCDD/PCDF) as equivalent toxicity WHO-TEQ (1998) (calculation), Sommatoria di policlorodibenzodiossine/policlorodibenzofurani (PCDD/PCDF) come tossicità equivalente WHO-TEQ (2005) (da calcolo)/Sum of polychlorinated dibenzodioxins/polychlorinated dibenzofurans (PCDD/PCDF) as equivalent toxicity WHO-TEQ (2005) (calculation)	EPA 1613B 1994, WHO-TEF 1998, Calcolo WHO-TEF 2005	

Alimenti/Food, Supporti da campionamento superfici ambienti del settore alimentare/Samples from surface sampling of food industry environment

Denominazione della prova / Campi di prova	*Metodo di prova*	*Tecnica di prova*	*O&I*
Stafilococchi coagulasi positivi (Staphylococcus aureus e altre specie)/Coagulase-positive staphylococci (Staphylococcus aureus and other species)	UNI EN ISO 6888-1:2021	Metodo colturale-conta	

Aria ambiente/Ambient air

Denominazione della prova / Campi di prova	*Metodo di prova*	*Tecnica di prova*	*O&I*
Etilmercaptano/Ethylmercaptan, Metilmercaptano/Methylmercaptan, N-butilmercaptano/N-butylmercaptan (>50 microgrammi)	MPI-253-2022 Rev.1	GC-FID	
Idrogeno/Hydrogen, Monossido di carbonio/Carbon monoxide (> 1 ppmV)	MPI-256-2022 Rev.2	GC-PDD	
IPA/PAH : Benzo(a)pirene/Benzo(a)pyrene	UNI EN 15549:2008	GC-MS	
Particolato sospeso PM10/Suspended particulate matter PM10, Particolato sospeso PM2.5/Suspended particulate matter PM2.5	UNI EN 12341:2014	Gravimetria	
Polveri totali/Mass concentration of particulate matter (>0,01 mg/m3)	MPI-103-2019 Rev. 6	Gravimetria	
Su particolato sospeso PM10/On suspended particulate matter PM10 : Arsenico/Arsenic, Cadmio/Cadmium, Nichel/Nickel, Piombo/Lead	UNI EN 14902:2005/EC1:2008	ICP-MS	

CHIMICA APPLICATA DEPURAZIONE ACQUE di GIGLIO FILIPPO & C. Snc Via Pio La Torre, 13 - AREA P.I.P. 92013 Menfi AG	UNI CEI EN ISO/IEC 17025:2018
	Revisione: **67** Data: **29/02/2024**
	Sede **A** pag. **13** di **37**

Aria di ambienti di lavoro/Workplace air

Denominazione della prova / Campi di prova	*Metodo di prova*	*Tecnica di prova*	*O&I*
1-1-1-2-tetracloroetano/1-1-1-2-tetrachloroethane, 1-1-1-tricloroetano (metilcloroformio)/1-1-1-trichloroethane (methylchloroform), 1-1-2-2-tetracloroetano/1-1-2-2-tetrachloroethane, 1-1-2-tricloroetano/1-1-2-trichloroethane, 1-1-dicloroetano/1-1-dichloroethane, 1-1-dicloroetilene/1-1-dichloroethene, 1-1-dicloropropene/1-1-dichloropropene, 1-2-3-tricloropropano/1-2-3-trichloropropane, 1-2-3-trimetilbenzene/1-2-3-trimethylbenzene, 1-2-4-trimetilbenzene/1-2-4-trimethylbenzene, 1-2-dibromo-3-cloropropano/1-2-dibromo-3-chloropropane, 1-2-dibromoetano/1-2-dibromoethane, 1-2-diclorobenzene/1-2-dichlorobenzene, 1-2-dicloroetano/1-2-dichloroethane, 1-2-dicloroetilene (cis)/1-2-dichloroethene (cis), 1-2-dicloroetilene (trans)/1-2-dichloroethene (trans), 1-2-dicloropropano/1-2-dichloropropane, 1-3-5-trimetilbenzene/1-3-5-trimethylbenzene, 1-3-diclorobenzene/1-3-dichlorobenzene, 1-3-dicloropropano/1-3-dichloropropane, 1-3-dicloropropene (cis)/1-3-dichloropropene (cis), 1-3-dicloropropene (trans)/1-3-dichloropropene (trans), 1-4-diclorobenzene/1-4-dichlorobenzene, 1-ottene/1-octene, 1,4-diossano/1,4-Dioxane, 2-2-dicloropropano/2-2-dichloropropane, 2-4-diclorotoluene/2-4-dichlorotoluene, 2-clorotoluene/2-Chlorotoluene, 2-esanone/2-hexanone, 2-metil-1-3-butadiene (isoprene)/2-methyl-1-3-butadiene (isoprene), 2-nitropropano/2-nitropropane, 3-etiltoluene/3-ethyltoluene, 4-clorotoluene/4-Chlorotoluene, 4-etiltoluene/4-ethyltoluene, 4-isopropiltoluene/4-isopropyltoluene, Acetato di 2-butossietile/2-butoxyethyl acetate, Acetato di etile/Ethyl acetate, Acetato di isoamile/Isoamyl acetate, Acetato di isobutile/Isobutyl acetate, Acetato di n-amile/N-amyl acetate, Acetato di n-butile/N-butyl acetate, Acetato di n-propile/n-propyl acetate, Acetato di sec-butile/sec-butylacetate, Acetato di tert-butile/tert-butyl acetate, Acrilato di 2-etilesile /2-Ethylhexyl acrylate, Acrilato di etile/Ethyl acrylate, Acrilato di metile/Methyl acrylate, Acrilato di n-butile/N-butyl acrylate, Acrilonitrile/Acrylonitrile, Alfa-metilstirene/Alpha-methylstyrene, Benzene/Benzene, Benzil cloruro/Benzyl chloride, Bromobenzene/Bromobenzene, Bromoclorometano/Bromochloromethane, Bromodiclorometano/Bromodichloromethane, Butilcicloesano/Butylcyclohexane, Cicloesano/Cyclohexane, Cicloesanone/Cyclohexanene, Clorobenzene/Chlorobenzene, Cloroetano/Chloroethane, Cloroetilene (Cloruro di vinile)/Chloroethylene (Vinyl chloride), Clorometano/Chloromethane, D-Limonene (cinene)/D-Limonene (cinene), Decametilciclopentasilossano/Decamethylcyclopentasiloxane, Decametiltetrasilossano/Decamethyltetrasiloxane, Di-isobutil chetone (DIBK)/Di-isobutyl ketone (DIBK), Di-metil chetone (Acetone)/Di-methyl ketone (Acetone), Dibromoclorometano/Dibromochloromethane, Dibromometano/Dibromomethane, Diciclopentadiene/Dicyclopentadiene, Diclorometano/Dichloromethane, Dodecametilcicloesasilossano/Dodecamethylcyclohexasiloxane, Dodecametilpentasilossano/Dodecamethylpentasiloxane, Esacloro-1-3-butadiene/Hexachloro-1-3-butadiene, Esadecano/Hexadecane, Esametildisilossano/Hexamethyldisiloxane, Etilbenzene/Ethylbenzene, Etilterbutiletere (ETBE)/Ethyltertbutylether (ETBE), Isopropilbenzene (Cumene)/Isopropylbenzene (Cumene), m+p-xilene/m+p-xylene, Metacrilato di etile/Ethyl methacrylate, Metacrilato di isobutile/Isobutyl methacrylate, Metacrilonitrile/Methacrylonitrile, Metil etil chetone (MEK)/Methyl ethyl ketone (MEK), Metil isobutilchetone (MIBK)/Methyl isobuthylketone (MIBK), Metilterbutiletere (MTBE)/Methyltertbutylether (MTBE), N-butilbenzene/N-butylbenzene, n-decano/N-decane, n-dodecano/N-dodecane, n-eptano/n-heptane, n-esano/n-hexane, n-nonano/N-nonane, n-ottano/N-octane, n-pentano/n-pentane, n-propilbenzene/N-propylbenzene, n-undecano/N-undecane, o-xilene/o-xylene, Octametilciclotetrasilossano/Octamethylcyclotetrasiloxane, Propionitrile/Propionitrile, sec-butilbenzene/sec-butylbenzene, Stirene/Styrene, ter-butilbenzene/ter-butylbenzene, Tetracloroetilene/Tetrachloroethene, Tetraclorometano (Tetracloruro di carbonio)/Tetrachloromethane (Carbon tetrachloride), Tetraidrofurano/Tetrahydrofuran, Toluene/Toluene, Tribromometano (Bromoformio)/Tribromomethane (Bromoform), Tricloroetilene (Trielina)/Trichloroethene, Triclorofluorometano (FREON 11)/Trichlorofluoromethane (FREON 11), Triclorometano (Cloroformio)/Trichloromethane (Chloroform), Vinilcicloesene/Vinylcyclohexene	ISO 16200-1:2001	GC-MS	

1-butanolo (alcol n-butilico)/1-butanol (n-butyl alcohol), 1-propanolo (alcol n-propilico)/1-propanol (n-propylic alcohol), 2-butanolo (alcol sec-butilico)/2-butanol (sec-butyl alcohol), 2-metil-1-propanolo (alcol isobutilico)/2-methyl-1-propanol (Isobutanol), 2-metil-2-propanolo (alcol terbutilico)/2-methyl-2-propanol (tert-Butyl alcohol), 2-propanolo (alcol isopropilico)/2-propanol (isopropyl alcohol), Etanolo (Alcol etilico)/Ethanol (Ethyl alcohol), Metanolo (Alcol metilico)/Methanol (Methyl alcohol)	ISO 16200-1:2001	GC-FID

Aria di ambienti di lavoro/Workplace air, Aria di ambienti di vita/Ambient air

Denominazione della prova / Campi di prova	*Metodo di prova*	*Tecnica di prova*	*O&I*
Amianto/Asbestos : Fibre aerodisperse di Amianto/Airborne fibres of asbestos	DM 06/09/1994 GU n 288 10/12/1994 All 2 met B	Microscopia elettronica: SEM	
Fibre aerodisperse/Airborne fibre	DM 06/09/1994 GU n 288 10/12/1994 All 2 Met A	Microscopia ottica: MOCF	

Campioni gassosi/Gaseous samples, Emissioni e flussi aeriformi convogliati/Emissions to air and gas flows in ducts

Denominazione della prova / Campi di prova	*Metodo di prova*	*Tecnica di prova*	*O&I*
Concentrazione di odore/Odour concentration	UNI EN 13725:2022	Olfattometria dinamica	

Cereali/Cereals

Denominazione della prova / Campi di prova	*Metodo di prova*	*Tecnica di prova*	*O&I*
Aflatossina B1/Aflatoxin B1, Aflatossina B2/Aflatoxin B2, Aflatossina G1/Aflatoxin G1, Aflatossina G2/Aflatoxin G2, Aflatossine totali (B1 + B2 +G1 +G2)/Total aflatoxins (B1 + B2 +G1 +G2) (0,4- 10 µg/kg)	MPI-96-2022 Rev.3	LC-MS/MS	

Combustibili solidi secondari (CSS)/Solid recovered fuels

Denominazione della prova / Campi di prova	*Metodo di prova*	*Tecnica di prova*	*O&I*
Potere calorifico inferiore /Net calorific value, Potere calorifico superiore/Gross calorific value	UNI EN ISO 21654:2022	Calorimetria	

Compost (1)/Compost (1), Fanghi/Sludges, Rifiuti/Wastes, Sedimenti/Sediments, Suoli/Soils

Denominazione della prova / Campi di prova	*Metodo di prova*	*Tecnica di prova*	*O&I*
Cromato (da calcolo)/Chromate (calculation), Cromo esavalente (Cr VI)/Hexavalent Chromium (Cr VI)	EPA 3060A 1996, EPA 7199 1996	IC	

Compost (1)/Compost (1), Fanghi/Sludges, Rifiuti/Wastes, Sedimenti/Sediments, Terreni/Soils

Denominazione della prova / Campi di prova	*Metodo di prova*	*Tecnica di prova*	*O&I*
Cromato (da calcolo)/Chromate (calculation), Cromo esavalente (Cr VI)/Hexavalent Chromium (Cr VI)	EPA 3060A 1996 + EPA 7196A 1992	Spettrofotometria UV-VIS	

Compost/Compost

Denominazione della prova / Campi di prova	*Metodo di prova*	*Tecnica di prova*	*O&I*
Azoto organico/Organic nitrogen	ANPA 14 Man 3 2001	Titrimetria	
Azoto totale/Total nitrogen	ANPA 13 + 14 Man 3 2001	Calcolo	
Azoto totale/Total nitrogen (NTK)	ANPA 13 Man 3 2001	Titrimetria	
Carbonio fulvico (HA+FA)/Fulvic carbon (HA+FA), Carbonio umico (HA+FA)/Humified carbon (HA+FA)	ANPA 11 Man 3 2001	Titrimetria	
Carbonio organico/Organic carbon	ANPA 10 Man 3 2001	Titrimetria	
Ceneri/Ash, Solidi volatili/Volatile solids	ANPA 6 Man 3 2001	Gravimetria	
Indice di germinazione/Index of germination	UNI 10780:1998 App K	Misura della dimensione	
Materiali inerti: materiali inerti totali, plastica, vetro, metallo/Inert material:total inert materials, plastic, glass, metallic materials	ANPA 4 Man 3 2001	Gravimetria	

pH/pH	ANPA 8 Man 3 2001	Potenziometria	
Salinità/Salinity	ANPA 9 Man 3 2001	Conduttimetria	
Salmonella spp/Salmonella spp	UNI 10780:1998 App H	Metodo colturale - ricerca	
Sostanza secca/Dry matter, Umidità/Moisture	ANPA 5 Man 3 2001	Gravimetria	

Compost/Compost, Rifiuti organici/Biowaste

Denominazione della prova / Campi di prova	*Metodo di prova*	*Tecnica di prova*	*O&I*
Indice di respirazione dinamico potenziale/Potential dinamic respirometric index, Indice di respirazione dinamico reale/Real dinamic respirometric index	UNI 11184:2016	Polarografia	

Compost/Compost, Sedimenti (1)/Sediments (1), Suoli/Soils

Denominazione della prova / Campi di prova	*Metodo di prova*	*Tecnica di prova*	*O&I*
Inibizione della crescita radicale/Inhibition of root growth	ISO 11269-1:2012	Esame visivo	

Composti chimici solidi e liquidi/Solid and liquid chemical compounds

Denominazione della prova / Campi di prova	*Metodo di prova*	*Tecnica di prova*	*O&I*
Punto di infiammabilità/Flash point	ASTM E502-21a + ASTM D3828-16a(2021)	Misura della temperatura	

Effluenti torbidi e colorati/Effluents (especially turbid and coloured), Estratti acquosi (percolati, eluati ed elutriati) di suoli/Aqueous extracts (e.g. leachates, eluates, elutriates) of soil, Rifiuti solidi (torbidi e colorati)/Wastes (especially turbid and coloured), Sedimenti/Sediments, Sospensioni acquose di sedimenti (superficiali, salmastri, e marini)/Water suspensions of sediments (fresh water, brackish, and seawater sediments)

Denominazione della prova / Campi di prova	*Metodo di prova*	*Tecnica di prova*	*O&I*
Valutazione della tossicità acuta con batteri bioluminescenti: Vibrio fischeri/Acute toxicity test with bioluminescent bacteria: Vibrio fischeri	ISO 21338:2010	Spettrofotometria UV-VIS	

Emissioni da sorgente fissa/Stationary source emissions

Denominazione della prova / Campi di prova	*Metodo di prova*	*Tecnica di prova*	*O&I*
1-butanolo (alcol n-butilico)/1-butanol (n-butyl alcohol), 1-propanolo (alcol n-propilico)/1-propanol (n-propylic alcohol), 2-butanolo (alcol sec-butilico)/2-butanol (sec-butyl alcohol), 2-metil-1-propanolo (alcol isobutilico)/2-methyl-1-propanol (Isobutanol), 2-metil-2-propanolo (alcol terbutilico)/2-methyl-2-propanol (tert-Butyl alcohol), 2-propanolo (alcol isopropilico)/2-propanol (isopropyl alcohol), Etanolo (Alcol etilico)/Ethanol (Ethyl alcohol), Metanolo (Alcol metilico)/Methanol (Methyl alcohol) (>2 microgrammi)	MPI-254-2022 Rev.2	GC-FID	
Antimonio/Antimony, Arsenico/Arsenic, Cadmio/Cadmium, Cobalto/Cobalt, Cromo/Chromium, Manganese/Manganese, Nichel/Nickel, Piombo/Lead, Rame/Copper, Tallio/Thallium, Vanadio/Vanadium	UNI EN 14385:2004	ICP-OES	
Concentrazione in massa di polveri basse concentrazioni/Low range mass concentration of dust	UNI EN 13284-1:2017	Gravimetria	
Fluoruri gassosi espressi come Acido Fluoridrico/Gaseous fluoride expressed as Hydrofluoric acid	ISO 15713:2006	Potenziometria	

Emissioni da sorgenti attive/Stack emission from active area sources, Emissioni e flussi aeriformi convogliati/Emissions to air and gas flows in ducts

Denominazione della prova / Campi di prova	*Metodo di prova*	*Tecnica di prova*	*O&I*
Portata di odore/Odour emission rate	UNI EN 13725:2022	Calcolo	

Emissioni: flussi gassosi convogliati/Stack emission in conveyed gas flow

Denominazione della prova / Campi di prova	*Metodo di prova*	*Tecnica di prova*	*O&I*
Acido solfidrico (Solfuro d'idrogeno)/Hydrogen sulfide (Sulphur hydride)	MU 634:84	Titrimetria	

Fanghi (1)/Sludges (1), Rifiuti/Wastes, Sedimenti (1)/Sediments (1), Terreni (1)/Soils (1)

Denominazione della prova / Campi di prova	*Metodo di prova*	*Tecnica di prova*	*O&I*
Residuo secco a 105°C/Dry residue at 105°C, Umidità (da calcolo)/Moisture (calculation)	UNI EN 14346:2007 Met A	Gravimetria	

Fanghi/Sludges, Rifiuti (1)/Wastes (1), Sedimenti (1)/Sediments (1), Suoli/Soils

Denominazione della prova / Campi di prova	*Metodo di prova*	*Tecnica di prova*	*O&I*
Perclorato/Perchlorate	EPA 6850 2007	HPLC-MS	

Fanghi/Sludges, Rifiuti (1)/Wastes (1), Suoli/Soils

Denominazione della prova / Campi di prova	*Metodo di prova*	*Tecnica di prova*	*O&I*
Composti perfluoroalchilici (PFAS)/Perfluoroalkyl compounds : Acido perfluoroottanosolfonico (PFOS)/Perfluorooctanesulfonic acid (PFOS)	ASTM D7968-17a	LC-MS/MS	

Fanghi/Sludges, Rifiuti/Wastes, Sedimenti (1)/Sediments (1)

Denominazione della prova / Campi di prova	*Metodo di prova*	*Tecnica di prova*	*O&I*
Anioni/Anions : Solfuri/Sulphides	CNR IRSA 12 Q 64 Vol 3 1986	Titrimetria	

Fanghi/Sludges, Rifiuti/Wastes, Sedimenti (1)/Sediments (1), Solidi/Solids, Suoli (1)/Soils (1)

Denominazione della prova / Campi di prova	*Metodo di prova*	*Tecnica di prova*	*O&I*
Cianuri disponibili/Cyanides amenable, Cianuri liberi/Free cyanides, Cianuri totali/Total cyanides	EPA 9010C 2004, EPA 9013A 2014, EPA 9014 2014	Spettrofotometria UV-VIS	

Fanghi/Sludges, Rifiuti/Wastes, Sedimenti (1)/Sediments (1), Solidi/Solids, Terreni/Soils

Denominazione della prova / Campi di prova	*Metodo di prova*	*Tecnica di prova*	*O&I*
pH/pH	EPA 9045D 2004	Potenziometria	

Fanghi/Sludges, Rifiuti/Wastes, Sedimenti (1)/Sediments (1), Suoli/Soils

Denominazione della prova / Campi di prova	*Metodo di prova*	*Tecnica di prova*	*O&I*
Pesticidi/Pesticides : Alaclor/Alachlor, Aldrina/Aldrin, Alfa-esaclorocicloesano (alfa-HCH)/Alpha-hexachlorocyclohexane (alpha-HCH), Beta-esaclorocicloesano (beta-HCH)/Beta-hexachlorocyclohexane (beta-HCH), Clordano (cis)/Chlordane (cis), Clordano (trans)/Chlordane (trans), Delta-esaclorocicloesano (delta-HCH)/Delta-hexachlorocyclohexano (delta-HCH), Dieldrina/Dieldrin, Endosulfan alfa/Endosulfan alpha, Endosulfan beta/Endosulfan beta, Endrina/Endrin, Eptacloro epossido/Heptachlor epoxide, Eptacloro/Heptachlor, Esaclorobenzene (HCB)/Hexachlorobenzene (HCB), Gamma-esaclorocicloesano (gamma-HCH Lindano)/Gamma-hexachlorocyclohexane (gamma-HCH Lindane), Metossicloro/Methoxychlor, Mirex/Mirex, o-p'-DDD (Diclorodifenildicloroetano)/o-p'-DDD (Dichlorodiphenyldichloroethane), o-p'-DDE (Diclorodifenildicloroetilene)/o-p'-DDE (Dichlorodiphenyldichloroethylene), o-p'-DDT (Diclorodifeniltricloroetano)/o-p'-DDT (Dichlorodiphenyltrichloroethane), p-p'-DDD (Diclorodifenildicloroetano)/p-p'-DDD (Dichlorodiphenyldichloroethane), p-p'-DDT (Diclorodifeniltricloroetano)/p-p'-DDT (Dichlorodiphenyltrichloroethane), p-p'-DDE (Diclorodifenildicloroetilene)/p-p'-DDE (Dichlorodiphenyldichloroethylene), Paraffine clorurate a catena corta (SCCP) C10-C13/Short-chain chlorinated paraffins (SCCP) C10-C13, Toxafene/Toxaphene	EPA 3541 1994, EPA 3630C 1996, EPA 8081B 2007	GC-ECD	
Residuo secco/Dry weight content, Sostanza secca (da calcolo)/Dry matter (calculation), Umidità (da calcolo)/Moisture (calculation)	UNI EN 15934:2012	Gravimetria	

Fanghi/Sludges, Rifiuti/Wastes, Sedimenti (1)/Sediments (1), Terreni (1)/Soils (1)

Denominazione della prova / Campi di prova	*Metodo di prova*	*Tecnica di prova*	*O&I*

Azoto ammoniacale/Ammonium nitrogen	CNR IRSA 7 Q 64 Vol 3 1986	Titrimetria
Azoto/Nitrogen	CNR IRSA 6 Q 64 Vol 3 1985	Titrimetria
Coliformi fecali/Fecal coliforms	CNR IRSA 3.2 Q 64 Vol 1 1983 + APAT CNR IRSA 7020 B Man 29 2003	Metodo colturale-conta
Coliformi totali/Total coliforms	CNR IRSA 3.1 Q 64 Vol 1 1983 + APAT CNR IRSA 7010 B Man 29 2003	MPN
Salmonella spp/Salmonella spp	CNR IRSA 3.5 Q 64 Vol 1 1983	Metodo colturale - ricerca
Spore di clostridium spp solfito riduttori/Spores of sulphite-reducing clostridium	CNR IRSA 3.4 Q 64 Vol 1 1983 + APAT CNR IRSA 7060 B Man 29 2003	Metodo colturale-conta
Streptococchi fecali/Intestinal streptococci	CNR IRSA 3.3 Q 64 Vol 1 1983 + APAT CNR IRSA 7040 A Man 29 2003	MPN
Su eluati da test di cessione/In eluates from leaching test : Acenaftene/Acenaphthene, Acenaftilene/Acenaphthylene, Antracene/Anthracene, Benzo(a)antracene/Benzo(a)anthracene, Benzo(a)pirene/Benzo(a)pyrene, Benzo(b)fluorantene/Benzo(b)fluoranthene, Benzo(e)pirene/Benzo(e)pyrene, Benzo(ghi)perilene/Benzo(ghi)perylene, Benzo(j)fluorantene/Benzo(j)fluoranthene, Benzo(k)fluorantene/Benzo(k)fluoranthene, Crisene/Chrysene, Dibenzo(ae)pirene/Dibenzo(ae)pyrene, Dibenzo(ah)antracene/Dibenzo(ah)anthracene, Dibenzo(ah)pirene/Dibenzo(ah)pyrene, Dibenzo(ai)pirene/Dibenzo(ai)pyrene, Dibenzo(al)pirene/Dibenzo(al)pyrene, Fenantrene/Phenanthrene, Fluorantene/Fluoranthene, Fluorene/Fluorene, Indeno(1-2-3-cd)pirene/Indeno(1-2-3-cd)pyrene, Naftalene/Naphthalene, Perilene/Perylene, Pirene/Pyrene	UNI EN 12457-2:2004, EPA 3510C 1996, EPA 8270E 2018	GC-MS
Su eluati da test di cessione/In eluates from leaching test : Alaclor/Alachlor, Aldrina/Aldrin, Alfa-esaclorocicloesano (alfa-HCH)/Alpha-hexachlorocyclohexane (alpha-HCH), Atrazina/Atrazine, Beta-esaclorocicloesano (beta-HCH)/Beta-hexachlorocyclohexane (beta-HCH), Clordano (Cis + Trans)/Chlordane (Cis + Trans), Clordecone/Chlordecone (Kepone), Delta-esaclorocicloesano (delta-HCH)/Delta-hexachlorocyclohexano (delta-HCH), Dieldrina/Dieldrin, Endosulfan alfa/Endosulfan alpha, Endosulfan beta/Endosulfan beta, Endosulfan/Endosulfan, Endrina/Endrin, Eptacloro epossido/Heptachlor epoxide, Eptacloro/Heptachlor, Esaclorobenzene (HCB)/Hexachlorobenzene (HCB), Gamma-esaclorocicloesano (gamma-HCH Lindano)/Gamma-hexachlorocyclohexane (gamma-HCH Lindane), Isodrina/Isodrin, Metossicloro/Methoxychlor, Mirex/Mirex, o-p'-DDD (Diclorodifenildicloroetano)/o-p'-DDD (Dichlorodiphenyldichloroethane), o-p'-DDE (Diclorodifenildicloroetilene)/o-p'-DDE (Dichlorodiphenyldichloroethylene), o-p'-DDT (Diclorodifeniltricloroetano)/o-p'-DDT (Dichlorodiphenyltrichloroethane), p-p'-DDD (Diclorodifenildicloroetano)/p-p'-DDD (Dichlorodiphenyldichloroethane), p-p'-DDT (Diclorodifeniltricloroetano)/p-p'-DDT (Dichlorodiphenyltrichloroethane), p-p'-DDE (Diclorodifenildicloroetilene)/p-p'-DDE (Dichlorodiphenyldichloroethylene)	UNI EN 12457-2:2004, EPA 3510C 1996, EPA 8270E 2018	GC-MS

Su eluati da test di cessione/In eluates from leaching test : Cianuri liberi/Free cyanides, Cianuri totali/Total cyanides	UNI EN 12457-2:2004, UNI EN ISO 14403-2:2013	Continuous flow analysis CFA	
Su eluati da test di cessione/In eluates from leaching test : Indice di fenolo/Phenol index	UNI EN 12457-2:2004, EN ISO 14402:2004	Continuous flow analysis CFA	
Su eluati da test di cessione/In eluates from leaching test : pH/pH	UNI EN 12457-2:2004, UNI EN ISO 10523:2012	Potenziometria	
Su eluati da test di cessione/In eluates from leaching test : Tensioattivi anionici/Anionic surfactants	UNI EN 12457-2:2004, APAT CNR IRSA 5170 Man 29 2003	Spettrofotometria UV-VIS	

Fanghi/Sludges, Rifiuti/Wastes, Sedimenti (1)/Sediments (1), Terreni/Soils

Denominazione della prova / Campi di prova	*Metodo di prova*	*Tecnica di prova*	*O&I*
Azoto nitrico/Nitric nitrogen	CNR IRSA 8a Q 64 Vol 3 1986	Spettrofotometria UV-VIS	
Cianuri liberi/Free cyanides, Cianuri totali/Total cyanides	MU 2251:08 App C	IC	
Composti perfluoroalchilici (PFAS)/Perfluoroalkyl compounds : Acido 1H,1H,2H,2H-Perfluoroottansolfonico (6:2 FTS)/1H,1H,2H,2H-Perfluorooctanesulfonic acid (6:2 FTS), Acido 2H-2H-3H-3H-perfluoroundecanoico (H4PFUnA)/2H-2H-3H-3H-perfluoroundecanoic (H4PFUnA), Acido 2H-2H-perfluorodecanoico (H2PFDA)/2H-2H-Perfluorodecanoic acid (H2PFDA), Acido 7H-perfluoroeptanoico (HPFHpA)/7H-Perfluoroheptanoic acid (HPFHpA), Acido N-etil perfluoroottansolfonoamidoacetico (N-Et-FOSAA)/N-ethyl perfluorooctanesulfonamidoacetic acid (N-Et-FOSAA), Acido N-metil perfluoroottansolfonoamidoacetico (N-Me-FOSAA)/N-methyl perfluorooctanesulfonamidoacetic acid (N-Me-FOSAA), Acido perfluoro-3,7-dimetillottanoico/Perfluoro-3,7-dimethyloctanoic acid, Acido perfluoro-n-esadecanoico (PFHxDA)/Perfluoro-n-hexadecanoic acid (PFHxDA), Acido perfluoro-n-ottadecanoico (PFODA)/Perfluoro-n-octadecanoic acid (PFODA), Acido perfluorobutanoico (PFBA) /Perfluorobutanoic acid (PFBA), Acido perfluorobutansolfonico (PFBS)/Perfluorobutanesulfonic acid (PFBS), Acido perfluorodecanoico (PFDA)/Perfluorodecanoic acid (PFDA), Acido perfluorodecansolfonico (PFDS)/Perfluorodecanesulfonic acid (PFDS), Acido perfluorododecanoico (PFDoA)/Perfluorododecanoic acid (PFDoA), Acido perfluorododecanosulfonico (PFDOS)/Perfluorododecanesulfonic Acid (PFDOS), Acido perfluoroeptanoico (PFHpA)/Perfluoroheptanoic acid (PFHpA), Acido perfluoroeptansolfonico (PFHpS)/Perfluoroheptanesulfonic acid (PFHpS), Acido perfluoroesanoico (PFHxA)/Perfluorohexanoic acid (PFHxA), Acido perfluoroesansolfonico (PFHxS)/Perfluorohexanesulfonic acid (PFHxS), Acido perfluorononanoico (PFNA)/Perfluorononanoic acid (PFNA), Acido perfluorononansolfonico (PFNS)/Perfluorononanesulfonic acid (PFNS), Acido perfluoroottanoico (PFOA)/Perfluorooctanoic acid (PFOA), Acido perfluoroottanosolfonico (PFOS)/Perfluorooctanesulfonic acid (PFOS), Acido perfluoropentanoico (PFPeA)/Perfluoropentanoic acid (PFPeA), Acido perfluoropentansolfonico (PFPeS)/Perfluoropentanesulfonic acid (PFPeS), Acido perfluorotetradecanoico (PFTeDA)/Perfluorotetradecanoic acid (PFTeDA), Acido perfluorotridecanoico (PFTrDA)/Perfluorotridecanoic acid (PFTrDA), Acido perfluoroundecanoico (PFUnA)/Perfluoroundecanoic acid (PFUnA), N-etil-eptadecafluoro ottan sulfonamide etanolo (N-Et-FOSE)/N-ethyl-heptadecafluorooctanesulphonamidoethanol (N-Et-FOSE), N-metil-eptadecafluoro ottan sulfonamide etanolo (N-Me-FOSE)/N-methyl-heptadecafluorooctanesulphonamidoethanol (N-Me-FOSE), Perfluoro-1-ottanosulfonil fluoride (PFoDE)/Perfluoro-1-octanesulfonyl fluoride (PFoDE), Perfluoro ottan sulfonamide (PFOSA)/Perfluorooctanesulphonamide (PFOSA)	EPA 3550C 2007, EPA 3570 2002, EPA 8327 2021	LC-MS/MS	

Fosforo totale/Total phosphorus	CNR IRSA 9 Q 64 Vol 3 1985	Spettrofotometria UV-VIS
Lieviti e ifomiceti/Moulds and hyphomycetes	CNR IRSA 5 Q 64 Vol 1 1983	Metodo colturale-conta
pH/pH	CNR IRSA 1 Q 64 Vol 3 1985 + APAT CNR IRSA 2060 Man 29 2003	Potenziometria
Residuo a 600°C/Residue at 600°C, Residuo secco a 105°C/Dry residue at 105°C, Solidi totali fissi a 550°C/Total fixed solids at 550°C, Solidi totali volatili/Volatile total solids, Umidità (da calcolo)/Moisture (calculation)	CNR IRSA 2 Q 64 Vol 2 1984/Notiziario IRSA 2 2008	Gravimetria
Sostanza organica/Organic matter	CNR IRSA 5 Q 64 Vol 3 1988	Titrimetria

Fanghi/Sludges, Rifiuti/Wastes, Sedimenti/Sediments

Denominazione della prova / Campi di prova	*Metodo di prova*	*Tecnica di prova*	*O&I*
Carbonio inorganico totale (TIC)/Total Inorganic Carbon (TIC), Carbonio organico totale (TOC)/Total Organic Carbon (TOC), Carbonio totale (TC)/Total carbon (TC)	UNI EN 15936:2022	Spettrofotometria IR	
Perdita al fuoco (PAF)/Loss on ignition, Residuo al fuoco (ROI)/Residue on ignition	UNI EN 15169:2007	Gravimetria	

Fanghi/Sludges, Rifiuti/Wastes, Sedimenti/Sediments, Solidi/Solids, Terreni/Soils

Denominazione della prova / Campi di prova	*Metodo di prova*	*Tecnica di prova*	*O&I*
1-2-3-4-6-7-8-eptaclorodibenzo-p-diossina (HpCDD)/1-2-3-4-6-7-8-heptachlorodibenzo-p-dioxin (HpCDD), 1-2-3-4-6-7-8-eptaclorodibenzofurano (HpCDF)/1-2-3-4-6-7-8-heptachlorodibenzofuran (HpCDF), 1-2-3-4-7-8-9-eptaclorodibenzofurano (HpCDF)/1-2-3-4-7-8-9-heptachlorodibenzofuran (HpCDF), 1-2-3-4-7-8-esaclorodibenzo-p-diossina (HxCDD)/1-2-3-4-7-8-hexachlorodibenzo-p-dioxin (HxCDD), 1-2-3-4-7-8-esaclorodibenzofurano (HxCDF)/1-2-3-4-7-8-hexachlorodibenzofuran (HxCDF), 1-2-3-6-7-8-esaclorodibenzo-p-diossina (HxCDD)/1-2-3-6-7-8-hexachlorodibenzo-p-dioxin (HxCDD), 1-2-3-6-7-8-esaclorodibenzofurano (HxCDF)/1-2-3-6-7-8-hexachlorodibenzofuran (HxCDF), 1-2-3-7-8-9-esaclorodibenzo-p-diossina (HxCDD)/1-2-3-7-8-9-hexachlorodibenzo-p-dioxin (HxCDD), 1-2-3-7-8-9-esaclorodibenzofurano (HxCDF)/1-2-3-7-8-9-hexachlorodibenzofuran (HxCDF), 1-2-3-7-8-pentaclorodibenzo-p-diossina (PeCDD)/1-2-3-7-8-pentachlorodibenzo-p-dioxin (PeCDD), 1-2-3-7-8-pentaclorodibenzofurano (PeCDF)/1-2-3-7-8-pentachlorodibenzofuran (PeCDF), 2-3-4-6-7-8-esaclorodibenzofurano (HxCDF)/2-3-4-6-7-8-hexachlorodibenzofuran (HxCDF), 2-3-4-7-8-pentaclorodibenzofurano (PeCDF)/2-3-4-7-8-pentachlorodibenzofuran (PeCDF), 2-3-7-8-tetraclorodibenzo-p-diossina (TCDD)/2-3-7-8-tetrachlorodibenzo-p-dioxin (TCDD), 2-3-7-8-tetraclorodibenzofurano (TCDF)/2-3-7-8-tetrachlorodibenzofuran (TCDF), Ottaclorodibenzo-p-diossina (OCDD)/Octachlorodibenzo-p-dioxin (OCDD), Ottaclorodibenzofurano (OCDF)/Octachlorodibenzofuran (OCDF)	EPA 8280B 2007	HRGC-LRMS	

CHIMICA APPLICATA DEPURAZIONE ACQUE di GIGLIO FILIPPO & C. Snc Via Pio La Torre, 13 - AREA P.I.P. 92013 Menfi AG	UNI CEI EN ISO/IEC 17025:2018	
	Revisione: **67**	Data: **29/02/2024**
	Sede **A**	pag. **20** di **37**

Fanghi/Sludges, Rifiuti/Wastes, Sedimenti/Sediments, Suoli/Soils

Denominazione della prova / Campi di prova	*Metodo di prova*	*Tecnica di prova*	*O&I*
1-2-3-4-6-7-8-eptaclorodibenzo-p-diossina (HpCDD)/1-2-3-4-6-7-8-heptachlorodibenzo-p-dioxin (HpCDD), 1-2-3-4-6-7-8-eptaclorodibenzofurano (HpCDF)/1-2-3-4-6-7-8-heptachlorodibenzofuran (HpCDF), 1-2-3-4-7-8-9-eptaclorodibenzofurano (HpCDF)/1-2-3-4-7-8-9-heptachlorodibenzofuran (HpCDF), 1-2-3-4-7-8-esaclorodibenzo-p-diossina (HxCDD)/1-2-3-4-7-8-hexachlorodibenzo-p-dioxin (HxCDD), 1-2-3-4-7-8-esaclorodibenzofurano (HxCDF)/1-2-3-4-7-8-hexachlorodibenzofuran (HxCDF), 1-2-3-6-7-8-esaclorodibenzo-p-diossina (HxCDD)/1-2-3-6-7-8-hexachlorodibenzo-p-dioxin (HxCDD), 1-2-3-6-7-8-esaclorodibenzofurano (HxCDF)/1-2-3-6-7-8-hexachlorodibenzofuran (HxCDF), 1-2-3-7-8-9-esaclorodibenzo-p-diossina (HxCDD)/1-2-3-7-8-9-hexachlorodibenzo-p-dioxin (HxCDD), 1-2-3-7-8-9-esaclorodibenzofurano (HxCDF)/1-2-3-7-8-9-hexachlorodibenzofuran (HxCDF), 1-2-3-7-8-pentaclorodibenzo-p-diossina (PeCDD)/1-2-3-7-8-pentachlorodibenzo-p-dioxin (PeCDD), 1-2-3-7-8-pentaclorodibenzofurano (PeCDF)/1-2-3-7-8-pentachlorodibenzofuran (PeCDF), 2-3-4-6-7-8-esaclorodibenzofurano (HxCDF)/2-3-4-6-7-8-hexachlorodibenzofuran (HxCDF), 2-3-4-7-8-pentaclorodibenzofurano (PeCDF)/2-3-4-7-8-pentachlorodibenzofuran (PeCDF), 2-3-7-8-tetraclorodibenzo-p-diossina (TCDD)/2-3-7-8-tetrachlorodibenzo-p-dioxin (TCDD), 2-3-7-8-tetraclorodibenzofurano (TCDF)/2-3-7-8-tetrachlorodibenzofuran (TCDF), Ottaclorodibenzo-p-diossina (OCDD)/Octachlorodibenzo-p-dioxin (OCDD), Ottaclorodibenzofurano (OCDF)/Octachlorodibenzofuran (OCDF)	EPA 1613B 1994	HRGC-HRMS	
Amianto/Asbestos : Actinolite/Actinolite, Amosite/Amosite, Antofillite/Anthophyllite, Crisotilo/Chrysotile, Crocidolite/Crocidolite, Tremolite/Tremolite (Qualitativa)	MPI-260-2022 Rev.0	Microscopia ottica: MOCF	
Amianto/Asbestos : Actinolite/Actinolite, Amosite/Amosite, Antofillite/Anthophyllite, Crisotilo/Chrysotile, Crocidolite/Crocidolite, Tremolite/Tremolite (100-10000 mg/kg)	MPI-261-2022 Rev.0	Microscopia elettronica: SEM	
Amianto/Asbestos : Amosite/Amosite, Crisotilo/Chrysotile, Crocidolite/Crocidolite (1-50 %)	MPI-262-2022 Rev.0	Spettrofotometria IR	
Di-butilstagno (DBT)/Di-butyltin (DBT), Di-ottilstagno (DOT)/Di-octyltin (DOT), Mono-butilstagno (MBT)/Mono-butyltin (MBT), Mono-ottilstagno (MOT)/Mono-octyltin (MOT), Tetra-butilstagno (TTBT)/Tetra-butyltin (TTBT), Tri-butilstagno (TBT)/Tri-butyltin (TBT), Tri-cicloesilstagno (TCyT)/Tri-cyclohexyltin (TCyT), Tri-fenilstagno (TPhT)/Tri-phenyltin (TPhT)	UNI EN ISO 23161:2019	GC-MS	

PCB/PCB : 2-2-3-3-4-4-5-eptaclorobifenile (PCB 170)/2-2-3-3-4-4-5-heptachlorobiphenyl (PCB 170), 2-2-3-3-4-4-esaclorobifenile (PCB 128)/2-2-3-3-4-4-hexachlorobiphenyl (PCB 128), 2-2-3-3-4-5-6-eptaclorobifenile (PCB 177)/2-2-3-3-4-5-6-heptachlorbiphenyl (PCB 177), 2-2-3-4-4-5-5-eptaclorobifenile (PCB 180)/2-2-3-4-4-5-5-heptachlorobiphenyl (PCB 180), 2-2-3-4-4-5-6-eptaclorobifenile (PCB 183)/2-2-3-4-4-5-6-heptachlorbiphenyl (PCB 183), 2-2-3-4-4-5-esaclorobifenile (PCB 138)/2-2-3-4-4-5-hexachlorobiphenyl (PCB 138), 2-2-3-4-5-5-6-eptaclorobifenile (PCB 187)/2-2-3-4-5-5-6-heptachlorbiphenyl (PCB 187), 2-2-3-4-5-5-esaclorobifenile (PCB 146) /2-2-3-4-5-5-hexachlorobiphenyl (PCB 146), 2-2-3-4-5-6-esaclorobifenile (PCB 149)/2-2-3-4-5-6-hexachlorobiphenyl (PCB 149), 2-2-3-5-5-6-esaclorobifenile (PCB 151)/2-2-3-5-5-6-hexachlorobiphenyl (PCB 151), 2-2-3-5-6-pentaclorobifenile (PCB 95)/2-2-3-5-6-pentachlorobiphenyl (PCB 95), 2-2-4-4-5-5-esaclorobifenile (PCB 153)/2-2-4-4-5-5-hexachlorobiphenyl (PCB 153), 2-2-4-4-5-pentaclorobifenile (PCB 99)/2-2-4-4-5-pentachlorobiphenyl (PCB 99), 2-2-4-5-5-pentaclorobifenile (PCB 101)/2-2-4-5-5-pentachlorobiphenyl (PCB 101), 2-2-5-5-tetraclorobifenile (PCB 52)/2-2-5-5-tetrachlorobiphenyl (PCB 52), 2-3-3-4-4-5-5-eptaclorobifenile (PCB 189)/2-3-3-4-4-5-5-heptachlorbiphenyl (PCB 189), 2-3-3-4-4-5-esaclorobifenile (PCB 156)/2-3-3-4-4-5-hexachlorobiphenyl (PCB 156), 2-3-3-4-4-5-esaclorobifenile (PCB 157)/2-3-3-4-4-5-hexachlorobiphenyl (PCB 157), 2-3-3-4-4-pentaclorobifenile (PCB 105)/2-3-3-4-4-pentachlorobiphenyl (PCB 105), 2-3-3-4-6-pentaclorobifenile (PCB 110)/2-3-3-4-6-pentachlorobiphenyl (PCB 110), 2-3-4-4-5-5-esaclorobifenile (PCB 167)/2-3-4-4-5-5-hexachlorobiphenyl (PCB 167), 2-3-4-4-5-pentaclorobifenile (PCB 114)/2-3-4-4-5-pentachlorobiphenyl (PCB 114), 2-3-4-4-5-pentaclorobifenile (PCB 118)/2-3-4-4-5-pentachlorobiphenyl (PCB 118), 2-3-4-4-5-pentaclorobifenile (PCB 123)/2-3-4-4-5-pentachlorobiphenyl (PCB 123), 2-4-4-triclorobifenile (PCB 28)/2-4-4-trichlorobiphenyl (PCB 28), 2-4-6-triclorobifenile (PCB 30)/2-4-6-trichlorobiphenyl (PCB 30), 3-3-4-4-5-5-esaclorobifenile (PCB 169)/3-3-4-4-5-5-hexachlorobiphenyl (PCB 169), 3-3-4-4-5-pentaclorobifenile (PCB 126)/3-3-4-4-5-pentachlorobiphenyl (PCB 126), 3-3-4-4-tetraclorobifenile (PCB 77)/3-3-4-4-tetrachlorobiphenyl (PCB 77), 3-4-4-5-tetraclorobifenile (PCB 81)/3-4-4-5-tetrachlorobiphenyl (PCB 81)	EPA 1668C 2010	HRGC-HRMS
PCB/PCB : Sommatoria di policlorobifenili (PCB) come tossicità equivalente WHO-TEQ (2005) (da calcolo)/Sum of polychlorobiphenyl (PCB) as equivalent toxicity WHO-TEQ (2005) (calculation)	EPA 1668C 2010, WHO-TEF 2005	Calcolo

Sommatoria di policlorodibenzodiossine/policlorodibenzofurani (PCDD/PCDF) come tossicità equivalente I-TEQ (da calcolo)/Sum of polychlorinated dibenzodioxins/polychlorinated dibenzofurans (PCDD/PCDF) as equivalent toxicity I-TEQ from I-TEF (calculation), Sommatoria di policlorodibenzodiossine/policlorodibenzofurani (PCDD/PCDF) come tossicità equivalente WHO-TEQ (2005) (da calcolo)/Sum of polychlorinated dibenzodioxins/polychlorinated dibenzofurans (PCDD/PCDF) as equivalent toxicity WHO-TEQ (2005) (calculation)	EPA 1613B 1994, NATO/CCMS I-TEF 1988, WHO-TEF 2005	Calcolo	

Fanghi/Sludges, Rifiuti/Wastes, Sedimenti/Sediments, Terreni (1)/Soils (1)

Denominazione della prova / Campi di prova	*Metodo di prova*	*Tecnica di prova*	*O&I*
Carbonio inorganico totale (TIC)/Total Inorganic Carbon (TIC), Carbonio organico totale (TOC)/Total Organic Carbon (TOC), Carbonio totale (TC)/Total carbon (TC)	UNI EN 13137:2002	Spettrofotometria IR	

Fanghi/Sludges, Rifiuti/Wastes, Sedimenti/Sediments, Terreni/Soils

Denominazione della prova / Campi di prova	*Metodo di prova*	*Tecnica di prova*	*O&I*
Acidità/Acidity, Alcalinità totale/Total alkalinity, Alcalinità/Alkalinity, Idrossidi/Hydroxides (> 1 mg/kg)	MPI-249-2022 Rev.1	Titrimetria	
Anilina/Aniline, Difenilammina/Diphenylamine, m-anisidina (3-metossi-anilina)/m-anisidine (3-methoxy-aniline), o-anisidina (2-metossi-anilina)/o-anisidine (2-methoxy-aniline), p-anisidina (4-metossi-anilina)/p-anisidine (4-methoxy-aniline), p-toluidina (4-metilanilina)/p-toluidine (4-methylaniline)	EPA 3550C 2007, EPA 3620C 2014, EPA 8270E 2018	GC-MS	
Anioni/Anions : Solfiti/Sulphites (> 0,7 mg/kg)	MPI-248-2022 Rev.1	Titrimetria	
Benzil butilftalato (BBP)/Benzyl butylphthalate (BBP), Di-2-etilesilftalato (DEHP)/Di-2-ethylhexylphthalate (DEHP), Di-butilftalato (DBP)/Di-butylphthalate (DBP), Di-etilftalato (DEP)/Di-ethylphthalate (DEP), Di-metilftalato (DMP)/Di-methylphthalate (DMP), Di-n-ottilftalato (DNOP)/Di-n-octylphthalate (DNOP)	EPA 3550C 2007, EPA 8270E 2018	GC-MS	
Fluoruri/Fluoride (1- 25 mg/kg)	MPI-250-2022 Rev.1	Potenziometria	

CHIMICA APPLICATA DEPURAZIONE ACQUE di GIGLIO FILIPPO & C. Snc Via Pio La Torre, 13 - AREA P.I.P. 92013 Menfi AG	UNI CEI EN ISO/IEC 17025:2018	
	Revisione: **67**	Data: **29/02/2024**
	Sede **A**	pag. **23** di **37**

PCB/PCB : 2-2-3-3-4-4-5-5-6-6-decaclorobifenile (PCB 209)/2-2-3-3-4-4-5-5-6-6-decachlorobiphenyl (PCB 209), 2-2-3-3-4-4-5-5-6-nonaclorobifenile (PCB 206)/2-2-3-3-4-4-5-5-6-nonachlorobiphenyl (PCB 206), 2-2-3-3-4-4-5-eptaclorobifenile (PCB 170)/2-2-3-3-4-4-5-heptachlorobiphenyl (PCB 170), 2-2-3-3-4-4-esaclorobifenile (PCB 128)/2-2-3-3-4-4-hexachlorobiphenyl (PCB 128), 2-2-3-3-4-5-5-6-6-nonaclorobifenile (PCB 208)/2-2-3-3-4-5-5-6-6-nonachlorobiphenyl (PCB 208), 2-2-3-3-4-5-6-eptaclorobifenile (PCB 177)/2-2-3-3-4-5-6-heptachlorbiphenyl (PCB 177), 2-2-3-4-4-5-5-eptaclorobifenile (PCB 180)/2-2-3-4-4-5-5-heptachlorobiphenyl (PCB 180), 2-2-3-4-4-5-6-eptaclorobifenile (PCB 183)/2-2-3-4-4-5-6-heptachlorbiphenyl (PCB 183), 2-2-3-4-4-5-esaclorobifenile (PCB 138)/2-2-3-4-4-5-hexachlorobiphenyl (PCB 138), 2-2-3-4-5-5-6-eptaclorobifenile (PCB 187)/2-2-3-4-5-5-6-heptachlorbiphenyl (PCB 187), 2-2-3-4-5-5-esaclorobifenile (PCB 146) /2-2-3-4-5-5-hexachlorobiphenyl (PCB 146), 2-2-3-4-5-6-esaclorobifenile (PCB 149)/2-2-3-4-5-6-hexachlorobiphenyl (PCB 149), 2-2-3-5-5-6-esaclorobifenile (PCB 151)/2-2-3-5-5-6-hexachlorobiphenyl (PCB 151), 2-2-3-5-6-pentaclorobifenile (PCB 95)/2-2-3-5-6-pentachlorobiphenyl (PCB 95), 2-2-4-4-5-5-esaclorobifenile (PCB 153)/2-2-4-4-5-5-hexachlorobiphenyl (PCB 153), 2-2-4-4-5-pentaclorobifenile (PCB 99)/2-2-4-4-5-pentachlorobiphenyl (PCB 99), 2-2-4-5-5-pentaclorobifenile (PCB 101)/2-2-4-5-5-pentachlorobiphenyl (PCB 101), 2-2-4-6-6-pentaclorobifenile (PCB 104)/2-2-4-6-6-pentachlorobiphenyl (PCB 104), 2-2-5-5-tetraclorobifenile (PCB 52)/2-2-5-5-tetrachlorobiphenyl (PCB 52), 2-2-6-6-tetraclorobifenile (PCB 54)/2-2-6-6-tetrachlorobiphenyl (PCB 54), 2-2-6-triclorobifenile (PCB 19)/2-2-6-trichlorobiphenyl (PCB 19), 2-2-diclorobifenile (PCB 4)/2-2-dichlorobiphenyl (PCB 4), 2-3-3-4-4-5-5-eptaclorobifenile (PCB 189)/2-3-3-4-4-5-5-heptachlorbiphenyl (PCB 189), 2-3-3-4-4-5-esaclorobifenile (PCB 156)/2-3-3-4-4-5-hexachlorobiphenyl (PCB 156), 2-3-3-4-4-5-esaclorobifenile (PCB 157)/2-3-3-4-4-5-hexachlorobiphenyl (PCB 157), 2-3-3-4-4-pentaclorobifenile (PCB 105)/2-3-3-4-4-pentachlorobiphenyl (PCB 105), 2-3-3-4-6-pentaclorobifenile (PCB 110)/2-3-3-4-6-pentachlorobiphenyl (PCB 110), 2-3-4-4-5-5-esaclorobifenile (PCB 167)/2-3-4-4-5-5-hexachlorobiphenyl (PCB 167), 2-3-4-4-5-pentaclorobifenile (PCB 114)/2-3-4-4-5-pentachlorobiphenyl (PCB 114), 2-3-4-4-5-pentaclorobifenile (PCB 118)/2-3-4-4-5-pentachlorobiphenyl (PCB 118), 2-3-4-4-5-pentaclorobifenile (PCB 123)/2-3-4-4-5-pentachlorobiphenyl (PCB 123), 2-4-4-triclorobifenile (PCB 28)/2-4-4-trichlorobiphenyl (PCB 28), 2-4-5-triclorobifenile (PCB 31)/2-4-5-trichlorobiphenyl (PCB 31), 2-clorobifenile (PCB 1)/2-chlorobiphenyl (PCB 1), 2,2,3,3,4,4,6-eptaclorobifenile (PCB 171)/2,2,3,3,4,4,6-heptachlorobiphenyl (PCB 171), 2,2,3,3,5,5,6,6-ottaclorobifenile (PCB 202)/2,2,3,3,5,5,6,6-octachlorobiphenyl (PCB 202), 2,2,3,4,5,6,6-eptaclorobifenile (PCB 188)/2,2,3,4,5,6,6-heptachlorobiphenyl (PCB 188), 2,2,4,4,6,6-esaclorobifenile (PCB 155)/2,2,4,4,6,6-hexachlorobiphenyl (PCB 155), 2,3,3,4,4,5,5,6-ottaclorobifenile (PCB 205)/2,3,3,4,4,5,5,6-octachlorobiphenyl (PCB 205), 3-3-4-4-5-5-esaclorobifenile (PCB 169)/3-3-4-4-5-5-hexachlorobiphenyl (PCB 169), 3-3-4-4-5-pentaclorobifenile (PCB 126)/3-3-4-4-5-pentachlorobiphenyl (PCB 126), 3-3-4-4-tetraclorobifenile (PCB 77)/3-3-4-4-tetrachlorobiphenyl (PCB 77), 3-4-4-5-tetraclorobifenile (PCB 81)/3-4-4-5-tetrachlorobiphenyl (PCB 81), 3-4-4-triclorobifenile (PCB 37)/3-4-4-trichlorobiphenyl (PCB 37), 4-4-diclorobifenile (PCB 15)/4-4-dichlorobiphenyl (PCB 15), 4-clorobifenile (PCB 3)/4-chlorobiphenyl (PCB 3)	EPA 3541 1994, EPA 3630C 1996, GC-MS EPA 8270E 2018	
PCB/PCB : Aroclor 1016/Aroclor 1016, Aroclor 1221/Aroclor 1221, Aroclor 1232/Aroclor 1232, Aroclor 1242/Aroclor 1242, Aroclor 1248/Aroclor 1248, Aroclor 1254/Aroclor 1254, Aroclor 1260/Aroclor 1260, Aroclor 5060/Aroclor 5060, Aroclor 5442/Aroclor 5442, Aroclor 5460/Aroclor 5460	EPA 3541 1994, EPA 3630C 1996, GC-ECD EPA 8082A 2007	
Sommatoria di policlorobifenili (PCB) come tossicità equivalente WHO-TEQ (2005) (da calcolo)/Sum of polychlorobiphenyl (PCB) as equivalent toxicity WHO-TEQ (2005) (calculation)	EPA 3541 1994, EPA 3630C 1996, EPA 8270E 2018, WHO-TEF 2005	Calcolo

Sommatoria di policlorodibenzodiossine/policlorodibenzofurani (PCDD/PCDF) come tossicità equivalente WHO-TEQ (1998) (da calcolo)/Sum of polychlorinated dibenzodioxins/polychlorinated dibenzofurans (PCDD/PCDF) as equivalent toxicity WHO-TEQ (1998) (calculation), Sommatoria di policlorodibenzodiossine/policlorodibenzofurani (PCDD/PCDF) come tossicità equivalente WHO-TEQ (2005) (da calcolo)/Sum of polychlorinated dibenzodioxins/polychlorinated dibenzofurans (PCDD/PCDF) as equivalent toxicity WHO-TEQ (2005) (calculation)	EPA 8280B 2007, NATO/CCMS I-TEF 1988, WHO-TEF 2005	Calcolo

Fanghi/Sludges, Rifiuti/Wastes, Suoli/Soils

Denominazione della prova / Campi di prova	*Metodo di prova*	*Tecnica di prova*	*O&I*
Idrocarburi C40-C54/Hydrocarbons C40-C54 (13- 36 mg/Kg)	MPI-251-2022 Rev.1	GC-FID	

Fanghi/Sludges, Rifiuti/Wastes, Terreni (1)/Soils (1)

Denominazione della prova / Campi di prova	*Metodo di prova*	*Tecnica di prova*	*O&I*
Su eluati da test di cessione/In eluates from leaching test : 2-4-6-triclorofenolo/2-4-6-trichlorophenol, 2-4-diclorofenolo/2-4-dichlorophenol, 2-4-dimetilfenolo/2-4-dimethylphenol, 2-clorofenolo/2-chlorophenol, 2-etilfenolo/2-ethylphenol, 2-metilfenolo /2-methylphenol, 3-metilfenolo/3-methylphenol, 4-cloro-3-metilfenolo (PCMC)/4-chloro-3-methilphenol (PCMC), 4-metilfenolo/4-methylphenol, Fenolo/Phenol, Pentaclorofenolo/Pentachlorophenol	UNI EN 12457-2:2004, EPA 3510C 1996, EPA 8270E 2018	GC-MS	
Su eluati da test di cessione/In eluates from leaching test : Alluminio/Aluminium, Antimonio/Antimony, Arsenico/Arsenic, Bario/Barium, Berillio/Beryllium, Boro/Boron, Cadmio/Cadmium, Cobalto/Cobalt, Cromo/Chromium, Ferro/Iron, Manganese/Manganese, Molibdeno/Molybdenum, Nichel/Nickel, Piombo/Lead, Rame/Copper, Selenio/Selenium, Stagno/Tin, Tallio/Thallium, Vanadio/Vanadium, Zinco/Zinc	UNI EN 12457-2:2004, APAT CNR IRSA 3020 Man 29 2003	ICP-OES	
Su eluati da test di cessione/In eluates from leaching test : Ammoniaca (da calcolo)/Ammonia (calculation), Azoto ammoniacale (da calcolo)/Ammonium nitrogen (calculation), Calcio/Calcium, Ione Ammonio/Ammonium ion, Magnesio/Magnesium, Potassio/Potassium, Sodio/Sodium	UNI EN 12457-2:2004, UNI EN ISO 14911:2001	IC	
Su eluati da test di cessione/In eluates from leaching test : Antimonio/Antimony, Arsenico/Arsenic, Bario/Barium, Berillio/Beryllium, Cadmio/Cadmium, Cobalto/Cobalt, Cromo/Chromium, Mercurio/Mercury, Molibdeno/Molybdenum, Nichel/Nickel, Piombo/Lead, Rame/Copper, Selenio/Selenium, Tallio/Thallium, Vanadio/Vanadium, Zinco/Zinc	UNI EN 12457-2:2004, UNI EN ISO 17294-2:2016	ICP-MS	
Su eluati da test di cessione/In eluates from leaching test : Aroclor 1016/Aroclor 1016, Aroclor 1221/Aroclor 1221, Aroclor 1232/Aroclor 1232, Aroclor 1242/Aroclor 1242, Aroclor 1248/Aroclor 1248, Aroclor 1254/Aroclor 1254, Aroclor 1260/Aroclor 1260, Aroclor 5060/Aroclor 5060, Aroclor 5442/Aroclor 5442, Aroclor 5460/Aroclor 5460	UNI EN 12457-2:2004, EPA 3510C 1996, EPA 3620C 2014, EPA 8082A 2007	GC-ECD	
Su eluati da test di cessione/In eluates from leaching test : Azoto ammoniacale (da calcolo)/Ammonium nitrogen (calculation), Azoto nitroso (da calcolo)/Nitrous nitrogen (calculation), Cloruri/Chloride, Fosforo (da fosfati)/Phosphorus (from Phosphate), Nitriti/Nitrite, Ortofosfati/Orthophosphates, Solfati/Sulphates	UNI EN 12457-2:2004, ISO 15923-1:2013	Spettrofotometria UV-VIS	
Su eluati da test di cessione/In eluates from leaching test : Azoto ammoniacale/Ammonium nitrogen	UNI EN 12457-2:2004, APAT CNR IRSA 4030 C Man 29 2003	Spettrofotometria UV-VIS	
Su eluati da test di cessione/In eluates from leaching test : Azoto ammoniacale/Ammonium nitrogen, Ione Ammonio/Ammonium ion	UNI EN 12457-2:2004, APAT CNR IRSA 4030 C Man 29 2003	Titrimetria	

Su eluati da test di cessione/In eluates from leaching test : Bromuri/Bromide, Cloruri/Chloride, Fluoruri/Fluoride, Fosfati/Phosphate, Nitrati/Nitrate, Solfati/Sulphates	UNI EN 12457-2:2004, UNI EN ISO 10304-1:2009	IC
Su eluati da test di cessione/In eluates from leaching test : Carbonio organico disciolto (DOC)/Dissolved organic carbon (DOC), Carbonio organico totale (TOC)/Total Organic Carbon (TOC)	UNI EN 12457-2:2004, UNI EN 1484:1999	Spettrofotometria IR
Su eluati da test di cessione/In eluates from leaching test : Cianuri liberi/Free cyanides, Cianuri totali/Total cyanides	UNI EN 12457-2:2004, MU 2251:08 - solo/only p.to 8.2.2	IC
Su eluati da test di cessione/In eluates from leaching test : Cianuri/Cyanides	UNI EN 12457-2:2004, APAT CNR IRSA 4070 Man 29 2003	Spettrofotometria UV-VIS
Su eluati da test di cessione/In eluates from leaching test : Conducibilità/Conductivity	UNI EN 12457-2:2004, APAT CNR IRSA 2030 Man 29 2003	Conduttimetria
Su eluati da test di cessione/In eluates from leaching test : Cromato (da calcolo)/Chromate (calculation), Cromo esavalente (Cr VI)/Hexavalent Chromium (Cr VI)	UNI EN 12457-2:2004, EPA 7199 1996	IC
Su eluati da test di cessione/In eluates from leaching test : Fenoli/Phenols	UNI EN 12457-2:2004, APAT CNR IRSA 5070 A1 Man 29 2003, APAT CNR IRSA 5070 A2 Man 29 2003	Spettrofotometria UV-VIS
Su eluati da test di cessione/In eluates from leaching test : Fibre di amianto/Asbestos fibers	UNI EN 12457-2:2004, DLgs n 114 17/03/1995 GU SO n 92 20/04/1995 All B	Gravimetria
Su eluati da test di cessione/In eluates from leaching test : Fluoruri/Fluoride	UNI EN 12457-2:2004, APAT CNR IRSA 4100 B Man 29 2003	Potenziometria
Su eluati da test di cessione/In eluates from leaching test : Indice di fenolo/Phenol index	UNI EN 12457-2:2004, UNI EN 16192:2012, ISO 6439:1990	Spettrofotometria UV-VIS
Su eluati da test di cessione/In eluates from leaching test : pH/pH	UNI EN 12457-2:2004, APAT CNR IRSA 2060 Man 29 2003	Potenziometria
Su eluati da test di cessione/In eluates from leaching test : Richiesta chimica di ossigeno (COD)/Chemical oxygen demand (COD)	UNI EN 12457-2:2004, APAT CNR IRSA 5130 Man 29 2003	Titrimetria
Su eluati da test di cessione/In eluates from leaching test : Solfuri/Sulphides	UNI EN 12457-2:2004, APAT CNR IRSA 4160 Man 29 2003	Titrimetria
Su eluati da test di cessione/In eluates from leaching test : Solidi totali disciolti (TDS)/Total dissolved solids (TDS)	UNI EN 12457-2:2004, APAT CNR IRSA 2090 A Man 29 2003	Gravimetria

Fanghi/Sludges, Sedimenti/Sediments, Suoli/Soils

Denominazione della prova / Campi di prova	*Metodo di prova*	*Tecnica di prova*	*O&I*
Stafilococchi coagulasi positivi/Coagulase-positive staphylococci (>1 ufc)	MPI-247-2022 Rev.3	Metodo colturale-conta	

Fibre minerali artificiali (fibre artificiali vetrose, fibre ceramiche refrattarie, fibre cristalline e policristalline)/Bulk man made mineral fibres (refractory ceramic fibres -RCF, man-made vitreous fibres -MMVF, Crystalline epolicrystalline fibers)

Denominazione della prova / Campi di prova	*Metodo di prova*	*Tecnica di prova*	*O&I*
Diametro geometrico medio ponderato rispetto alla lunghezza della fibra DMGPL-2ES/Length weighted geometric mean diameter of fibres DMGPL-2ES	Reg CE 761/2009 23/07/2009 GU CE L220 24/08/2009 All II	Microscopia elettronica: SEM	

Grassi di origine vegetale/Vegetable fats, Oli di origine vegetale/Vegetable oils

Denominazione della prova / Campi di prova	*Metodo di prova*	*Tecnica di prova*	*O&I*
Indice di perossidi/Peroxide index, Numero di perossidi/Peroxide value	COI/T.20/Doc n 35/rev 1 2017	Titrimetria	

Liquidi isolanti/Insulating liquids

Denominazione della prova / Campi di prova	*Metodo di prova*	*Tecnica di prova*	*O&I*

PCB/PCB : Policlorobifenili (PCB) totali/Total Polychlorobiphenyl (PCB)	CEI EN 61619:1998	GC-ECD

Materiali massivi (> 1% amianto)/Bulk materials (> 1% asbestos)

Denominazione della prova / Campi di prova	*Metodo di prova*	*Tecnica di prova*	*O&I*
Amianto/Asbestos : Actinolite/Actinolite, Amosite/Amosite, Antofillite/Anthophyllite, Crisotilo/Chrysotile, Crocidolite/Crocidolite, Tremolite/Tremolite	DM 06/09/1994 GU n 288 10/12/1994 All 3	Microscopia ottica: MOCF	
Amianto/Asbestos : Amosite/Amosite, Crisotilo/Chrysotile, Crocidolite/Crocidolite	DM 06/09/1994 GU n 288 10/12/1994 All 1 Met A + DGR n° 8/6777 12/03/2008 BURL 1° SS 08/04/2008	FTIR	

Materiali massivi (>= 0,01% amianto)/Bulk materials (>= 0,01% asbestos), Materiali polverulenti (>= 0,01% amianto)/Powdery materials (>= 0,01 asbestos), Materiali polverulenti (0,01-1% amianto)/Powdery materials (0,01-1% asbestos)

Denominazione della prova / Campi di prova	*Metodo di prova*	*Tecnica di prova*	*O&I*
Amianto/Asbestos : Actinolite/Actinolite, Amosite/Amosite, Antofillite/Anthophyllite, Crisotilo/Chrysotile, Crocidolite/Crocidolite, Tremolite/Tremolite	DM 06/09/1994 GU n 288 10/12/1994 All 1 Met B	Microscopia elettronica: SEM	

Oli d'oliva/Olive oils, Oli di sansa/Olive pomace oils

Denominazione della prova / Campi di prova	*Metodo di prova*	*Tecnica di prova*	*O&I*
Acidi grassi liberi/Free fatty acids	COI/T.20/Doc n 34/rev 1 2017	Titrimetria	
Analisi spettrofotometrica nell'ultravioletto/UV spectrophotometric analysis, DeltaK/DeltaK, K232/K232, K264/K264, K268/K268, K270/K270, K272/K272	COI/T.20/Doc n 19/rev 5 2019	Spettrofotometria UV-VIS	

Prodotti ittici/Seafood, Vini/Wines

Denominazione della prova / Campi di prova	*Metodo di prova*	*Tecnica di prova*	*O&I*
Cadaverina (1-5 diamminopentano)/Cadaverine (1-5 diaminopentane), Istamina/Histamine, Putrescina (1-4 diamminobutano)/Putrescine (1-4 diaminobutane), Serotonina/Serotonin, Triptammina/Tryptamine (1-20 mg/kg 1-20 mg/l)	MPI-104- 2022 Rev. 3	LC-MS/MS	

CHIMICA APPLICATA DEPURAZIONE ACQUE di GIGLIO FILIPPO & C. Snc Via Pio La Torre, 13 - AREA P.I.P. 92013 Menfi AG	UNI CEI EN ISO/IEC 17025:2018
	Revisione: **67** Data: **29/02/2024**
	Sede **A** pag. **27** di **37**

Rifiuti liquidi acquosi (1)/Aqueous liquid wastes (1)

Denominazione della prova / Campi di prova	*Metodo di prova*	*Tecnica di prova*	*O&I*
1-2-3-4-6-7-8-eptaclorodibenzo-p-diossina (HpCDD)/1-2-3-4-6-7-8-heptachlorodibenzo-p-dioxin (HpCDD), 1-2-3-4-6-7-8-eptaclorodibenzofurano (HpCDF)/1-2-3-4-6-7-8-heptachlorodibenzofuran (HpCDF), 1-2-3-4-7-8-9-eptaclorodibenzofurano (HpCDF)/1-2-3-4-7-8-9-heptachlorodibenzofuran (HpCDF), 1-2-3-4-7-8-esaclorodibenzo-p-diossina (HxCDD)/1-2-3-4-7-8-hexachlorodibenzo-p-dioxin (HxCDD), 1-2-3-4-7-8-esaclorodibenzofurano (HxCDF)/1-2-3-4-7-8-hexachlorodibenzofuran (HxCDF), 1-2-3-6-7-8-esaclorodibenzo-p-diossina (HxCDD)/1-2-3-6-7-8-hexachlorodibenzo-p-dioxin (HxCDD), 1-2-3-6-7-8-esaclorodibenzofurano (HxCDF)/1-2-3-6-7-8-hexachlorodibenzofuran (HxCDF), 1-2-3-7-8-9-esaclorodibenzo-p-diossina (HxCDD)/1-2-3-7-8-9-hexachlorodibenzo-p-dioxin (HxCDD), 1-2-3-7-8-9-esaclorodibenzofurano (HxCDF)/1-2-3-7-8-9-hexachlorodibenzofuran (HxCDF), 1-2-3-7-8-pentaclorodibenzo-p-diossina (PeCDD)/1-2-3-7-8-pentachlorodibenzo-p-dioxin (PeCDD), 1-2-3-7-8-pentaclorodibenzofurano (PeCDF)/1-2-3-7-8-pentachlorodibenzofuran (PeCDF), 2-3-4-6-7-8-esaclorodibenzofurano (HxCDF)/2-3-4-6-7-8-hexachlorodibenzofuran (HxCDF), 2-3-4-7-8-pentaclorodibenzofurano (PeCDF)/2-3-4-7-8-pentachlorodibenzofuran (PeCDF), 2-3-7-8-tetraclorodibenzo-p-diossina (TCDD)/2-3-7-8-tetrachlorodibenzo-p-dioxin (TCDD), 2-3-7-8-tetraclorodibenzofurano (TCDF)/2-3-7-8-tetrachlorodibenzofuran (TCDF), Ottaclorodibenzo-p-diossina (OCDD)/Octachlorodibenzo-p-dioxin (OCDD), Ottaclorodibenzofurano (OCDF)/Octachlorodibenzofuran (OCDF)	EPA 8280B 2007	HRGC-LRMS	

Composti perfluoroalchilici (PFAS)/Perfluoroalkyl compounds : Acido 1H,1H,2H,2H-Perfluoroottansolfonico (6:2 FTS)/1H,1H,2H,2H-Perfluorooctanesulfonic acid (6:2 FTS), Acido 2H-2H-3H-3H-perfluoroundecanoico (H4PFUnA)/2H-2H-3H-3H-perfluoroundecanoic (H4PFUnA), Acido 2H-2H-perfluorodecanoico (H2PFDA)/2H-2H-Perfluorodecanoic acid (H2PFDA), Acido 7H-perfluoroeptanoico (HPFHpA)/7H-Perfluoroheptanoic acid (HPFHpA), Acido N-etil perfluoroottansolfonoamidoacetico (N-Et-FOSAA)/N-ethyl perfluorooctanesulfonamidoacetic acid (N-Et-FOSAA), Acido N-metil perfluoroottansolfonoamidoacetico (N-Me-FOSAA)/N-methyl perfluorooctanesulfonamidoacetic acid (N-Me-FOSAA), Acido perfluoro-3,7-dimetillottanoico/Perfluoro-3,7-dimethyloctanoic acid, Acido perfluoro-n-esadecanoico (PFHxDA)/Perfluoro-n-hexadecanoic acid (PFHxDA), Acido perfluoro-n-ottadecanoico (PFODA)/Perfluoro-n-octadecanoic acid (PFODA), Acido perfluorobutanoico (PFBA) /Perfluorobutanoic acid (PFBA), Acido perfluorobutansolfonico (PFBS)/Perfluorobutanesulfonic acid (PFBS), Acido perfluorodecanoico (PFDA)/Perfluorodecanoic acid (PFDA), Acido perfluorodecansolfonico (PFDS)/Perfluorodecanesulfonic acid (PFDS), Acido perfluorododecanoico (PFDoA)/Perfluorododecanoic acid (PFDoA), Acido perfluorododecanosulfonico (PFDOS)/Perfluorododecanesulfonic Acid (PFDOS), Acido perfluoroeptanoico (PFHpA)/Perfluoroheptanoic acid (PFHpA), Acido perfluoroeptansolfonico (PFHpS)/Perfluoroheptanesulfonic acid (PFHpS), Acido perfluoroesanoico (PFHxA)/Perfluorohexanoic acid (PFHxA), Acido perfluoroesansolfonico (PFHxS)/Perfluorohexanesulfonic acid (PFHxS), Acido perfluorononanoico (PFNA)/Perfluorononanoic acid (PFNA), Acido perfluorononansolfonico (PFNS)/Perfluorononanesulfonic acid (PFNS), Acido perfluoroottanoico (PFOA)/Perfluorooctanoic acid (PFOA), Acido perfluoroottanosolfonico (PFOS)/Perfluorooctanesulfonic acid (PFOS), Acido perfluoropentanoico (PFPeA)/Perfluoropentanoic acid (PFPeA), Acido perfluoropentansolfonico (PFPeS)/Perfluoropentanesulfonic acid (PFPeS), Acido perfluorotetradecanoico (PFTeDA)/Perfluorotetradecanoic acid (PFTeDA), Acido perfluorotridecanoico (PFTrDA)/Perfluorotridecanoic acid (PFTrDA), Acido perfluoroundecanoico (PFUnA)/Perfluoroundecanoic acid (PFUnA), N-etil-eptadecafluoro ottan sulfonamide etanolo (N-Et-FOSE)/N-ethyl-heptadecafluorooctanesulphonamidoethanol (N-Et-FOSE), N-metil-eptadecafluoro ottan sulfonamide etanolo (N-Me-FOSE)/N-methyl-heptadecafluorooctanesulphonamidoethanol (N-Me-FOSE), Perfluoro-1-ottanosulfonil fluoride (PFoDE)/Perfluoro-1-octanesulfonyl fluoride (PFoDE), Perfluoro ottan sulfonamide (PFOSA)/Perfluorooctanesulphonamide (PFOSA)	EPA 3512 2021, EPA 8327 2021	LC-MS/MS	
Paraffine clorurate a catena corta (SCCP) C10-C13/Short-chain chlorinated paraffins (SCCP) C10-C13	EPA 3510C 1996, EPA 8081B 2007	GC-ECD	
Pesticidi/Pesticides : Toxafene/Toxaphene	EPA 3510C 1996, EPA 8081B 2007	GC-ECD	
Solidi fissi a 600°C/Fixed solids at 600°C, Solidi volatili a 600°C/Volatile solids at 600°C	APAT CNR IRSA 2090 D Man 29 2003	Gravimetria	
Sommatoria di policlorodibenzodiossine/policlorodibenzofurani (PCDD/PCDF) come tossicità equivalente WHO-TEQ (2005) (da calcolo)/Sum of polychlorinated dibenzodioxins/polychlorinated dibenzofurans (PCDD/PCDF) as equivalent toxicity WHO-TEQ (2005) (calculation)	EPA 8280B 2007, WHO-TEF 2005	Calcolo	

Rifiuti liquidi acquosi/Aqueous liquid wastes

Denominazione della prova / Campi di prova	*Metodo di prova*	*Tecnica di prova*	*O&I*
Idrocarburi C40-C54/Hydrocarbons C40-C54 (13- 36 mg/Kg)	MPI-251-2022 Rev.1	GC-FID	

Rifiuti organici trattati/Treated biowaste

Denominazione della prova / Campi di prova	*Metodo di prova*	*Tecnica di prova*	*O&I*
Escherichia coli/Escherichia coli	CEN/TR 16193:2013 Met A	Metodo colturale-conta	

Rifiuti/Wastes

Denominazione della prova / Campi di prova	*Metodo di prova*	*Tecnica di prova*	*O&I*
Bromo/Bromine, Cloro/Chlorine, Fluoro/Fluorine, Iodio/Iodine, Zolfo/Sulphur	UNI EN 14582:2016 + UNI EN ISO 10304-1:2009	IC	
Densità apparente/Bulk density, Peso specifico apparente/Apparent specific gravity	ASTM D5057-17	Gravimetria	

Rifiuti/Wastes, Sedimenti (1)/Sediments (1), Terreni/Soils

Denominazione della prova / Campi di prova	*Metodo di prova*	*Tecnica di prova*	*O&I*
Descrizione fisica/Physical description	ASTM D4979-19	_	

Rifiuti/Wastes, Terreni/Soils

Denominazione della prova / Campi di prova	*Metodo di prova*	*Tecnica di prova*	*O&I*
Pesticidi/Pesticides : Clordecone/Chlordecone (Kepone)	EPA 3541 1994, EPA 3630C 1996, EPA 8270E 2018	GC-MS	

Sedimenti (1)/Sediments (1), Suoli/Soils

Denominazione della prova / Campi di prova	*Metodo di prova*	*Tecnica di prova*	*O&I*
Scheletro/Granulometric fraction	DM 13/09/1999 SO n 185 GU n 248 21/10/1999 Met II.1	Gravimetria	

Sedimenti marini/Marine sediments

Denominazione della prova / Campi di prova	*Metodo di prova*	*Tecnica di prova*	*O&I*
Distribuzione granulometrica/Particle size distribution	ICRAM Metodologie analitiche di riferimento - sedimenti (2001) Scheda 3	Misura della dimensione	

Sedimenti/Sediments, Suoli/Soils

Denominazione della prova / Campi di prova	*Metodo di prova*	*Tecnica di prova*	*O&I*
Distribuzione granulometrica/Particle size distribution	DM 13/09/1999 SO n 185 GU n 248 21/10/1999 Met II.6	Misura della dimensione	

Solidi/Solids

Denominazione della prova / Campi di prova	*Metodo di prova*	*Tecnica di prova*	*O&I*
Infiammabilità/Flammability	Reg CE 440/2008 30/05/2008 GU CE L142 31/05/2008 All Parte A10	_	

Suoli/Soils

Denominazione della prova / Campi di prova	*Metodo di prova*	*Tecnica di prova*	*O&I*
Basi di scambio: Calcio/Exchangeable bases: Calcium, Basi di scambio: Magnesio/Exchangeable bases: Magnesium, Basi di scambio: Potassio/Exchangeable bases: Potassium, Basi di scambio: Sodio/Exchangeable bases: Sodium	ISO 11464:2006 + UNI EN ISO 11260:2018	ICP-OES	
Capacità di scambio cationico/Cation exchange capacity (C.S.C.)	DM 13/09/1999 SO n 185 GU n 248 21/10/1999 Met XIII.2 DM 25/03/2002 GU n 84 10/04/2002	Titrimetria complessometrica	
Carbonio organico/Organic carbon, Frazione organica di carbonio (FOC)(da calcolo)/Organic carbon fraction (FOC) (calculation), Sostanza organica/Organic matter	DM 13/09/1999 SO n 185 GU n 248 21/10/1999 Met VII.2	Titrimetria	
Conducibilità elettrica/Electrical conductivity	DM 13/09/1999 SO n 185 GU n 248 21/10/1999 Met IV.1	Conduttimetria	

Curva Granulometrica/Particle size curve	DM 13/09/1999 SO n 185 GU n 248 21/10/1999 Met II.3 + Met II.4 + Met II.6	Gravimetria	
Idrocarburi alifatici C19-C36/Aliphatic hydrocarbons C19-C36, Idrocarburi alifatici C9-C18/Aliphatic hydrocarbons C9-C18, Idrocarburi aromatici C11-C22/Aromatic hydrocarbon C11-C22	MassDEP-EPH-2019-2.1	GC-FID	
pH/pH	DM 13/09/1999 SO n 185 GU n 248 21/10/1999 Met III.1	Potenziometria	

Supporti da campionamento aria sorgenti fisse/Samples from air sampling of Stationary source

Denominazione della prova / Campi di prova	*Metodo di prova*	*Tecnica di prova*	*O&I*
1-2-3-4-6-7-8-eptaclorodibenzo-p-diossina (HpCDD)/1-2-3-4-6-7-8-heptachlorodibenzo-p-dioxin (HpCDD), 1-2-3-4-6-7-8-eptaclorodibenzofurano (HpCDF)/1-2-3-4-6-7-8-heptachlorodibenzofuran (HpCDF), 1-2-3-4-7-8-9-eptaclorodibenzofurano (HpCDF)/1-2-3-4-7-8-9-heptachlorodibenzofuran (HpCDF), 1-2-3-4-7-8-esaclorodibenzo-p-diossina (HxCDD)/1-2-3-4-7-8-hexachlorodibenzo-p-dioxin (HxCDD), 1-2-3-4-7-8-esaclorodibenzofurano (HxCDF)/1-2-3-4-7-8-hexachlorodibenzofuran (HxCDF), 1-2-3-6-7-8-esaclorodibenzo-p-diossina (HxCDD)/1-2-3-6-7-8-hexachlorodibenzo-p-dioxin (HxCDD), 1-2-3-6-7-8-esaclorodibenzofurano (HxCDF)/1-2-3-6-7-8-hexachlorodibenzofuran (HxCDF), 1-2-3-7-8-9-esaclorodibenzo-p-diossina (HxCDD)/1-2-3-7-8-9-hexachlorodibenzo-p-dioxin (HxCDD), 1-2-3-7-8-9-esaclorodibenzofurano (HxCDF)/1-2-3-7-8-9-hexachlorodibenzofuran (HxCDF), 1-2-3-7-8-pentaclorodibenzo-p-diossina (PeCDD)/1-2-3-7-8-pentachlorodibenzo-p-dioxin (PeCDD), 1-2-3-7-8-pentaclorodibenzofurano (PeCDF)/1-2-3-7-8-pentachlorodibenzofuran (PeCDF), 2-3-4-6-7-8-esaclorodibenzofurano (HxCDF)/2-3-4-6-7-8-hexachlorodibenzofuran (HxCDF), 2-3-4-7-8-pentaclorodibenzofurano (PeCDF)/2-3-4-7-8-pentachlorodibenzofuran (PeCDF), 2-3-7-8-tetraclorodibenzo-p-diossina (TCDD)/2-3-7-8-tetrachlorodibenzo-p-dioxin (TCDD), 2-3-7-8-tetraclorodibenzofurano (TCDF)/2-3-7-8-tetrachlorodibenzofuran (TCDF), Ottaclorodibenzo-p-diossina (OCDD)/Octachlorodibenzo-p-dioxin (OCDD), Ottaclorodibenzofurano (OCDF)/Octachlorodibenzofuran (OCDF)	UNI EN 1948-2:2006 + UNI EN 1948-3:2006	HRGC-HRMS	
IPA/PAH : Acenaftene/Acenaphthene, Acenaftilene/Acenaphthylene, Antracene/Anthracene, Benzo(a)antracene/Benzo(a)anthracene, Benzo(a)pirene/Benzo(a)pyrene, Benzo(b)fluorantene/Benzo(b)fluoranthene, Benzo(ghi)perilene/Benzo(ghi)perylene, Benzo(k)fluorantene/Benzo(k)fluoranthene, Crisene/Chrysene, Dibenzo(ah)antracene/Dibenzo(ah)anthracene, Fenantrene/Phenanthrene, Fluorantene/Fluoranthene, Fluorene/Fluorene, Indeno(1-2-3-cd)pirene/Indeno(1-2-3-cd)pyrene, Pirene/Pyrene	ISO 11338-2:2003 cap 6.2	GC-MS	

PCB/PCB : 2-3-3-4-4-5-5-eptaclorobifenile (PCB 189)/2-3-3-4-4-5-5-heptachlorbiphenyl (PCB 189), 2-3-3-4-4-5-esaclorobifenile (PCB 156)/2-3-3-4-4-5-hexachlorobiphenyl (PCB 156), 2-3-3-4-4-5-esaclorobifenile (PCB 157)/2-3-3-4-4-5-hexachlorobiphenyl (PCB 157), 2-3-3-4-4-pentaclorobifenile (PCB 105)/2-3-3-4-4-pentachlorobiphenyl (PCB 105), 2-3-4-4-5-5-esaclorobifenile (PCB 167)/2-3-4-4-5-5-hexachlorobiphenyl (PCB 167), 2-3-4-4-5-pentaclorobifenile (PCB 114)/2-3-4-4-5-pentachlorobiphenyl (PCB 114), 2-3-4-4-5-pentaclorobifenile (PCB 118)/2-3-4-4-5-pentachlorobiphenyl (PCB 118), 2-3-4-4-5-pentaclorobifenile (PCB 123)/2-3-4-4-5-pentachlorobiphenyl (PCB 123), 3-3-4-4-5-5-esaclorobifenile (PCB 169)/3-3-4-4-5-5-hexachlorobiphenyl (PCB 169), 3-3-4-4-5-pentaclorobifenile (PCB 126)/3-3-4-4-5-pentachlorobiphenyl (PCB 126), 3-3-4-4-tetraclorobifenile (PCB 77)/3-3-4-4-tetrachlorobiphenyl (PCB 77), 3-4-4-5-tetraclorobifenile (PCB 81)/3-4-4-5-tetrachlorobiphenyl (PCB 81)	UNI EN 1948-2:2006 + UNI EN 1948-4:2014/EC1:2014	HRGC-HRMS	
PCB/PCB : Sommatoria di policlorobifenili (PCB) come tossicità equivalente WHO-TEQ (1998) (da calcolo)/Sum of polychlorobiphenyl (PCB) as equivalent toxicity WHO-TEQ (1998) (calculation)	UNI EN 1948-2:2006 + UNI EN 1948-4:2014/EC1:2014	Calcolo	
Sommatoria di policlorodibenzodiossine/policlorodibenzofurani (PCDD/PCDF) come tossicità equivalente I-TEQ (da calcolo)/Sum of polychlorinated dibenzodioxins/polychlorinated dibenzofurans (PCDD/PCDF) as equivalent toxicity I-TEQ from I-TEF (calculation)	NATO/CCMS I-TEF 1988, UNI EN 1948-2:2006 + UNI EN 1948-3:2006	Calcolo	

Supporti da campionamento superfici ambienti del settore alimentare/Samples from surface sampling of food industry environment

Denominazione della prova / Campi di prova	*Metodo di prova*	*Tecnica di prova*	*O&I*
Microrganismi a 30°C/Microorganisms at 30°C	UNI EN ISO 4833-2:2022	Metodo colturale-conta	

Vini/Wines

Denominazione della prova / Campi di prova	*Metodo di prova*	*Tecnica di prova*	*O&I*
Ocratossina A/Ochratoxin A (0,2- 5 µg/kg)	MPI-95-2022 Rev.3	LC-MS/MS	

ELENCO PROVE ACCREDITATE - CON CAMPO FISSO IN CATEGORIA: II

Aria ambiente/Ambient air

Denominazione della prova / Campi di prova	*Metodo di prova*	*Tecnica di prova*	*O&I*
Benzene/Benzene	UNI EN 14662-3:2015	GC-PID	
Diossido di azoto/Nitrogen dioxide, Monossido di azoto/Nitrogen monoxide, Ossidi di azoto (NOx)/Nitrogen oxides (NOx)	UNI EN 14211:2012	Chemiluminescenza	
Diossido di zolfo/Sulfur dioxide	UNI EN 14212:2012/EC1:2014	Spettrofotometria UV fluorescenza	
Monossido di carbonio/Carbon monoxide	UNI EN 14626:2012	Spettrofotometria IR	
Ozono/Ozone	UNI EN 14625:2012	Spettrofotometria UV-VIS	

ELENCO PROVE ACCREDITATE - CON CAMPO FISSO IN CATEGORIA: III

Acque destinate al consumo umano (1)/Drinking waters (1), Acque di mare/Marine waters, Acque di scarico/Waste waters, Acque sotterranee/Ground waters, Acque superficiali/Surface waters

Denominazione della prova / Campi di prova	*Metodo di prova*	*Tecnica di prova*	*O&I*
Conducibilità/Conductivity	APAT CNR IRSA 2030 Man 29 2003	Conduttimetria	

Acque destinate al consumo umano (1)/Drinking waters (1), Acque di scarico/Waste waters, Acque naturali/Natural waters

Denominazione della prova / Campi di prova	*Metodo di prova*	*Tecnica di prova*	*O&I*
Campionamento per parametri chimici/Sampling for chemical parameters	APAT CNR IRSA 1030 Man 29 2003	_	
Cloro libero/Free chlorine	APAT CNR IRSA 4080 Man 29 2003	Spettrofotometria UV-VIS	
pH/pH	APAT CNR IRSA 2060 Man 29 2003	Potenziometria	
Temperatura/Temperature	APAT CNR IRSA 2100 Man 29 2003	Misura della temperatura	

Acque destinate al consumo umano (1)/Drinking waters (1), Acque di scarico/Waste waters, Acque naturali/Natural waters, Rifiuti liquidi acquosi (1)/Aqueous liquid wastes (1)

Denominazione della prova / Campi di prova	*Metodo di prova*	*Tecnica di prova*	*O&I*
Campionamento per parametri microbiologici/Sampling for microbiological parameters	APAT CNR IRSA 6010 Man 29 2003	_	

Acque destinate al consumo umano da impianti di trattamento e da sistemi di distribuzione convogliato/Drinking waters from treatment works and piped distribution systems

Denominazione della prova / Campi di prova	*Metodo di prova*	*Tecnica di prova*	*O&I*
Campionamento per parametri chimici/Sampling for chemical parameters	ISO 5667-5:2006	_	

Acque destinate al consumo umano/Drinking waters, Acque di piscina (1)/Swimming pool waters (1), Acque di scarico/Waste waters, Acque minerali naturali (1)/Natural mineral waters (1), Acque naturali/Natural waters, Rifiuti liquidi acquosi (1)/Aqueous liquid wastes (1)

Denominazione della prova / Campi di prova	*Metodo di prova*	*Tecnica di prova*	*O&I*
Potenziale di ossidoriduzione/Oxidation-reduction potential	APHA Standard Methods for Examination of Water and Wastewater Ed 23rd 2017 2580 B	Potenziometria	

Acque destinate al consumo umano/Drinking waters, Acque di scarico/Waste waters, Acque naturali/Natural waters

Denominazione della prova / Campi di prova	*Metodo di prova*	*Tecnica di prova*	*O&I*
Campionamento per parametri microbiologici/Sampling for microbiological parameters	ISO 19458:2006	_	

Acque di mare/Marine waters, Acque di scarico/Waste waters, Acque naturali/Natural waters

Denominazione della prova / Campi di prova	*Metodo di prova*	*Tecnica di prova*	*O&I*
Ossigeno disciolto/Dissolved oxygen	UNI EN ISO 5814:2013	Potenziometria	

Acque di scarico industriali/Industrial waste waters, Acque dolci/Fresh waters, Acque sotterranee/Ground waters, Acque trattate/Treated waters, Estratti acquosi ed eluati/Aqueous extracts and leachates, Percolati/Leachates, Sedimenti/Sediments

Denominazione della prova / Campi di prova	*Metodo di prova*	*Tecnica di prova*	*O&I*
Campionamento per parametri ecotossicologici/Sampling for ecotoxicological parameters	ISO 5667-16:2017	_	

Acque di scarico/Waste waters

Denominazione della prova / Campi di prova	*Metodo di prova*	*Tecnica di prova*	*O&I*

Campionamento per parametri chimici/Sampling for chemical parameters	ISO 5667-10:2020	_	
Materiali grossolani/Coarse materials	Legge n 319 10/05/1976 GU n 141 29/05/1976 Tab A p.to 5 + APAT CNR IRSA 2090 B Man 29 2003	Gravimetria	

Acque sotterranee/Ground waters

Denominazione della prova / Campi di prova	*Metodo di prova*	*Tecnica di prova*	*O&I*
Campionamento per parametri chimici/Sampling for chemical parameters	Man UNICHIM 196/2 2004 - solo/only p.fo 5 e 7	_	

Ambienti di lavoro/Work places

Denominazione della prova / Campi di prova	*Metodo di prova*	*Tecnica di prova*	*O&I*
Livelli di rumore: livello di esposizione personale al rumore (Lex)/Noise levels: Lex, Livelli di rumore: livello sonoro continuo equivalente (LEQ), pressione acustica di picco (Ppeak)/Noise levels: LEQ, Ppeak	UNI 9432:2011 + UNI EN ISO 9612:2011	Fonometria	

Ambienti di lavoro/Work places, Ambienti di vita/Indoor environment, Ambienti esterni/Outdoor environment

Denominazione della prova / Campi di prova	*Metodo di prova*	*Tecnica di prova*	*O&I*
Livello continuo equivalente di pressione sonora ponderata A/Continuous equivalent level of weighted sound pressure A	DM 16/03/1998 GU n 76 01/04/1998 All B	Fonometria	

Aria ambiente/Ambient air

Denominazione della prova / Campi di prova	*Metodo di prova*	*Tecnica di prova*	*O&I*
Direzione del vento/Wind direction, Velocità del vento/Wind speed	WMO n 8 2018 capitolo 5	_	
Pressione barometrica/Barometric pressure	WMO n 8 2018 capitolo 3	_	
Temperatura/Temperature	WMO n 8 2018 capitolo 2	_	
Umidità relativa/Relative moisture	WMO n 8 2018 capitolo 4	_	

Compost/Compost

Denominazione della prova / Campi di prova	*Metodo di prova*	*Tecnica di prova*	*O&I*
Campionamento per parametri chimici/Sampling for chemical parameters	ANPA 1 Man 3 2001	_	

Emissioni da sorgente fissa/Stationary source emissions

Denominazione della prova / Campi di prova	*Metodo di prova*	*Tecnica di prova*	*O&I*
AST-Prova di sorveglianza annuale/AST-annual surveillance tests, Prova di linearità/Linearity test, QAL2-Taratura e convalida dell'AMS/QAL2-Calibration and validation of AMS	UNI EN 14181:2015	_	
Campionamento per Idrocarburi policiclici aromatici (IPA)/Sampling for Polycyclic aromatic hydrocarbon (PAH)	ISO 11338-1:2003	_	
Campionamento per PCB diossina simili/Sampling for PCB dioxin like, Campionamento per PCDD/PCDF/Sampling for PCDD/PCDF	UNI EN 1948-1:2006	_	
Carbonio organico totale (TOC)/Total Organic Carbon (TOC)	UNI EN 13526:2002	FID	
Carbonio organico totale (TOC)/Total Organic Carbon (TOC)	UNI EN 12619:2013/EC1:2013	FID	
Monossido di carbonio/Carbon monoxide	UNI EN 15058:2017	Spettrofotometria IR	
Ossidi di azoto (NOx)/Nitrogen oxides (NOx)	UNI EN 14792:2017	Chemiluminescenza	
Ossigeno/Oxygen	UNI EN 14789:2017	Paramagnetismo	
Vapore acqueo (Umidità)/Water vapour (moisture)	UNI EN 14790:2017	Gravimetria	

Velocità e portata/Velocity and Volume flow rate	UNI EN ISO 16911-1:2013 (solo Annex A)	Tubo di Pitot	

Emissioni: flussi gassosi convogliati/Stack emission in conveyed gas flow

Denominazione della prova / Campi di prova	*Metodo di prova*	*Tecnica di prova*	*O&I*
Diossido di azoto/Nitrogen dioxide, Monossido di azoto/Nitrogen monoxide, Ossidi di azoto (NOx)/Nitrogen oxides (NOx)	ISO 11042-1:1996	Chemiluminescenza	
Diossido di carbonio/Carbon dioxide, Diossido di zolfo/Sulfur dioxide, Monossido di carbonio/Carbon monoxide	ISO 11042-1:1996	Spettrofotometria IR	
Velocità e portata/Velocity and Volume flow rate	UNI 10169:2001	Tubo di Pitot	

Escavo di fondali marini/ Seabed excavation

Denominazione della prova / Campi di prova	*Metodo di prova*	*Tecnica di prova*	*O&I*
Campionamento per parametri ecotossicologici/Sampling for ecotoxicological parameters, Campionamento per parametri microbiologici/Sampling for microbiological parameters	DM 15/07/2016 GU n 208 06/09/2016 All 1	_	

Fanghi/Sludges, Rifiuti/Wastes

Denominazione della prova / Campi di prova	*Metodo di prova*	*Tecnica di prova*	*O&I*
Campionamento per parametri chimici/Sampling for chemical parameters	UNI 10802:2013	_	

Fiumi/Rivers, Torrenti/Streams

Denominazione della prova / Campi di prova	*Metodo di prova*	*Tecnica di prova*	*O&I*
Campionamento per parametri chimici/Sampling for chemical parameters	ISO 5667-6:2014	_	

Materiali misti prodotti dal trattamento meccanico dei rifiuti (1)/Mixed materials produced by the mechanical treatment of waste (1), Rifiuti urbani/Urban wastes

Denominazione della prova / Campi di prova	*Metodo di prova*	*Tecnica di prova*	*O&I*
Analisi merceologica/Product analysis, Altro non classificabile/Other unclassifiable, Carta e cartone/Paper and board, Cuoio/Leather, Gomma/Rubber, Legno/Wood, Materiali inerti: materiali inerti totali, plastica, vetro, metallo/Inert material:total inert materials, plastic, glass, metallic materials, Materiali pericolosi/Hazardous materials, Metalli/Metals, Organico/Organic, Pelle e cuoio/Leather and hide, Plastiche/Palstic material, Poliaccoppiati/Polylaminate, Sottovaglio <20mm/Undersize <20mm, Tessili sanitari/Medical textiles, Tessili/Textiles, Vetro/Glass	ANPA RTI CTN_RIF 1/2000 Met 3	Gravimetria + esame visivo	

Sedimenti marini/Marine sediments

Denominazione della prova / Campi di prova	*Metodo di prova*	*Tecnica di prova*	*O&I*
Campionamento per parametri chimici/Sampling for chemical parameters	ISO 5667-19:2004	_	

Suoli/Soils

Denominazione della prova / Campi di prova	*Metodo di prova*	*Tecnica di prova*	*O&I*
Campionamento per parametri chimici/Sampling for chemical parameters	Man UNICHIM 196/2 2004 - solo/only p.fo 5 e 6	_	

Superfici ambienti del settore alimentare (Supporti da campionamento superfici)/Surface in the food industry environment (Samples from surface sampling)

Denominazione della prova / Campi di prova	*Metodo di prova*	*Tecnica di prova*	*O&I*
Campionamento per parametri microbiologici/Sampling for microbiological parameters	ISO 18593:2018	_	

CHIMICA APPLICATA DEPURAZIONE ACQUE di GIGLIO FILIPPO & C. Snc Via Pio La Torre, 13 - AREA P.I.P. 92013 Menfi AG	UNI CEI EN ISO/IEC 17025:2018	
	Revisione: **67**	Data: **29/02/2024**
	Sede **A**	pag. **36** di **37**

ELENCO PROVE ACCREDITATE - CON CAMPO FLESSIBILE

Alimenti/Food

Denominazione della prova / Campi di prova	*Metodo di prova*	*Tecnica di prova*	*O&I*
Metalli/Metals (_)	Vedere elenco dei dettagli delle prove flessibili	ICP-MS	
Pesticidi/Pesticides (_)	Vedere elenco dei dettagli delle prove flessibili	LC-MS/MS	

Campioni ambientali acquosi/Environmental aqueous samples

Denominazione della prova / Campi di prova	*Metodo di prova*	*Tecnica di prova*	*O&I*
Composti perfluoroalchilici/Perfluoroalkyl compounds (_)	Vedere elenco dei dettagli delle prove flessibili	LC-MS/MS	

Campioni ambientali liquidi/Liquid Environmental samples

Denominazione della prova / Campi di prova	*Metodo di prova*	*Tecnica di prova*	*O&I*
Anioni/Anions	Vedere elenco dei dettagli delle prove flessibili	IC	
Composti organici semi volatili/Semi volatile organic compounds	Vedere elenco dei dettagli delle prove flessibili	LC-MS/MS	
Composti organici semi volatili/Semi volatile organic compounds	Vedere elenco dei dettagli delle prove flessibili	GC-MS	
Composti organovolatili (Quantitativa)/Volatile organic compounds (Quantitative)	Vedere elenco dei dettagli delle prove flessibili	GC-MS	
Idrocarburi/Hydrocarbons	Vedere elenco dei dettagli delle prove flessibili	GC-FID	
Metalli/Metals	Vedere elenco dei dettagli delle prove flessibili	ICP-MS	
Metalli/Metals	Vedere elenco dei dettagli delle prove flessibili	ICP-OES	

Campioni ambientali solidi/Solid Environmental samples

Denominazione della prova / Campi di prova	*Metodo di prova*	*Tecnica di prova*	*O&I*
Anioni/Anions	Vedere elenco dei dettagli delle prove flessibili	IC	
Composti organici semi volatili/Semi volatile organic compounds	Vedere elenco dei dettagli delle prove flessibili	LC-MS/MS	
Composti organici semi volatili/Semi volatile organic compounds (_)	Vedere elenco dei dettagli delle prove flessibili	GC-MS	
Composti organovolatili (Quantitativa)/Volatile organic compounds (Quantitative)	Vedere elenco dei dettagli delle prove flessibili	GC-MS	
Idrocarburi/Hydrocarbons	Vedere elenco dei dettagli delle prove flessibili	GC-FID	
Metalli/Metals	Vedere elenco dei dettagli delle prove flessibili	ICP-MS	
Metalli/Metals	Vedere elenco dei dettagli delle prove flessibili	ICP-OES	

Emissioni/Stack emission

Denominazione della prova / Campi di prova	*Metodo di prova*	*Tecnica di prova*	*O&I*
Composti inorganici/Inorganic compounds	Vedere elenco dei dettagli delle prove flessibili	Spettrofotometria UV-VIS	

CHIMICA APPLICATA DEPURAZIONE ACQUE di GIGLIO FILIPPO & C. Snc Via Pio La Torre, 13 - AREA P.I.P. 92013 Menfi AG	UNI CEI EN ISO/IEC 17025:2018	
	Revisione: **67**	Data: **29/02/2024**
	Sede **A**	pag. **37** di **37**

Composti inorganici/Inorganic compounds	Vedere elenco dei dettagli delle prove flessibili	IC
Emissioni di composti organovolatili/Volatile organic compounds emission	Vedere elenco dei dettagli delle prove flessibili	GC-MS

Legenda/Note

Il simbolo (1), se presente, indica: "Materiale/Prodotto/Matrice" non previsto dal metodo ma assimilabile/The symbol (1), if present, means: Material/Product/Matrix not provided for by the method but acceptable
Per la definizione della "categoria" di prova indicata nel titolo, si veda il Regolamento Generale ACCREDIA RG-02.

MPI = metodo di prova sviluppato dal laboratorio/laboratory developed test method

Il QRcode consente di accedere direttamente al sito www.accredia.it per verificare la validità dell'elenco prove e del certificato di accreditamento rilasciato al laboratorio.

L'eventuale simbolo "X" riportato nella colonna "O&I" indica che il laboratorio è accreditato anche per fornire opinioni e interpretazioni basate sui risultati delle specifiche prove contrassegnate.

L'eventuale simbolo (*) indica che è attiva una sospensione dell'accreditamento per la specifica attività riportata a fianco

Laboratorio

CHIMICA APPLICATA DEPURAZIONE ACQUE di GIGLIO FILIPPO & C. Snc

Sede A - Numero di accreditamento 0439

Via Pio La Torre, 13 - AREA P.I.P., 92013 Menfi (AG)

Prove accreditate con campo flessibile

PROVE ACCREDITATE CON CAMPO FLESSIBILE	MATERIALE / PRODOTTO/ MATRICE	MISURANDO / PROPRIETA' MISURATA / DENOMINAZIONE DELLA PROVA	METODO DI PROVA ED ANNO DI EMISSIONE	TECNICA DI PROVA	CAMPO DI MISURA E/O DI PROVA	CAT.
Prova accreditata con campo flessibile	**ALIMENTI/FOOD**	**METALLI/METALS (_)**	**Vedere elenco dei dettagli delle prove flessibili**			
Prova correlata	Alimenti di Origine Vegetale e loro trasformati	Cromo, Ferro, Manganese, Nichel, Rame, Selenio, Stronzio, Zinco	MPI 245 2020 Rev.0	ICP-MS		0
Prova correlata	Alimenti: Pesce, Uva	Mercurio, piombo	UNI EN 13805:2014 + UNI EN 15763:2010	ICP-MS		0
Prova accreditata con campo flessibile	**ALIMENTI/FOOD**	**PESTICIDI/PESTICIDES (_)**	**Vedere elenco dei dettagli delle prove flessibili**			
Prova correlata	Alimenti di Origine Vegetale e loro trasformati	Chlormequat	CVUA EURL-SRM QuPPe vers 12 M4.1 2021	LC-MS/MS		0
Prova correlata	Alimenti di Origine Vegetale e loro trasformati	Glyfosate, N-Acetyl Glyphosate, Glufosinate; N-acetyl-glufosinate (NAG); MPPA Glufosinate-ammonio (somma di glufosinate, dei suoi sali, MPP e NAG, espressa in equivalenti di glufosinate); AMPA; N-Acethyl-AMPA; Fosetyl (espresso come fosetyl); Phosphonic acid; Fosetyl-Aluminium (somma di fosetyl, phosphonic acid e dei loro sali, espressi come fosetyl); Ethephon; HEPA; Clorate.	CVUA EURL-SRM QuPPe vers 12 M1.1 2021	LC-MS/MS		0

PROVE ACCREDITATE CON CAMPO FLESSIBILE	MATERIALE / PRODOTTO/ MATRICE	MISURANDO / PROPRIETA' MISURATA / DENOMINAZIONE DELLA PROVA	METODO DI PROVA ED ANNO DI EMISSIONE	TECNICA DI PROVA	CAMPO DI MISURA E/O DI PROVA	CAT.
Prova correlata	Alimenti di Origine Vegetale e loro trasformati	Perclorato	CVUA EURL-SRM QuPPe vers 12 M1.3 2021	LC-MS/MS		0
Prova correlata	Alimenti di origine vegetale	Residui di pesticidi (metodo QuEChERS): 2,4,5-T, 2,4-D, 2,4-DB, 2-Naphthoxy acetic acid, 3,4,5-Trimethacarb, 3,5-Dichloroaniline, 4-Chlorophenoxyacetic acid, Abamectin, Acephate, Acetamiprid, Aclonifen, Acrinathin, Alachlor, Aldicarb, Allethrin, Alloxydim-Sodium, Alphamethrine, Ametoctradin, Ametryne, Amisulbrom, Anilazine, Atrazine, Atrazine-desethyl, Atrazine-desisopropyl, Azadirachtin A, Azinphos, Azinphos-ethyl, Azocyclotin, Azoxystrobin, Benalaxyl, Bendiocarb, Benfluralin, Benfuracarb, Benomyl, Bentazone, Benthiavalicarb-isopropyl, Benzoximate, Benzoylprop-ethyl, Bifenazate, Bifenox, Bifenthrin, Bitertanole (mixture of isomers), Boscalid, Bromophos-ethyl, Bromophos-methyl, Bromopropylate, Bromoxynil, Bromuconazole, Bupirimate, Buprofezin, Butocarboxim, Butylate, Cadusafos, Captan, Carbaryl, Carbendazim, Carbofenotion, Carbofuran, Carboxin, Carfentrazone-ethyl, Chlorantraniliprole, Chlorfenviphos, Chlorfluazuron, Chloridazon, Chlormephos, Chlorothalonil, Chlorpropham, Chlorpyrifos, Chlorpyrifos-methyl, Chlorthal-dimethyl, Cinosulfuron, Clethodim, Clofentezine, Clothianidin, Clozolinate, Coumaphos, Crotoxyphos, Cyanazine (Bladex), Cyazofamid, Cybutryne, Cycloxydim, Cyflufenamid, Cyfluthrin, Cymoxanil, Cypermethrin, Cyproconazole, Cyprodinil, Cyromazine, Deltamethrin, Demeton (total, mixed isomers), Demeton-S-methyl-sulfone, Demeton-S-methyl-sulfoxide, Desmetryn, Diazinon, Dicamba, Dichlobenil, Dichlobutrazol (mixture of stereo isomers), Dichlofluanid, Dichlorprop, Dichlorvos, Diclofop methyl, Dicloran, Dicofol, Diethofencarb, Difenoconazole, Diflubenzuron, Diflufenican, Dimethachlor, Dimethoate, Dimethomorph, Diniconazole, Dinitramine, Dinocap, Diphenamid, Diquat dibromide monohydrate, Disulfoton, Dithianon, Diuron, Dodine, Emamectin, Endosulfan (alpha + beta), Epoxiconazole, Ethiofencarb, Ethion, Ethirimol, Ethofenprox, Ethoprophos, Etoxazole, Famoxadone, Famphur, Fenamidone, Fenarimol, Fenazaquin, Fenbuconazole, Fenbutatin oxide, Fenhexamid, Fenitrothion, Fenoprop (2,4,5-TP), Fenothiocarb, Fenoxaprop-P, Fenoxycarb, Fenpropathrin, Fenpropidin, Fenpropimorph, Fenpyroximate, Fensulfothion, Fenthion, Fenvalerate+Esfenvalerate, Fipronil, Flamprop-M-isopropyl, Flazasulfuron, Fluazifop, Fluazinam, Flubendiamide, Flucythrinate, Fludioxonil, Flufenacet, Flufenoxuron, Flufenzine, Fluopicolide, Fluopyram, Fluquinconazole, Fluroxypyr, Flurtamone, Flusilazole, Flutriafol, Folpet, Fomesafen, Fonofos, Formetanate hydrochloride, Formothion, Fosetyl-aluminum, Fuberidazole, Gibberellic acid, Haloxyfop, Heptenophos, Hexaconazole, Hexaflumuron, Hexythiazox, Imazalil, Imazapyr, Imazaquin, Imazethapyr, Imazosulfuron, Imidacloprid, Indoxacarb, Ioxynil, Iprodione, Iprovalicarb, Isofenphos, Isoproturon, Isoxaben, Isoxaflutole, Kresoxim methyl, lambda-Cyhalothrin, Leptophos, Linuron, Lufenuron, Malathion, Mancozeb, Mandipropamid, MCPA, MCPB, Mecoprop (MCPP), Mepanipyrim, Meptyldinocap, Metaflumizone, Metalaxyl-M, Methamidophos, Methidathion, Methiocarb, Methomyl, Methoxyfenozide, Methyl Parathion, Metobromuron, Metolachlor, Metosulam, Metrafenone, Metribuzin, Metsulfuron-methyl, Mevinphos, Molinate, Monocrotophos, Monolinuron, Myclobutanil.	UNI EN 15662:2018	LC-MS/MS		0
Prova correlata	Alimenti di origine vegetale	Residui di pesticidi (metodo QuEChERS): 2,4-dimetilanilina, 2,6-Dimetilanilina, 2,4,6-triclorofenolo, 2-idrossipropoxycarbazone, 3- idrossi-carbofuran, 6-benziladenina, 4-Bromofenilurea, 1,4 -Dimetilnaftalene, 2,4'-dicofol, 4,4'-dicofol, 2,4,6-Tribromoanisolo, 3,4-dicloroanilina, 3-cloroanilina, 2-fenilfenolo, 4-Fenilfenolo, o,p' – DDD, p,p' – DDD, o,p' – DDT, p,p' – DDT, o,p' – DDE, p,p' – DDE, DDT (somma di p,p'-DDT, o,p'-DDT,p-p'-DDE e p-p'-DDD), Antraquinone, Acetochloro, Acechinocil, Acenochinocil idrossi, Acibenzolar-S-methyl, Acido di diclofop, Aldrin, Aldicarb Sulfone, Aldicarb solfossido, alfa – Clordano, alfa – esaclorocicloesano, Alfa –endosulfan, Amidosulfuron, Azaconazole, Aminocarb, Amitraz, Asulam, Avermectin B1a, Avermectin B1b, Isomero delta 8,9 di avermectine B1a, Azimsulfuron, Abamectine (somma di avermectin B1a, avermectin B1b e isomero delta 8,9 di avermectin B1a), Aldicarb (somma di aldicarb, aldicarb solfossido e aldicarb sulfone), Aldrin e dieldrin (aldrin e dieldrin combinati), Amitraz (amitraz compresi i metaboliti contenenti la frazione di	UNI EN 15662:2018	LC-MS/MS		0

PROVE ACCREDITATE CON CAMPO FLESSIBILE	MATERIALE / PRODOTTO/ MATRICE	MISURANDO / PROPRIETA' MISURATA / DENOMINAZIONE DELLA PROVA	METODO DI PROVA ED ANNO DI EMISSIONE	TECNICA DI PROVA	CAMPO DI MISURA E/O DI PROVA	CAT.
		2,4-dimetilanilina), Barban, beta – esaclorocicloesano, Beta- endosulfan, Benodanil, Bensulfuron-methyl, Benztiazuron, Bifenile, Bixafen, Bromacil, Bromociclen, Bromfenvinfos, Bispiribac, BTS9608 - 2,4,6 – acido triclorofenossiacetico, BTS40348, BTS44595, BTS44596, Butaclor, Butafenacil, Butocarboxim sulfoxide, Butralin, Buturon, BYI08330 enol-glucoside, BYI08330-chetoidrossilico, BYI08330-enolo, BYI08330-monoidrossilico, Carbosulfano, Carbetamide, Carbendazim e benomil (somma di benomil e carbenzadim espressi come carbenzadim), Carbofenotion-Metile, Carbofurano (somma di carbofurano (incluso carbofurano generato da carbosulfan, benfuracarb o furatiocarb) e 3- idrossi-carbofuran, Captafol, Cialofop butile, Ciantraniliprole, Chinomethionate, Chlorsulfuron, Chlortoluron, Chlorthiophos, Cianofos, Ciclanilide, Cifenotrin, Cimiazolo, Ciprosulfamide, Cis-clordano, Cis-Nonacloro, Cletodim (somma di setossidim e cletodim), Climbazolo, Clodinafop-propargyl, Clomazone, Clorbenside, Clorbromuron, Clorbufam, Clordano (somma di Cis-clordano e trans-clordano), Clordimeform, Clorfenapir, Clorfenson, Cloridazon-desfenil, Cloridazon (somma di cloridazon e cloridazon-desfenil), Cloropropilato, Clorprofam (clorprofam e 3-cloroanilina), Cloroxuron, Clordecone, Clorobenzilate, Cloroneb, Clortiamid, Clortion, Cloquintocet Mexyl, Coumatetralil, Crimidina, Cyanofenphos, Cycloate, Cycluron, delta-esaclorocicloesano, Demeton-O, Demeton-S, Demeton-S-metile, Ossidemeton-metile (somma di ossidemeton-metile e demeton-S- metilsolfone), Desmedipham, Diafentiuron, Diallate, Dialifos, Dichlofenthion, Diclocymet, Diclofop (somma di diclofop-metile e acido di diclofop), Dicofol (somma degli isomeri p, p' e o,p'), Dichetonitrile, Dicloran, Dicrotophos, Dieldrin, Dietil-M-toluamide (DEET), Difenamide, Difenilammina, Dimethametryn, Dimethenamide, Dimepiperate, Dimetoato (somma di Dimetoato e Ometoato), Dimoxystrobin, Dinotefuran, Dioxacarb, Dioxation, Dipropetrin, Disulfoton-solfone, Disulfoton-solfossido, Disulfoton (somma di disulfoton, solfossido di disulfoton e solfone di disulfoton), Ditalimfos, DNOC, Edifenfos, Endosulfan-solfato, Endosulfan (somma degli isomeri alfa e beta e del solfato di endosulfan), Endrin, Endrin aldeide, EPN, Eptacloro, Eptacloro epossido, Eptacloro (somma di Eptacloro e di Eptacloro epossido), Esaclorobenzene, Esazinone, Etaconazolo, Esaflumuron, Esfenvalerate, Etalfluralin, Etoxiquin, Ethofumesate, Etiofencarb solfone, Etiofencarb solfossido, Etossisulfuron, Etridiazolo, Etrimfos, Exitiazox, Fenamiphos, Fenamifos solfone, Fenamifos solfossido, Fenamifos (somma di fenamifos e del relativo solfossido e solfone), Fenclorfos, Fenclorfosoxon, Fenclorfos (somma di fenclorfos e fenclorfosoxon), Fenflutrin, Fenkapton, Fenobucarb, Fenson, Fenmedifam, Fenotrina, Fenoxaprop-P-etile, Fensulfothion-sulfone, Fention oxon, Fention oxon solfone, Fention oxon solfossido, Fention solfossido, Fenthion-sulfone, Fention (fention e il suo analogo ossigenato, i loro sulfossidi e sulfoni), Fentoato, Fenuron, Fenvalerate, Fipronil desulfinil, Fipronil Sulfone, Flonicamide, Florasulam, Florpyrauxifen-Benzyl, Flucarbazone, Flucloralin, Flucycloxuron, Flufenacet ossalato, Flufenacet tioglicolato solfossido, Flufenacet (somma di tutti i composti), Flumetralin, Flumetrina, Flumioxazina, Fluotrimazolo, Fluxapyroxad, Fluoxastrobin, Flupiradifurone, Fluralaner, Fluroclоridone, Flurprimidolo, Flutiacet metile, Forchlorfenuron, Fosthiazate, Foramsulfuron, FM-6-1(N-(4-cloro-2-trifluorometilfenil- n-propoxyacetamidine), Furalaxyl, Furathiocarb, gamma– Clordano, gamma – esaclorocicloesano, Halfenprox, Halosulfuron-metile, Haloxyfop-etotyl, Imazametabenz, Imazametabenz metile, Imazamox, Iodofenfos, Iodosulfuron Metile, Iprobenfos, Isazofos, Isocarbofos, Isodrin, Isopirazam, Isoprocarb, Isoprotiolano, isopropalin, Isoxadifen etile, Isoxaflutole (somma di Isoxaflutole e del relativo metabolita Dichetonitrile), Isoxation, Landrin (trimetacarb 3,4,5), Lenacil, Malaoxon, Malation (somma di Malation e Malaoxon), Mecarbam, Mecoprop (somma di mecoprop-P e mecoprop), Mefenpir dietile, Mepronil, Merphos, Metamitron, Metacrifos, Metazaclor, 479M04, 479M08, 479M16, Metazaclor: Somma dei metaboliti 479M04, 479M08, 479M16, Methabenzthiazuron, Methiocarb-sulfone, Metiocarb solfossido, Metiocarb (somma del metiocarb e del metiocarb solfossido e solfone), Metconazolo, Mesotrione, Metolcarb, Metoprene, Metoprotrin, Metossicloro, Metoxuron, Milbemicin A3, Milbemicin A4, Milbemectin (somma di milbemicin A4 e milbemicin A3), Mirex, Monuron, Naled (dibrom), Naptalam, Neburon, Nicosulfuron, Nitenpyram, Nitralin, Nitrapirin, Nitrofen, NOA-beta (2-naftilossiacetic acid), Norfluazuron, Novaluron, Ofurace, Ossicarbossina, Oxamil-oxime, Oxasulfuron, Paraoxon				

PROVE ACCREDITATE CON CAMPO FLESSIBILE	MATERIALE / PRODOTTO/ MATRICE	MISURANDO / PROPRIETA' MISURATA / DENOMINAZIONE DELLA PROVA	METODO DI PROVA ED ANNO DI EMISSIONE	TECNICA DI PROVA	CAMPO DI MISURA E/O DI PROVA	CAT.
		ethyl, Paraoxon methyl, Paration metile (somma di paration metile e paraoxon metile), Penconazole, Pebulate, Pencycuron, Penoxulam, Pentacloranilina, Pentacloroanisolo, Pentaclorobene, Pentaclorofenolo, Permetrina-cis, Permetrina-trans, Permetrina (somma degli isomeri), Pertano, Phenmedipham, Phenthoate, Phoxim, Phorate oxon, Phorate oxon solfone, Phorate solfone, Phorate solfossido, Phorate (somma di forate, del suo analogo ossigenato e dei loro solfoni), Phosmet oxon, Phosmet (fosmet e fosmet oxon), Phthalimide, Picolinafen, Pinoxaden, Piperofos, Piracarbolid, Piroxsulam, Pirimicarb desmetil-formamido, Pyridalyl, Pretilaclor, Primisulfuron metile, Prochloraz, Procloraz (somma di procloraz e dei relativi metaboliti contenenti la frazione di 2,4,6-triclorofenolo), Profam, Profluralin, Profoxydim, Prometon, Propaquizafop, Propetamphos, Propoxycarbazone, Prosulfocarb, Prothiofos, Protioconazolo, Protioconazolo:protioconazolo-destio (somma di isomeri), Protoato, Quinclorac, Quintozene, Quintozene (somma di quintozene e di pentacloroanilina), Quizalofop-ethile, Resmetrin, Rimsulfuron, Saflufenacil, Saflufenacil (M800H11), Saflufenacil(M800H35), Saflufenacil (somma di saflufenacil, M800H11 e M800H35), Sedaxane, S421 (Ottaclorodipropil Etere), Silafluofen, Siltiofam, Simetrina, Spinetoram, Spinosyn D, Spirotetrammato e i suoi 4 metaboliti BYI08330-enolo, BYI08330-chetoidrossilico, BYI08330-monoidrossilico e BYI08330 enol-glucoside), Sulcotrione, Sulfallate, Sulfentrazone, Sulfosulfuron, Sulfoxaflor, Sulprofos, Tebupirimifos, Tebutam, Tecnazene, Telodrin, Tembotrione, Temefos, Tepraloxydim, Terbacil, Terbufos solfone, Terbufos solfossido, Terbutilazina-Desetil, Tetrasul, TFNA, TFNG, Flonicamid: somma di flonicamid, TFNA e TFNG, Thiocyclam, Thiodicarb, Tiencarbazone metile, Tiofanox solfone, Tiofanox solfossido, Tiometon, Tralkoxydim, Transflutrina, Tri-allate, Triazoxide, Triasulfuron, Triazamate, Tribenuron-methyl, Triciclazolo, Triclornat, Tridemorf, Triflumazolo: triflumazolo e il metabolita FM-6-1, Triflusulfuron methyl, Trinexapac etile, Trinexapac (somma di trinexapac (acido) e dei suoi Sali), Triticonazole, Uniconazolo.				
Prova correlata	Alimenti di origine vegetale	Residui di pesticidi (metodo QuEChERS): Napropamide, Nitrothal-isopropyl, Nuarimol, Omethoate, Oxadiazon, Oxadixyl, Oxamyl, Oxyfluorfen, Paclobutrazol, Parathion, Pendimethalin, Permethrin, Phorate, Phosalone, Phosmet, Phospamidon, Picoxystrobin, Piperonyl butoxide, Pirimicarb desmethyl, Pirimiphos-ethyl, Pirimiphos-methyl, Procymidone, Profenofos, Promecarb, Prometryn, Propachlor, Propamocarb free base (Propamocarb), Propanil, Propargite, Propazine, Propiconazole, Propisochlor, Propoxur, Propyzamide, Proquinazid, Prosulfuron, Pymetrozine, Pyraclostrobin, Pyraflufen-ethyl, Pyrazophos, Pyrethrins, Pyridaben, Pyridaphenthion, Pyrifenox, Pyrimethanil, Pyriproxyfen, Quinalphos, Quinmerac, Quinoxyfen, Rotenone, Sethoxydim, Simazine, Spinetoram, Spinosad, Spirodiclofen, Spiromesifen, Spirotetramat, Spiroxamine, Sulfotepp, tau-Fluvalinate, Tebuconazole, Tebufenozide, Tebufenpyrad, Teflubenzuron, Tefluthrin, Terbufos, Terbumeton, Terbuthylazine, Terbutryn, Tetrachlorvinphos, Tetraconazole, Tetradifon, Tetramethrin, Thiabendazole, Thiacloprid, Thiamethoxam, Thifensulfuron-methyl, Thiobencarb, Thiofanox, Thionazin, Thiophanate-methyl, Tiocarbazil, Tolclofos-methyl, Tolylfluanid, Tralomethrin, Triadimefon, Triadimenol, Triazophos, Trichlorfon, Triclopyr, Trifloxystrobin, Triflumizole, Triflumuron, Trifluralin, Triforine, Valifenalate, Vamidothion, Vinclozolin, Zoxam.	UNI EN 15662:2018	LC-MS/MS		0
Prova accreditata con campo flessibile	**CAMPIONI AMBIENTALI ACQUOSI/ ENVIRONMENTAL AQUEOUS SAMPLES**	**COMPOSTI PERFLUOROALCHILICI/PERFLUOROALKYL COMPOUNDS (_)**	**Vedere elenco dei dettagli delle prove flessibili**			
Prova correlata	Acque di scarico, rifiuti liquidi	Acido perfluoroottansolfonico (PFOS)	ASTM D7979-20	LC-MS/MS		0

PROVE ACCREDITATE CON CAMPO FLESSIBILE	MATERIALE / PRODOTTO/ MATRICE	MISURANDO / PROPRIETA' MISURATA / DENOMINAZIONE DELLA PROVA	METODO DI PROVA ED ANNO DI EMISSIONE	TECNICA DI PROVA	CAMPO DI MISURA E/O DI PROVA	CAT.
Prova correlata	Acque, Acque destinate a consumo umano	Perfluorinated alkyl acids PFAS: Perfluoro-n-octanoic acid (PFOA), Perfluoro-n-hexanoic acid (PFHxA), Perfluoro-n-butanoic acid (PFBA), Perfluoro-n-pentanoic acid (PFPeA), Perfluoro-1-butanesulfonate Acid (PFBS), Perfluoro-n-heptanoic acid (PFHpA), Perfluoro-n-undecanoic acid (PFUnDA), Perfluoro-n-dodecanoic acid (PFDoA) Perfluoro-1-hexanesulfonate Acid(PFHxS), Perfluoro-n-nonanoic acid (PFNA), Perfluoro-n-decanoic acid (PFDA), Perfluoro-1-octanesulfonate Acid(PFOS) ,Perfluoro-n-tridecanoic acid (PFTrDA), Perfluoro-n-tetradecanoic acid (PFTA), Perfluoro-n-hexadecanoic acid (PFHxDA), Perfluoro-n-octadecanoic acid (PFODA), Perfluoro-1-decanesulfonate Acid (PFDS), Perfluoropentansulfonate Acid (PFPeS), Perfluoroheptansulfonate Acid (PFHpS), Perfluorononansulfonate Acid (PFNS), Perfluoroundecansulfonate Acid (PFUnDS), Perfluorododecansulfonate Acid (PFDoS), Perfluorotridecansulfonate Acid (PFTrDS), 2,3,3,3-tetrafluoro-2-(eptafluoropropossi)propanoic Acid (GENX)/(HFPO-DA), 1H,1H,2H,2H- Perfluoroottansulfonate Acidi/Fluorotelomer Sulfonate (6:2 FTS)/(H4PFOS) Acidi perfluoroalchilici: Acido perfluorottanico (PFOA), Acido perfluoroesanoico (PFHxA), Acido perfluorobutanoico (PFBA) Acido perfluoropentanoico (PFPeA), Acido Perfluorobutansolfonico (PFBS), Acido perfluoroeptanoico, (PFHpA), Acido perfluoroeptanoico, (PFHpA), Acido perfluoroundecanoico (PFUnDA), Acido Perfluoesansolfonico (PFHxS), Acido perfluorononaico (PFNA), Acido perfluorodecanoico (PFDA), Acido Perfluoroottansolfonico (PFOS), Acido Perfluorotridecanoico (PFTrDA), Acido Perfluorotetradecanoico (PFTA), Acido Perfluoroesadecanoico (PFHxDA), Acido Perfluoro ottanoico (PFODA), Acido Perfluorodecansolfonico (PFDS), Acido Perfluoropentansolfonico (PFPeS), Acido Perfluoroeptansolfonico (PFHpS), Acido Perfluorononansolfonico (PFNS), Acido Perfluoroundecansolfonico (PFUnDS), Acido Perfluorododecansolfonico (PFDoS), Acido Perfluorotridecansusolfonico (PFTrDS), Acido 2,3,3,3-tetrafluoro-2-(eptafluoropropossi)propanoico (GENX) /(HFPO-DA), Acido 1H,1H,2H,2H-Perfluoroottansolfonico/Fluorotelomero Solfonato (6:2 FTS)/(H4PFOS)	ISO 21675:2019	LC-MS/MS		0
Prova accreditata con campo flessibile	**CAMPIONI AMBIENTALI LIQUIDI/LIQUID ENVIRONMENTAL SAMPLES**	**ANIONI/ANIONS**	**Vedere elenco dei dettagli delle prove flessibili**			
Prova correlata	Acque destinate al consumo umano/ Drinking waters, Acque di mare/ Marine waters, Acque di scarico/Waste waters, Acque sotterranee/Ground waters, Acque superficiali/Surface waters, Eluati da test di cessione (1)/ Eluates from leaching test (1), Rifiuti liquidi acquosi (1)/Aqueous liquid wastes (1)	Anioni/Anions : Bromuri/Bromide, Cloruri/Chloride, Fluoruri/Fluoride, Fosfati/Phosphate, Nitrati/Nitrate, Solfati/Sulphates	UNI EN ISO 10304-1:2009	Cromatografia Ionica		0

PROVE ACCREDITATE CON CAMPO FLESSIBILE	MATERIALE / PRODOTTO/ MATRICE	MISURANDO / PROPRIETA' MISURATA / DENOMINAZIONE DELLA PROVA	METODO DI PROVA ED ANNO DI EMISSIONE	TECNICA DI PROVA	CAMPO DI MISURA E/O DI PROVA	CAT.
Prova correlata	Acque destinate al consumo umano/ Drinking waters, Acque di scarico/ Waste waters, Acque dolci/Fresh waters, Acque meteoriche/ Rain waters, Acque minerali naturali/ Natural mineral waters, Acque sotterranee/Ground waters, Acque superficiali/Surface waters, Acque trattate/Treated waters, Rifiuti liquidi acquosi (1)/Aqueous liquid wastes (1)	Anioni/Anions : Azoto nitrico (da calcolo)/Nitric nitrogen (calculation), Azoto nitroso (da calcolo)/Nitrous nitrogen (calculation), Bromuri/Bromide, Cloruri/Chloride, Fluoruri/Fluoride, Fosfati/Phosphate, Nitrati/Nitrate, Nitriti/Nitrite, Solfati/Sulphate	APAT CNR IRSA 4020 Man 29 2003	Cromatografia Ionica		0
Prova correlata	Acque destinate al consumo umano/ Drinking waters, Acque sotterranee/ Ground waters, Acque superficiali/ Surface waters	Anioni/Anions : Azoto nitrico (da calcolo)/Nitric nitrogen (calculation), Azoto nitroso (da calcolo)/Nitrous nitrogen (calculation), Bromuri/Bromide, Cloruri/Chloride, Fluoruri/Fluoride, Nitrati/Nitrate, Nitriti/Nitrite, Orto-fosfati/Ortho-Phosphate-P, Solfati/ Sulphates	EPA 300.1 1997 part A + EC 1999	Cromatografia Ionica		0
Prova correlata	Acque destinate al consumo umano/ Drinking waters, Acque sotterranee/ Ground waters, Acque superficiali/ Surface waters	Anioni/Anions : Bromati/Bromate, Clorati/Chlorate, Cloriti/Chlorite	EPA 300.1 1997 part B + EC 1999	Cromatografia Ionica		0
Prova correlata	Rifiuti liquidi acquosi (1)/Aqueous liquid wastes (1)	Anioni/Anions : Bromati/Bromate, Clorati/Chlorate, Cloriti/Chlorite	EPA 300.0 1993 part B	Cromatografia Ionica		0
Prova correlata	Rifiuti liquidi acquosi (1)/Aqueous liquid wastes (1)	Anioni/Anions : Bromuri/Bromide, Cloruri/Chloride, Fluoruri/Fluoride, Nitrati/Nitrate, Nitriti/Nitrite, Ortofosfati/Orthophosphates, Solfati/Sulphates	EPA 300.0 1993 part A	Cromatografia Ionica		0

PROVE ACCREDITATE CON CAMPO FLESSIBILE	MATERIALE / PRODOTTO/ MATRICE	MISURANDO / PROPRIETA' MISURATA / DENOMINAZIONE DELLA PROVA	METODO DI PROVA ED ANNO DI EMISSIONE	TECNICA DI PROVA	CAMPO DI MISURA E/O DI PROVA	CAT.
Prova accreditata con campo flessibile	**CAMPIONI AMBIENTALI LIQUIDI/LIQUID ENVIRONMENTAL SAMPLES**	**COMPOSTI ORGANICI SEMI VOLATILI/SEMI VOLATILE ORGANIC COMPOUNDS**	**Vedere elenco dei dettagli delle prove flessibili**			
Prova correlata	Acque destinate al consumo umano/ Drinking waters, Acque di piscina (1)/ Swimming pool waters (1), Acque di scarico/Waste waters, Acque naturali/Natural waters, Rifiuti liquidi acquosi (1)/Aqueous liquid wastes (1)	1-2-3-4-tetraclorobenzene/1-2-3-4-tetrachlorobenzene, 1-2-3-5-tetraclorobenzene/1-2-3-5-tetrachlorobenzene, 1-2-3-triclorobenzene/1-2-3-trichlorobenzene, 1-2-4-5-tetraclorobenzene/1-2-4-5-tetrachlorobenzene, 1-2-4-triclorobenzene/1-2-4-trichlorobenzene, 1-2-dinitrobenzene/1-2-dinitrobenzene, 1-3-5-triclorobenzene/1-3-5-trichlorobenzene, 1-3-dinitrobenzene/ 1-3-dinitrobenzene, 1-cloro-2-nitrobenzene/1-chloro-2-nitrobenzene, 1-cloro-3-nitrobenzene/1-chloro-3-nitrobenzene, 1-cloro-4-nitrobenzene/1-chloro-4-nitrobenzene, 2-4-diamminotoluene (DMT)/2-4-diaminotoluene (DMT), 2-4-dinitrotoluene/2-4-dinitrotoluene, 2-6-diamminotoluene/2-6-diaminotoluene, 2-6-dinitrotoluene/2-6-dinitrotoluene, Anilina/Aniline, Difenilammina/ Diphenylamine, Esaclorobenzene (HCB)/Hexachlorobenzene (HCB), m-anisidina (3-metossi-5-anilina)/m-anisidine (3-methoxy-5-aniline), Nitrobenzene/Nitrobenzene, o-anisidina (2-metossi-5-anilina)/o-anisidine (2-methoxy-5-aniline), p-anisidina (4-metossi-5-anilina)/p-anisidine (4-methoxy-5-aniline), p-toluidina (4-metilanilina)/p-toluidine (4-methylaniline), Pentaclorobenzene/Pentachlorobenzene	EPA 3510C 1996, EPA 8270E 2018	GC MS		0
Prova correlata	Acque destinate al consumo umano/ Drinking waters, Acque di piscina (1)/ Swimming pool waters (1), Acque di scarico/Waste waters, Acque naturali/Natural waters, Rifiuti liquidi acquosi (1)/Aqueous liquid wastes (1)	Alaclor/Alachlor, Aldrina/Aldrin, Alfa-esaclorocicloesano (alfa-HCH)/Alpha-hexachlorocyclohexane (alpha-HCH), Atrazina/ Atrazine, Beta-esaclorocicloesano (beta-HCH)/Beta-hexachlorocyclohexane (beta-HCH), Clordano (cis)/Chlordane (cis), Clordano (trans)/Chlordane (trans), Clordecone/Chlordecone (Kepone), Delta-esaclorocicloesano (delta-HCH)/Delta-hexachlorocyclohexano (delta-HCH), Dieldrina/Dieldrin, Endosulfan alfa/Endosulfan alpha, Endosulfan beta/Endosulfan beta, Endosulfan/Endosulfan, Endrina/Endrin, Eptacloro epossido/Heptachlor epoxide, Eptacloro/Heptachlor, Esaclorobenzene (HCB)/Hexachlorobenzene (HCB), Gamma-esaclorocicloesano (gamma-HCH Lindano)/Gamma-hexachlorocyclohexane (gamma-HCH Lindane), Isodrina/Isodrin, Metossicloro/Methoxychlor, Mirex/Mirex, o-p'-DDD (Diclorodifenildicloroetano)/o-p'-DDD (Dichlorodiphenyldichloroethane), o-p'-DDE (Diclorodifenildicloroetilene)/o-p'-DDE (Dichlorodiphenyldichloroethylene), o-p'-DDT (Diclorodifeniltricloroetano)/o-p'-DDT (Dichlorodiphenyltrichloroethane), p-p'-DDD (Diclorodifenildicloroetano)/p-p'-DDD (Dichlorodiphenyldichloroethane), p-p'-DDT (Diclorodifeniltricloroetano)/p-p'-DDT (Dichlorodiphenyltrichloroethane), p-p'-DDE (Diclorodifenildicloroetilene)/p-p'-DDE (Dichlorodiphenyldichloroethylene)	EPA 3510C 1996, EPA 8270E 2018	GC MS		0
Prova correlata	Acque destinate al consumo umano/ Drinking waters, Acque di piscina (1)/ Swimming pool waters (1), Acque di scarico/Waste waters, Acque naturali/Natural waters, Rifiuti liquidi	PCB/PCB : 2-2-3-3-4-4-5-5-6-6-decaclorobifenile (PCB209)/2-2-3-3-4-4-5-5-6-6-decachlorobiphenyl (PCB 209), 2-2-3-3-4-4-5-5-6-nonaclorobifenile (PCB206)/2-2-3-3-4-4-5-5-6-nonachlorobiphenyl (PCB 206),2-2-3-3-4-4-5-eptaclorobifenile (PCB 170)/2-2-3-3-4-4-5heptachlorobiphenyl(PCB 170), 2-2-3-3-4-4-esaclorobifenile (PCB128)/2-2-3-3-4-4-hexachlorobiphenyl (PCB 128),2-2-3-3-4-5-5-6-6-nonaclorobifenile (PCB208)/2-2-3-3-4-5-5-6-6-nonachlorobiphenyl (PCB 208),2-2-3-3-4-5-6-eptaclorobifenile (PCB 177)/2-2-3-3-4-5-6-heptachlorbiphenyl(PCB 177), 2-2-3-4-4-5-5-eptaclorobifenile (PCB180)/2-2-3-4-4-5-5-heptachlorobiphenyl (PCB 180),2-2-3-4-4-5-6-eptaclorobifenile (PCB 183)/2-2-3-4-4-5-6-heptachlorbiphenyl(PCB 183), 2-2-3-4-4-5-esaclorobifenile (PCB138)/2-2-3-4-4-5-hexachlorobiphenyl (PCB 138), 2-2-3-4-5-5-6-eptaclorobifenile (PCB 187)/2-2-3-4-5-5-6-heptachlorbiphenyl(PCB 187), 2-2-3-4-5-5-esaclorobifenile (PCB 146)/2-2-3-4-5-5-hexachlorobiphenyl (PCB 146), 2-2-3-4-5-6-esaclorobifenile (PCB149)/2-2-3-4-5-6-hexachlorobiphenyl (PCB 149), 2-2-3-5-5-6-esaclorobifenile(PCB 151)/2-2-3-5-5-6-hexachlorobiphenyl (PCB 151),2-2-3-5-6-pentaclorobifenile	EPA 3510C 1996, EPA 3630C 1996, EPA 8270E 2018	GC MS		0

PROVE ACCREDITATE CON CAMPO FLESSIBILE	MATERIALE / PRODOTTO/ MATRICE	MISURANDO / PROPRIETA' MISURATA / DENOMINAZIONE DELLA PROVA	METODO DI PROVA ED ANNO DI EMISSIONE	TECNICA DI PROVA	CAMPO DI MISURA E/O DI PROVA	CAT.
	acquosi (1)/Aqueous liquid wastes (1)	(PCB 95)/2-2-3-5-6-pentachlorobiphenyl (PCB 95),2-2-4-4-5-5-esaclorobifenile (PCB 153)/2-2-4-4-5-5-hexachlorobiphenyl (PCB153), 2-2-4-4-5-pentaclorobifenile (PCB 99)/2-2-4-4-5-pentachlorobiphenyl(PCB 99), 2-2-4-5-5-pentaclorobifenile (PCB101)/2-2-4-5-5-pentachlorobiphenyl (PCB 101), 2-2-4-6-6-pentaclorobifenile(PCB 104)/2-2-4-6-6-pentachlorobiphenyl (PCB 104), 2-2-5-5-tetraclorobifenile(PCB 52)/2-2-5-5-tetrachlorobiphenyl (PCB 52), 2-2-6-6-tetraclorobifenile (PCB54)/ 2-2-6-6-tetrachlorobiphenyl (PCB 54), 2-2-6-triclorobifenile (PCB19)/2-2-6-trichlorobiphenyl (PCB 19), 2-2-diclorobifenile (PCB4)/2-2-dichlorobiphenyl (PCB 4), 2-3-3-4-4-5-5-eptaclorobifenile (PCB189)/2-3-3-4-4-5-5-heptachlorbiphenyl (PCB 189), 2-3-3-4-4-5-esaclorobifenile(PCB 156)/2-3-3-4-4-5-hexachlorobiphenyl (PCB 156),2-3-3-4-4-5-esaclorobifenile (PCB 157)/ 2-3-3-4-4-5-hexachlorobiphenyl (PCB157), 2-3-3-4-4-pentaclorobifenile (PCB 105)/2-3-3-4-4-pentachlorobiphenyl(PCB 105), 2-3-3-4-6-pentaclorobifenile (PCB110)/2-3-3-4-6-pentachlorobiphenyl (PCB 110), 2-3-4-4-5-5-esaclorobifenile(PCB 167)/ 2-3-4-4-5-5-hexachlorobiphenyl (PCB 167), 2-3-4-4-5-pentaclorobifenile (PCB 114)/2-3-4-4-5-pentachlorobiphenyl (PCB114), 2-3-4-4-5-pentaclorobifenile (PCB 118)/2-3-4-4-5-pentachlorobiphenyl(PCB 118), 2-3-4-4-5-pentaclorobifenile (PCB123)/ 2-3-4-4-5-pentachlorobiphenyl (PCB 123), 2-4-4-triclorobifenile (PCB28)/2-4-4-trichlorobiphenyl (PCB 28), 2-4-5-triclorobifenile (PCB31)/2-4-5-trichlorobiphenyl (PCB 31), 2-clorobifenile (PCB 1)/2-chlorobiphenyl(PCB 1), 2,2,3,3,4,4,6-eptaclorobifenile (PCB171)/2,2,3,3,4,4,6-heptachlorobiphenyl (PCB 171), 2,2,3,3,5,5,6,6-ottaclorobifenile (PCB 202)/ 2,2,3,3,5,5,6,6-octachlorobiphenyl(PCB 202), 2,2,3,4,5,6,6-eptaclorobifenile (PCB188)/2,2,3,4,5,6,6-heptachlorobiphenyl (PCB 188), 2,2,4,4,6,6-esaclorobifenile (PCB 155)/2,2,4,4,6,6-hexachlorobiphenyl (PCB 155),2,3,3,4,4,5,5,6-ottaclorobifenile (PCB 205)/2,3,3,4,4,5,5,6-octachlorobiphenyl(PCB 205), 3-3-4-4-5-5-esaclorobifenile (PCB169)/3-3-4-4-5-5-hexachlorobiphenyl (PCB 169), 3-3-4-4-5-pentaclorobifenile (PCB 126)/3-3-4-4-5-pentachlorobiphenyl (PCB 126), 3-3-4-4-tetraclorobifenile(PCB 77)/3-3-4-4-tetrachlorobiphenyl (PCB 77), 3-4-4-5-tetraclorobifenile (PCB81)/3-4-4-5-tetrachlorobiphenyl (PCB 81), 3-4-4-triclorobifenile (PCB37)/3-4-4-trichlorobiphenyl (PCB 37), 4-4-diclorobifenile (PCB15)/4-4-dichlorobiphenyl (PCB 15), 4-clorobifenile (PCB 3)/4-chlorobiphenyl(PCB 3)				
Prova correlata	Acque destinate al consumo umano/ Drinking waters, Acque di piscina (1)/ Swimming pool waters (1), Acque di scarico/Waste waters, Acque naturali/Natural waters, Rifiuti liquidi acquosi (1)/Aqueous liquid wastes (1)	Sommatoria di policlorobifenili (PCB) come tossicità equivalenteWHO-TEQ (2005) (da calcolo)/Sum of polychlorobiphenyl (PCB) asequivalent toxicity WHO-TEQ (2005) (calculation)	EPA 3510C 1996, EPA 3630C 1996, EPA 8270E 2018, WHO-TEF 2005	GC MS		0
Prova correlata	Acque destinate al consumo umano/ Drinking waters, Acque di scarico/ Waste waters, Acque naturali/Natural waters, Rifiuti liquidi	2-4-6-triclorofenolo/2-4-6-trichlorophenol, 2-4-diclorofenolo/2-4-dichlorophenol, 2-4-dimetilfenolo/2-4-dimethylphenol, 2-4-dinitrofenolo/2-4-dinitrophenol, 2-clorofenolo/2-chlorophenol, 2-etilfenolo/2-ethylphenol, 2-metilfenolo /2-methylphenol, 2-nitrofenolo/2-nitrophenol, 3-metilfenolo/3-methylphenol, 4-6-dinitro-2-metilfenolo/4-6-dinitro-2-methylphenol, 4-cloro-3-metilfenolo (PCMC)/4-chloro-3-methilphenol (PCMC), 4-metilfenolo/4-methylphenol, 4-nitrofenolo/4-nitrophenol, Acetato di Pentaclorofenolo/Pentachlorophenol acetate, Dodecanoato di Pentaclorofenolo/Pentachlorophenol dodecanoate, Fenolo/ Phenol, Pentaclorofenolo/Pentachlorophenol, Nonilfenolo/Nonylphenol, Octilfenolo/Octylphenol	EPA 3510C 1996, EPA 8270E 2018	GC MS		0

PROVE ACCREDITATE CON CAMPO FLESSIBILE	MATERIALE / PRODOTTO/ MATRICE	MISURANDO / PROPRIETA' MISURATA / DENOMINAZIONE DELLA PROVA	METODO DI PROVA ED ANNO DI EMISSIONE	TECNICA DI PROVA	CAMPO DI MISURA E/O DI PROVA	CAT.
	acquosi (1)/Aqueous liquid wastes (1)					
Prova correlata	Acque destinate al consumo umano/ Drinking waters, Acque di scarico/ Waste waters, Acque naturali/Natural waters, Rifiuti liquidi acquosi (1)/Aqueous liquid wastes (1)	Acenaftene/Acenaphthene, Acenaftilene/Acenaphthylene,Antracene/Anthracene, Benzo(a)antracene/Benzo(a)anthracene, Benzo(a)pirene/Benzo(a)pyrene,Benzo(b)fluorantene/Benzo(b)fluoranthene, Benzo(e)pirene/Benzo(e)pyrene, Benzo(ghi)perilene/Benzo(ghi)perylene, Benzo(j)fluorantene/Benzo(j)fluoranthene, Benzo(k)fluorantene/ Benzo(k)fluoranthene, Crisene/Chrysene, Dibenzo(ae)pirene/Dibenzo(ae)pyrene, Dibenzo(ah)antracene/ Dibenzo(ah)anthracene, Dibenzo(ah)pirene/Dibenzo(ah)pyrene,Dibenzo(ai)pirene/Dibenzo(ai)pyrene, Dibenzo(al)pirene/ Dibenzo(al)pyrene, Fenantrene/Phenanthrene, Fluorantene/Fluoranthene, Fluorene/Fluorene, Indeno(1-2-3-cd)pirene/ Indeno(1-2-3-cd)pyrene, Naftalene/Naphthalene, Perilene/Perylene, Pirene/Pyrene	EPA 3510C 1996, EPA 8270E 2018	GC MS		0
Prova correlata	Acque di scarico/ Waste waters, Acque naturali/Natural waters, Rifiuti liquidi acquosi (1)/Aqueous liquid wastes (1)	Azinfos-etile/Azinphos-ethyl, Azinfos-metile/Azinphos-methyl, Clorfenvinfos/Chlorfenvinphos, Clorpirifos etile/Chlorpyriphos-Ethyl, Clorpirifos metile/Chlorpyriphos methyl, Coumafos/Coumaphos, Crotoxifos/Crotoxyphos, Diazinone/Diazinon, Diclorvos/Dichlorvos, Dimetoato/Dimethoate, Famphur/Famphur, Fenitrotion/Fenitrothion, Fensulfotion/Fensulfothion, Fention/Fenthion, Forate/Phorate, Leptofos/Leptophos, Malation/Malathion, Metidation/Methidathion, Mevinfos/Mevinphos (Phosdrin), Paration-etile /Parathion-Ethyl, Paration-metile/Parathion-methyl, Tetraclorvinfos/Tetrachlorvinphos, Triazofos/ Triazophos	EPA 3510C 1996, EPA 8270E 2018	GC MS		0
Prova correlata	Rifiuti liquidi acquosi (1)/Aqueous liquid wastes (1)	1-2-3-4-5-6-7-eptacloronaftalene/1-2-3-4-5-6-7-heptachloronaphthalene, 1-2-3-4-5-6-esacloronaftalene/1-2-3-4-5-6-hexachloronaphthalene, 1-2-3-4-tetracloronaftalene/1-2-3-4-tetrachloronaphthalene, 1-2-3-5-7-pentacloronaftalene/1-2-3-5-7-pentachloronaphthalene, 1-2-3-tricloronaftalene/1-2-3-trichloronaphthalene, 1-2-dicloronaftalene/1-2-dichloronaphthalene, 2-cloronaftalene/2-chloronaphthalene, Ottacloronaftalene/Octachloronaphthalene	EPA 3510C 1996, EPA 8270E 2018	GC MS		0
Prova correlata	Rifiuti liquidi acquosi (1)/Aqueous liquid wastes (1)	2-2'-3-4-4'-5'-6-eptabromodifeniletere (BDE183)/2-2'-3-4-4'-5'-6-heptabromodiphenylether (BDE 183), 2-2'-3-4-4'-pentabromodifeniletere (BDE85)/2-2'-3-4-4'-pentabromodiphenylether (BDE 85), 2-2'-4-4'-5-5'-esabromodifeniletere (BDE153)/2-2'-4-4'-5-5'-hexabromodiphenylether (BDE 153),2-2'-4-4'-5-6'-esabromodifeniletere (BDE154)/2-2'-4-4'-5-6'-hexabromodiphenylether (BDE 154), 2-2'-4-4'-5-pentabromodifeniletere (BDE99)/2-2'-4-4'-5-pentabromodiphenylether (BDE 99), 2-2'-4-4'-6 pentabromodifeniletere (BDE100)/2-2'-4-4'-6-pentabromodiphenylether (BDE 100), 2-2'-4-4'-tetrabromodifeniletere (BDE47)/2-2'-4-4'-tetrabromodiphenylether (BDE 47),2-3'-4-4'-tetrabromodifeniletere (BDE66)/2-3'-4-4'-tetrabromodiphenylether (BDE 66), 2-4-4'-tribromodifeniletere (BDE 28)/2-4-4'-tribromodiphenylether (BDE 28), Decabromodifeniletere (BDE209)/Decabromodiphenylether (BDE 209), Eptabromodifeniletere (HeptaBDE)/ Heptabromodiphenylether (HeptaBDE), Esabromodifeniletere (HexaBDE)/Hexabromodiphenylether (HexaBDE), Pentabromodifeniletere (PentaBDE)/Pentabromodiphenylether (PentaBDE), Tetrabromodifeniletere (TetraBDE)/ Tetrabromodiphenylether (TetraBDE)	EPA 3510C 1996, EPA 8270E 2018	GC MS		0
Prova correlata	Rifiuti liquidi acquosi (1)/Aqueous liquid wastes (1)	Esabromobifenile (HexaBB)/Hexabromobiphenyl (HexaBB)	EPA 3510C 1996, EPA 8270E 2018	GC MS		0
Prova accreditata	**CAMPIONI AMBIENTALI LIQUIDI/LIQUID**	**COMPOSTI ORGANICI SEMI VOLATILI/SEMI VOLATILE ORGANIC COMPOUNDS**	**Vedere elenco dei dettagli**			

PROVE ACCREDITATE CON CAMPO FLESSIBILE	MATERIALE / PRODOTTO/ MATRICE	MISURANDO / PROPRIETA' MISURATA / DENOMINAZIONE DELLA PROVA	METODO DI PROVA ED ANNO DI EMISSIONE	TECNICA DI PROVA	CAMPO DI MISURA E/O DI PROVA	CAT.
con campo flessibile	**ENVIRONMENTAL SAMPLES**		**delle prove flessibili**			
Prova correlata	Acque destinate al consumo umano/ Drinking waters	Acidi aloacetici/Haloacetic acids: Acido cloroacetico/Chloroacetic Acid, Acido dicloroacetico/Dichloroacetic Acid, Acido tricloroacetico/Trichloroacetic Acid, Acido dibromoacetico/Dibromoacetic Acid, Acido Bromoacetico/Bromoacetic acid	MPI-264-2023 Rev.0	LC-MS/MS		0
Prova correlata	Acque destinate al consumo umano/ Drinking waters	Microcistina LR/Microcystin LR	EPA 544 Version 1.0 2015	LC-MS/MS		0
Prova correlata	Acque destinate al consumo umano/ Drinking waters, Acque di scarico/ Waste waters, Acque naturali/Natural waters	Acrilammide/Acrylamide	EPA 3535A 2007, EPA 8321B 2007	LC-MS/MS		0
Prova correlata	Acque destinate al consumo umano/ Drinking waters, Acque di scarico/ Waste waters, Acque naturali/Natural waters, Rifiuti liquidi acquosi (1)/Aqueous liquid wastes (1)	1-methyl-2-Pyrrolidinone 1-Metil-2-Pirrolidone, 2-2-bis(4-idrossifenil)propano (Bisfenolo A) (BPA)/2-2-bis(4-hydroxyphenyl)propane (Bisphenol A) (BPA), 17-Beta-Estradiolo/17-Beta-Estradiol, 4-Metilbenzotriazolo+ 5-Metilbenzotriazolo /4-Metilbenzotriazole+ 5-Metilbenzotriazole, Acesulfame K/Acesulfame potassico /E950, Acetominophen/ Paracetamolo/Paracetamol, Amoxicillina/Amoxicillin, Atenolol /Atenololo, Benzotriazolo/Benzotriazole, Carbamazepina/ Carbamazepine, Diclofenac/Diclofenac, Sulfametossazolo/Sulfamethoxazole, Trimetoprim/Trimethoprim.	UNI EN ISO 21676:2021	LC-MS/MS		0
Prova correlata	Acque destinate al consumo umano/ Drinking waters, Acque di scarico/ Waste waters, Acque naturali/Natural waters, Rifiuti liquidi acquosi (1)/Aqueous liquid wastes (1)	Esabromociclododecano (HBCDD)/Hexabromocyclododecane (HBCDD)	EPA 3512 2021, EPA 3535A 2007, EPA 8321B 2007	LC-MS/MS		0
Prova correlata	Acque di scarico/ Waste waters, Acque sotterranee/Ground waters, Acque	Acido p-ftalico/p-phthalic acid	EPA 8321B 2007	LC-MS/MS		0

PROVE ACCREDITATE CON CAMPO FLESSIBILE	MATERIALE / PRODOTTO/ MATRICE	MISURANDO / PROPRIETA' MISURATA / DENOMINAZIONE DELLA PROVA	METODO DI PROVA ED ANNO DI EMISSIONE	TECNICA DI PROVA	CAMPO DI MISURA E/O DI PROVA	CAT.
	superficiali/Surface waters					
Prova accreditata con campo flessibile	**CAMPIONI AMBIENTALI LIQUIDI/LIQUID ENVIRONMENTAL SAMPLES**	**COMPOSTI ORGANOVOLATILI (QUANTITATIVA)/VOLATILE ORGANIC COMPOUNDS (QUANTITATIVE)**	**Vedere elenco dei dettagli delle prove flessibili**			
Prova correlata	Acque destinate al consumo umano/ Drinking waters, Acque di scarico/ Waste waters, Acque naturali/Natural waters, Rifiuti liquidi acquosi/Aqueous liquid wastes	1-1-1-2-tetracloroetano/1-1-1-2-tetrachloroethane, 1-1-1-tricloroetano (metilcloroformio)/1-1-1-trichloroethane (methylchloroform), 1-1-2-2-tetracloroetano/1-1-2-2-tetrachloroethane, 1-1-2-tricloroetano/1-1-2-trichloroethane, 1-1-dicloroetano/1-1-dichloroethane, 1-1-dicloroetilene/1-1-dichloroethene,1-2-3-tricloropropano/1-2-3-trichloropropane, 1-2-dibromoetano/1-2-dibromoethane, 1-2-diclorobenzene/1-2-dichlorobenzene, 1-2-dicloroetano/1-2-dichloroethane, 1-2-dicloroetilene (cis)/1-2-dichloroethene (cis), 1-2-dicloroetilene (trans)/1-2-dichloroethene (trans), 1-2-dicloropropano/1-2-dichloropropane, 1-3-diclorobenzene/1-3-dichlorobenzene, 1-4-diclorobenzene/1-4-dichlorobenzene, Bromodiclorometano/ Bromodichloromethane, Clorobenzene/Chlorobenzene, Cloroetilene (Cloruro di vinile)/Chloroethylene (Vinyl chloride), Clorometano/Chloromethane, Dibromoclorometano/Dibromochloromethane, Diclorometano/Dichloromethane, Epicloridrina/ Epichlorohydrin, Esacloro-1-3-butadiene/Hexachloro-1-3-butadiene, Tetracloroetilene/Tetrachloroethene, Tetraclorometano (Tetracloruro di carbonio)/Tetrachloromethane (Carbon tetrachloride), Tribromometano (Bromoformio)/Tribromomethane (Bromoform), Tricloroetilene (Trielina)/Trichloroethene, Triclorometano (Cloroformio)/Trichloromethane (Chloroform)	EPA 5030C 2003, EPA 8260D 2018	GC MS		0
Prova correlata	Acque destinate al consumo umano/ Drinking waters, Acque di scarico/ Waste waters, Acque naturali/Natural waters, Rifiuti liquidi acquosi/Aqueous liquid wastes	Benzene/Benzene, Etilbenzene/Ethylbenzene, m-xilene/m-xylene, o-xilene/o-xylene, p-xilene/p-xylene, Stirene/Styrene, Toluene/Toluene	EPA 5030C 2003, EPA 8260D 2018	GC MS		0
Prova correlata	Acque destinate al consumo umano/ Drinking waters, Acque di scarico/ Waste waters, Acque naturali/Natural waters, Rifiuti liquidi acquosi/Aqueous liquid wastes	Etilterbutiletere (ETBE)/Ethyltertbutylether (ETBE), Metilterbutiletere (MTBE)/Methyltertbutylether (MTBE)	EPA 5030C 2003, EPA 8260D 2018	GC MS		0

PROVE ACCREDITATE CON CAMPO FLESSIBILE	MATERIALE / PRODOTTO/ MATRICE	MISURANDO / PROPRIETA' MISURATA / DENOMINAZIONE DELLA PROVA	METODO DI PROVA ED ANNO DI EMISSIONE	TECNICA DI PROVA	CAMPO DI MISURA E/O DI PROVA	CAT.
Prova correlata	Rifiuti liquidi acquosi/ Aqueous liquid wastes	1-3-butadiene/1-3-butadiene, Esacloroetano/Hexachloroethane, Pentacloroetano/Pentachloroethane	EPA 5021A 2014, EPA 8260D 2018	GC MS		0
Prova correlata	Rifiuti liquidi acquosi/ Aqueous liquid wastes	1-butanolo (alcol n-butilico)/1-butanol (n-butyl alcohol), 1-propanolo (alcol n-propilico)/1-propanol (n-propylic alcohol), 2-metil-1-propanolo (alcol isobutilico)/2-methyl-1-propanol (Isobutanol), 2-metil-2-propanolo (alcol terbutilico)/2-methyl-2-propanol (tert-Butyl alcohol), 2-propanolo (alcol isopropilico)/2-propanol (isopropyl alcohol), Acetonitrile/Acetonitrile, Acrilonitrile/Acrylonitrile, Cicloesano/Cyclohexane, Etanolo (Alcol etilico)/Ethanol (Ethyl alcohol), Isopropilbenzene (Cumene)/ Isopropylbenzene (Cumene), n-eptano/n-heptane, n-esano/n-hexane, n-propilbenzene/N-propylbenzene	EPA 5021A 2014, EPA 8260D 2018	GC MS		0
Prova correlata	Rifiuti liquidi acquosi/ Aqueous liquid wastes	2-nitropropano/2-nitropropane, Acetato di etile/Ethyl acetate, Acrilato di etile/Ethyl acrylate, Di-metil chetone (Acetone)/Di-methyl ketone (Acetone), Limonene (cinene)/Limonene (cinene), Metacrilonitrile/Methacrylonitrile, Metil isobutilchetone (MIBK)/Methyl isobuthylketone (MIBK), Ossido di etilene/Ethylene oxide, Propionitrile/Propionitrile, Tetraidrofurano/ Tetrahydrofuran	EPA 5021A 2014, EPA 8260D 2018	GC MS		0
Prova accreditata con campo flessibile	**CAMPIONI AMBIENTALI LIQUIDI/LIQUID ENVIRONMENTAL SAMPLES**	**IDROCARBURI/HYDROCARBONS**	**Vedere elenco dei dettagli delle prove flessibili**			
Prova correlata	Acque destinate al consumo umano (1)/ Drinking waters (1), Acque di scarico/ Waste waters, Acque sotterranee (1)/ Ground waters (1), Acque superficiali/ Surface waters, Rifiuti liquidi acquosi (1)/ Aqueous liquid wastes (1)	Idrocarburi C10-C40/Hydrocarbons C10-C40, Idrocarburi pesanti C>12/Heavy hydrocarbons C>12	UNI EN ISO 9377-2:2002	GC FID		0
Prova correlata	Acque destinate al consumo umano/ Drinking waters, Acque di scarico/ Waste waters, Acque naturali/Natural waters, Rifiuti liquidi acquosi/Aqueous liquid wastes	Idrocarburi C10-C28 (DRO)/Hydrocarbons C10-C28 (DRO)	EPA 3510C 1996, EPA 3620C 2014, EPA 8015C 2007	GC FID		0

PROVE ACCREDITATE CON CAMPO FLESSIBILE	MATERIALE / PRODOTTO/ MATRICE	MISURANDO / PROPRIETA' MISURATA / DENOMINAZIONE DELLA PROVA	METODO DI PROVA ED ANNO DI EMISSIONE	TECNICA DI PROVA	CAMPO DI MISURA E/O DI PROVA	CAT.
Prova correlata	Acque naturali/ Natural waters, Rifiuti liquidi acquosi (1)/ Aqueous liquid wastes (1)	Idrocarburi totali (da calcolo)/Total hydrocarbons (calculation)	EPA 5021A 2014 + EPA 8015C 2007 + UNI EN ISO 9377-2:2002	GC FID		0
Prova correlata	Acque naturali/ Natural waters, Rifiuti liquidi acquosi/ Aqueous liquid wastes	Idrocarburi leggeri C≤12/Light hydrocarbons C≤12	EPA 5021A 2014, EPA 8015C 2007	GC FID		0
Prova correlata	Rifiuti liquidi/Liquid wastes	Idrocarburi C10-C40/Hydrocarbons C10-C40	UNI EN 14039:2005	GC FID		0
Prova accreditata con campo flessibile	**CAMPIONI AMBIENTALI LIQUIDI/LIQUID ENVIRONMENTAL SAMPLES**	**METALLI/METALS**	**Vedere elenco dei dettagli delle prove flessibili**			
Prova correlata	Acque destinate al consumo umano/ Drinking waters, Acque di falda/ Ground waters, Acque superficiali/ Surface waters	Alluminio/Aluminium, Antimonio/Antimony, Argento/Silver, Arsenico/Arsenic, Bario/Barium, Berillio/Beryllium, Boro/Boron, Cadmio/Cadmium, Cobalto/Cobalt, Cromo/Chromium, Ferro/Iron, Manganese/Manganese, Nichel/Nickel, Piombo/Lead, Rame/Copper, Selenio/Selenium, Silice (da calcolo)/Silica (calculation), Silicio/Silicon, Stagno/Tin, Stronzio/Strontium,Tallio/ Thallium, Vanadio/Vanadium, Zinco/Zinc	APAT CNR IRSA 3020 Man 29 2003	ICP-OES		0
Prova correlata	Acque destinate al consumo umano/ Drinking waters, Acque di piscina (1)/ Swimming pool waters (1), Acque di scarico/Waste waters, Acque minerali naturali (1)/ Natural mineral waters (1), Acque sotterranee/Ground waters, Acque superficiali/Surface	Alluminio/Aluminium, Antimonio/Antimony, Argento/Silver, Arsenico/Arsenic, Bario/Barium, Berillio/Beryllium, Boro/Boron, Cadmio/Cadmium, Cobalto/Cobalt, Cromo/Chromium, Ferro/Iron, Manganese/Manganese, Nichel/Nickel, Piombo/Lead, Rame/Copper, Selenio/Selenium, Silice (da calcolo)/Silica (calculation), Silicio/Silicon, Stagno/Tin, Stronzio/Strontium, Tallio/ Thallium, Vanadio/Vanadium, Zinco/Zinc	UNI EN ISO 11885:2009	ICP-OES		0

PROVE ACCREDITATE CON CAMPO FLESSIBILE	MATERIALE / PRODOTTO/ MATRICE	MISURANDO / PROPRIETA' MISURATA / DENOMINAZIONE DELLA PROVA	METODO DI PROVA ED ANNO DI EMISSIONE	TECNICA DI PROVA	CAMPO DI MISURA E/O DI PROVA	CAT.
	waters, Rifiuti liquidi acquosi (1)/Aqueous liquid wastes (1)					
Prova correlata	Acque destinate al consumo umano/ Drinking waters, Acque di piscina/ Swimming pool waters, Acque di scarico/Waste waters, Acque naturali/Natural waters, Rifiuti liquidi acquosi (1)/Aqueous liquid wastes (1)	Alluminio/Aluminium, Antimonio/Antimony, Argento/Silver, Arsenico/Arsenic, Bario/Barium, Berillio/Beryllium, Boro/Boron, Cadmio/Cadmium, Cobalto/Cobalt, Cromo/Chromium, Ferro/Iron, Litio/Lithium, Manganese/Manganese, Mercurio/Mercury, Molibdeno/Molybdenum, Nichel/Nickel, Piombo/Lead, Rame/Copper, Selenio/Selenium, Silicio/Silicon, Stagno/Tin, Tallio/ Thallium, Stronzio/Strontium, Tellurio/Tellurium, Titanio/Titanium, Vanadio/Vanadium, Zinco/Zinc	EPA 3015A 2007, EPA 6010D 2018	ICP-OES		0
Prova correlata	Acque di scarico/ Waste waters, Rifiuti liquidi acquosi (1)/ Aqueous liquid wastes (1)	Alluminio/Aluminium, Antimonio/Antimony, Argento/Silver, Arsenico/Arsenic, Bario/Barium, Berillio/Beryllium, Boro/Boron, Cadmio/Cadmium, Cobalto/Cobalt, Cromo/Chromium, Ferro/Iron, Manganese/Manganese, Nichel/Nickel, Piombo/Lead, Rame/Copper, Selenio/Selenium, Silice (da calcolo)/Silica (calculation), Silicio/Silicon, Stagno/Tin, Stronzio/Strontium ,Tallio/ Thallium, Vanadio/Vanadium, Zinco/Zinc	APAT CNR IRSA 3010 B + 3020 Man 29 2003	ICP-OES		0
Prova accreditata con campo flessibile	**CAMPIONI AMBIENTALI LIQUIDI/LIQUID ENVIRONMENTAL SAMPLES**	**METALLI/METALS**	**Vedere elenco dei dettagli delle prove flessibili**			
Prova correlata	Acque destinate al consumo umano/ Drinking waters, Acque di piscina/ Swimming pool waters, Acque di scarico/Waste waters, Acque minerali naturali (1)/ Natural mineral waters (1), Acque sotterranee/Ground waters, Acque superficiali/Surface	Alluminio/Aluminium, Antimonio/Antimony, Argento/Silver, Arsenico/Arsenic, Bario/Barium, Berillio/Beryllium, Boro/Boron, Cadmio/Cadmium, Cobalto/Cobalt, Cromo/Chromium, Ferro/Iron, Manganese/Manganese, Mercurio/Mercury, Nichel/Nickel, Piombo/Lead, Rame/Copper, Selenio/Selenium, Stronzio/Strontium, Tallio/Thallium, Uranio/Uranium, Vanadio/Vanadium, Zinco/Zinc	UNI EN ISO 17294-2:2016	ICP MS		0

PROVE ACCREDITATE CON CAMPO FLESSIBILE	MATERIALE / PRODOTTO/ MATRICE	MISURANDO / PROPRIETA' MISURATA / DENOMINAZIONE DELLA PROVA	METODO DI PROVA ED ANNO DI EMISSIONE	TECNICA DI PROVA	CAMPO DI MISURA E/O DI PROVA	CAT.
	waters, Rifiuti liquidi acquosi (1)/Aqueous liquid wastes (1)					
Prova correlata	Acque destinate al consumo umano/ Drinking waters, Acque di scarico/ Waste waters, Acque minerali naturali (1)/ Natural mineral waters (1), Acque sotterranee/Ground waters, Acque superficiali/Surface waters, Rifiuti liquidi acquosi (1)/Aqueous liquid wastes (1)	Alluminio/Aluminium, Antimonio/Antimony, Argento/Silver, Arsenico/Arsenic, Bario/Barium, Berillio/Beryllium, Boro/Boron, Cadmio/Cadmium, Cobalto/Cobalt, Cromo/Chromium, Ferro/Iron, Litio/Lithium, Manganese/Manganese, Mercurio/Mercury, Molibdeno/Molybdenum, Nichel/Nickel, Piombo/Lead, Platino/Platinum, Rame/Copper, Selenio/Selenium, Stagno/Tin, Stronzio/Strontium, Tallio/Thallium, Tellurio/Tellurium, Torio/Thorium, Uranio/Uranium, Vanadio/Vanadium, Zinco/Zinc	UNI EN ISO 15587-2:2002, UNI EN ISO 17294-2:2016	ICP MS		0
Prova accreditata con campo flessibile	**CAMPIONI AMBIENTALI SOLIDI/SOLID ENVIRONMENTAL SAMPLES**	**ANIONI/ANIONS**	**Vedere elenco dei dettagli delle prove flessibili**			
Prova correlata	Fanghi/Sludges, Rifiuti/Wastes, Sedimenti (1)/ Sediments (1), Terreni/Soils	Anioni/Anions : Bromati/Bromate, Clorati/Chlorate, Cloriti/Chlorite	EPA 300.0 1993 part B	Cromatografia Ionica		0
Prova correlata	Fanghi/Sludges, Rifiuti/Wastes, Sedimenti (1)/ Sediments (1), Terreni/Soils	Anioni/Anions : Bromuri/Bromide, Cloruri/Chloride, Fluoruri/Fluoride, Nitrati/Nitrate, Nitriti/Nitrite, Ortofosfati/Orthophosphates, Solfati/Sulphates	EPA 300.0 1993 part A	Cromatografia Ionica		0
Prova accreditata con campo flessibile	**CAMPIONI AMBIENTALI SOLIDI/SOLID ENVIRONMENTAL SAMPLES**	**COMPOSTI ORGANICI SEMI VOLATILI/SEMI VOLATILE ORGANIC COMPOUNDS**	**Vedere elenco dei dettagli delle prove flessibili**			

PROVE ACCREDITATE CON CAMPO FLESSIBILE	MATERIALE / PRODOTTO/ MATRICE	MISURANDO / PROPRIETA' MISURATA / DENOMINAZIONE DELLA PROVA	METODO DI PROVA ED ANNO DI EMISSIONE	TECNICA DI PROVA	CAMPO DI MISURA E/O DI PROVA	CAT.
Prova correlata	Fanghi/Sludges, Rifiuti/Wastes, Suoli/ Soils	Acido o-ftalico/o-phthalic acid	EPA 3550C 2007, EPA 8321B 2007	LC-MS/MS		0
Prova correlata	Rifiuti/Wastes	Esabromociclododecano (HBCDD)/Hexabromocyclododecane (HBCDD	EPA 3550C 2007, EPA 3570 2002, EPA 8321B 2007	LC-MS/MS		0
Prova accreditata con campo flessibile	**CAMPIONI AMBIENTALI SOLIDI/SOLID ENVIRONMENTAL SAMPLES**	**COMPOSTI ORGANICI SEMI VOLATILI/SEMI VOLATILE ORGANIC COMPOUNDS (_)**	**Vedere elenco dei dettagli delle prove flessibili**			
Prova correlata	Fanghi, sedimenti, rifiuti solidi, terreni, matrici solide	Polibromodifenileteri: 2 2' 3 4 4' 5 6'-eptabromodifeniletere (BDE-183), 2 2' 3 4 4'-pentabromodifeniletere (BDE-85), 2 2' 4 4' 5 6'-esabromodifeniletere (BDE-154), 2 2' 4 4' 5 5'-esabromodifeniletere (BDE-153), 2 2' 4 4' 5-pentabromodifeniletere (BDE-99), 2 2' 4 4' 6-pentabromodifeniletere (BDE-100), 2 2' 4 4'-tetrabromodifeniletere (BDE-47), 2 3' 4 4'-tetrabromodifeniletere (BDE-66), 2 4 4'-tribromodifeniletere (BDE-28), Tetrabromodifeniletere, Pentabromodifeniletere, Esabromodifeniletere, Eptabromodifeniletere. Decabromodifeniletere. Sommatoria PBDE. Esabromodifenile. Naftaleni policlorurati: Octachloronaphthalene, 1,2,3,4,5,6,7-Heptachloronaphthalene, 1,2,3,4,5,6-Hexachloronaphthalene, 1,2,3,4-Tetrachloronaphthalene, 1,2,3,5,7-Pentachloronaphthalene 1,2,3-Trichloronaphthalene, 1,2-Dichloronaphthalene, 2-Chloronaphthalene. Sommatoria naftaleni policlorurati	EPA 3541 1994 + EPA 3630C 1996 + EPA 8270E 2018, EPA 3541 1994 + EPA 8270E 2018	GC-MS		0
Prova correlata	Fanghi, sedimenti, rifiuti, terreni, matrici solide	Ammine aromatiche: anilina, o-anisidina, m-anisidina, p-anisidina, difenilammina, p-toluidina, 2,4-Toluendiammina, 2-6-Toluendiammina. Sommatoria ammine aromatiche. Clorobenzeni: 1,2,4-triclorobenzene, 1,2,4,5-tetraclorobenzene, pentaclorobenzene, esaclorobenzene, 1,3,5-Triclorobenzene, 1,2,3-Triclorobenzene, 1,2,3,4-Tetraclorobenzene, 1,2,3,5-Tetraclorobenzene. Nitrobenzeni: nitrobenzene, 1,2-dinitrobenzene, 1,3-dinitrobenzene, 1,4-dinitrobenzene. Cloronitrobenzeni:1-cloro-3nitrobenzene, 1-cloro-4nitrobenzene, 1 cloro -2 Nitrobenzene. Sommatoria Cloronitrobenzeni. Esteri dell'acido ftalico: bis-(2-etil-esil-ftalato), butil-benzil-ftalato, di-(n-butil)-ftalato, di-etil-ftalato, di-metil-ftalato, di-n-octil-ftalato	EPA 3541 1994 + EPA 3620C 2014 + EPA 8270E 2018, EPA 3541 1994 + EPA 8270E 2018	GC-MS		0
Prova correlata	Fanghi, sedimenti, rifiuti, terreni, matrici solide	Composti aromatici policiclici: benzo(a)antracene, benzo(a)pirene, benzo(b)fluorantene, benzo(k)fluorantene, benzo(g,h,i)perilene, crisene, dibenzo(a,e)pirene, dibenzo(a,h)pirene, dibenzo(a,i)pirene, dibenzo(a,l)pirene, dibenzo(a,h)antracene, indenopirene, pirene, naftalene, acenaftilene, acenaftene, fluorene, fenantrene, antracene, fluorantene, benzo(j)Fluorantene, benzo (e)Pirene, perilene. Sommatoria composti aromatici policiclici. Fenoli e clorofenoli: 2-clorofenolo, fenolo, 2,4-dimetilfenolo, 2,4-diclorofenolo, 2,6-diclorofenolo, 2-metilfenolo (o-cresolo), 2,4,5-triclorofenolo, 2,4,6-triclorofenolo, 4-cloro-3-metilfenolo, 2-etilfenolo, 2,3,4,5-tetraclorofenolo, 2,3,4,6-tetraclorofenolo, 2,3,5,6-tetraclorofenolo, Pentaclorofenolo, 3-metil-fenolo (m-cresolo), 4-metil-fenolo (p-cresolo), Metil-Fenolo (o-m-p), Sommatoria (o-m-p cresolo), Pentaclorofenolo e suoi Sali ed esteri, Atrazina, Alachlor.	EPA 3541 1994 + EPA 3630C 1996 + EPA 8270E 2018, EPA 3541 1994 + EPA 8270E 2018	GC-MS		0

PROVE ACCREDITATE CON CAMPO FLESSIBILE	MATERIALE / PRODOTTO/ MATRICE	MISURANDO / PROPRIETA' MISURATA / DENOMINAZIONE DELLA PROVA	METODO DI PROVA ED ANNO DI EMISSIONE	TECNICA DI PROVA	CAMPO DI MISURA E/O DI PROVA	CAT.
Prova correlata	Fanghi, sedimenti, rifiuti, terreni, matrici solide	Composti organici semivolatili: 2-Nitrofenolo, 4-Nitrofenolo, 2,4-Dinitrofenolo, 2,4-Dinitrotoluene, 2,6-Dinitrotoluene, 4,6-Dinitro-2-metilfenolo, Solventi azotati.	EPA 3541 1994 + EPA 3630C 1996 + EPA 8270E 2018, EPA 3541 1994 + EPA 8270E 2018	GC-MS		0
Prova correlata	Fanghi, sedimenti, rifiuti, terreni, suoli	Composti organici semivolatili: 3-metil-fenolo (m-cresolo) + 4-metil-fenolo (p-cresolo), Sommatoria fenoli, o-Toluidina, m-Toluidina, Sommatoria clorobenzeni, Sommatoria Nitrobenzeni, Di-allil- ftalato, Di-isobutil- ftalato, Di-isopentil- ftalato, Di-(n-pentil) - ftalato, Bis(2-metossietil)-ftalato, Di-esil- ftalato, di-ciclo-esil.ftalato, Sommatoria esteri dell'acido ftalico, alfa-esaclorocicloesano, beta – esaclorocicloesano, gamma – esaclorocicloesano (lindano), delta – esaclorocicloesano, Sommatoria alfa-beta-gamma-delta esaclorocicloesano, Aldrin, Endrin, Dieldrin, Isodrin, alfa – Clordano, gamma – Clordano, Clordano, Eptacloro, Eptacloro Epossido, alfa-endosulfano, beta-endosulfano, Endosulfano (alfa+beta), o,p'- DDE, p,p'-DDE, o,p'- DDD, p,p'-DDD, o,p'-DDT, p,p'-DDT, DDD, DDT, DDE, Sommatoria DDD + DDT + DDE, Metossicloro, Mirex, Clordecone, Sommatoria fitofarmaci, 2,2'-4,4'-5,5'-Esabromobifenile, ,2'-4,4'-6,6'-Esabromobifenile, Dicofol	EPA 3541 1994 + EPA 3630C 1996 + EPA 8270E 2018, EPA 3541 1994 + EPA 3620C 2014 + EPA 8270E 2018, EPA 3541 1994 + EPA 8270E 2018	GC-MS		0
Prova accreditata con campo flessibile	**CAMPIONI AMBIENTALI SOLIDI/SOLID ENVIRONMENTAL SAMPLES**	**COMPOSTI ORGANOVOLATILI (QUANTITATIVA)/VOLATILE ORGANIC COMPOUNDS (QUANTITATIVE)**	**Vedere elenco dei dettagli delle prove flessibili**			
Prova correlata	Fanghi/Sludges, Rifiuti/Wastes, Sedimenti/ Sediments, Solidi/ Solids, Suoli/Soils	1-1-1-tricloroetano (metilcloroformio)/1-1-1-trichloroethane (methylchloroform), 1-1-2-2-tetracloroetano/1-1-2-2-tetrachloroethane, 1-1-2-tricloroetano/1-1-2-trichloroethane, 1-1-dicloroetano/1-1-dichloroethane, 1-1-dicloroetilene/1-1-dichloroethene, 1-2-3-tricloropropano/1-2-3-trichloropropane, 1-2-dibromoetano/1-2-dibromoethane, 1-2-diclorobenzene/1-2-dichlorobenzene, 1-2-dicloroetano/1-2-dichloroethane, 1-2-dicloroetilene (cis+trans)/1-2-dichloroethene (cis+trans), 1-2-dicloropropano/1-2-dichloropropane, 1-3-diclorobenzene/1-3-dichlorobenzene, 1-4-diclorobenzene/1-4-dichlorobenzene, Bromodiclorometano/Bromodichloromethane, Clorobenzene/Chlorobenzene, Cloroetilene (Cloruro di vinile)/Chloroethylene (Vinyl chloride), Clorometano/Chloromethane, Dibromoclorometano/Dibromochloromethane, Diclorometano/ Dichloromethane, Esacloro-1-3-butadiene/Hexachloro-1-3-butadiene, Tetracloroetilene/Tetrachloroethene, Tribromometano (Bromoformio)/Tribromomethane (Bromoform), Tricloroetilene (Trielina)/Trichloroethene, Triclorometano (Cloroformio)/ Trichloromethane (Chloroform)	EPA 5021A 2014, EPA 5035A 2002, EPA 8260D 2018	GC MS		0
Prova correlata	Fanghi/Sludges, Rifiuti/Wastes, Sedimenti/	Benzene/Benzene, Etilbenzene/Ethylbenzene, Stirene/Styrene, Toluene/Toluene, Xileni/Xylenes	EPA 5021A 2014, EPA 5035A 2002,	GC MS		0

PROVE ACCREDITATE CON CAMPO FLESSIBILE	MATERIALE / PRODOTTO/ MATRICE	MISURANDO / PROPRIETA' MISURATA / DENOMINAZIONE DELLA PROVA	METODO DI PROVA ED ANNO DI EMISSIONE	TECNICA DI PROVA	CAMPO DI MISURA E/O DI PROVA	CAT.
	Sediments, Solidi/ Solids, Suoli/Soils		EPA 8260D 2018			
Prova correlata	Fanghi/Sludges, Rifiuti/Wastes, Sedimenti/ Sediments, Solidi/ Solids, Suoli/Soils	Etilterbutiletere (ETBE)/Ethyltertbutylether (ETBE), Metilterbutiletere (MTBE)/Methyltertbutylether (MTBE)	EPA 5021A 2014, EPA 5035A 2002, EPA 8260D 2018	GC MS		0
Prova correlata	Rifiuti/Wastes	1-3-butadiene/1-3-butadiene, Esacloroetano/Hexachloroethane, Pentacloroetano/Pentachloroethane	EPA 5021A 2014, EPA 8260D 2018	GC MS		0
Prova correlata	Rifiuti/Wastes	2-nitropropano/2-nitropropane, Acetato di etile/Ethyl acetate, Acrilato di etile/Ethyl acrylate, Di-metil chetone (Acetone)/Di-methyl ketone (Acetone), Limonene (cinene)/Limonene (cinene), Metacrilonitrile/Methacrylonitrile, Metil isobutilchetone (MIBK)/Methyl isobuthylketone (MIBK), Ossido di etilene/Ethylene oxide, Propionitrile/Propionitrile, Tetraidrofurano/ Tetrahydrofuran	EPA 5021A 2014, EPA 8260D 2018	GC MS		0
Prova correlata	Rifiuti/Wastes	Limonene (cinene)/Limonene (cinene)	EPA 5021A 2014, EPA 8260D 2018	GC MS		0
Prova correlata	Rifiuti/Wastes, Suoli	1-butanolo (alcol n-butilico)/1-butanol (n-butyl alcohol), 1-propanolo (alcol n-propilico)/1-propanol (n-propylic alcohol), 1,1 Dicloropropene/1,1 Dicloropropene, 1,2-dibromo-3-cloropropano/1,2-dibromo-3-cloropropane, 1,3-dicloropropano/1,3-dicloropropane, 2-clorotoluene/2-clorotoluene , 4-clorotoluene /4-clorotoluene, 2-metil-1-propanolo (alcol isobutilico)/2-methyl-1-propanol (Isobutanol), 2-metil-2-propanolo (alcol terbutilico)/2-methyl-2-propanol (tert-Butyl alcohol), 2-propanolo (alcol isopropilico)/2-propanol (isopropyl alcohol), 1,3,5,-trimetilbenzene/1,3,5,-trimetilbenzene, 1,1,1,2 Tetracloroetano/ 1,1,1,2 Tetracloroethane, Acetonitrile/Acetonitrile, Acrilonitrile/Acrylonitrile, Bromobenzene/Bromobenzene,Cicloesano/ Cyclohexane, Cis-1,3-dicloropropene / Cis-1,3-dicloropropene, Etanolo (Alcol etilico)/Ethanol (Ethyl alcohol), Dibromometano/ Dibromomethane, Isopropilbenzene (Cumene)/Isopropylbenzene(Cumene), n-eptano/n-heptane, n-esano/n-hexane,n-propilbenzene/N-propylbenzene, Metilcicloesano /Methylciclohexane, m-viniltoluene /m-Vinyltoluene, Tetraclorometano / Tetrachloromethane, Trans-1,3-dicloropropene/ Trans-1,3-dicloropropene,	EPA 5021A 2014, EPA 8260D 2018	GC MS		0
Prova accreditata con campo flessibile	**CAMPIONI AMBIENTALI SOLIDI/SOLID ENVIRONMENTAL SAMPLES**	**IDROCARBURI/HYDROCARBONS**	**Vedere elenco dei dettagli delle prove flessibili**			
Prova correlata	Fanghi (1)/Sludges (1), Rifiuti (1)/Wastes (1), Sedimenti (1)/ Sediments (1), Suoli/ Soils, Terreni/Soils	Idrocarburi C10-C40/Hydrocarbons C10-C40, Idrocarburi pesanti C>12/Heavy hydrocarbons C>12	UNI EN ISO 16703:2011	GC FID		0

PROVE ACCREDITATE CON CAMPO FLESSIBILE	MATERIALE / PRODOTTO/ MATRICE	MISURANDO / PROPRIETA' MISURATA / DENOMINAZIONE DELLA PROVA	METODO DI PROVA ED ANNO DI EMISSIONE	TECNICA DI PROVA	CAMPO DI MISURA E/O DI PROVA	CAT.
Prova correlata	Fanghi/Sludges, Rifiuti/Wastes, Sedimenti/ Sediments, Terreni/ Soils	Idrocarburi C10-C28 (DRO)/Hydrocarbons C10-C28 (DRO)	EPA 3541 1994, EPA 3620C 2014, EPA 8015C 2007	GC FID		0
Prova correlata	Fanghi/Sludges, Rifiuti/Wastes, Sedimenti/ Sediments, Terreni/ Soils	Idrocarburi leggeri C≤12/Light hydrocarbons C≤12	EPA 5021A 2014, EPA 8015C 2007	GC FID		0
Prova correlata	Rifiuti solidi/Solid wastes	Idrocarburi C10-C40/Hydrocarbons C10-C40	UNI EN 14039:2005	GC FID		0
Prova correlata	Rifiuti/Wastes, Suoli/ Soils	Idrocarburi totali (da calcolo)/Total hydrocarbons (calculation)	EPA 5021A 2014 + EPA 8015C 2007 + UNI EN 14039:2005, EPA 5021A 2014 + EPA 8015C 2007 + UNI EN ISO 16703:2011	GC FID		0
Prova accreditata con campo flessibile	**CAMPIONI AMBIENTALI SOLIDI/SOLID ENVIRONMENTAL SAMPLES**	**METALLI/METALS**	**Vedere elenco dei dettagli delle prove flessibili**			
Prova correlata	Compost (1)/ Compost (1)	Mercurio/Mercury	EPA 3051A 2007, EPA 6010D 2018	ICP-OES		0
Prova correlata	Fanghi (1)/Sludges (1), Rifiuti/Wastes, Sedimenti (1)/ Sediments (1), Suoli (1)/Soils (1)	Alluminio/Aluminium, Antimonio/Antimony, Argento/Silver,Arsenico/Arsenic, Bario/Barium, Berillio/Beryllium, Boro/ Boron,Cadmio/Cadmium, Calcio/Calcium, Cobalto/Cobalt, Cromo/Chromium,Ferro/Iron, Fosforo/Phosphorus, Litio/Lithium, Magnesio/Magnesium,Manganese/Manganese, Mercurio/Mercury, Molibdeno/Molybdenum,Nichel/Nickel, Piombo/Lead, Potassio/Potassium, Rame/Copper,Selenio/Selenium, Sodio/Sodium, Stagno/Tin, Tallio/Thallium,Tellurio/Tellurium, Titanio/ Titanium, Vanadio/Vanadium, Zinco/Zinc, Zolfo/Sulphur	UNI EN 13657:2004, UNI EN 16170:2016	ICP-OES		0
Prova correlata	Fanghi (1)/Sludges (1), Rifiuti/Wastes, Sedimenti (1)/	Alluminio/Aluminium, Antimonio/Antimony, Arsenico/Arsenic,Bario/Barium, Berillio/Beryllium, Boro/Boron, Cadmio/Cadmium, Cobalto/Cobalt, Cromo/Chromium, Ferro/Iron, Manganese/Manganese, Molibdeno/Molybdenum, Nichel/Nickel, Piombo/Lead, Rame/Copper, Selenio/Selenium, Stagno/Tin, Tallio/Thallium, Vanadio/Vanadium, Zinco/Zinc	UNI EN 13657:2004, APAT CNR	ICP-OES		0

PROVE ACCREDITATE CON CAMPO FLESSIBILE	MATERIALE / PRODOTTO/ MATRICE	MISURANDO / PROPRIETA' MISURATA / DENOMINAZIONE DELLA PROVA	METODO DI PROVA ED ANNO DI EMISSIONE	TECNICA DI PROVA	CAMPO DI MISURA E/O DI PROVA	CAT.
	Sediments (1), Terreni (1)/Soils (1)		IRSA 3020 Man 29 2003			
Prova correlata	Fanghi (1)/Sludges (1), Rifiuti/Wastes, Sedimenti/ Sediments, Terreni (1)/Soils (1)	Mercurio/Mercury	EPA 3051A 2007, EPA 6010D 2018	ICP-OES		0
Prova correlata	Rifiuti organici trattati/ Treated biowaste	Arsenico/Arsenic, Bario/Barium, Berillio/Beryllium, Boro/Boron, Cadmio/Cadmium, Calcio/Calcium, Cobalto/Cobalt, Cromo/ Chromium, Ferro/Iron, Fosforo/Phosphorus, Litio/Lithium, Magnesio/Magnesium, Manganese/Manganese, Mercurio/Mercury, Molibdeno/Molybdenum, Nichel/Nickel, Piombo/Lead, Potassio/Potassium, Rame/Copper, Selenio/Selenium, Sodio/Sodium, Stagno/Tin, Tallio/Thallium,Tellurio/Tellurium, Titanio/Titanium, Vanadio/Vanadium, Zinco/Zinc,Zolfo/Sulphur	UNI EN 16174:2012 Met A + UNI EN 16170:2016	ICP-OES		0
Prova accreditata con campo flessibile	**CAMPIONI AMBIENTALI SOLIDI/SOLID ENVIRONMENTAL SAMPLES**	**METALLI/METALS**	**Vedere elenco dei dettagli delle prove flessibili**			
Prova correlata	Fanghi/Sludges, Rifiuti (1)/Wastes (1), Sedimenti (1)/ Sediments (1), Suoli/ Soils	Torio/Thorium, Uranio/Uranium, Osmio/Osmium	UNI EN 16174:2012 Met B + UNI EN 16171:2016	ICP-MS		0
Prova accreditata con campo flessibile	**EMISSIONI/STACK EMISSION**	**COMPOSTI INORGANICI/INORGANIC COMPOUNDS**	**Vedere elenco dei dettagli delle prove flessibili**			
Prova correlata	Emissioni da sorgente fissa/ Stationary source emissions	Ammoniaca/Ammonia	MU 632:84	Spettrofotometria UV-Visibile		0
Prova accreditata con campo flessibile	**EMISSIONI/STACK EMISSION**	**COMPOSTI INORGANICI/INORGANIC COMPOUNDS**	**Vedere elenco dei dettagli delle prove flessibili**			
Prova correlata	Emissioni da sorgente fissa/	Cloruri gassosi (espressi come Acido cloridrico)/Gaseous chlorides (expressed as Hydrochloric acid)	UNI EN 1911:2010 +	Cromatografia Ionica		0

PROVE ACCREDITATE CON CAMPO FLESSIBILE	MATERIALE / PRODOTTO/ MATRICE	MISURANDO / PROPRIETA' MISURATA / DENOMINAZIONE DELLA PROVA	METODO DI PROVA ED ANNO DI EMISSIONE	TECNICA DI PROVA	CAMPO DI MISURA E/O DI PROVA	CAT.
	Stationary source emissions		UNI EN ISO 10304-1:2009			
Prova correlata	Emissioni da sorgente fissa/ Stationary source emissions	Diossido di zolfo/Sulfur dioxide	UNI EN 14791:2017 cap 9.2	Cromatografia Ionica		0
Prova accreditata con campo flessibile	**EMISSIONI/STACK EMISSION**	**EMISSIONI DI COMPOSTI ORGANOVOLATILI/VOLATILE ORGANIC COMPOUNDS EMISSION**	**Vedere elenco dei dettagli delle prove flessibili**			
Prova correlata	Emissioni da sorgente fissa/ Stationary source emissions	1-1-1-2-tetracloroetano/1-1-1-2-tetrachloroethane, 1-1-1-tricloroetano(metilcloroformio)/1-1-1-trichloroethane (methylchloroform),1-1-2-2-tetracloroetano/1-1-2-2-tetrachloroethane,1-1-2-tricloroetano/1-1-2-trichloroethane, 1-1-dicloroetano/1-1 dichloroethane,1-1-dicloroetilene/1-1-dichloroethene, 1-1-dicloropropene/1-1-dichloropropene,1-2-3-tricloropropano/1-2-3-trichloropropane,1-2-3-trimetilbenzene/1-2-3-trimethylbenzene,1-2-4-trimetilbenzene/1-2-4-trimethylbenzene,1-2-dibromo-3-cloropropano/1-2-dibromo-3-chloropropane,1-2-dibromoetano/1-2-dibromoethane,1-2-diclorobenzene/1-2-dichlorobenzene, 1-2-dicloroetano/1-2-dichloroethane,1-2-dicloroetilene (cis)/1-2-dichloroethene (cis), 1-2-dicloroetilene(trans)/1-2-dichloroethene (trans), 1-2-dicloropropano/1-2-dichloropropane,1-3-5-trimetilbenzene/1-3-5-trimethylbenzene,1-3-diclorobenzene/1-3-dichlorobenzene,1-3-dicloropropano/1-3-dichloropropane, 1-3-dicloropropene(cis)/ 1-3-dichloropropene (cis), 1-3-dicloropropene (trans)/1-3-dichloropropene(trans), 1-4-diclorobenzene/1-4-dichlorobenzene, 1-ottene/1-octene,1,4-diossano/1,4-Dioxane, 2-2-dicloropropano/2-2-dichloropropane,2-4-diclorotoluene/2-4-dichlorotoluene, 2-clorotoluene/2-Chlorotoluene,2-esanone/2-hexanone, 2-metil-1-3-butadiene(isoprene)/2-methyl-1-3-butadiene (isoprene), 2-nitropropano/2-nitropropane,3-etiltoluene/3-ethyltoluene, 4-clorotoluene/4-Chlorotoluene,4-etiltoluene/4-ethyltoluene, 4-isopropiltoluene/4-isopropyltoluene, Acetato di2-butossietile/2-butoxyethyl acetate, Acetato di etile/Ethyl acetate, Acetato di isoamile/Isoamyl acetate, Acetato di isobutile/Isobutyl acetate, Acetato di n-amile/N-amyl acetate, Acetato di n-butile/N-butyl acetate, Acetato di sec-butile/sec-butylacetate, Acetato di tert butile/tert-butyl acetate, Acrilato di 2-etilesile /2-Ethylhexyl acrylate, Acrilato di etile/Ethyl acrylate, Acrilato di metile/Methyl acrylate, Acrilato di n-butile/N-butyl acrylate, Acrilato di n-propile/n-Propyl acrylate, Acrilonitrile/Acrylonitrile, Alfa-metilstirene/Alpha-methylstyrene, Benzene/Benzene, Benzil cloruro/ Benzyl chloride, Bromobenzene/Bromobenzene,Bromoclorometano/Bromochloromethane,Bromodiclorometano/ Bromodichloromethane, Butilcicloesano/Butylcyclohexane,Cicloesano/Cyclohexane,Cicloesanone/ Cyclohexanene,Clorobenzene/Chlorobenzene, Cloroetano/Chloroethane, Cloroetilene (Cloruro divinile)/Chloroethylene (Vinyl chloride), Clorometano/Chloromethane,D-Limonene (cinene)/D-Limonene (cinene),Decametilciclopentasilossano/ Decamethylcyclopentasiloxane,Decametiltetrasilossano/Decamethyltetrasiloxane, Di-isobutil chetone(DIBK)/Di-isobutyl ketone (DIBK), Di-metil chetone (Acetone)/Di-methyl ketone(Acetone), Dibromoclorometano/ Dibromochloromethane,Dibromometano/Dibromomethane,Diciclopentadiene/Dicyclopentadiene,Diclorometano/ Dichloromethane,Dodecametilcicloesasilossano/Dodecamethylcyclohexasiloxane,Dodecametilpentasilossano/ Dodecamethylpentasiloxane,Esacloro-1-3-butadiene/Hexachloro-1-3-butadiene, Esadecano/ Hexadecane,Esametildisilossano/Hexamethyldisiloxane, Etilbenzene/Ethylbenzene,Etilterbutiletere (ETBE)/ Ethyltertbutylether (ETBE), Isopropilbenzene(Cumene)/Isopropylbenzene (Cumene), m+p-xilene/m+p-xylene, Metacrilato di etile/Ethyl methacrylate, Metacrilato di isobutile/Isobutyl methacrylate, Metacrilato di metile/Methyl methacrylate,	UNI CEN/TS 13649:2015	GC MS		0

PROVE ACCREDITATE CON CAMPO FLESSIBILE	MATERIALE / PRODOTTO/ MATRICE	MISURANDO / PROPRIETA' MISURATA / DENOMINAZIONE DELLA PROVA	METODO DI PROVA ED ANNO DI EMISSIONE	TECNICA DI PROVA	CAMPO DI MISURA E/O DI PROVA	CAT.
		Metacrilonitrile/Methacrylonitrile,Metil etil chetone (MEK)/Methyl ethyl ketone (MEK), Metil isobutilchetone (MIBK)/Methyl isobuthylketone (MIBK), Metilterbutiletere (MTBE)/Methyltertbutylether (MTBE), N-butilbenzene/N-butylbenzene, n-decano/N-decane, n-dodecano/N-dodecane, n-eptano/n-heptane, n-esano/n-hexane, n-nonano/N-nonane, n-ottano/N-octane, n-pentano/n-pentane, n-propilbenzene/N-propylbenzene, n-undecano/N-undecane, o-xilene/o-xylene, Octametilciclotetrasilossano/Octamethylcyclotetrasiloxane, Propionitrile/Propionitrile, sec-butilbenzene/sec-butylbenzene, Stirene/Styrene, ter-butilbenzene/ter-butylbenzene, Tetracloroetilene/Tetrachloroethene, Tetraclorometano (Tetracloruro di carbonio)/Tetrachloromethane (Carbon tetrachloride), Tetraidrofurano/Tetrahydrofuran, Toluene/Toluene, Tribromometano (Bromoformio)/Tribromomethane (Bromoform), Tricloroetilene (Trielina)/Trichloroethene, Triclorofluorometano (FREON 11)/ Trichlorofluoromethane (FREON 11), Triclorometano (Cloroformio)/Trichloromethane (Chloroform), Vinilcicloesene/ Vinylcyclohexene				

Documento prodotto sotto la responsabilita' del laboratorio
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