

TEST REPORT

Test Report n°	20200907A-001	Test Report Date	22/10/2020
Description	Stack Emission monitoring at the sampling point "chimney 6A", in Delimara Power Station- Marsaxlokk. Start 14:20 - 09/09/2020 - End 16:20 - 09/09/2020		Client D3 Power Generation Delimara Power Station Administration -
Sample Reception Date	09/09/2020		
Test Start Date	09/09/2020		
Test Finish Date	12/10/2020		
Sampling mode	Curated by SUNLAB group Laboratory		
Sampling Plan	///		
Sampling Method	See the methods reported next to the tests		
Reference for the Limits	///		
Annex	YES		
Note:			

Tests	U.O.M.	Method	Result	Uncertainty	L.Min.	L.Max.
Chemical Analysis						
Methane (*)	mg C/Nm ³	UNI EN ISO 25140:2010	416	28	///	///
Sampling for Formaldehyde determination (*)	///	NIOSH 2016:2003	////	///	///	///
Determination of Formaldehyde (s) (*)	mg/Nm ³	NIOSH 2016:2003	< 0.01	///	///	///

General terms and conditions:

< Not Detectable because lower than detection limit of the method >

The sample (solid, liquid, gaseous matrix) is stored by our Laboratory for two weeks unless particular disposition of the law.

When indicated, the uncertainty of the measure is expressed in the same unit of measurement of the test performed with a probability of the measure of 95% and a coverage factor K=2 for the chemical tests

This Test report is relative to the sample subordinate to test and it cannot be partially reproduced without written approval from of the Sunlab Ltd

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When the customer requires the item to be tested acknowledging a deviation from specified conditions (acceptance with reservation), the Laboratory declines all responsibility for the validity of the analytical results.

In the case of subcontracting, the symbol (s) and the reference to the laboratory that performed this activity is shown on the side of the test

(s) = "This test is carried out by another laboratory (LabAnalysis - Accredia No 0077)"

The records of testing of this sample are kept for a minimum period of 10 years

(*) This test is not in the Scope of Accreditation

Our laboratory does not formulate opinions and interpretations and / or declarations of conformity, unless explicitly requested by the customer. In this case, these are reported in a note.

Laboratory Director
(~~dot~~ Filippo Giglio)



SUNLAB GROUP Ltd
Life Sciences Park San Gwann Industrial Estate(Malta)

Annex to Test Report n° 20200907A-001

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Description of the test

Verification of conformity with the limits imposed in the authorization

Contact person for the company

David Griscti - Miao Zhang

Emission Point

6A

Ambient conditions during the sampling

Temperature (°C)

37,3

Pressure (hPa)

1013

Relative humidity (%)

49

Reference conditions to correct the result

Pressure: 1013,25 hPa

Temperature: 0°C

Oxygen : 15%

Operation conditions

Plant description

Power Generation

Process Features

Power Generation

Emission source

DE41 and DE 42

Fuel

Natural Gas

Fuel consumption (kg/h)

///

Coordinates GPS

Nord: 35°49'57.93" N Est: 14°33'29.19" E

Operating Plant Conditions

100%

Plant potentiality

///

Emission frequency (events / day)

1

Emission duration (h/g)

24

Emission type

continuous / constant

Abatement system

SCR/Denox + Filter

Characteristics of the stack and Conformity of sampling Platform

Geometry of chimney

Circular

Flow direction

Vertical

Chimney dimensions

diametro

2m

Chimney section in correspondence of the sampling point

3,142

m²

Height from the ground

65

m

Height from the ground of the sampling point

27

m

Number of Sampling ports

1

Sampling platform area is > 5 m² and support > 400 kg

Yes

Lighting presence

Yes

Presence of electrical installation

Yes

Presence of handrail or parapet (in the case of high altitude platforms)

Yes

Safety condition

Yes

Conformity of the the sampling plan:

No

N ° diameters before the sampling point:

12,5

Criterion Conformity

> 5

Conformity

Yes

N ° diameters after the sampling point:

12,5

> 2 (> 5 on direct outlet in atm)

Yes

Number of Sampling ports:

1

1 if $\Phi < 35$ cm, 2 if $\Phi > 35$ cm

No

Presence of stabilization flow systems

Yes. The Idraulic Diameter criterion is not applicable because flow stability is guaranteed by the technical installations in the duct.

In case of non-compliance with the sampling plan, the characterization of the emission rate and flow is carried out after application of the quality controls required by the technical standard EN ISO 16911-1: 2013 Annex A, which demonstrated the stationarity and homogeneity of the stack flow. In addition to the quality controls, the measures provided for in paragraph 8.2 of the technical standard EN 15259: 2008 have been applied.

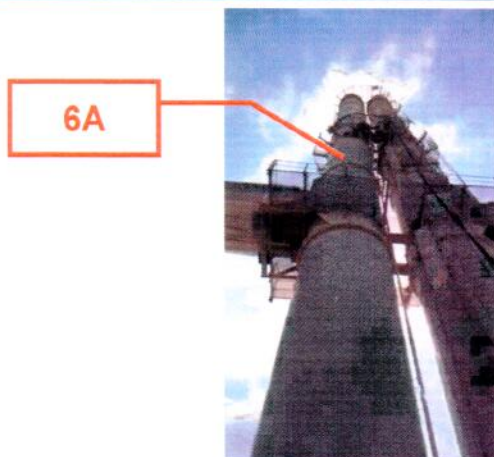


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Photo of the Emission Point



Velocity and flow rate

Date	Method	Start Time	EN ISO 16911-1:2013	Finish Time
10/09/2020		10:15		10:50

Gas composition

Parameter	Method	u.d.m.	
Oxygen (on dry gas)	EN 14789:2017	%	13,00
Carbon dioxide (on dry gas)	ISO 11042-1:1996	%	5,9
Moisture (water content)	EN 14790:2017	molar fraction	0,089
Average molar mass	EN ISO 16911-1:2013 Annex A	g/mol	28,45
Density	EN ISO 16911-1:2013 Annex A	kg/m ³	0,635

Instrument

Flow measuring device	Isokinetic Station DADO LAB - ST5 V8.5		
Velocity measurement	Type	Constant of the pitot tube (K)	Certificate of calibration
Pitot tube	S	k=0,83254	CETIAT - CALIBRATION CERTIFICATE N° A1834611A

Measured values

Parameter	Method	u.d.m.	Result
Flow direction	///	///	Vertical
Differential Pressure	EN ISO 16911-1:2013 Annex A	Pa	474,7
Average emission Velocity (v)	EN ISO 16911-1:2013 Annex A	m/s	32,2
Average emission Temperature	EN ISO 16911-1:2013 Annex A	°C	270,5
Pressure at the sampling point	EN ISO 16911-1:2013 Annex A	[kPa]	101
Effective gas flow rate (Qe)	EN ISO 16911-1:2013 Annex A	m ³ /h	360000
Wet and Normalized Flow Rate(Qn)	EN ISO 16911-1:2013 Annex A	Nm ³ /h	180000
Dry and Normalized Flow Rate(Qns)	EN ISO 16911-1:2013 Annex A	Nm ³ /h	170000
Dry, Normalized and correct for O ₂ Flow Rate	EN ISO 16911-1:2013 Annex A	Nm ³ /h	220000

Note: The flow data are rounded to significant digits and the average is calculated on the basis of the exact number later and rounded.

Observations during the sampling phases and analysis

Laboratory Director
Dott. Filippo Giglio

QF 21.02 rev.00

Annex

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TEST REPORT

Test Report n°	20200907A-002	Test Report Date	22/10/2020
Description	Stack Emission monitoring at the sampling point "chimney 6B", in Delimara Power Station- Marsaxlokk. Start 11:20 - 10/09/2020 - End 13:20 - 10/09/2020		Client D3 Power Generation Delimara Power Station Administration -
Sample Reception Date	10/09/2020		
Test Start Date	10/09/2020		
Test Finish Date	12/10/2020		
Sampling mode	Curated by SUNLAB group Laboratory		
Sampling Plan	///		
Sampling Method	See the methods reported next to the tests		
Reference for the Limits	///		
Annex	YES		
Note:			

Tests	U.O.M.	Method	Result	Uncertainty	L.Min.	L.Max.
Chemical Analysis						
Methane (*)	mg C/Nm ³	UNI EN ISO 25140:2010	155	10	///	///
Sampling for Formaldehyde determination (*)	///	NIOSH 2016:2003	///	///	///	///
Determination of Formaldehyde (s) (*)	mg/Nm ³	NIOSH 2016:2003	< 0.01	///	///	///

General terms and conditions:

< Not Detectable because lower than detection limit of the method >

The sample (solid, liquid, gaseous matrix) is stored by our Laboratory for two weeks unless particular disposition of the law.

When indicated, the uncertainty of the measure is expressed in the same unit of measurement of the test performed with a probability of the measure of 95% and a coverage factor K=2 for the chemical tests

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(s) = "This test is carried out by another laboratory (LabAnalysis - Accredia No 0077)".

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Laboratory Director
(dott. Filippo Giglio)



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Life Sciences Park San Gwann Industrial Estate(Malta)

Annex to Test Report n° 20200907A-002

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Description of the test

Verification of conformity with the limits imposed in the authorization

Contact person for the company

David Griscti - Miao Zhang

Emission Point

6B

Ambient conditions during the sampling

Temperature (°C)

35

Pressure (hPa)

1020

Relative humidity (%)

66

Reference conditions to correct the result

Pressure: 1013,25 hPa

Temperature: 0°C

Oxygen : 15%

Operation conditions

Plant description

Power Generation

Process Features

Power Generation

Emission source

DE43 and DE 44

Fuel

Natural Gas

Fuel consumption (kg/h)

///

Coordinates GPS

Nord: 35°49'57.93" N Est: 14°33'29.19" E

Operating Plant Conditions

100%

Plant potentiality

///

Emission frequency (events / day)

1

Emission duration (h/g)

24

Emission type

continuous / constant

Abatement system

SCR/Denox + Filter

Characteristics of the stack and Conformity of sampling Platform

Geometry of chimney

Circular

Flow direction

Vertical

Chimney dimensions

diametro

2m

Chimney section in correspondence of the sampling point

3,142

m²

Height from the ground

65

m

Height from the ground of the sampling point

30

m

Number of Sampling ports

1

Sampling platform area is > 5 m² and support > 400 kg

Yes

Lighting presence

Yes

Presence of electrical installation

Yes

Presence of handrail or parapet (in the case of high altitude platforms)

Yes

Safety condition

Yes

Conformity of the the sampling plan:

No

N ° diameters before the sampling point:

12,5

Criterion Conformity

> 5

Conformity

Yes

N ° diameters after the sampling point:

12,5

> 2 (> 5 on direct outlet in atm)

Yes

Number of Sampling ports:

1

1 if $\Phi < 35$ cm, 2 if $\Phi > 35$ cm

No

Presence of stabilization flow systems

Yes. The Idraulic Diameter criterion is not applicable because flow stability is guaranteed by the technical installations in the duct.

In case of non-compliance with the sampling plan, the characterization of the emission rate and flow is carried out after application of the quality controls required by the technical standard EN ISO 16911-1: 2013 Annex A, which demonstrated the stationarity and homogeneity of the stack flow. In addition to the quality controls, the measures provided for in paragraph 8.2 of the technical standard EN 15259: 2008 have been applied.



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Annex to Test Report n° 20200907A-002

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Photo of the Emission Point



6B

Velocity and flow rate

Date	Method	Start Time	10:30	EN ISO 16911-1:2013	Finish Time	11:00
09/09/2020						

Gas composition

Parameter	Method	u.d.m.	
Oxygen (on dry gas)	EN 14789:2017	%	13,00
Carbon dioxide (on dry gas)	ISO 11042-1:1996	%	5,9
Moisture (water content)	EN 14790:2017	molar fraction	0,075
Average molar mass	EN ISO 16911-1:2013 Annex A	g/mol	28,61
Density	EN ISO 16911-1:2013 Annex A	kg/m ³	0,535

Instrument

Flow measuring device		Isokinetic Station DADO LAB - ST5 V8.5	
Velocity measurement	Type	Constant of the pitot tube (K)	Certificate of calibration
Pitot tube	S	k=0.83254	CETIAT - CALIBRATION CERTIFICATE N° A1834611A

Measured values

Parameter	Method	u.d.m.	Result
Flow direction	///	///	Vertical
Differential Pressure	EN ISO 16911-1:2013 Annex A	Pa	526,1
Average emission Velocity (v)	EN ISO 16911-1:2013 Annex A	m/s	36,9
Average emission Temperature	EN ISO 16911-1:2013 Annex A	°C	382,6
Pressure at the sampling point	EN ISO 16911-1:2013 Annex A	[kPa]	102
Effective gas flow rate (Qe)	EN ISO 16911-1:2013 Annex A	m ³ /h	420000
Wet and Normalized Flow Rate(Qn)	EN ISO 16911-1:2013 Annex A	Nm ³ /h	170000
Dry and Normalized Flow Rate(Qns)	EN ISO 16911-1:2013 Annex A	Nm ³ /h	160000
Dry, Normalized and correct for O ₂ Flow Rate	EN ISO 16911-1:2013 Annex A	Nm ³ /h	220000

Note: The flow data are rounded to significant digits and the average is calculated on the basis of the exact number later and rounded.

Observations during the sampling phases and analysis

Laboratory Director
Dott. Filippo Giglio

QF 21.02 rev.00

Annex

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TEST REPORT

Test Report n°	20200907A-003	Test Report Date	22/10/2020
Description	Stack Emission monitoring at the sampling point "chimney 6C", in Delimara Power Station- Marsaxlokk. Start 10:10 - 14/09/2020 - End 12:10 - 14/09/2020		Client D3 Power Generation Delimara Power Station Administration -
Sample Reception Date	14/09/2020		
Test Start Date	14/09/2020		
Test Finish Date	12/10/2020		
Sampling mode	Curated by SUNLAB group Laboratory		
Sampling Plan	///		
Sampling Method	See the methods reported next to the tests		
Reference for the Limits	///		
Annex	YES		
Note:			

Tests	U.O.M.	Method	Result	Uncertainty	L.Min.	L.Max.
Chemical Analysis						
Methane (*)	mg C/Nm ³	UNI EN ISO 25140:2010	216	11	///	///
Sampling for Formaldehyde determination (*)	///	NIOSH 2016:2003	///	///	///	///
Determination of Formaldehyde (s) (*)	mg/Nm ³	NIOSH 2016:2003	0.02	///	///	///

General terms and conditions:

< Not Detectable because lower than detection limit of the method >

The sample (solid, liquid, gaseous matrix) is stored by our Laboratory for two weeks unless particular disposition of the law.

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(s) = "This test is carried out by another laboratory (LabAnalysis - Accredia No 0077)".

The records of testing of this sample are kept for a minimum period of 10 years

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Laboratory Director
(dott. Filippo Giglio)



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Life Sciences Park San Gwann Industrial Estate(Malta)

Annex to Test Report n° 20200907A-003

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Description of the test

Verification of conformity with the limits imposed in the authorization

Contact person for the company

David Griscti - Miao Zhang

Emission Point

6C

Ambient conditions during the sampling

Temperature (°C)

35

Pressure (hPa)

1020

Relative humidity (%)

66

Reference conditions to correct the result

Pressure: 1013,25 hPa

Temperature: 0°C

Oxygen : 15%

Operation conditions

Plant description

Power Generation

Process Features

Power Generation

Emission source

DE45

Fuel

Natural Gas (Diesel is emergency fuel)

Fuel consumption (kg/h)

///

Coordinates GPS

Nord: 35°49'57.93" N Est: 14°33'29.19" E

Operating Plant Conditions

100%

Plant potentiality

///

Emission frequency (events / day)

1

Emission duration (h/g)

24

Emission type

continuous / constant

Abatement system

SCR/Denox + Filter

Characteristics of the stack and Conformity of sampling Platform

Geometry of chimney

Circular

Flow direction

Vertical

Chimney dimensions

diametro

2m

Chimney section in correspondence of the sampling point

3,142

m²

Height from the ground

65

m

Height from the ground of the sampling point

27

m

Number of Sampling ports

1

Sampling platform area is > 5 m² and support > 400 kg

Yes

Lighting presence

Yes

Presence of electrical installation

Yes

Presence of handrail or parapet (in the case of high altitude platforms)

Yes

Safety condition

Yes

Conformity of the the sampling plan:

No

N ° diameters before the sampling point:

12,5

Criterion Conformity

> 5

Conformity

Yes

N ° diameters after the sampling point:

12,5

> 2 (> 5 on direct outlet in atm)

Yes

Number of Sampling ports:

1

1 if Φ < 35 cm, 2 if Φ > 35 cm

No

Presence of stabilization flow systems

Yes. The Idraulic Diameter criterion is not applicable because flow stability is guaranteed by the technical installations in the duct.

In case of non-compliance with the sampling plan, the characterization of the emission rate and flow is carried out after application of the quality controls required by the technical standard EN ISO 16911-1: 2013 Annex A, which demonstrated the stationarity and homogeneity of the stack flow. In addition to the quality controls, the measures provided for in paragraph 8.2 of the technical standard EN 15259: 2008 have been applied.



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Annex to Test Report n° 20200907A-003

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Photo of the Emission Point



6C Stack

Velocity and flow rate

Date	Method	Start Time	Finish Time
11/09/2020		10:30	11:00

EN ISO 16911-1:2013

Gas composition

Parameter	Method	u.d.m.	
Oxygen (on dry gas)	EN 14789:2017	%	9,01
Carbon dioxide (on dry gas)	ISO 11042-1:1996	%	4,18
Moisture (water content)	EN 14790:2017	molar fraction	0,107
Average molar mass	EN ISO 16911-1:2013 Annex A	g/mol	27,85
Density	EN ISO 16911-1:2013 Annex A	kg/m ³	0,521

Instrument

Flow measuring device		Isokinetic Station DADO LAB - ST5 V8.5	
Velocity measurement	Type	Constant of the pitot tube (K)	Certificate of calibration
Pitot tube	S	k=0,83254	CETIAT - CALIBRATION CERTIFICATE N° A1834611A

Measured values

Parameter	Method	u.d.m.	Result
Flow direction	///	///	Vertical
Differential Pressure	EN ISO 16911-1:2013 Annex A	Pa	86,9
Average emission Velocity (v)	EN ISO 16911-1:2013 Annex A	m/s	12,4
Average emission Temperature	EN ISO 16911-1:2013 Annex A	°C	163,6
Pressure at the sampling point	EN ISO 16911-1:2013 Annex A	[kPa]	102
Effective gas flow rate (Qe)	EN ISO 16911-1:2013 Annex A	m ³ /h	140000
Wet and Normalized Flow Rate(Qn)	EN ISO 16911-1:2013 Annex A	Nm ³ /h	88000
Dry and Normalized Flow Rate(Qns)	EN ISO 16911-1:2013 Annex A	Nm ³ /h	79000
Dry, Normalized and correct for O ₂ Flow Rate	EN ISO 16911-1:2013 Annex A	Nm ³ /h	160000

Note: The flow data are rounded to significant digits and the average is calculated on the basis of the exact number later and rounded.

Observations during the sampling phases and analysis

Laboratory Director
Dott. Filippo Giglio

QF 21.02 rev.00

Annex

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TEST REPORT

Test Report n°	20200907A-004	Test Report Date	22/10/2020
Description	Stack Emission monitoring at the sampling point "chimney 6D", in Delimara Power Station- Marsaxlokk. Start 11:15 - 11/09/2020 - End 13:15 - 11/09/2020		
Sample Reception Date	11/09/2020	Client	D3 Power Generation
Test Start Date	11/09/2020		Delimara Power Station
Test Finish Date	12/10/2020		Administration -
Sampling mode	Curated by SUNLAB group Laboratory		
Sampling Plan	///		
Sampling Method	See the methods reported next to the tests		
Reference for the Limits	///		
Annex	YES		
Note:			

Tests	U.O.M.	Method	Result	Uncertainty	L.Min.	L.Max.
Chemical Analysis						
Methane (*)	mg C/Nm ³	UNI EN ISO 25140:2010	296	20	///	///
Sampling for Formaldehyde determination (*)	///	NIOSH 2016:2003	////	///	///	///
Determination of Formaldehyde (s) (*)	mg/Nm ³	NIOSH 2016:2003	0.03	///	///	///

General terms and conditions:

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SUNLAB GROUP Ltd
Life Sciences Park San Gwann Industrial Estate(Malta)

Annex to Test Report n° 20200907A-004

Page 1 of 2

Description of the test

Verification of conformity with the limits imposed in the authorization

Contact person for the company

David Griscti - Miao Zhang

Emission Point

6D

Ambient conditions during the sampling

Temperature (°C)

27,3

Pressure (hPa)

1016

Relative humidity (%)

88

Reference conditions to correct the result

Pressure: 1013,25 hPa

Temperature: 0°C

Oxygen : 15%

Operation conditions

Plant description

Power Generation

Process Features

Power Generation

Emission source

DE47 and DE 48

Fuel

Natural Gas (Diesel is emergency fuel)

Fuel consumption (kg/h)

///

Coordinates GPS

Nord: 35°49'57.93" N Est: 14°33'29.19" E

Operating Plant Conditions

100%

Plant potentiality

///

Emission frequency (events / day)

1

Emission duration (h/g)

24

Emission type

continuous / constant

Abatement system

SCR/Denox + Filter

Characteristics of the stack and Conformity of sampling Platform

Geometry of chimney

Circular

Flow direction

Vertical

Chimney dimensions

diametro

2m

Chimney section in correspondence of the sampling point

3,142

m²

Height from the ground

65

m

Height from the ground of the sampling point

30

m

Number of Sampling ports

1

Sampling platform area is > 5 m² and support > 400 kg

Yes

Lighting presence

Yes

Presence of electrical installation

Yes

Presence of handrail or parapet (in the case of high altitude platforms)

Yes

Safety condition

Yes

Conformity of the the sampling plan:

No

N ° diameters before the sampling point:

12,5

Criterion Conformity

> 5

Conformity

Yes

N ° diameters after the sampling point:

12,5

> 2 (> 5 on direct outlet in atm)

Yes

Number of Sampling ports:

1

1 if $\Phi < 35$ cm, 2 if $\Phi > 35$ cm

No

Presence of stabilization flow systems

Yes. The Idraulic Diameter criterion is not applicable because flow stability is guaranteed by the technical installations in the duct.

In case of non-compliance with the sampling plan, the characterization of the emission rate and flow is carried out after application of the quality controls required by the technical standard EN ISO 16911-1: 2013 Annex A, which demonstrated the stationarity and homogeneity of the stack flow. In addition to the quality controls, the measures provided for in paragraph 8.2 of the technical standard EN 15259: 2008 have been applied.



SUNLAB GROUP Ltd
Life Sciences Park San Gwann Industrial Estate(Malta)

Annex to Test Report n° **20200907A-004**

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Photo of the Emission Point



6D

Velocity and flow rate

Date	Method	Start Time	Finish Time
14/09/2020		9:25	9:55

EN ISO 16911-1:2013

Gas composition

Parameter	Method	u.d.m.	
Oxygen (on dry gas)	EN 14789:2017	%	13,00
Carbon dioxide (on dry gas)	ISO 11042-1:1996	%	5,9
Moisture (water content)	EN 14790:2017	molar fraction	0,111
Average molar mass	EN ISO 16911-1:2013 Annex A	g/mol	28,19
Density	EN ISO 16911-1:2013 Annex A	kg/m ³	0,782

Instrument

Flow measuring device		#N/D	
Velocity measurement	Type	Constant of the pitot tube (K)	Certificate of calibration
Pitot tube	S	k=0,83254	CETIAT - CALIBRATION CERTIFICATE N° A1834611A

Measured values

Parameter	Method	u.d.m.	Result
Flow direction	///	///	Vertical
Differential Pressure	EN ISO 16911-1:2013 Annex A	Pa	67,8
Average emission Velocity (v)	EN ISO 16911-1:2013 Annex A	m/s	10,8
Average emission Temperature	EN ISO 16911-1:2013 Annex A	°C	169,0
Pressure at the sampling point	EN ISO 16911-1:2013 Annex A	[kPa]	102
Effective gas flow rate (Qe)	EN ISO 16911-1:2013 Annex A	m ³ /h	120000
Wet and Normalized Flow Rate(Qn)	EN ISO 16911-1:2013 Annex A	Nm ³ /h	76000
Dry and Normalized Flow Rate(Qns)	EN ISO 16911-1:2013 Annex A	Nm ³ /h	68000
Dry, Normalized and correct for O ₂ Flow Rate	EN ISO 16911-1:2013 Annex A	Nm ³ /h	90000

Note: The flow data are rounded to significant digits and the average is calculated on the basis of the exact number later and rounded.

Observations during the sampling phases and analysis

Laboratory Director
Dott. Filippo Giglio