

## Method Statement For Processing and Storage of WEEE and catalytic converters

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### **Objective/Scope.**

**This document is presented within the relevant directives and guidance with specific reference to the Transportation, Storage and Shipping of End-Of-Life vehicle catalytic converters and Waste from Electrical and Electronic Equipment.**

**This Method statement forms part of the application process with ERA on behalf of Mr Malcolm Aquilina and his activities at the Hal Far Site.**

**This document will cover the scope of intended operations involving End of Life vehicle Catalytic Converters and Waste from Electrical and Electronic Equipment (WEEE).**

**WEEE Operations will encompass the selection of appropriate partner providers, The Transportation of WEEE devices/components, the Disassembling of WEEE devices and components, The Storage and Shipping of WEEE devices and components.**

### **Regulatory Reference Standards**

**This Method Statement has been produced and evaluated to be in compliance with the directives of relating specifically to End of Life vehicle Catalytic Converters.**

**The list relating to WEEE materials (*Tower and laptop Type Computers*) is contained within the WEEE section of this Method Statement.**

### **Introduction:**

#### **Catalytic Converter Recycling Process:**

#### **Risk Assessment General Introduction:**

**The operations conducted at the Hal Far hub form a component within the overall retrieval and recycling of precious metals from within the ceramic monolith contained within catalytic converter units. All operations within the Hal Far hub will only and exclusively involve the assessing, de-canning, segregating, packaging and storage of the catalytic converter unit prior to transportation to overseas process partners.. All such activities involving and including the extraction of precious metals from the ceramic monolith will be conducted within the next phase of the overall process at a specialist overseas facility.**

**The intended activities within the project will involve the receipt, storage and processing of End-of-Life catalytic converter units.**

**This specific aim of the process involves the collection of the End of Life catalytic converter units. Once delivered to the Hal Far hub the units will be assessed and segregated as regards the physical state and condition. The units will then be prepared and packed for transportation to an end user facility outside of Malta.**

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The catalytic converter units involved will be composed of assorted end of life units originally component within road motor vehicle exhaust systems. All varieties of such catalytic converter units will be involved within the intended process.

The units will be sourced from appropriate and suitably competent suppliers within Malta.

The units involved within the process will comprise of a random mixture of the various types and variants of catalytic converters, predominantly from motor cars but also including larger commercial vehicles. The disposition of the units involved at any one time will be dependent on the type of units provided by the suppliers at that time. It is anticipated that the Hal Far hub will have the capability to process up to 100 individual units per day. Additionally storage provision will be provided for 400 units at the hub prior to transportation to next process partner overseas.

The Individual catalytic converter units involved can be separated within three identifiable groups. These being:

1. **Units intact:** These will be units that present no obvious visible damage to the external metal casing containing the ceramic monolith. Additionally, when viewed from the attached pipe section, the ceramic monolith will display no visible sign of damage or degradation.
2. **Unit partially damaged:** These will be units that present obvious visible damage to the metal outer casing. In such instances, the internal ceramic monolith may be visible. In such instances damage or degradation to the ceramic monolith may be visible.
3. **Units severely damaged:** These units will present severe damage to their metal casing. Damage and degradation to the ceramic monolith will be visible.

The third category of catalytic converter within the condition groupings represents the highest risk factor as regards potential release of fibre from the units. The second grouping represents the next highest level, with the first grouping representing the lowest level respectively.

To safely, effectively and sustainably manage and mitigate the potential hazard of fibre release from the ceramic monoliths, all three groupings of units will be subject to the same standard operating procedures. These procedures will involve the sealing (to *a standard capable of containment of particulate matter of dimensions appropriate to Refractory Ceramic Fibres*) of each and all individual units separately at the supplier site prior to transportation to the Hal Far hub. The individual sealing and packaging will be such that potential fibre release to the immediate and general atmosphere will be contained within the individual sealing materials.

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**Unit Groupings (Physical Condition)**



**Group 1 type example.**



**Group 2 type example.**



### Group 3 Example

#### Hazards Present Within Catalytic Converters

A number of Identifiable Hazards are associated with the handling and storage operations involving end-of-life vehicle Catalytic Converters. These Hazards may be present in all varieties of Catalytic Converters (varieties based on type, manufacturer, construction method and physical condition).

The Identified and Potential Hazards involve the following:

1. Sharp Edge Hazards in the form of jagged and or sharp exposed edges/surface on metal casings
2. Contamination Hazards. Carbon based particulate materials on exposed surfaces of the catalytic converter.
3. Contamination Hazards. Refractory Ceramic Fibre (RCF) materials present on exposed surfaces of Catalytic Converters.
4. Inhalation Hazards. Carbon based particulate materials on exposed surfaces of the catalytic converter.
5. Inhalation Hazard. Refractory Ceramic Fibre materials present on exposed surfaces of Catalytic Converters.

The most severe potential hazard in terms of severity of effects of exposure to, is the inhalation of Refractory Ceramic Fibre (RCF). This fibrous material presents a chronic agent on inhalation to the respiratory system and in particular the lungs. Effects of potential exposure are proportional to length of exposure (short term and long term) and concentration of exposure (*short term and long term*).

Refractory Ceramic Fibre (RCF) is a component within the internal structure of some varieties of Catalytic Converters. It is provided to the unit as a form of thermal insulation. Although it is not a component in all Catalytic Converter variants, it is not reasonably possible to accurately identify all such variants containing RCF, unless the converter is damaged and RCF is visually identifiable. The End of Life Catalytic Converters will be

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presented to the Hal Far site in a diversity of physical states. The safe identification and segregation of specific units identified and/or suspected as containing RCF material is not realistically reliable. Additionally, there exists a potential for non RCF containing units to be contaminated with RCF from other units prior to their arrival at the Hal Far site or one of its suppliers. However, documents 71A and 71B submitted as part of application EP 1280/22 states that the risk of encountering RCF-containing catalytic converters is low. Furthermore, the results of the samples sent for testing had a fibre-concentration value significantly lower than the concentration limit.

### **WASTE DISPOSAL**

Waste and scrap material containing RCF or HBF should be transferred to strong and durable containers.

### **LABELLING**

The containers will be sealed and clearly labelled using the Globally Harmonised System of Classification and Labelling (*GHS*).

**Table 3** Example of label elements for Refractory Ceramic Fibres waste

Example of label elements for Refractory Ceramic Fibres waste	
Product identifier	Product (Contains: XYZ)
Pictogram	
Signal word	<b>DANGER</b>
Hazard statement	<b>May cause cancer. May irritate skin and eyes.</b>
Suggested precautionary statements	<p>Do not breathe dust.</p> <p>Do not use until safety precautions have been read and understood.</p> <p>Use personal protective equipment as required.</p> <p>Wash hands thoroughly after handling.</p> <p>If exposed or concerned: Get medical advice and attention.</p> <p>Dispose of contents in accordance with local regulations.</p>
Details	My Company, My Street, My Town, My State, 0000
Telephone	Tel: (99) 9999 9999

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**Operational Process. Handling and Storage.**



**1. An image of a Type A Catalytic Converter. The unit is in the physical state as seen upon arrival at the Half Far site, from the supplier. (All such units will be contained in sealed and solid storage containers at the supplier's site, prior to and during transportation to the Hal Far site).**



**2. An image of a Type B Catalytic Converter. The unit is in the physical state as seen upon arrival at the Half Far site, from the supplier. (All such units will be contained in sealed and solid storage containers at the supplier's site, prior to and during transportation to the Hal Far site).**



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3. An image of a Type C Catalytic Converter. The unit is in the physical state as seen upon arrival at the Half Far site, from the supplier. *(All such units will be contained in sealed and solid storage containers at the supplier's site, prior to and during transportation to the Hal Far site).*



4. An image of a Type A Catalytic Converter. The unit



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**5. An image of a Type A Catalytic Converter contained within a heavy duty polythene bag. The polythene bag has been secured by means of swan necking its opening and the application of 2 cable ties. This process is standard with all such units on arrival at the Hal Far site from the suppliers.**



**6. An image of a Type C Catalytic Converter. The unit is shown with a heavy-duty polythene bag.**



**7. An image of a Type C Catalytic Converter contained within a heavy-duty polythene bag. The polythene bag has been secured by swan necking its opening and the application of 2 cable ties. This process is standard with all such units on arrival at the Hal Far site from the suppliers.**

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**8. An image of the ceramic monolith materials (contents of a Catalytic Converter). It is anticipated that a comparatively small proportion of units delivered to the Hal Far site will be in a similar condition, i.e. the metal casing being fully removed.**



**9. An image of the steel monolith materials, contents of a Catalytic Converter. It is anticipated that a small proportion of units delivered to the Hal Far site will be in a similar condition, i.e. the metal casing being fully removed.**



**10. An image of the ceramic monolith materials (contents of a Catalytic Converter),**

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contained within a heavy-duty polythene bag. The polythene bag has been secured by means of swan necking its opening and the application of 2 cable ties. This process is standard with all such units on arrival at the Hal Far site from the suppliers. All such materials will be required to be contained in this method by the suppliers prior to transportation to the Hal Far site.



11/12. Images of solid storage containers. The containers are provided with a locking collar and lid mechanism that provides particulate and fibre containment. These containers will be utilised to store the Type A,B and C Catalytic Converters types at the Hal Far Site prior to and during transportation to and from the site. The containers will also be utilised to store any separated ceramic monolith materials.



13. An image of a solid storage container and a Type C Catalytic Converter, contained within a heavy-duty polythene bag. A maximum of 5 such units contained within individual heavy duty polythene bags will be contained within each solid storage container. Additionally, the containment of separated ceramic monolith

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**material will also be limited to a maximum of 5 individual heavy duty polythene bags per solid storage container.**

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## **WEEE Device/Components (*Tower and Laptop Type Computers*) Operations. Preamble.**

The Hal Far site will provide the capability for the initial process involved in the recycling collection and distribution of the sorted WEEE devices and component materials. The envisaged scope of these operations will encompass the following evolutions.

1. The initial storage phase of all WEEE related devices and components. As per requirement of joint memorandum of understanding with all partner material providers/suppliers, there will be a strict and reviewed protocol relating to the initial segregation and storage of all WEEE related devices and components. This protocol will include ensuring only pre agreed WEEE devices or components are involved.
2. All partner providers/suppliers will have a requirement to continually demonstrate both awareness and compliance with their existing and any future amended policies and protocols relating to the following critical operational areas. Manual handling, this will be inclusive of individual as well as team activities involved in the movement and transportation of bulk WEEE devices and components. Containment and storage. All partners, staff and representatives involved in the preparation and storage of all WEEE devices and components will provide an ongoing and continued awareness of the required standards as relating to the safe storage and containment of all WEEE devices and components, on their own site in readiness for collection by our own team members.
3. Additional specific identified hazards: All partner organisation staff and representatives will show their continued awareness of any specific or additional hazard in relation to the storage, handling and preparation of WEEE devices and components. This will include such areas as sharp edges and potential cut, puncture, injection hazards.
4. Materials involved. The Hal Far site will act as storage and distribution hub for WEEE devices and associated components. The items involved will consist solely of tower type computers and laptop type computers only.

ALL suppliers will be required at ALL times whilst working with and on behalf of the Hal Far site to only select and provide such items. Any incoming WEEE which is not within the proposed list of accepted waste will be temporary stored in the quarantine area on site and dispatched to an authorised facility permitted to accept that waste.

The activities conducted with the devices and components listed above will be restricted and limited to the following processes:

1. The identification and selection of such wastes at supplier sites.
2. The preparation of all such wastes at supplier sites for transportation to the Hal Far site, this will include segregation storage.

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3. The acceptance policies and procedures at the Hal Far site regarding all of this material these devices and associated materials, this will involve the only pre-determined and agreed materials from supplier sites as well as ensuring they are in the required safe conditions as regards physical integrity and consignment packing on arrival.
4. The MANUAL and MECHANICAL DIASSEMBLY of WEEE devices and components at the Hal Far site: This will be LIMITED to the IMMEDIATE REMOVAL OF ANY BATTERY/POWER SOURCE, Removal of screens from laptop type computers removal of any outer casing around circuit boards, motherboards, electrical microelectronic circuits contained within. This will additionally involve the identification of the key components by staff involved of the components within the devices to be retrieved for recycling. All operations will be limited to this phase of mechanical and physical destruction. All of the listed evolutions will be achieved by staff exclusively TRAINED and AUTHORISED to conduct such SPECIFIED and SYSTEMATIC operations, working with hand-operated and powered hand tools. The processes involved with staff utilising these tools will be the systematic disassembly of items listed in order to access and remove SPECIFIED TARGETED components within.

Once the initial phase of mechanical disassembly of devices and components has been completed by staff at the Hal Far site, the process of segregation and storage will be implemented.

This will involve the various disassembled items being segregated and stored separately as regards classification of composition. Additionally, any item being identified as presenting an existing potential hazard in terms of type or any form of secondary contamination will also be stored separately and designated additional hazardous materials bin.

Throughout the whole process all elements and components of devices will be segregated and placed into one of the pre-determined categories and storage bins, as such there will be no unidentified waste or by-product materials at the end of each dismantling and containment phase.

Should any such contaminated items arrive at the site they will be segregated immediately, placed in the quarantine area and sealed separately from other items.



4. A view of a WEEE bulk component storage container. All target components will be stored in such containers during post-dismantling procedures, transportation and shipping to recycling facilities.

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## **Disassembly Procedures**

### **Laptop Type Computers**

Laptop computers will be subject to the following requirements

1. They will be segregated from Tower Type Computers.
2. They will be assessed to identify any obvious damage to their view screens. Those displaying apparent damage will be segregated from other devices and placed in sealed marked (*Hazardous*) heavy duty plastic bags. They will be placed in separate solid containers for transportation to Hal Far.
3. Any screen damaged devices will be reported to Hal Far prior to transportation.
4. All intact devices will be packed and in solid containers to prevent physical damage during handling and transportation.
5. All intact devices will have their screens removed as a complete element by means of releasing the hinge mechanism to the main body.

### **Tower Type Computer**

1. Unscrew the four screws (if available) remove the back cover, or remove one of the side covers, usually found on the right side of the computer if you're facing it.
2. Disconnect all the connectors and remove the DVD player.
3. Remove the power supply by unplugging the connectors, then unscrewing the unit from the frame.
4. Remove the hard drive from the side of the slot by unscrewing the four screws and securing it in place.
5. Remove the button battery and heat sink from the motherboard. Also, remove the memory by pushing the clips on both ends of the module.
6. Remove the CPU fan connected to the heat sink by removing the four screws that secure it in place.
7. Disconnect all cables from the motherboard, then unscrew it from the frame.

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## **Shipping Procedures**

Waste will be shipped according to the Regulation (EC) No. 1013/2006 on shipments of waste and in line with S.L. 549.65 - the Waste Regulations.

Green listed waste destined for recovery will be handled according to Article 18 and Annex V11.

Hazardous waste destined for recovery will be handled according to Annex 4.