

# Catalytic Converters containing Refractory Ceramic Fibre (RCF) DRAFT

Quick guide nnn\_nn

Issued dd/mm/yyyy

## What's this document about?

This guide provides advice on the classification and coding of automotive catalytic converters and the permitting requirements for waste management sites storing and processing waste automotive catalytic converters.

## Who does this apply to?

This guide provides regulatory officers and permitting officers with technical standards and compliance guidance relating to automotive catalytic converters.

This guidance is written for Environment Agency staff however it may be shared with external bodies and parties.

## Contact for queries and feedback

- Tania Tucker
- Please give [anonymous feedback](#) for this document

## Contents

Catalytic converters - what are they and how to identify them .....	2
Support mats in some catalytic converters .....	2
The internal structure of a catalytic converter .....	3
Classification of catalytic converters .....	4
Storing and bulking up catalytic converters .....	4
Processing catalytic converters containing RCF .....	5
Permitting requirements for storage and processing sites .....	7
Technical Competence.....	7
Charging .....	8
Disposing of RCF matting and metal casing contaminated with RCF ..	9
Related documents .....	9

## Catalytic converters - what are they and how to identify them

---

### Automotive catalytic converters

Catalytic converters come in all shapes and sizes, depending on the make and model of vehicle they originate from. They are fitted to a vehicle exhaust system and their purpose is to reduce the amount of volatile organic compounds (VOCs), carbon monoxide and nitrogen oxides emitted in the exhaust gas of the vehicle. The term catalytic converters in this document also includes diesel particulate filters where they contain RCF.

---



Figure 1 - a mixed load of catalytic converters

### The catalyst

Catalytic converters have a ceramic monolith core with a honeycomb structure. The catalyst within the honeycomb tends to be a mix of 'precious metals'. Platinum is the most widely used, along with palladium and rhodium (although other precious metals can also be used).

---

### Recycling the catalytic converter

Catalytic converters once removed from the vehicle are "de-canned". Decanning is where the metal casing is cut open using and the ceramic monolith block is removed. The monolith block is then milled to a homogenous powder that is sent for processing to remove the precious metals.

---

## Support mats in some catalytic converters

---

### Support matting

In some catalytic converters and diesel particulate filters there is a support mat made from refractory ceramic fibre (RCF). This matting is used to protect the honeycomb centre and also as insulation to maintain the high temperatures needed for the reactions that take place in the honeycomb centre.

---

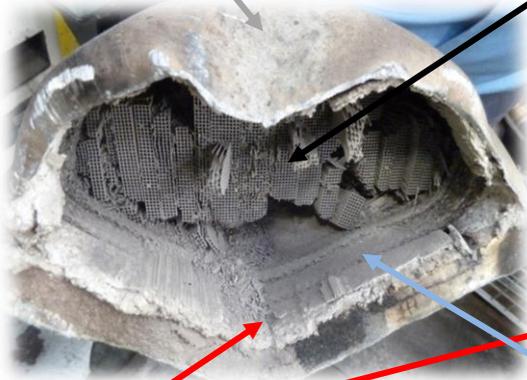
### RCF

RCF is classified as a Category 1B carcinogen and has properties very similar to asbestos, therefore catalytic converters containing RCF matting must be classed as hazardous waste.

# The internal structure of a catalytic converter

Metal external casing

Honeycomb centre (the catalyst) containing precious metals

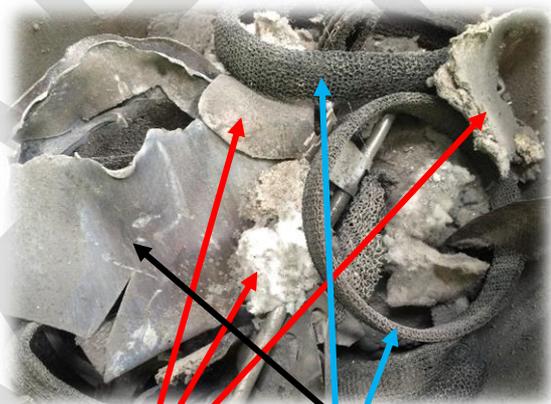


RCF matting

Metal banding securing the RCF matting



Metal mesh matting in a catalytic converter with no RCF matting



RCF and mesh banding removed from the casing and core



RCF matting and no metal mesh matting.



RCF attached to the casing but not held with banding.

## Classification of catalytic converters

---

### Whole catalytic converter units

- Catalytic converters with RCF matting should be classified as hazardous waste. *Hazardous vehicle components - catalytic converter containing RCF mat. List of Waste code 16 01 21\**
- Where a catalytic converter is removed from a vehicle and it is not possible to determine whether it has RCF matting it must be coded as 16 01 21\*.
- Catalytic converters that do not have an RCF mat within them should be *described as – catalytic converter not containing RCF matting* List of Waste code 16 01 22.
- If catalytic converters are being either imported or exported and it is not possible to confirm that there is no RCF matting present - the load should be classified as *A2030- waste catalysts but excluding such wastes specified on list B*. Further details on International Waste shipments can be found at <https://www.gov.uk/importing-and-exporting-waste>

### The monolithic honeycomb block

This contains the catalyst and once removed from the metal casing this should be coded.

- 16 08 01 - *Spent catalysts containing gold, silver, rhenium, rhodium, palladium, iridium or platinum (except 16 08 07\*)*.

### Metal casing

- Metal catalytic converter casing that does not contain RCF matting should be *coded 16 01 17 - Ferrous metal*.
- Metal catalytic converter casing containing the RCF matting should be *coded - Metal catalytic converter casing containing RCF - 16 01 21\**.

### RCF

- RCF matting removed from the metal casing should be *coded - RCF matting from catalytic converters -16 01 21\**.

## Storing and bulking up catalytic converters

---

### Safe storage and handling at producer sites

Waste catalytic converters are produced at vehicle repair garages and at End-of-Life Vehicle (ELV) sites.

When the catalytic converters are removed from vehicles:

- They must be stored and transported in a manner that does not result in the metal casing being pierced or breached.
- If the metal casing of a catalytic converter unit becomes damaged it should either be double bagged in a minimum of 400 gauge polyethylene or wrapped in a minimum of 400 gauge polyethylene sheeting.
- No treatment (de-canning) or further processing should be done on site unless an environmental permit is in place that specifically authorises this (see below) and the processing machinery is suitably extracted and abated.

---

**Consignment notes**

Catalytic converters containing RCF matting should be consigned from site as hazardous waste 16 01 21\* and consigned to a suitably permitted site for decanning.

Where it is not possible to determine whether or not the catalytic converter unit has RCF matting within it must be classed as 16 01 21\*.

From March 2016 consignment notes must be completed for movements of catalytic converters containing RCF (and those where it is not possible to determine if they contain RCF). Consignee returns must also be completed and records kept as required by the Hazardous Waste Regulations.

Whilst the permitting arrangements are regularised at sites formerly operating under the low risk positions and at permitted sites that do not have the correct waste codes. We accept that the catalytic converters are being consigned to sites that not authorised to take them.

As we have adopted a position to allow a 3 month transitional to allow operators apply for a permit or variation we do not propose to take any action in relation to this unless there are other breaches of the Hazardous Waste Regulations, duty of care, other permit breaches or the Relevant Objectives are breached as a consequence.

---

**Carriage of dangerous goods**

The HSE have confirmed that RCF has not been classed as dangerous goods for transport. A UN number has not been assigned to RCF so the Carriage of Dangerous Goods legislation does not apply.

---

## Processing catalytic converters containing RCF

---

**De-canning catalytic converters containing RCF**

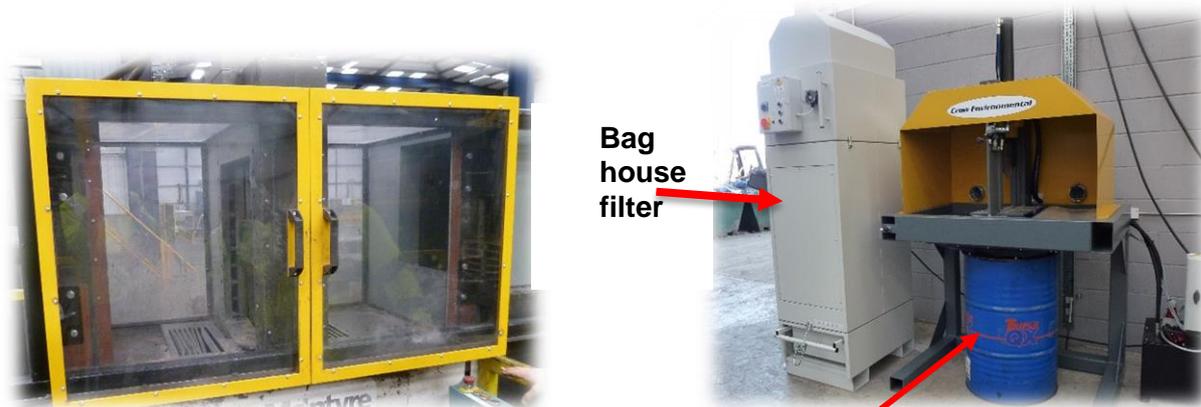
There are a number of systems available for 'de-canning' catalytic converters. We will require that the catalysts are cut open and the catalyst removed under local extracted ventilation (LEV) and abated with a HEPA filter.

<http://www.hse.gov.uk/lev/>

Some sites will also remove the RCF matting from the metal casing – this must be done under local extracted ventilation (LEV) with abatement and discharged via a HEPA filter.

---

## Catalytic converter de-canning plants



There are different types of decanning plants. They all have a guillotine which cuts the catalytic converter open. The honeycomb centre is knocked out into a bag or drum. The cutting must be done under Local Extracted Ventilation (LEV).



## Minimising exposure to RCF when cutting open catalytic converters

### HSE requirements

We do not regulate or advise on health and safety requirements but we do work closely with the HSE.

The advice we have received from the HSE is that where catalytic converters containing RCF are being cut open (de-canned) then it is likely that RCF fibres will be released. The Control of Substances Hazardous to Health (COSHH) Regulations will therefore apply. These Regulations are enforced by HSE. Exposure to RCF must be reduced as low as reasonably practicable (ALARP) and suggested measures to control exposure to RCFs should include:

- Local exhaust ventilation at the de-canning process
- PPE
- Respiratory Protective Equipment (RPE) when carrying out cleaning and maintenance operations
- Information, instruction and training (on the hazards/control measures of RCF)

- Hygiene procedures

If you come across a decanning process that you have concerns about it you can [report your concern to the HSE](#)

## Permitting requirements for storage and processing sites

---

### Storage sites.

Storage of catalytic converters removed from vehicle at the place of production are covered by a Non-waste framework directive exemption for both catalytic converters with or without RCF if at a garage or vehicle repair shop.

Storing catalytic converters at ELV sites or at intermediate sites (a place other than where the catalytic converters were removed from the vehicle):

- Storage of <50 tonnes of hazardous waste residues eg. batteries, waste oil including catalytic converters at ELV sites where they have been removed from the vehicle. (Current ELV permit)
  - Storage of <50 tonnes of hazardous waste including catalytic converters with or without containing RCF matting at an intermediate site (Bespoke waste operation)
  - Storing >50 tonnes of hazardous waste including catalytic converters **containing RCF** matting at an intermediate site. (Installation - Schedule 1, Section 5.6 A(1)(a))
- 

### Processing sites.

The guillotining and decanning of the honeycomb centre of the catalytic converter is a physico-chemical treatment process.

- Processing > 10 tonnes per day of hazardous waste including catalytic converters containing RCF matting. (Installation -Schedule 1, Section 5.3A(1)(a)(ii)).
  - Processing < 10 tonnes per day of hazardous waste including catalytic converters containing RCF matting. (Bespoke waste operation)
  - Processing catalytic converters not containing RCF (Bespoke waste operation).
- 

## Technical Competence

---

### Newly Permitted sites.

Operators of sites that are applying for a new permit and are relying on the Wamitab/CIWM technical competence scheme have a period of 1 year to become a competent manager. They must however complete the [EPOC](#) within 4 weeks of the site becoming operational (in this case of the permit being granted).

- They will need to complete the Hazardous Waste Treatment qualification for 'de-canning', or for storage sites a Hazardous Waste Transfer qualification within 1 year of the permit being granted.

There is a similar 'period of grace' under the EU Skills Scheme

---

## Currently Permitted sites.

Operators of sites that are applying to vary their permits to allow them to treat (de-can) catalytic converters that are hazardous waste will need to have a Technically Competent Manager who has the Hazardous Waste Treatment qualification, or for storage sites Hazardous Waste Transfer qualification if relying on the Wamitab/CIWM scheme.

Given that these are unusual circumstances we are allowing existing operators time to vary their permit to allow them to continue accepting catalytic converters that are hazardous waste. We will allow operators a year from permit issue to gain the relevant qualification. Further details can be found on the WAMITAB website  
<http://www.wamitab.org.uk/pg/competence>

Similarly, we will also allow a period of one year for any operator using the EU Skills scheme to have certified any changes that may be necessary to their CMS scheme as a result of catalytic converters they accept being regarded as hazardous. Further details can be found on the website  
<http://www.euskills.co.uk/waste-management>

---

## Charging

---

### New permits for ELV sites with converter processing.

There are two scenarios for new application charges.

If an ELV operator removes catalytic converters from an ELV and has an additional process on site that dismantles the catalytic converters to remove the catalyst then they would be charged in accordance with

- **Schedule 3, Table 1- Permit for the treatment of waste in or on land, Part A - Treatment of waste for the purpose of recycling, Part(c) - Any waste not falling within subparagraphs (a), (b) or (d).**

If they are also accepting catalytic converter units from other sources to process they will fall into the same charging table as dedicated catalytic converter processing sites. See below.

### New permits at dedicated catalytic converter processing sites.

If an operator is receiving catalytic converters from ELV and then dismantles the catalytic converters to remove the catalyst then they would be charged in accordance with

- **Schedule 3, Table 1- Permit for the treatment of waste in or on land, Part A - Treatment of waste for the purpose of recycling, Part(a) - Any waste that is hazardous.**

Further information on the charging scheme can be found at:

<https://www.gov.uk/government/publications/environmental-permitting-ep-charges-scheme-april-2014-to-march-2015>

### Variations to existing permits.

There are two scenarios:

- A site which has an existing permit usually an A20 which needs varying to allow them to accept and process the additional waste codes 16 01 21\* and 16 01 22. Provided the de-canning process and abatement is suitable we would view this as an **admin variation**.
- A site has an existing permit which needs varying to allow the additional waste codes 16 01 21\* and 16 01 22 but the process and abatement

needs to be reviewed and improvements made. We would seek an improvement condition requiring this. This is **not** an admin variation and the type of variation would be dependent on the amount of technical assessment required.

---

**Facility type code.**

New permits and permits that are varied to allow the processing of catalytic converters and include the waste code 16 01 21\* will be classed as:

- A16a - physical treatment of hazardous waste. This should be identified on the OPRA form.

Further information can be found in

<https://www.gov.uk/government/publications/opra-for-epr-operational-risk-appraisal>

---

## Disposing of RCF matting and metal casing contaminated with RCF

---

**RCF matting only.**

- RCF matting removed from catalytic converters must be double bagged in 400 gauge polyethylene, or in 400 gauge polyethylene lined sealable bags or wrapped in 400 gauge polyethylene plastic and sealed.
- The bags/sealed plastic must be stored in a secure place or lockable rigid container which is suitably labelled to identify that it contains RCF.
- The bags of RCF **must not be re-opened or compacted** and must be handled to ensure their integrity is maintained.
- The bagged RCF is hazardous waste and must be consigned to a suitably permitted facility (eg. landfill for disposal) and coded as 16 01 21\* Bagged RCF matting from catalytic converters.

**Metal casing not containing RCF**

Metal casing that does not contain RCF or has had the RCF mat fully removed can be sent for shredding and recovery at a suitably permitted metal recycling site.

---

**Metal casing containing RCF**

Metal casing which has RCF matting remaining within it must be classed as hazardous waste and consigned from the site for disposal. The metal casings must be either:

- double bagged in 400 gauge polyethylene lined sealable bulk bags or
- wrapped in 400 gauge polyethylene and then stored in a lockable rigid container.

This waste must be sent to a suitably permitted landfill for disposal and coded as 16 01 21\*

---

## Related documents

---

**Links**

**Reference documents**

- [Consignment of hazardous waste](#)

- [Charging scheme](#)
- [OPRA score guidance](#)
- [HSE - ELV information](#)
- [International Waste Shipments](#)

DRAFT