



# CARE GUIDANCE

RECOMMENDATIONS ON BEST PRACTICE

**LEVEL 3**

## Maintenance and Repair Operations



# MAINTENANCE AND REPAIR OPERATIONS

## INTRODUCTION

This is a level 3 document in the ECFIA CARE Guidance series and should be read in conjunction with the level 1 document "Working with HTIW – Effective Risk Management".

This document provides information on potential means of reducing workplace exposure to HTIW (fibrous) dust during maintenance and repair operations in high temperature process installations such as furnaces. The advice provided here is generic.

## WHAT IS THE CARE PROGRAMME?

ECFIA's Controlled And Reduced Exposure (CARE) Programme is an important part of the Product Stewardship Programme. It allows employers to proactively minimize fibrous dust exposure and thus protect workers' health.

## WHAT ARE THE CARE GUIDANCE DOCUMENTS?

These documents form a comprehensive library of information on the safe handling and use of HTIW products. They have been written by industry experts and are designed to give customers of ECFIA members helpful information to put in place effective controls to minimise exposure to airborne fibres. This series of documents will progressively grow as new documents are produced.

**Level 1 guidance document:** "Working with HTIW - Effective risk management"

**Level 2 guidance documents:** Risk management measures applicable to HTIW

**Level 3 guidance documents:** Examples of specific applications



## **WHAT ARE MAINTENANCE AND REPAIR OPERATIONS?**

Maintenance and repair operations in this context relate to repairs in installations such as furnaces and kilns that are part of a maintenance programme. They are generally small scale infrequent operations carried out on site that may not justify the installation of full engineering controls.

## **DUST EXPOSURE**

There is significant potential for particulate and fibrous dust exposure during repair operations, as the process generally involves removal of 'old' HTIW material and installation of new material. Fibrous dust monitoring during installation and removal has shown that these processes can create airborne fibre levels above recommended exposure limits.

Repairs involving HTIW blanket generally involve cutting the blanket to be removed using a knife and then tearing the pieces by hand. The new piece of blanket is then inserted into place in the furnace lining.

Preferably prefabricated shapes (modules or blanket pieces) should be used for repair as machining and cutting HTIW materials immediately prior to repair operations can create further sources of potential fibrous dust exposure through, for example, the use of band saws, lathes and hand tools.

Some recommendations for fibrous dust controls are given in this section. However, these are necessarily generic in nature and for specialised applications it is recommended that a ventilation expert or occupational hygienist is consulted for specialist advice.

## **GENERAL RECOMMENDATIONS**

Maintenance and repair operations are typically high dust activities and therefore operators should always wear appropriate respiratory protection equipment. As a bare minimum, workers should wear an FFP3 half-face disposable dust mask.

For workers who regularly undertake repair activities, it is recommended that a full-face air fed mask is worn. Additionally, these workers should wear disposable overalls, goggles and gloves when carrying out such operations.

All waste material should be placed carefully in clearly labelled sealed plastic bags and disposed of according to local regulations and guidelines. While there are very few feasible engineering controls, the use of a mobile LEV system is a possible solution that should be considered. This is covered in the level 2 CARE Guidance document "LEV".

### CONTROLS DURING THE REMOVAL STEP

Access to the kiln/furnace where the removal is being carried out should be restricted to those operators involved in the removal process, and the area should be cordoned off.

Where possible, HTIW materials to be removed should be dampened before removal to reduce possible exposure to fibrous dust. This can be done with a water sprayer, spraying a fine cloud of water droplets onto the material.

### CONTROLS DURING THE INSTALLATION STEP

Wherever possible, materials for repairing/relining kilns and furnaces should be prepared higher up the supply chain where dust exposures can be more easily controlled. Where such preparations have to be conducted on site, this should be done under LEV wherever possible; guidance on dust control for specific activities is given in the Level 3 guidance documents for hand tools, band saws and die presses. All off-cuts from the preparation stages should be handled carefully and disposed of appropriately (i.e. not thrown into boxes or left on the machine once work has been completed).

### PORTABLE EXTRACTION EQUIPMENT



Fig. 1: Portable Extraction System

### USE OF ALTERNATIVE FORMS OF HTIW

It may be possible to use alternative forms of HTIW materials in repair operations. A number of options are discussed in the level 2 CARE Guidance document "Exposure reduction through use of alternative product forms and processes". Examples of possible alternatives include:

- Use of pre-cut blanket rather than cutting blanket strips on site
- Using a mastic type material to plug gaps in the material rather than using blanket

## FINAL MEASURES

Upon completion of the operation, the work area and surroundings should be cleared of any dust and debris; best practice is to use a HEPA filtered vacuum cleaner for this. Dry sweeping should not be done as this can disturb dust, allowing it to become airborne. If the use of a HEPA filtered vacuum cleaner is not possible, wet sweeping with a dust suppressant should be employed.

## SUMMARY

During maintenance and repair operations, professional and careful handling of HTIW materials is required to prevent dust exposure. One of the best ways of preventing dust creation is, when technically possible, wetting the HTIW material before removing it, shadow vacuuming as it is removed and portable dust extraction.

Dust should be further reduced by using a HEPA filter system to clean the area after removal.

All HTIW waste should be collected in plastic bags and sealed air-tight prior to disposal.

## FURTHER INFORMATION

### CARE Guidance Documents

Level 2: "Local Exhaust Ventilation (LEV) Systems for High Temperature Insulation Wool (HTIW)"

Level 3: "Waste Disposal"

Level 3: "Removal of HITW materials"

Level 3: "Installation of HITW materials"

Level 3: "Use of Powered Hand tools"

### Links

- [www.ecfia.eu](http://www.ecfia.eu)
- [www.hse.gov.uk/coshh](http://www.hse.gov.uk/coshh)
- [www.baua.de](http://www.baua.de)
- [www.inrs.fr](http://www.inrs.fr) \*

\* *see in particular document: Exposure to refractory ceramic fibre during repair and maintenance „Exposition aux fibres céramiques réfractaires lors de travaux d'entretien et de maintenance" ED 6084, December 2010.*