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CARE GUIDANCE

RECOMMENDATIONS ON BEST PRACTICE

LEVEL 3

Module Manufacturing

MODULE MANUFACTURING

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".

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

BACKGROUND

With respect to energy consumption, HTIW modules are the best choice for high-temperature thermal insulation for industrial furnaces and are the most frequently applied product form in temperature ranges up to around 1650°C. Depending on the particular requirements and equipment design, modules are produced in various sizes and densities and can easily be handled and adapted to the requirements of the application.

Providing the application conditions are taken into account in the design stage, and with the correct selection of module types, later maintenance or repair (retamping), and therefore potential worker exposure to fibrous dust, can be avoided. The first consideration is to incorporate pre-frabricated HTIW products such as modules into the construction design.

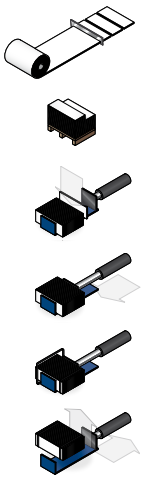
MANUFACTURING PROCESS

Modules are manufactured to specified shapes and designs using a range of different machinery, equipment and techniques. In general, 'modules' consist of blanket strips which are pressed together to form blocks and held together with various aids.

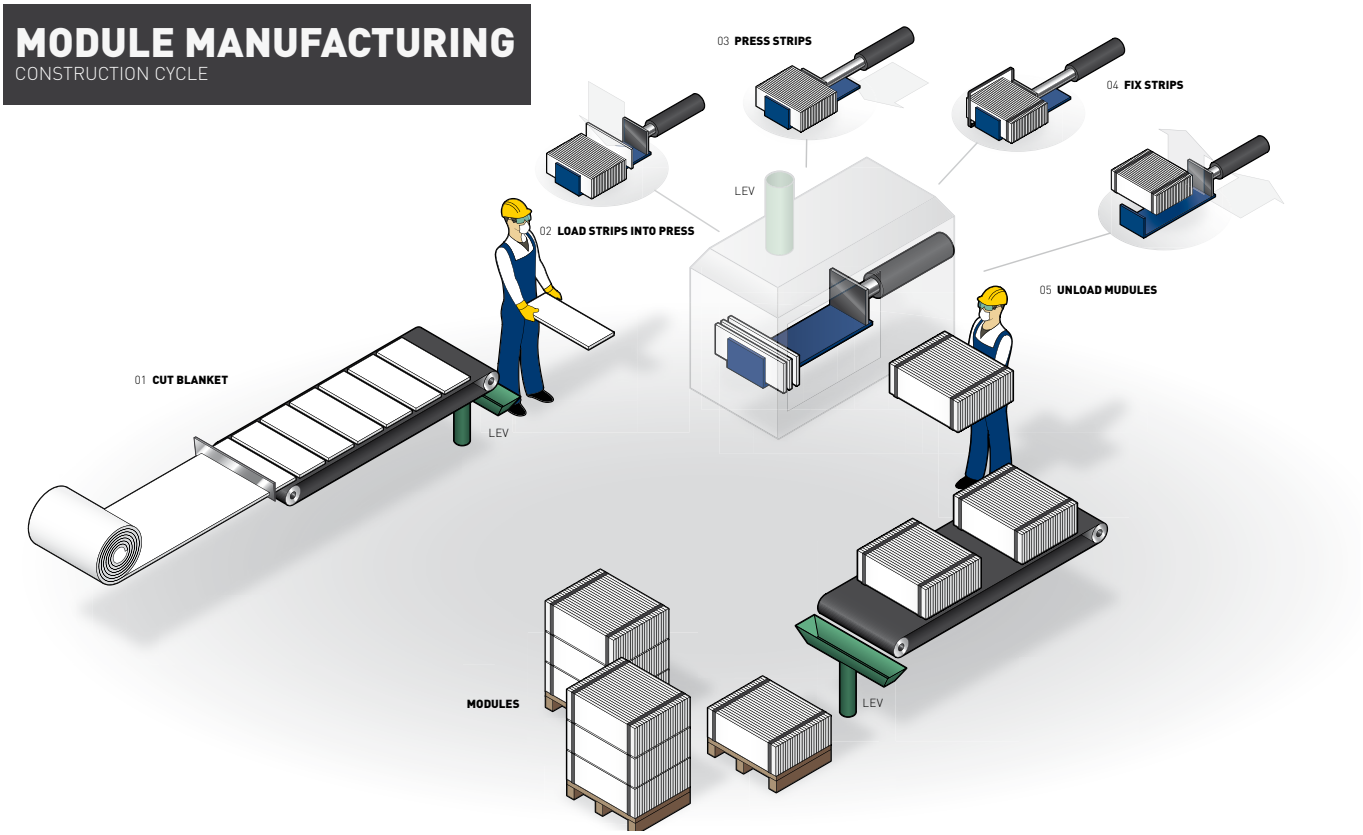
Normally, HTIW-blanket is cut to the required dimensions for the module-making either direct from the manufacturing line or strips are cut from the standard blanket roll as delivered. The strips are then packed into a collection chamber by the operator and mechanically compressed with pneumatic or hydraulic presses. The blanket strips can be used as they are or folded according to the required dimensions of the module and then be compressed. In the pressed stage the modules are fixed (e.g. using cords, ropes or plastic band).

During cutting and handling of the strips in the module-making operation, dust is generated and must be adequately controlled to ensure operator' safety.

There are several sources of dust emissions that should be considered when designing dust controls:



- Cutting or die-cutting the blanket
- Putting strips on the pallet
- Packing the blanket strips into the module machine
- Compressing activity in the press equipment
- Fixing strips
- Removing the module from the press
- Sawing to the final module dimensions
- Packaging of modules on the pallet



Generally the main press has dust controls, but this is also the part of the operation which has the least worker interaction. Depending on the nature of the process, additional controls may be necessary to reduce dust generation during the production handling and packing steps.

Some examples of dust controls that can help to reduce the dust levels in the workplace are as follows:

Enclosures

Enclosures constructed around the module production area can significantly reduce operator exposure.

Extraction

Extraction (local exhaust ventilation) is generally found within the pressing machine area, which helps to minimise dust emissions by drawing the dust away as it is created by the compaction process. Extraction should also be considered within an enclosure to further reduce dust generation.

Automation

Automation is only sensible if large numbers of standard modules are produced on a regular basis: this is because of the high investment cost and much higher operating costs if the equipment set-up has to be changed when low numbers of modules are produced. Module machinery that has some degree of automation in terms of material feeding has been found to create lower worker exposure to fibrous dust as it reduces the amount of handling that the worker has to undertake. Therefore the material feed process should be automated wherever possible. Ideally, product take-off should also be automated but this is not always possible due to the variation in module shape, size and complexity produced on single machines.

SUMMARY

Fibrous dust from HTIW and other sources can be avoided by:

- using automated processes where possible
- having sensible material flow to reduce handling
- integrating LEV in various production steps
- skilling workers in safe and appropriate handling techniques.

FURTHER INFORMATION

CARE Guidance Documents

Level 2: "Local Exhaust Ventilation (LEV) Systems for High Temperature Insulation Wool (HTIW)"
Level 3: "Die Cutting"
Level 3: "Saws"
Level 3: "Good practice in HTIW materials warehouse"
Level 3: "Powered hand tools"