



CODE OF PRACTICE WORKING WITH REFRACTORY CERAMIC FIBRES (RCF)

October 2000

This code of practice applies only to RCF defined as MMVF in EU-Regulation 97/69/EC.

BACKGROUND

Refractory ceramic fibre (RCF) has been classified by the European Union as a category 2 carcinogen that is it "should be regarded as if it is carcinogenic to man". It has also been classified as "irritant". The carcinogen decision was based solely on results in animal experiments. Although RCF has been used for nearly 40 years no significant health effects have been found in humans.

If there is any risk, it is not from the RCF products themselves but from the inhalation of fibrous dust released. If such a release exists it should be minimised, and as a consequence to the classification some additional precautions are made mandatory. For these reasons care needs to be taken when working with RCF and here we outline a series of precautions tailored to the use of RCF products. These are based on the more general requirements for the protection of workers from carcinogens at work.

RCF products should be limited to professional use in well-organised workplaces. Statutory or other applicable exposure limit values for RCF dust need to be observed and exposure shall be reduced to as low a level as is technically possible. Please check your local and national regulations and exposure limits before working with RCF. You should have documented your reasons for using this material and also comply with various other administrative measures. As these measures differ from area to area they cannot be listed here; ECFIA or your local supplier will help you comply with these requirements.

This Code of Practice gives specific advice on the appropriate handling of RCF.

WORK PLACE RISK ASSESSMENT

A first requirement when working with RCF is to carry out a risk assessment at the workplace. The sources of dust release related to your RCF-application(s) shall be recognised. Their potential to expose workers shall be evaluated (nature, degree, duration) in order to help defining a proper level of control. This evaluation can be made by conducting air monitoring or by using existing information from the ECFIA CARE Programme.

1. Evaluation by air monitoring.

The levels of fibrous dust occurring while using RCF may be monitored. In this case an approved method must be used. Measurements should be made with personal samplers worn by operators while they carry out significant tasks. The monitoring will help to identify and prioritise the needs for control. It will also help to check that conditions are not deteriorating with time. Airborne dust levels should always be kept to a minimum. Through the CARE programme, ECFIA or your supplier, can help organise measurements and keep you informed of the levels measured in other user premises.

2. Evaluation by reference to existing information.

Within the ECFIA-CARE-Programme dust levels associated to a number of tasks were evaluated (see ECFIA publication "Recognition and Control of Exposure to Refractory Ceramic Fibres (RCF)", November 1999). Refer to this ECFIA document to estimate the kind of workplace conditions associated to your specific RCF application(s).

3. Control measures.

Based on this evaluation, you will be able to define appropriate control measures as described below.

DUST CONTROL

1. Organisation of work.

- Where dust emission cannot be avoided minimise dust exposure. Use operating procedures which will limit workers' fibre dust exposure.
- Exposure can be avoided by different means such as use of preformed shapes, encapsulated parts or dustless processes.
- Areas where RCF products are used should be clearly identified. Access should be restricted to persons who have been informed of the health aspects of RCF and trained to use RCF products properly.
- The number of workers involved (directly or indirectly) should be limited to the minimum. This is most easily achieved by appropriate organisation of working practices. Procedures limiting the amount of handling should be used.
- Only the minimum amount of RCF product should be kept at the workplace; material should be stored in its original packaging; this should only be opened when needed. RCF materials not fully used should be repacked to prevent dust release and safely stored.

2. Technical measures.

- Extraction and ventilation should be arranged so as to prevent dust dispersion. Exhausted air should not be reintroduced into the working area unless filtered efficiently in accordance with local or national requirements. Ventilation systems should be designed so that bystanders are not exposed to RCF dust.
- The ventilation system and the dust collectors should be regularly inspected and maintained.
- Isolation of some processes may be useful in specific circumstances.

WORKING HABITS

Train operators in good and clean working habits.

- All operators should be informed about all aspects of health related to the use of RCF, trained in safe handling and instructed to make proper use of any equipment provided.
- Training and information should be given before employment and updated as necessary.
- Experience has shown that different operators carrying out the same process can create different amounts of dust. Bad habits, such as throwing scrap onto the floor instead of placing carefully in a bin, can substantially increase dust in the atmosphere. Close observation of working practices may reveal aspects that can be improved by training or changing handling procedures.

HOUSEKEEPING

Keep the workplace clean. Avoid dry brushing.

- Dirt and scrap can act as sources of airborne fibre therefore regular good housekeeping will significantly reduce dust levels. The housekeeping programme should be planned to include systematic cleaning and should result in a clean and orderly work environment, which will also be safe.
- Cleaning should be carried out with a vacuum cleaner fitted with a high efficiency particulate (HEPA) exhaust filter to prevent dust being blown back into the atmosphere. If this is not possible clean by wet sweeping, dry brushing should never be used. Particular care should be taken to ensure that dust is not released when emptying the vacuum cleaners, waste bins, dust collectors or in the subsequent disposal of the dust.
- Compressed air should not be used.

PERSONAL PROTECTIVE EQUIPMENT

Provide appropriate protective equipment and train operators to fit and use it properly.

The table summarises the recommendations and requirements for respirators and other protective equipment.

Information on the selection of suitable respirators is available in National Standards, in guidance issued by health and safety authorities and from suppliers. All respiratory protective equipment (RPE) should be suitable for its intended use and approved under local or European guidelines.

hats, goggles and reusable masks should be cleaned after each use, stored in a dust free area and replaced by the employer when necessary.

Airborne fibre concentration	Gloves	Eye protection	RPE FFP2, P2, TM1P, TH2P	RPE FFP3, P3, TM2P, TH3P	Protective overalls
Below the limit value	Recommended		Recommended		
Between the Limit value and 10 times the limit value.	Recommended	Recommended	No	FFP3 Required	Recommended
10 to 30 times the limit value	Recommended	Required	No	TM2P, TH3P Required	Required
During wrecking of after-use insulation	Required	Required	No	Depending on level as above	Required

Table: Suggested policy for personal protective equipment

WORK CLOTHES

Require operators to wear suitable clothing.

- Operators should be provided with clothing specifically for use in their working area. This can be in the form of disposable, lightweight overalls worn over normal clothing. Working clothing should be long-sleeved; tight cuffs or collars should be avoided as they can cause irritation by rubbing fibres into the skin. Where appropriate further precautions need to be taken by providing gloves, head and eye protection.
- Work clothing should be removed when the operator leaves the workplace and stored separately from normal clothing; compressed air should not be used in an attempt to remove adhering fibres. Each worker should be provided with two lockers in an appropriate changing and washing area. Changing arrangements should be designed to minimise dust exposure during dressing and undressing.
- Clothing worn in RCF workplaces should be laundered by the employer separately from personal clothes. Where heavy contamination by fibre has occurred care should be taken to ensure that the equipment used for laundering is itself thoroughly cleaned after use. Gloves,

SKIN IRRITATION

Handling RCF can cause temporary, mild mechanical irritation. Instruct operators to wash after handling RCF.

- In some sensitive individuals RCF can cause skin irritation. Although this will be minimised by observing the precautions described above operators should also be encouraged to wash exposed skin areas regularly. Therefore appropriate washing facilities should be provided. The skin should first be rinsed with water and then washed with soap (not detergent). Persons sensitive to skin irritation usually acquire a degree of tolerance after a few days of exposure. However if, despite the above precautions, irritation persists then consideration should be given to transferring the individual to other work.

SMOKING

Smoking at the workplace is forbidden.

- Smokers who are also exposed to RCF dust are more likely to have a dry cough and suffer from slight breathlessness. No such symp-

toms have been shown in non-smokers. For this, and for other more commonplace reasons, workers are advised to reduce any health risk by stopping smoking. In any case smoking is not permitted when working with RCF.

WASTE DISPOSAL

Handle, collect and dispose of scrap gently.

- Solid waste and scrap should be transferred carefully to suitable impervious containers or bags of adequate strength. They should be sealed and clearly labelled and disposed of regularly.
- RCF whether as supplied or after-use is not generally classified as a "hazardous waste" and may be disposed of at a tipping site licensed for the disposal of industrial waste. Please consult local regulations as requirements and nomenclature differ from area to area. Where the waste has been contaminated by hazardous waste expert guidance should be sought.
- Unless wet, RCF waste is usually dusty and so should be properly bagged, clearly and visibly labelled, contained and sealed for disposal. At some tip sites dusty wastes may be treated differently in order to ensure that they are dealt with promptly and to avoid them being windblown.

FIBRE REMOVAL AND FURNACE WRECKING

Special care is needed when removing used fibre.

- Alumino-silicate RCF may degrade with prolonged heating at temperatures above 900°C.
- Because high concentrations of fibrous and other dusts may be generated when after-service products are mechanically disturbed during operations such as wrecking the following is recommended:
 - Reduce dust emissions by means of adequate control measures.
 - If it is not possible to provide adequate dust extraction during the removal process then operators should wear high-efficiency respirators. Depending on the level of exposure powered respirators may be required for some removal operations. Follow the recommendations regarding protective clothing given in this document.
 - Isolation in some circumstances may be desirable.
 - Please check the local and national regulations on silica containing dusts and exposure limits.
- These procedures will ensure compliance with local regulatory exposure standards for free crystalline silica. And because devitrified fibres containing crystalline silica mixed with amorphous and other crystalline phases are far less biologically active than free crystalline silica dusts, these measures will provide a high degree of protection.

SPRAYING

Do not spray RCF-containing products.

- Preparations containing RCF should not be sprayed. It is known that this application is difficult to control.

Further Information

For further information, documents and assistance regarding health effects and the safe handling of RCF products, please refer to your supplier or contact ECFIA (www.ecfia.org).

The information contained in this document is believed to be correct at the date shown. Acceptance of advice or guidance given here does not, in any way, remove the need to comply with local and National legislative requirements and/or any particular worksite rules and regulations.