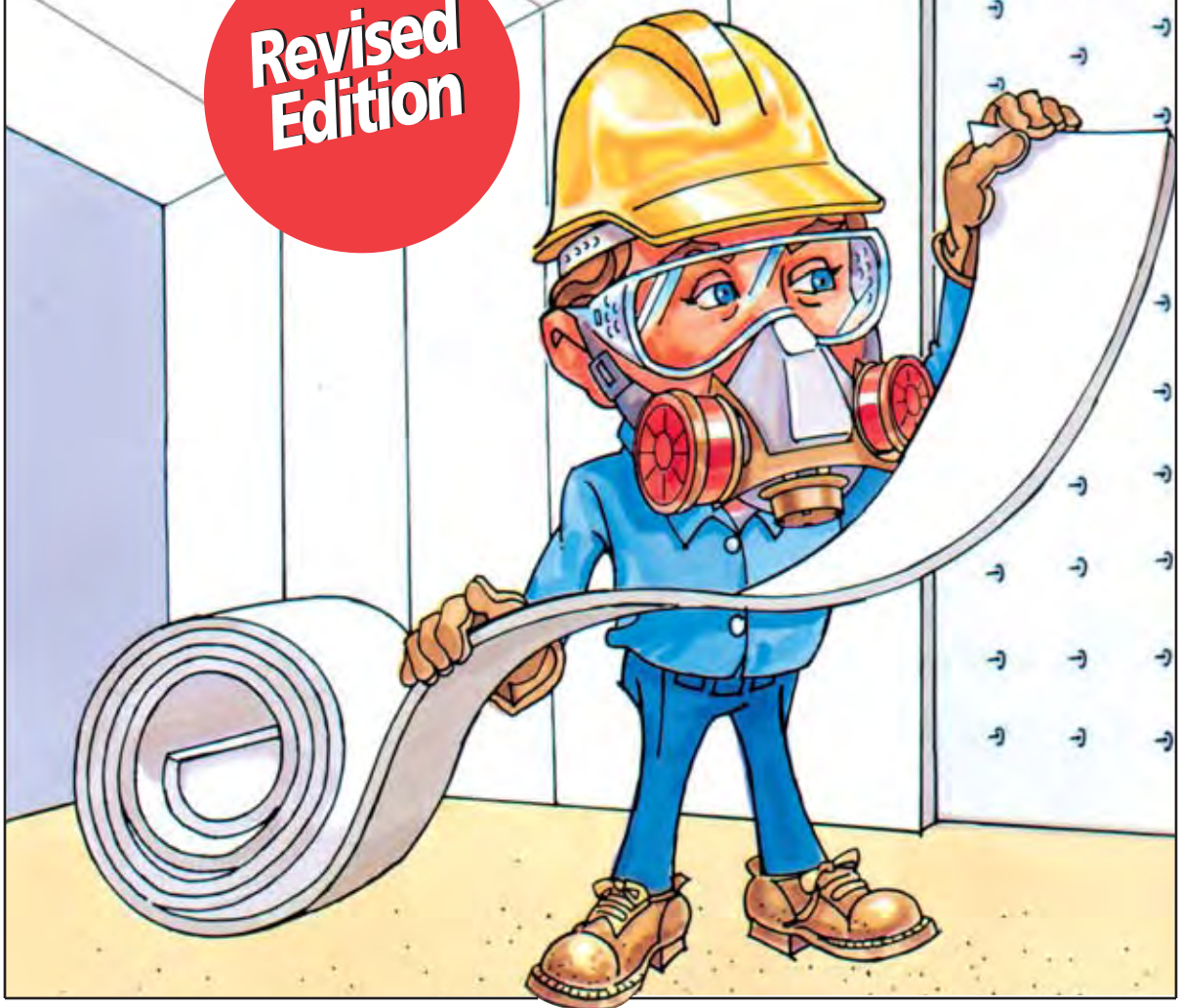


WORK PRACTICE GUIDE FOR REFRACTORY CERAMIC FIBER PRODUCTS

Revised
Edition



WHAT IS REFRACTORY CERAMIC FIBER?

Refractory Ceramic Fiber (RCF), along with fibrous glass and mineral wool, is part of a group of synthetic vitreous fibers (SVF). All of these materials are made from molten masses of raw material under highly controlled conditions.

RCF IS USED FOR:

- Thermal insulation in industrial furnaces and boilers
- High temperature stress relieving
- Heat resistant applications
- High temperature pipe and vessel insulation
- Furnace linings and heating element supports
- High temperature gaskets and seals
- Encapsulated high-temperature insulation for the aerospace, automotive and appliance industries
- Fire protection systems and firestops



HEALTH EFFECTS OF REFRACTORY CERAMIC FIBERS



Exposure to RCF may cause temporary mechanical irritation to eyes, skin and respiratory tract.

To date, no significant health effects in humans have been found, but animal studies have shown that at very high exposures and over long periods of time, some animals develop lung scarring and tumors.

RCF fibers can undergo partial conversion to cristobalite (a form of crystalline silica) after exposure to temperatures exceeding 1800°F for a long period of time. Prolonged/repeated inhalation of respirable crystalline silica dust may aggravate existing asthma or emphysema conditions and cause a delayed lung injury (*silicosis*).

In 2002 the International Agency for Research on Cancer (IARC) classified refractory ceramic fiber as a “possible human carcinogen (group 2B)”, IARC’s classification of refractory ceramic fiber was based on sufficient evidence of carcinogenicity in experimental animals and inadequate evidence (no data) of the carcinogenicity of refractory ceramic fiber to humans. In 1997 IARC classified crystalline silica, which may be found in after-service RCF, as “carcinogenic to humans (Group 1)”.

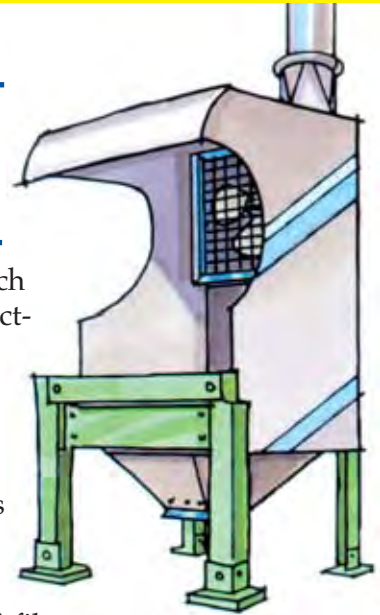
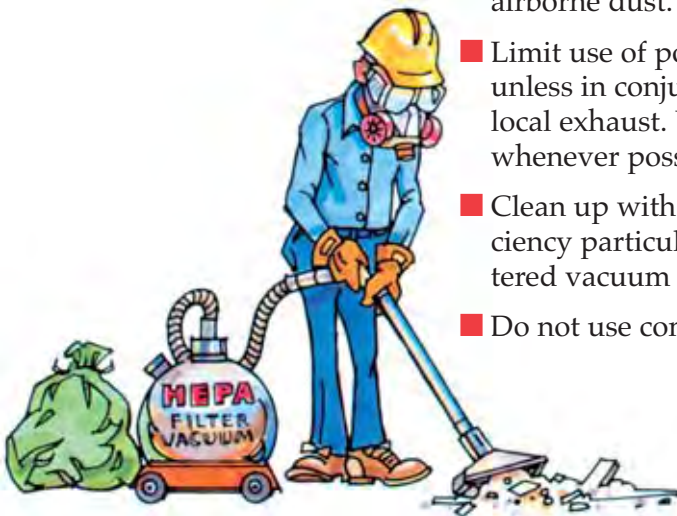
Proper work place engineering controls and recommended work practices are designed to minimize the potential risk associated with the manufacture, use, and disposal of RCF products.

WORKING WITH RCF

**ALWAYS KEEP
AIRBORNE
DUST TO A
MINIMUM.**

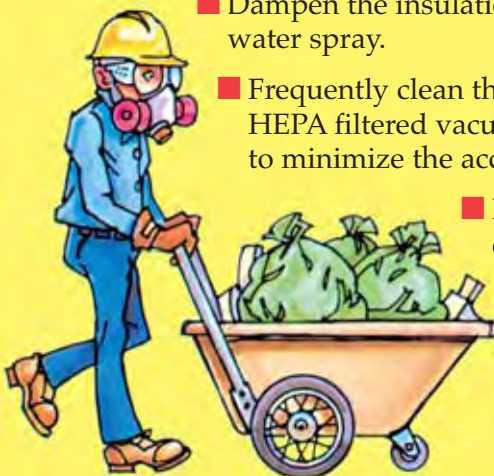
When installing RCF products:

- Use engineering controls, such as local exhaust or dust collecting systems, to minimize airborne dust.
- Limit use of power tools unless in conjunction with local exhaust. Use hand tools whenever possible.
- Clean up with high efficiency particulate air (HEPA) filtered vacuum or wet sweeping.
- Do not use compressed air for clean-up.



When removing RCF products:

- Dampen the insulation with a light water spray.
- Frequently clean the work area with HEPA filtered vacuum or wet sweeping to minimize the accumulation of debris.
- Follow proper disposal procedures as listed in the Material Safety Data Sheet (MSDS).



ALWAYS USE YOUR PERSONAL PROTECTION EQUIPMENT



- Use appropriate NIOSH certified respirators to avoid breathing fiber particulates and dust (**consult the supplier's MSDS**).
- Make sure you are trained in the proper use of your respirator.

- Wear full body clothing, gloves, hat and eye protection.

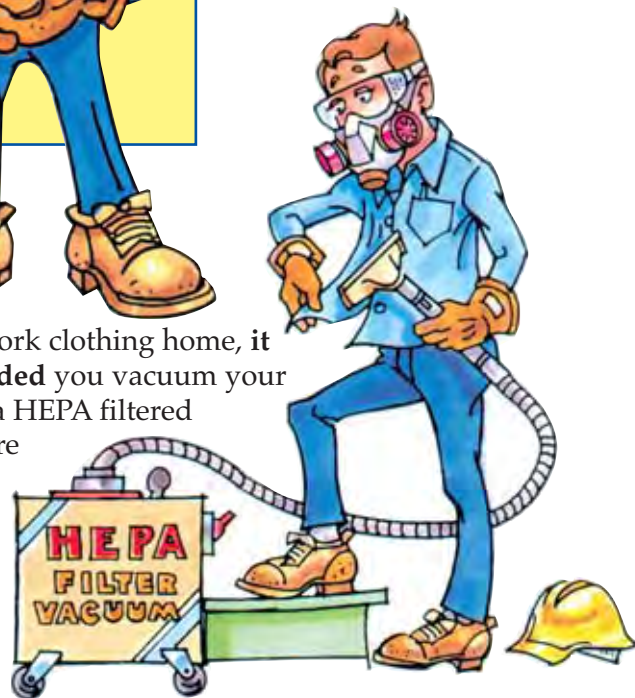


- Wash work clothes separately from other clothing. Rinse washer after use.



- Do not smoke, eat or drink in the work area.

- If you take work clothing home, it is **recommended** you vacuum your clothes with a HEPA filtered vacuum before leaving the work area.



MORE TIPS ON WORKING WITH RCF

MAKE SURE YOU GET THE PROPER TRAINING

Your employer should provide health and safety training for you in accordance with OSHA Hazard Communication Standard (29 CFR 1910.1200). After training, you should be familiar with:

- Potential hazards associated with RCF products.
- Work practices that can protect you from potential hazards.
- Material Safety Data Sheets and warning or caution labels.
- Protective equipment - use and limitations.

If you have any questions about any of these matters or if you feel you need further training, don't hesitate to ask your employer for help.



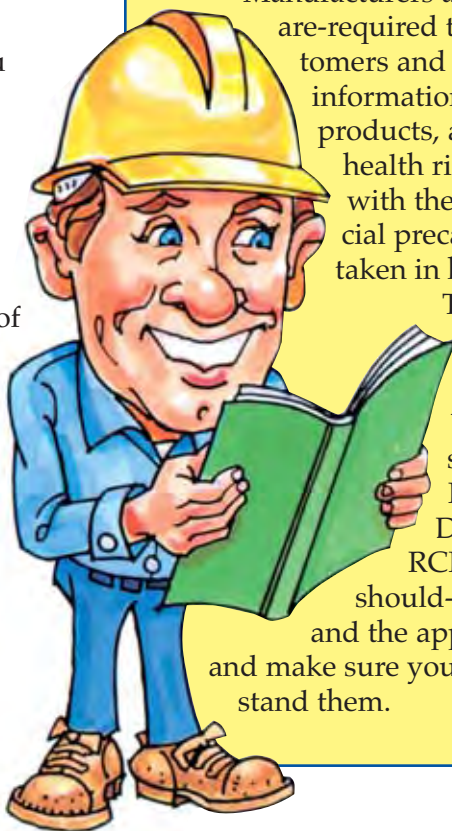
LEARN FROM YOUR MATERIAL SAFETY DATA SHEETS (MSDS)

Federal and state laws give you the right to know about the potentially hazardous substances in your workplace. The more you know, the better able you are to protect yourself. One of the ways you can learn is by reading the MSDS for all materials with which you work.

Manufacturers and distributors are required to provide customers and employees with information about their products, any potential health risks associated with them, and any special precautions to be taken in handling them.

This information is written on the MSDS.

Your company should have the Material Safety Data Sheets for RCF products. You should review the sheets and the appropriate labels and make sure you fully understand them.





OSHA'S GENERAL INDUSTRY STANDARDS FOR REFRACTORY CERAMIC FIBER

The Occupational Safety and Health Administration has considered, but not adopted, a Permissible Exposure Limit (PEL) for all synthetic vitreous fibers (SVF). To date, OSHA regulates RCF under a general duty category of "particulate not otherwise regulated" with an exposure of 5 milligrams per cubic meter (5 mg/m^3) for respirable dust and 15 milligrams per cubic meter (15 mg/m^3) for total dust. The Refractory Ceramic Fibers Coalition (RCFC) member companies have voluntarily established a Recommended Exposure Guideline (REG) of 0.5 fibers per cubic centimeter (0.5 f/cc), averaged over an 8-hour work day.

Crystalline silica (cristobalite) may be formed in RCF products following sustained high temperature ($>1800^\circ\text{F}$; 982°C) use.

DO YOU HAVE ANY QUESTIONS!



We hope you have found this information helpful. If you have any questions, ask your employer to provide further information about RCF products, industrial hygiene monitoring, and proper work practices. If you would like more technical information on respiratory protection and RCF health studies, ask your employer or contact one of these Refractory Ceramic Fibers Coalition member companies:

- **Thermal Ceramics Inc.** (800-722-5681)
- **Unifrax I LLC** (800-322-2293)
- **ANH Refractories Company** (800-237-6742)
- **Nutec Fibratex** (866-978-4715)



DO YOU KNOW HOW TO WORK WITH RCF?

When you work with RCF products, do you use proper work practices? To find out, answer yes or no to the following questions:

	YES	NO
I wear goggles or safety glasses with side shields.	<input type="checkbox"/>	<input type="checkbox"/>
I wear a respirator when conditions require it.	<input type="checkbox"/>	<input type="checkbox"/>
I perform a fit test for my respirator every time I wear it.	<input type="checkbox"/>	<input type="checkbox"/>
I wear a long-sleeved shirt and long pants or coveralls.	<input type="checkbox"/>	<input type="checkbox"/>
I wear protective gloves.	<input type="checkbox"/>	<input type="checkbox"/>
I wear a cap or hard hat.	<input type="checkbox"/>	<input type="checkbox"/>
I vacuum my work clothes before removing them from work.	<input type="checkbox"/>	<input type="checkbox"/>
I know not to shake my work clothes to remove dust or fibers.	<input type="checkbox"/>	<input type="checkbox"/>
I wash my work clothes separately from my other clothes.	<input type="checkbox"/>	<input type="checkbox"/>
I have read and understand the Material Safety Data Sheets.	<input type="checkbox"/>	<input type="checkbox"/>
If I get fibers on my skin, I wash with warm water and mild soap, and then apply skin cream.	<input type="checkbox"/>	<input type="checkbox"/>
I always read the product warning or caution labels.	<input type="checkbox"/>	<input type="checkbox"/>
I know how to get more information on RCF.	<input type="checkbox"/>	<input type="checkbox"/>

If you answer "no" to any of these questions, please re-read this booklet.



RCFC

Refractory Ceramic Fibers Coalition
 2300 N Street NW
 Suite 6178
 Washington, DC 20037
 Telephone (202) 663-9188
www.rcfc.net

Presented as a service of a Product Stewardship Program (PSP) by the Member Companies of the Refractory Ceramic Fibers Coalition.

This booklet is only a general guide and is not intended to replace an employer's Health and Safety Policies. Only the employer can establish the specific guidelines for a particular job assignment.