Thermal Ceramics

MATERIAL SAFETY DATA SHEET
(Following 91/155/EEC)

STANDARD, EMCAST, EMCAST LI, EMCAST CLI, HT CAST, MORCAST, 1700 CAST, SUPERCAST, 160F CASTABLE, MULCAST

MSDS NUMBER	DC1-3-EURO		
DATE OF FIRST ISSUE	05/1995	DATE OF LAST REVISION	12/2002

1. IDENTIFICATION OF THE PRODUCT AND OF THE COMPANY

IDENTIFICATION OF THE PRODUCT
The above mentioned products are dense castables.

USE OF THE PRODUCT
These products are monolithic refractories used in lining industrial furnaces, high temperature processing, kilns and metal melting applications.

IDENTIFICATION OF THE COMPANY

FRANCE THERMAL CERAMICS HSE Department
Route de Lauterbourg - BP 148
67163 WISSEMBOURG Cedex
Tel. : +33 (0)3 88 54 95 50
Fax : +33 (0)3 88 54 29 20

U.K. THERMAL CERAMICS LIMITED
Commercial Road, Bromborough
Wirral, Merseyside CH62 3NL
Tel. : +44 (0) 151 334 4030
Fax : +44 (0) 151 343 5437

2. COMPOSITION / INFORMATION ON INGREDIENTS

DESCRIPTION
These products are hydraulic setting dense castables.

COMPOSITION

COMPONENT	%	EINECS Number	SYMBOL	R PHRASES
Alumino-silicate	70-90	N.A.	N.A.	N.A.
Cement	< 20	266-045-5 or 234-931-0	N.A.	N.A.
Alumina	< 12	215-691-6	N.A.	N.A.
Clay	< 7	310-127-6	N.A.	N.A.
Fumed silica	< 5	273-761-1	N.A.	N.A.
Commissioning additives	< 0.5	N.A.	N.A.	N.A.

None of the components are radioactive under the terms of European Directive Euratom 96/29

3. HAZARDS IDENTIFICATION

ACUTE EFFECTS
Mild mechanical irritation to skin, eyes and upper respiratory system may result from exposure.
These effects are usually temporary.
When mixed with water, an increase in pH will occur. Alkaline mix may be irritating to skin and could cause damage to eyes.
Pre-existing skin and respiratory conditions including dermatitis, asthma or chronic lung disease might be aggravated by exposure.

CHRONIC RESPIRATORY HEALTH EFFECTS
These products may contain minimal amounts of crystalline silica. Prolonged/repeated inhalation of respirable crystalline silica dust may cause delayed lung injury (silicosis).
IARC (International Agency for Research on Cancer) states that there is "sufficient evidence in humans for the carcinogenicity of inhaled crystalline silica in the form of quartz or cristobalite from occupational sources to classify crystalline silica as carcinogenic to humans (Group 1)" (Monograph V 68). In making the overall evaluation the Working Group noted however that carcinogenicity in humans was not detected in all industrial circumstances studied.

4. FIRST-AID MEASURES

SKIN:
In case of skin irritation rinse affected areas with water and wash gently. Do not rub or scratch exposed skin.

EYES:
In case of eye contact flush abundantly with water; have eye bath available. Do not rub eyes.

NOSE AND THROAT:
If these become irritated move to a dust free area, drink water and blow nose.

If symptoms persist, seek medical advice.

5. FIRE-FIGHTING MEASURES

Non combustible products.
Packaging and surrounding materials may be combustible.
Use extinguishing agent suitable for surrounding combustible materials.

6. ACCIDENTAL RELEASE MEASURES

PERSONAL PROTECTION
Provide the workers with appropriate protective equipment until the situation is restored to normal (see section 8). Prevent further dust dispersion for example by damping the materials.

METHODS FOR CLEANING UP
Use a vacuum cleaner fitted with a high efficiency filter. If brushing is used, ensure that the area is wetted down first. Do not use compressed air for clean up.

ENVIRONMENTAL PROTECTION
Do not allow being wind blown. Do not flush spillage to drain and prevent from entering natural watercourses. For wastes disposal refer to section 13.

7. HANDLING AND STORAGE

HANDLING/TECHNIQUES TO REDUCE DUST EMISSIONS DURING HANDLING
Handling can be a source of dust emission. The process or processes should be designed to limit the amount of handling. Wherever possible handling should be carried out under ventilation with filtered exhaust. Regular good housekeeping will minimise secondary dust dispersal.

STORAGE
Store in original packaging in a dry area. Avoid damaging the packaging. Material supplied in multi-ply paper sacks or big bags.

SPECIFIC USE:
Please refer to your local Thermal Ceramics' supplier or ECFIA's website.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

HYGIENE STANDARDS AND EXPOSURE LIMITS

Industrial hygiene standards and occupational exposure limits vary between countries and local jurisdictions. Check which exposure levels apply to your facility. If no regulatory dust or other standards apply, a qualified industrial hygienist can assist with a specific workplace evaluation including recommendations for respiratory protection. Examples of exposure limits for respirable dust (in January 2002) are given below:

COUNTRY	EXPOSURE LIMIT*				SOURCE
	Respirable Dust	Crystalline silica	Quartz	Cristobalite	
Germany	6 mg/m^3		0.15 mg/m^3	0.15 mg/m^3	TRGS 900,
France	5 mg/m^3		0.10 mg/m^3	0.05 mg/m^3	Décret 97-331 du 10 avril 1997
U.K.	4 mg/m^3	0.30 mg/m^3			HSE - EH40

** Gravimetric concentrations of respirable dust – 8-hour time weighted average.*

ENGINEERING CONTROLS

Review your applications in order to identify potential sources of dust exposure. If necessary, conduct personal air monitoring. Use technical and/or organisational means to comply with regulations.

PERSONAL PROTECTIVE EQUIPMENT

Skin protection:

Use of gloves and work clothes is recommended.
Soiled clothes should be cleaned before being taken off (e.g. use vacuum cleaning, not compressed air).

Eye protection:

As necessary wear goggles or safety glasses with side shields.

Respiratory protection:

For dust concentrations below the exposure limit value, RPE is not required but FFP2 respirators may be used on a voluntary basis.
For short-term operations where excursions are less than ten times the limit value use FFP2 respirators.
In case of higher concentrations or where the concentration is not known, please seek advice from your company and/or local Thermal Ceramics' supplier.

INFORMATION AND TRAINING OF WORKERS

Workers should be trained on good working practices and informed on applicable local regulations.

ENVIRONMENTAL EXPOSURE CONTROLS

Refer to local, national or European applicable environmental permitted standards for air, water and soil. *For waste, refer to Section 13.*

9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE	Mix of white to dark brown aggregates and fine powders		
MELTING POINT	> 1250° C	**pH** (when is added with water)	8-12
SOLUBILITY	< 1 %	**DENSITY**	1.65-2.50 t/m^3

10. STABILITY AND REACTIVITY

CONDITIONS OR MATERIALS TO AVOID
Careful heat up of the product is essential to avoid rapid loss of the chemical combined water during heat up (see section 16).

DECOMPOSITION PRODUCTS
Continuous use of these products at temperature above 900°C may lead to the formation of several crystalline phases. For further information please refer to sections 3 and 11.

11. TOXICOLOGICAL INFORMATION

Available toxicological information is as follows:

ACUTE TOXICITY
Lethal dose 50 % (LD50) / lethal concentration 50% (LC50): N.A.

CHRONIC TOXICITY
As manufactured, these products may contain a minimal amount of crystalline silica.

Experimental study:
Animals exposed to very high concentrations of crystalline silica, artificially or by inhalation, have reported fibrosis and tumours (IARC Monographs 42 and 68).
Inhalation and intratracheal installation of crystalline silica in rats caused lung cancer. However, studies in other species such as mice and hamsters caused no lung cancer. Crystalline silica also caused fibrosis in rats and hamsters in several inhalation and intratracheal installation studies.

Epidemiology:
Prolonged/repeated inhalation of respirable crystalline silica dust may cause delayed lung injury (silicosis).
In evaluating crystalline silica as a cancer risk, the International Agency for Research on Cancer (IARC) reviewed several studies from different industries and concluded that crystalline silica from occupational sources inhaled in the form of quartz or cristobalite is carcinogenic to humans (Group 1) [IARC Monograph vol.68; June 1997].
However, in reaching its conclusion, IARC stated that the carcinogenicity in humans could not be found in all industries reviewed and that carcinogenicity might be dependent on inherent characteristics of crystalline silica or on external factors affecting biological activity (e.g., cigarette smoking) or distribution of its polymorphs.

12. ECOLOGICAL INFORMATION

These products are inert materials, which remain stable over the time.
No adverse effects of this material on the environment are anticipated.

13. DISPOSAL CONSIDERATIONS

Waste from these materials may be generally disposed of at a landfill, which has been licensed for this purpose. Please refer to the European list (Decision N° 2000/532/CE as modified) to identify your appropriate waste number, and insure national and/or regional regulation are complied with.

Taking into account any possible contamination during use, expert guidance should be sought.

Unless wetted, such a waste is normally dusty and so should be properly disposed of in sealed plastic bags or containers. At some authorised disposal sites, dusty waste may be treated differently in order to ensure they are dealt with promptly to avoid them being wind blown. Check for national and/or regional regulations, which may apply.

14. TRANSPORT INFORMATION

Not classified as dangerous goods under relevant international transport regulations (ADR, RID, IATA, IMDG).
Ensure that dust is not wind blown during transportation.

15. REGULATORY INFORMATION

PROTECTION OF WORKERS
Shall be in accordance with several European Directives as amended and their implementations by the Member States:

a) Council Directive 89/391/EEC dated 12 June 1989 “on the introduction of measures to encourage improvements in the safety and health of workers at work” (OJEC (Official Journal of the European Community) L 183 of 29 June 1989, p.1).
b) Council Directive 98/24/EC dated 7 April 1998 “on the protection of workers from the risks related to chemical agents at work” (OJEC L 131 of 5 May 1998, p.11).

OTHER POSSIBLE REGULATIONS
Member states are in charge of implementing European directives into their own national regulation within a period of time normally given in the directive. Member states may impose more stringent requirements.
Please **always** refer to any national regulation.

16. OTHER INFORMATION

Continuous use of these products at temperatures above 900°C may, as with many other refractories, lead to the formation of cristobalite (a type of crystalline silica).
Please refer to sections 3, 11 and to national regulation on crystalline silica.

Crystalline silica may be present in concentration overpassing 1% due to fluctuation of raw materials composition.

USEFUL REFERENCES

Non exhaustive list of some regulations:

- **Germany**

Gefahrstoffverordnung; Arbeitsmedizinische Vorsorge.
Berufsgenossenschaftliche Grundsätze: G 1.1 Gesundsheitsgefährlicher mineralischer Staub, Teil 1: Silikogener Staub.

- **France**

Décret n° 97-331, du 10 avril 1997 relatif à la protection de certains travailleurs exposés à l'inhalation de poussières siliceuses sur leurs lieux de travail.
Arrêté 10 avril 1997 relatif au contrôle de l'exposition des travailleurs exposés aux poussières de silice cristalline.

- **United Kingdom**

COSHH Regulation.
HSE EH 44: Dust: general principles of protection.
HSE EH 59: Crystalline silica guidance note.
MDHS 14/3: Health and Safety Executive (2000): “General methods for the sampling and gravimetric analysis of respirable and total inhalable dust”. Methods for the Determination of Hazardous Substances No. 14/3. HMSO, London.
MDHS 51/2: Health and Safety Executive (1988): “Quartz in respirable airborne dusts”. Laboratory method using X-ray diffraction (direct method). Methods for the Determination of Hazardous Substances No. 51/2, London.
MDHS 76: Health and Safety Executive (1994): “Cristobalite in respirable airborne dusts”. Laboratory method using X-ray diffraction (direct method). Methods for the Determination of Hazardous Substances No. 76, London.
MS (A) 15 - Silica dust and you.
HS (G) 72 - Control of respirable silica dust in heavy clay and refractory processes.

RECOMMENDED HEATING PROCEDURE

Cure for 24 hours, air dry for 24 hours minimum and raise to 110-130°C and hold for 6 hours (<300mm lining) or 24 hours (300-500mm lining) or until steam ceases. Raise to 550/600°C at 25°C per hour and hold for 6-8 hours. Raise to working temperature at 50°C per hour (<300 mm lining) or 25°C (300-500 mm lining). For linings thicker than 500 mm or installations greater than 30 tons, contact Thermal Ceramics. This information is only a guide. Please refer, for each product, to the defined commissioning schedules provided by Thermal Ceramics.

PRECAUTIONARY MEASURES TO BE TAKEN AFTER SERVICE AND UPON REMOVAL

Because high concentrations of dust may be generated when after-service products are mechanically disturbed during operations such as wrecking, it is recommended that:

a) control measures are taken to reduce dust emissions and
b) all personnel directly involved wear an adapted respirator to minimise exposure and comply with local regulatory limits.

WEBSITE:

For more information connect to:
The Thermal Ceramics' website: (http://www.thermalceramics.com/)

NOTICE:

The information presented herein is based on data considered to be accurate as of the date of preparation of this Material Safety Data Sheet. However safe as provided by law, no warranty or representation, express or implied, is made as to the accuracy or completeness of the foregoing data and safety information, nor is any authorisation given or implied to practice any patented invention without a licence. In addition, no responsibility can be assumed by the vendor for any damage or injury resulting from abnormal use, from any failure to adhere to recommended practices, or from any hazards inherent in the nature of the product (however, this shall not act to restrict the vendor's potential liability for negligence or under statute).