

Enfil™ Engineered Fibres

DESCRIPTION

Enfil™ Engineered Fibres are a family of fibres that have been developed to meet specific engineering needs. At present, 4 chemical compositions are available: Enfil SF, Enfil SH, Enfil HP and Enfil Z.

They are made by melting pure oxides in an electric furnace and pouring the molten material into a fiberizing chamber. Depending upon the fibre diameter required, the molten material is fiberised either by dropping it onto a rotating wheel, or atomising it with compressed air and drawing the droplets into fibres in an accelerating air stream.

SELECTION OF FIBRE TYPE

This is dependent upon the application since certain applications require fibre without unfiberised particles whereas in other applications unfiberised materials does not cause a problem. For advice on the selection of the correct fibre grade contact your local Morgan Thermal Ceramics distributor.

CLASSIFICATION TEMPERATURE

Enfil SF: 1100°C
Enfil SH: 1250°C
Enfil HP: 1260°C
Enfil Z: 1425°C

IDENTIFICATION

To uniquely identify each Enfil Fibre it is given a seven figure code (for example 85-BAC-08). The first two numbers give the Fibre Index (fibre cleanliness) and the last two the beaker value (fibre length). The three letters in the middle is a manufacturing code to guarantee uniformity of production.

TYPICAL APPLICATIONS

Applications, where the fibres are used to modify specific properties of a material: such as wear, strength or fatigue are as follows:

- Friction Materials
- Mastics
- Paints
- Cements
- Plastics
- Metals

AVAILABLE FORMS

De-shotted Fibres

The amount of unfiberised material (shot) present in a fibre can be controlled using state of the art technology. This is necessary where excess shot can be detrimental to the process or to the finished product. The level of cleanliness of a fibre is expressed as the Fibre Index, the higher the Fibre Index the cleaner the fibre, with 99 being the cleanest. There are three levels of Fibre Index available as standard, although it can also be tailored to suit individual applications. The standard grades are:
Fibre Index = 55 min.
Fibre Index = 85 min.
Fibre Index = 98 min.

Chopped Fibres

Thermal Ceramics has installed special equipment to enable the average fibre length to be tailored to suit individual customer requirements. Mean length can be controlled from 150 micron up to 25 mm. For the majority of applications, the standard grades of chopped fibres are sufficient (length is measured using a settling test called beaker value. The higher the number in this test, the longer the fibre). The standard grades are:

- 20 Coarse
Approx. "Beaker value" 200 ml*
 - 15 Medium
Approx. "Beaker value" 150 ml*
 - 08 Fine
Approx. "Beaker value" 80 ml*
- *Typical Figures TCL QC test

BENEFITS

- Excellent Resistance to chemical attack
- Unaffected by oil, water or steam
- Very low thermal expansion
- Excellent shock resistance
- Good corrosion resistance
- Low moisture absorption
- Low electrical conductivity
- Good tensile strength
- Constant coefficient of friction

Enfil™ Engineered Fibres

Main properties		Enfil SF	Enfil SH	Enfil HP	Enfil Z
Classification temperature	°C	1 100	1 250	1 260	
Properties Measured at Ambient Conditions (23°C/50% RH)					
Colour	White to light grey				
Beaker value	ml	50-650	50-650	50-650	50-650
Fibre index		55-98	55-98	55-98	55-98
Fibre diameter (mean)	Microns	3.0	3.0	2.0-3.5	3.0-3.5
Hardness	MOH	6	6	6	6
Tensile strength	MPa	-	-	1 400	1 400
High Temperature Performance*					
Specific heat	kJ/kg.K	1.0	1.0	1.07	1.07
Loss of ignition after 24 hours at 800 °C	%	0	0	0	0
Melting point	°C	1 500	1 500	> 1 650	> 1 650
Chemical Composition					
Al ₂ O ₃	%	Tr	Tr	47	36
SiO ₂	%	65.0	<69	53.0	50
ZrO ₂	%	-	<10	-	14
Fe ₂ O ₃	%	Tr	Tr	<0.1	<0.06

Availability and Packaging

Enfil Engineered Fibres are packed in polythene bales on pallets which are shrink wrapped with recyclable plastic. Standard packaging is in 20 kg bales with 360 kg per pallet. Special packaging can be arranged for special orders.

The values given herein are typical values obtained in accordance with accepted test methods and are subject to normal manufacturing variations. They are supplied as a technical service and are subject to change without notice. Therefore, the data contained herein should not be used for specification purposes. Check with your Thermal Ceramics office to obtain current information.

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