



4MG.028 Basalt Fibre

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Basalt fibre has properties that are far superior to fibreglass. For example, basalt fabric subjected to the flame of a Bunsen burner will redden and could withstand for several hours compared to a few seconds for a fibreglass fabric of the same density. Basalt products resist flame, continuous temperatures of up to 700 °C, chemicals (acids and bases), are very good acoustic and electrical insulators and have good mechanical properties.

Because basalt remains functional down to -260 °C, it can be used for high temperature as well as cryogenic applications. Basalt fibre products are particularly popular in the automotive sector, as building materials in the form of non-woven needled felts, or as insulation materials for exhaust pipes, for example in the form of sheaths, strips or fabrics. In addition, basalt fibre is the most environmentally friendly high temperature resistant material when it comes to both manufacturing and recycling it.

Manufacturing:

Basalt fibre is made by the pultrusion of volcanic rocks, melted in blast furnaces. The fibre is drawn, as opposed to extrusion. This process makes it possible to create a continuous fibre, reinforced with a polymer.

Applications

- Cryogenics
- Manufacture of composites and reinforcements
- Insulation of cables and pipes
- Ballistics
- Thermal and dielectric insulation

Final Advanced Materials Sàrl
4 avenue de Strasbourg
68350 Didenheim – France
Tel : +33 (0) 3 67 78 78 78

Final Advanced Materials GmbH
Basler Strasse 115
79115 Freiburg – Deutschland
Tel: + 49 (0) 761 47 87 336

www.final-materials.com

info@final-materials.com



General Characteristics

Thermal properties:

Basalt fibre products withstand temperatures from -260 °C to 700 °C (Z-Rock® tapes by Newtex can withstand up to 1,095 °C) and have a thermal conductivity close to that of fibreglass (0.031 W.m⁻¹.K⁻¹) and silica (0.038 W.m⁻¹.K⁻¹). The vitrification temperature of the basalt is 1,050 °C for a melting temperature of 1,450 °C.

Mechanical and physical properties:

Basalt fibre has better physical and mechanical properties than fibreglass or silica fibre.

Environmental resistance:

Basalt fibres are highly resistant to UV rays, chemicals (acids and bases), weather constraints (especially moisture), are rot-proof and remain sterile.

Benefits

- Good tensile strength (superior to fibreglass)
- Non-toxic and inert, it produces no gas or smoke
- Resistant to UV, chemicals and remains sterile
- Excellent dielectric insulator
- Excellent impact resistance
- Excellent thermal and acoustic insulation
- Withstands temperatures from -260 °C to 700 °C
- Cheaper than carbon, Kevlar® and fiberglass

Comparative Table

Property	Unit	Basalt	E-Glass	Silicat
Density	g/cm ³	2.75	2.6	2.10
Coefficient of linear expansion	x10 ⁻⁶ /K	5.5	5.3	0.5
Operating Temp.	°C	600	550	1,000
Peak Temperature	°C	700 – 1,095*	700	1,200
Thermal conductivity at 20 °C	W.m ⁻¹ .K ⁻¹	0.035	0.8-1.0	0.04

*Most product made of basalt fibres can withstand up to 700 °C; however, basalt tapes can withstand up to 1,095 °C due to their fabrication.



Product range

Needled Felts

Made from basalt fibres of 8 to 16 μm , the felts are classified M0 according to European standard EN 13-501-1. They do not burn, do not melt, produce neither smoke nor toxic gases, and are environmentally friendly and recyclable. They are mainly used as electrical and thermal insulators.

Property	Unit	Basalt Needed Felts		
Item N°		014-0100	014-0110	014-0120
Area density	g/m^2	480	780	1,100
Density	kg/m^3	120	130	137.5
Thickness	mm	4	6	8
Length	m	400	400	400
Operating temperature	$^{\circ}\text{C}$	600	600	600
Peak temperature	$^{\circ}\text{C}$	700	700	700

Sleeves

Manufactured from 8-16 μm basalt fibres, the sleeves are mainly used in the automotive industry or for electro-mechanical applications. They have thermal and mechanical properties superior to those of fibreglass and can be used in the manufacture of composites. They are also used in the insulation of electrical cables and as thermal protection for pipes and exhausts.

Property	Unit	Basalt Fibre Sleeves
Item N°		207-5501
Diameter	mm	1.5 to 22
Lining Thickness	mm	0.45
Length	m	100-200
Continuous Temp.	$^{\circ}\text{C}$	600
Peak Temp.	$^{\circ}\text{C}$	700

Z-Rock® Tapes

Newtex's Z-Rock® basalt fibre tapes are mainly used in the automotive industry for the insulation of exhaust systems. They withstand a continuous temperature of 815 $^{\circ}\text{C}$ and a peak temperature of 1,095 $^{\circ}\text{C}$.

Manufactured in the US, these strips have comparable properties to ZetexPlus® products, except they are more flexible and have a better rendering, meaning they avoid snagging during installation. They are mainly used in the automotive, aerospace and transportation sectors for cable, pipe and exhaust system insulation.



Property	Unit	Z-Rock® B-1050 Tapes			
Item N°		1200262	1200263	1200264	1200265
Area Density	g/m ²	915	915	915	915
Thickness	mm	1.1	1.1	1.1	1.1
Width	mm	25.4	25.4	51	51
Length	m	30.48	15.24	30.48	15.24
Continuous Temperature	°C	815	815	815	815
Peak Temperature.	°C	1,095	1,095	1,095	1,095

Fabrics

Made from continuous basalt fibres, the fabrics are used for protective purposes such as fire barriers. They remain flexible and easy to handle, even if they lose their mechanical properties and become rigid under excessive tension. Heavier than carbon, they are still less expensive. Much used in the automotive industry, these fabrics are mainly used for the insulation of exhaust pipes and to protect motor elements.

We offer coated versions, used for fire barriers. Uncoated versions can also be used as moulds in the manufacture of composites.

Property	Unit	Basalt Fibre Fabrics					
Item N°		014-0010	014-0020	014-0030	014-0040	014-0050	014-0060
Area density	g/m ²	115	220	240	350	630	940
Width	mm	1,270	1,270	1,270	1,270	1,270	1,270
Roll Length	m	100	100	100	100	100	50
Operating Temp.	°C	600	600	600	600	600	600
Peak Temp.	°C	700	700	700	700	700	700
Weave		Plain	Plain	Twill	Satin	Twill	Twill
Note			Twill available		Other width available		

Property	Unit	Basalt Fibre Fabrics with Coating		
Item N°		014-0100	014-0110	014-0120
Area density	g/m ²	245	365	645
Width	mm	1,500	1,500	1,540
Roll Length	m	50	50	500
Continuous Temp.	°C	600	600	600
Peak Temp.	°C	700	700	700
Weave		Plain	Satin	Twill
Note		Twill available		

Other products are available with a minimum order of 1,000 m.

Physical variables included in this documentation are provided by way of indication only and do not, under any circumstances, constitute a contractual undertaking. Please contact our technical service if you require any additional information.