

Basalt Fibers

Basalt fiber is similar to carbon fiber and fiberglass, but basalt has better mechanical properties than fiberglass and is lower in cost than carbon fiber. It is used as a fireproof textile in the aerospace and automotive industries and can also be used as a composite to produce a wide range of products

Features

1. High strength and high modulus fiber
2. Excellent shock resistance - good for ballistic applications
3. Low cost alternative and can replace carbon fiber in some applications including filament winding
4. High temperature resistance and good light resistance
5. Good fatigue and corrosion resistance properties
6. No need for special processing equipment
7. Easy to handle and process
8. Environment friendly. Basalt-reinforced composites can meet OEM's disposal requirements because complete disposal by incineration is possible. Huge contamination issues are often caused by incinerating glass fiber composites.
9. Can be recycled
10. Exhibit no health and safety risks
11. Compatible with many resins - unsaturated polyester, vinyl ester, epoxy, phenolic, etc.
12. Better chemical resistance than e-glass

Chemical Components	Percentage by Mass
SiO ₂	51.6 - 59.3
Al ₂ O ₃	14.6 - 18.3
CaO	5.9 - 9.4
MgO	3.0 - 5.3
Na ₂ O + K ₂ O	3.6 - 5.2
TiO ₂	0.8 - 2.25
Fe ₂ O ₃ + FeO	9.0 - 14.0
Others	0.09 - 0.13

Products

- Basalt Cloth and Unidirectional
- Roving and Yarn
- Chopped Strands
- Chopped Strand Mat, Needled Felts and Geogrids

Applications

- Filament winding of pipes, tanks and cylinders
- Reinforced plastics
- Chopped fibers for SMC, BMC and DMC
- Woven fabrics, mesh, and geogrids

Comparative technical index between basalt fibers & the other fibers

Properties	Continuous Basalt	E-Glass	S-Glass	Carbon	Aramid
Density (g/cm ³)	2.63 - 2.8	2.54 - 2.57	2.54	1.78	1.45
Tensile Strength (MPa)	4100 - 4840	3100 - 3800	4020 - 4650	3500 - 6000	2900 - 3400

Basalt Fiber Technical Index

Properties Index	Value
Thero-Physical Property	
Work temperature °C	-269 - 700°C
Bind temperature °C	1050°C
Thermal-conductivity coefficient (w/m° K)	0.03 - 0.038
Tensile strength after heat treatment (%)	

Elastic Modulus (GPa)	93.1 - 110	72.5 - 75.5	83 - 86	230 - 600	70 - 140
Elongation at break	3.1	4.7	5.3	1.5 - 2.0	2.8 - 3.6
Maximum Service Temperature°C	650	380	300	500	250

20°C	100
200°C	95
400°C	82
Chemical stability (loss weight after 3 hours boiled(%))	
2N HCl	2.2
2N NaOH	6.0
H ₂ O	0.2

Continuous Basalt Fiber Roving

Continuous Basalt roving is made of a bundle of parallel strands without twisting.

- Tensile strength of the roving 6-13μ is ≥ 0.6N/Tex
- Elastic modulus is ≥ 91GPa
- Elongation at break ≥ 3.1%
- High temperature and light resistance.

It is an inorganic fiber which can be used as a ballistics and protection material. It has an explosive prevention function which when used with ballistic materials is useful when there is an explosive blast.

Also there is no bounce, no spalling, no second execution fracture function, which is useful when used as a base material of a ceramic facing armouring system.



Above - basalt roving

Fields of application

- Filament-winding of various pipes, tanks and cylinders
- Various woven rovings, mesh fabrics and geotextiles
- Repair (healing) and strengthening of infrastructures
- Chopped fibers for heat resistant SMC, BMC and DMC
- Reinforcement of plastics

Examples of application

- Continuous basalt roving of 1200tex and 2400tex are preferred for making mesh fabrics, geogrids and base cloth for high-temperature filtration needed felts, which can be reliably used for temperatures from -260°C to 650°C; which has the stable handling property.
- Continuous basalt roving of 4800tex and 2400tex is preferred for filament-winding of pipes and tanks resistant to high-temperature, super low-temperature, chemical corrosion and high-pressure.
- Hybrid use with carbon fiber to filament-wind LPG and natural gas tanks
- Heat shields for tank gun tubes, gun turrets etc.

Roving Specifications

Product No	Diameter (µm)	Tex	Linear	Sizing	Sizing Content (%)	Moisture (%)
CBF7-400	7	400	± 20	Silane	≤ 0.04	< 0.01
CBF9-800	9	800	± 40	Silane	≤ 0.04	< 0.01
CBF13-800	13	800	± 40	Silane	≤ 0.04	< 0.01
CBF13-1200	13	1200	± 60	Silane	≤ 0.04	< 0.01

Continuous Basalt Fiber Textile Yarn

Continuous basalt textile yarn is made of multiple basalt strands by primary twisting (usually the filament diameter is under 9µm).

Continuous basalt textile yarns can be divided into weaving yarns and industrial yarns, and weaving yarns are usually made into cylindrical or milk bottle shape packages.


Fields of application

- Fabrics and tapes resistant to acids, alkalis and high temperature
- Base cloth of needled felt
- Base cloth for electric insulation board
- Electric insulation yarns and threads
- Advanced heat-resistant and chemical resistant fabrics
- Advanced unsulation materials
- Unidirectional fabrics with high temperature resistance, high elastic modulus, and high strength
- After the special surface treatment, the yarn for weaving fabrics with radiation resistance and heat resistance at 650-980°C

Product No.	Diameter (microns)	Linear Density (tex)	Tolerance (tex)	Twist / m	Sizing Type
CBF7-22 × 2-S68	7	45	± 2%	68± 5	texfile
CBF6-12 × 4-S120	6	48	± 2%	120± 5	texfile
CBF9-33 × 2-S68	9	66	± 2%	68± 5	texfile

■ Basalt Cloth & Unidirectional

Basalt Fiber Cloth



Above - basalt plain weave cloth

Basalt Fiber Unidirectional Cloth



Above - basalt unidirectional weave cloth

Basalt fiber fabrics are woven from continuous basalt yarn (diameter under 9μ) which can be custom-made to your needs. This fabric can handle temperatures of -260°C to 650°C . Different coatings can improve their properties including better flexibility, wearability, wave transparencies, water resistance, radiation resistance, thermo-shock resistance, chemical resistance and excellent temperature resistance (both high and low).

Continuous basalt fiber unidirectional fabric is a high performance engineering material with fibers of the fabric produced by GBF which are coated with sizes comparable with polyester, epoxy, phenolic and nylon resins, which improve the reinforcement effect of the basalt fiber unidirectional fabric.

Basalt fiber belongs to the silicate home and has the same thermal expansion coefficient, which makes it the best alternative to carbon fiber applied in the bridge, construction reinforcement and repair. Its BDRP & CFRP has outstanding comprehensive property and cost effectiveness.

Fields of Application - Fabrics

Base Cloth for:

- CCL
- Needled felt
- Fireproof fabrics
- Radiation-proof materials
- Chemical resistant materials
- Infrastructure repair and strengthening

They are particularly suitable for uses as awnings for anti-toxicity, anticorrosion, radiation - proof fire-proof purposes and for their equipment and facilities to be highly shielded.

Fields of Application - Unidirectional

- The reinforcement & repair of the construction and bridge.
- Radar cover, engine parts and radar lines.
- The body of the armored vehicle, structural parts, wheels and sleeves.
- Water ski, surfboard and surfing board.

Basalt fabric technical index

Product No.	Diameter (μm)	Area Weight (g/m ²)	Structure	Thickness (mm)	Width (mm)	Strength force (N / (25mm × 200mm))	
						Weft	Warp
BW7-200	7	200 ± 20	Plain	0.18	1000	≥ 1870	≥ 1600
BW9-200	9	200 ± 20	Twill	0.18	1000	≥ 1870	≥ 1600
BW13-330	13	330 ± 30	Satin	0.24	1000	≥ 1870	≥ 1600
BW13-650	13	650 ± 30	Plain	0.50	1000	≥ 1870	≥ 1600
BW13-900	13	900 ± 45	Plain	0.80	1000	≥ 1870	≥ 1600

Basalt fiber UD fabric technical index

Product No.	Area Weight (g/m ²)	Diameter (μm)	Tensile Strength (MPa)	Modulus (GPa)	Elongation (%)	Thickness (mm)
BUF7-200	200	7	2100	91	2.6	0.111
BUF7-300	300	7	2100	91	2.6	0.170
BUF13-280	280	13	2100	91	2.6	0.111
BUF13-380	380	13	2100	91	2.6	0.170

 **Continuous Basalt Fiber Chopped Strands**

Produced by cutting continuous basalt fiber and coated in silane sizing. Chopped strands are the best way to reinforce thermoplastic resin and reinforce concrete. Basalt chopped strands contains a special silicate, which gives it an excellent chemical resistance and an alkali tolerance. Basalt fiber chopped strands are the perfect material to take the place of PP & PAN to reinforce cement and concrete to improve the stability, low-temperature crack and fatigue resistance.



Above: basalt chopped strands

Fields of Application

- Reinforcement for thermoplastic resins, SMC, BMC and DMC
- Reinforcement for automobile, train and ship hulls
- Reinforcement for cement and concrete, used for dams in hydropower plants, cooling towers in thermal power plants, and steam pipelines in nuclear power plants
- Heat resistant needled felts, automobile mufflers

Basalt fiber chopped strands technical index

Product No.	Diameter (μm)	Length (mm)	Sizing type	Moisture content (%)
CBF13-6	13	6	Silane	0.1
CBF15-12	15	12	Hydrophilicity	6
CBF18-25	18	25	Lipophilicity	6
CBF22-70	22	70	Lipophilicity	6

■ Other Basalt Products

Other Basalt Products

Basalt Fiber Rebars

New - for concrete reinforcement.

Basalt Fiber Sheets

Made by pultrusion, 50 to 100mm width, thickness 1.2 to 1.4mm, length 10 to 50m.

Basalt Fiber Fire-Proof Panel

 in 3800 and 7600g/m². Excellent performance under 1000°C.

Basalt Fiber Needled Felt

in 6mm to 25mm thickness. Ideal for high temperature resistance and filtration.

Basalt Fiber Surface Mat

 in 30, 40, 50 and 100g/m².

Basalt Fiber Reinforced Plastics (BFRP)

in rod form in 3, 6, 10 and 25mm diameters.

Basalt Chopped Strand Mat

 in 150, 300 and 450g/m².

Basalt Bulked Yarn

in 260, 400, 800 and 1200tex sizes.

Basalt Fiber Braid Sleeve

in 20, 50, 100 and 127mm diameters.

Basalt Fiber Sealing Ropes

2 to 50mm thickness.

Basalt Fiber Multi-Directional Fabric

 in 0/90 degrees and 0/90 degrees +/- 45 degrees, 2 and 4 layers, 300, 450 and 600g/m² weights.

Basalt 3-D Woven

 in 1mm to 5mm thickness, 600 to 6000g/m² weights.

Basalt Fiber 3-D Sandwich Fabric

 in 2mm to 30mm thickness, 810 to 2820g/m² weights.

Basalt Fiber Fireproof Fabric

Fireproof fabric, used in high temperature applications and for fire-proofing.

Basalt Geogrid

 200 and 320g/m².