

Basalt Volcanic Composites

What are Basalt Fibers?

They are **Pultruded** fibers made from volcanic rock melted in high heat furnaces. Pultrusion is a manufacturing process for producing continuous lengths of FRP (fiber reinforced polymer) structural shapes. Raw materials include a liquid resin mixture (containing resin, fillers and specialized additives) and reinforcing fibers. The process involves pulling these raw materials (rather than pushing as is the case in extrusion) through a heated forming die using a continuous pulling device.

Basalt FRP is a Composite Rebar (BCR)

Basalt rebar is made as a continuous spiral formed by winding fibers into a highly durable compound. These fibers form a strong composite offering a wide range of applications for construction. Basalt rebars are resistant to corrosion and aggressive chemical liquids and are extremely light (4 times lighter than steel), producing considerably longer life expectancy in construction.

The Main Uses of Basalt Products are

Textile applications for fire protection :

Basalt does not melt nor shrink in flame and when not mechanically stressed, keeps its geometric integrity.

Basalt is exceptionally suited to block fire. Basalt products resist open flame. A fabric made of Basalt, with a Bunsen burner pointed at it (1100 - 1200°C) becomes red hot as a metal fabric would. This can last for hours. For reference, an E-glass fabric of the same surface density gets pierced by the same flame in a matter of seconds.

High Temperature Insulation (HTI) :

Basalt fibers, at present, exhibit a resistance to temperature superior to E glass fibers in the range -260° to +560°C. A perfect high temperature insulation material chopped Basalt fibers and non-woven Basalt needled mats find their place in the construction of auto and motorcycle exhaust mufflers and ovens. They are also used as the heat insulation of gas turbines, including nuclear plant locations, as basalt is known to resist degradation caused by radiation, unlike synthesized materials such as glasses. Basalt is also functional to very low temperatures (down to - 260°C). Other useful applications are insulation of liquid nitrogen tanks and pipes, and cryogenics.

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Top Ten Reasons to use Basalt Fibers

1. Stronger than fiberglass in tensile strength
2. Non-respirable, inert and safe to work with
3. 18% better elastic modulus
4. UV immune
5. Non-conductive
6. Will not harbor bacterial or microbial growth
7. Better impact resistance, does not shatter like carbon fibers
8. Ten times better electrical insulator than fiberglass
9. Very resistant to aggressive liquids, acids and alkalies
10. Has great sound attenuation properties

Oh yes! There are more reasons...cont. pg 4 >>

The Main Uses of Basalt Products *continued*

As reinforcement in composite materials :

The great mechanical properties of Basalt (strength & rigidity), easy wetting of the filament surface and recyclability make them particularly suitable for composites applications.

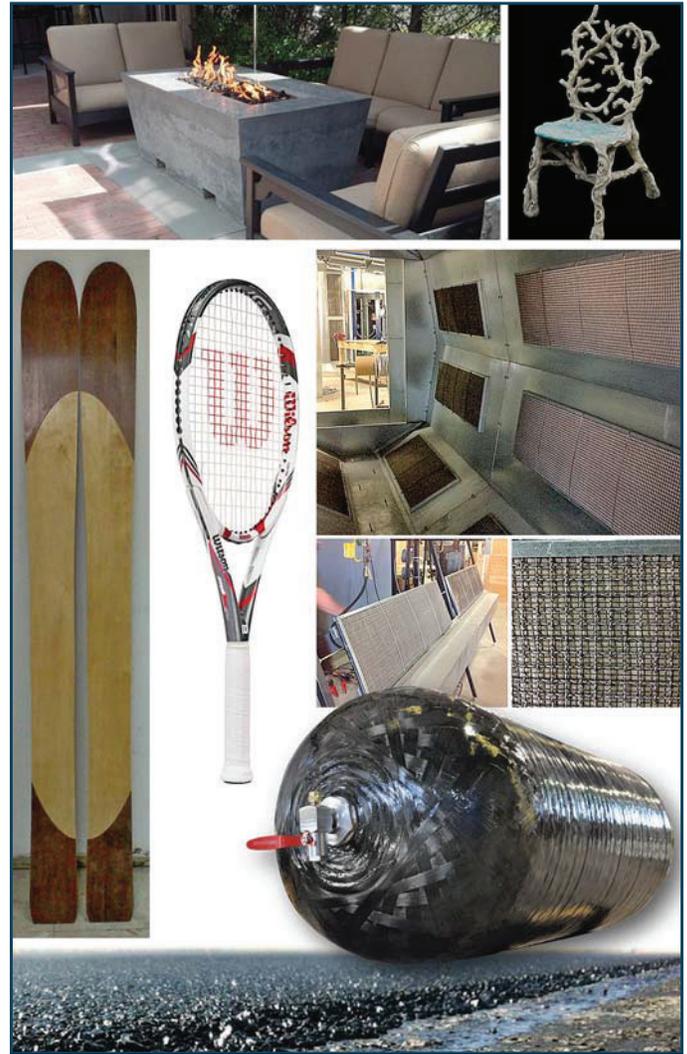
UV resistance, better acid resistance, better alkaline resistance and very low water absorption of Basalt fibers ensure excellent weatherability for outdoor Basalt fiber reinforced composites.

Higher thermal insulation and equally high electrical resistivity of Basalt fibers also allow making reinforced composites with good dielectric properties and better heat diffusion. Basalt is ten times better electrical insulator than fiberglass.

Basalt fiber reinforced injection molded parts have a better surface finish. This allows direct utility as an automotive interior decorative component.

Basalt continuous fibers have a melting temperature higher than that of the flame, which allows separation of the composite constitutions by fire at the recycling stage (e.g. in automotive industry). There is no disposal issue at the recycling stage after separation, being a natural product.

*For more Basalt Product Uses
go to www.basalt.guru*



Antimicrobial and Insulation Coatings from SBS

Smarter Building Systems is proud to offer various coatings with unique antimicrobial, insulation, corrosion and moisture protection. Here are two:

SBS-Thirty Plus is an epoxy ceramic based coating that is impervious to heat and water providing for extreme insulation value. At 10 mils (0.25mm) thickness the K value is 0.02 WmK. The SBS-ThirtyPlus is not just reflective "it is true insulation". It can get dirty, lose its reflectivity, and will still insulate because of the type of components that have been incorporated into the product.

SBS-ThirtyPlus provides for up to 68% sound reduction based on independent tests, and because it is "wetter than water", can even be applied under salt water. Applied directly over rust it offers unmatched protection against heat and cold extremes, mildew, alkali, UV, oils and grease. These are just a few of its amazing properties. SBS makes no specific R-value claims.

VIRACOAT Nano Ceramic Antimicrobial Coating addresses the urgency created by viruses and bacteria becoming more resistant to antibiotics and cleaning products. VIRACOAT Nano Ceramic antimicrobial coatings provide protections to the increasing threat.

When compared to other coatings, VIRACOAT specifically becomes part of the substrate. It creates a significant covalent bond whereby the sharing of the electrons between the coating and the substrate are connected. The procedure of linking the different materials creates a strong bond which is more tenacious compared to other covering materials and paints. VIRACOAT meets the standards of EPA and FDA approval due to its ability to protect surfaces from harmful microbes.

*To learn more about these coatings and others offered by Smarter Building Systems, contact Nick today –
Phone (401) 481 8422 or Email nick@basalt.email*

Selection of Basalt Products



BASALT PRODUCTS: Weaves, Weights, Dimensions, etc.

UNI-DIRECTIONAL FABRIC

Plain: 200 grams/m²; 300 grams/m²; 13 micron roving

Black: 200 grams/m²; Black 13 micron roving

MULTI-DIRECTIONAL FABRIC

Bi-Axial: 450 grams/m²; fiber angles +45°, - 45°; 13 micron roving.

Bi-Axial: 450 grams/m²; fiber angles 0°, 90°; 13 micron roving.

Bi-Axial: 650 grams/m²; fiber angles 0°, 90°; 13 micron roving.

Tri-Axial: 980 grams/m²; fiber angles 0°, +45°, - 45°; 13 micron roving.

Quad-Axial: 680 grams/m²; fiber angles 0°, 90°, +45°, -45°; 13 micron roving.

PLAIN WEAVE FABRIC

15x15: 108 grams/m²; 9 micron fibers. 65 grams/m²; 13 micron fibers.

180 grams/m²; 13 micron fibers. 200 grams/m²; 9 micron fibers.

7.2x7.2 : 220 grams/m²; 19 micron fibers.

5x5: 325 grams/m². 11 micron fibers.

5x3.5: 400 grams/m²; 11 micron fibers.

5x3: 650 grams/m²; 13 micron fibers.

TWILL WEAVE FABRIC

8x7: 200 grams/m². 9 micron fibers.

5x5: 350 grams/m². 13 micron fibers.

6x6: 900 grams/m². 13 micron fibers.

SATIN WEAVE FABRIC: 220 grams/m². 300 grams/m². 9 micron fibers.

COATED FABRIC: Aluminum Coated one side – 200 grams/m².

220 grams/m². 650 grams/m².

SURFACE VEIL (WET-LAID NON-WOVENS): 30 grams/m². 40 grams/m².

WOVEN TAPE: 25mm. 50mm. 75mm. 100mm. 135mm.

Heavy weight 25mm x 2mm thick.

TWILL WOVEN TAPE: 50mm. Plain or Aluminum coated one side

BI-AXIAL BRAIDED SLEEVING: Diameter 5 cm. 7 cm. 10 cm. 15 cm.

CHOPPED STRAND MAT: 200 grams/m². 350 grams/m².

CHOPPED FIBER: Length 3mm. 6mm. 9mm. 12mm. 18mm. 24mm.

30mm. 36mm. 50mm. 63mm. 90mm.

CONTINUOUS ROVING: 9 micron/136 tex. 13 micron/800 tex.

13 micron/1200 tex. 16 micron/2400 tex. 16 micron/4800 tex.

3-PLY ROPE: 3 plies of 6400 tex 16 micron roving, total tex 19,200

GUN ROVING: 15 micron/2400 tex

REBAR: Diameter 4mm. 6mm. 8mm. 10mm. 12mm. 25mm.

MESH: Plain or Resin Coated. Window size 5mm x 5mm. 10mm x 10mm.

25mm x 25mm. 50mm x 50mm.

NEEDLE FELT MAT: Thickness 6mm. 8mm. 12mm. 25mm.

RIGID BOARD: Thickness 6mm. 12mm. 18mm.

More Reasons to use Basalt Fibers!

- Much higher heat and extreme cold – cryogenics are made with basalt and so are fire curtains
- Much better pricing than S-glass, Kevlar and carbon fiber
- A beautiful golden color
- Supple – many weights and weaves available. Plain, satin, coated.
- Many times lighter than steel and yet 2-3 times stronger than steel
- Will not corrode
- Does not interfere with RF signals
- Ballistic impact properties
- Made from rock the concrete basalt products expand and contract at the same rate unlike others
- Great for making tool molds as basalt takes heat and does not conduct and does not move
- Basalt sleeves with no seams come in many sizes – used as spark plug covers for example
- Basalt boards with a fire retardant resin are a perfect backer with fire and insulation properties
- Basalt twine rope acts like a flexible rebar – a ten pound box of over a thousand feet!

Industries Currently Testing Basalt

- Cryogenics • Prosthetics
 Filament Winding • Construction
 State DOTs • Thermoplastics
 Molds/Tools • Asphalt • Ballistics
 Bridge Wraps • Manholes

What Application do you have that needs Better Performance at a Better Price?

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Comparative Technical Characteristics of Filament Made from E-Glass, Basalt and Silica

Properties	SI Units	Basalt Filaments	Fiberglass	Silica Filament
Thermal				
Maximum application temperature	(°C)	650°	600°	1100°
Sustained operating temperature	(°C)	600°	480°	1000°
Minimum operating temperature	(°C)	-260°	-60°	-170°
Thermal conductivity	(W/m K)	0.031-0.038	0.034-0.04	0.035-0.04
Melting temperature	(°C)	1450°	1120°	1550°
Vitrification conductivity	(°C)	1050°	600°	1300°-1670°
Glow loss	(%)	1.91	0.32	1.75
Thermal expansion coefficient	(ppm/ °C)	8.0°	5.4°	0.05°
Physical/Mechanical				
Density	(g/cm3)	2.75	2.6	2.15
Filament diameter	(microns)	9-23	9-13	9-15
Tensile strength	(M Pa)	4840	3450	4750
Compression	(psi)	550,000	440,000	510,000
Elastic modulus	(G Pa)	89	77	66
Linear expansion coefficient	(x10 /K)	5.5	5	0.5
Elongation at break	(%)	3.15	4.7	1.2
Absorption of humidity (65%RAH)	(%)	<0.1	<0.1	<0.1
Stability at tension (20 C°)	(%)	100	100	100
Stability at tension (200 C°)	(%)	95	92	94
Stability at tension (400 C°)	(%)	82	52	80
Acoustics				
Sound absorption coefficient	(%)	0.9-0.99	0.8-0.93	0.85-0.95
Electrical				
Specific volume resistance	(ohm.m)	1*10×12	1*10×11	1*10×11
Loss angle tangent frequency	(1 MHz)	0.005	0.0047	0.0049
Relative dielectric permeability	(1 MHz)	2.2	2.3	2.3
Chemical Resistance				
% weight loss after 3 hrs boiling in:				
H2O	(%)	0.2	0.7	0.05
2n NaOH (Sodium Hydroxide)	(%)	5.0	6.0	5.0
2n HCl (Hydrochloric acid)	(%)	2.2	38.9	15.7
Price Comparison		\$	\$	\$\$\$\$

Basalt Sample Packs Order Online

A wide assortment of our products are available in **Sample Packages** to allow you a chance to physically feel and see them before deciding on future purchases. Order online at www.smarter-building-systems.com/basalt-sample-packs/.

We can also put together **Custom Sample Packs**.
 Phone (401) 481 8422 or email Nick today
 for more Information and Technical Data.

Basalt Woven Fabric can be supplied with the following coating on one or both sides

COATING TYPE	PURPOSE
Thermoblocker	Intumescent barrier
Flock	Skin contact barrier
Silicon	Splatter protection
Acrylic	Splatter protection
PUR or EVA	Fatigue resistance