



Basalt chopped strand

Technical Data Sheet

30th November 2015

1. Fiber

Basalt fiber	Basalt continuous filament
Specific weight (without sizing), g/cm ³	2.67

2. Fiber cutting length

Fiber cutting length, mm	3.175	6.35	12.7	15.9	25.4	31.8	50.8	63.5	90.0
Fiber cutting length, Zoll	1/8	1/4	1/2	5/8	1	1.25	2	2.5	3.5
Tolerance	±20%	±10%	±10%	±10%	±10%	±10%	±10%	±10%	±10%

3. Types of sizing's

No.	Compatibility	Sizing content, % weight	Moisture content, % weight	Filament diameter, µm	Fiber cutting length, mm	Type
02	Phenolic, polypropylene* and polyamide* resins	0.4-0.8	<0.1	13.0, 15.0, 17.0 19.0	3.175 – 90.0 6.35 – 90.0	Silane
05	Water emulsion	0.06-0.1	6-9	13.0 – 19.0	6.35 – 90.0	Silane
11	Polyester, vinyl ester, epoxy resins	0.4-0.8	<0.1	13.0 – 19.0	25.4, 50.8, 90.0	Silane
12	Epoxy, phenolic resins	0.4-0.8	<0.1	13.0 – 19.0	6.35 – 90.0	Silane
13	Concrete	0.4-0.8	<0.1	13.0 – 19.0	6.35 – 50.8	Silane
14	Epoxy, phenolic resins	0.4-0.8	<0.1	17.0, 19.0	25.4, 50.8, 90.0	Silane
15	Polyester, vinyl ester, epoxy resins	0.7-1.0	<0.1	13, 15, 17, 19	12.7 – 90.0	Silane
16	Polypropylene	0.6	<0.1	13.0 15.0, 17.0, 19.0	6.35 – 90.0 3.175 – 90.0	Silane
41	Epoxy, vinyl ester, polyester resins	0.4-0.8	<0.1	13.0 – 19.0	25.4 – 90.0	Silane
42	Polyurethane and epoxy resins, concrete, cement	0.4-0.8	<0.1	13. – 19.0	6.35 – 90.0	Silane
42A	Polycarbonate (PC), Polyvinyl chloride (PVC)	0.4-0.8	<0.1	13. – 19.0	3.175 – 90.0	Silane

*Use of adhesion agent recommended.

4. Applications

LCA for Basalt fiber and SIC-test results on request

Sizing No.	Products, applications, advantages, brief description
02	Friction materials with PF, plastic reinforcement (PP, PA), BMC (with EP), brake pads, brake shoes, car parts, PP pipes, achieving higher strength.
05	Manufacture of mats of nonwovens in the wet process. Higher tensile strength and stiffness; Better retention of tensile strength and stiffness at elevated temperatures (80-15 ° C); Much better recyclability and environmental compatibility; Concrete modification; reduce cracking and achieve high compressive strength of concrete and mortar.
11, 15, 41	BMC (VE, UP and short basalt fibers, manufacture of car components, etc. achieving high strength.
12	Friction materials with PF, plastic reinforcement (PP, PA), BMC (with EP), brake pads, brake shoes, car parts, PP pipes, achieving higher strength.
13	Concrete modification; Improve the mechanical properties (strength, toughness) and reduction of cracks forming in concrete or mortar.
14	Manufacture of mats.
16	Plastic reinforcement with PP
42	Pultrusion with polyurethane and epoxy resins
42A	Plastic reinforcement

5. Packing information

Packing	Package item, kg	On pallet 120x80 cm, piece
PP-bag or PE-bag	20	25, 30
Big-Bag with pallet carton	600	1
Plastic container	1000	1

6. Storage

Basalt fibers are placed in the closed package or container, Wet basalt fibers (sizing No. 05) are placed in the hermetically sealed package or container

7. Properties of basalt fiber

a. Mechanical properties

Monofilament diameter, µm	10	13	17
Tensile test according ASTM D-3822 (Dry fiber), tensile strength, mN/tex	≥ 700	≥ 650	≥ 600
Tensile test according ASTM D-2343 (in epoxy impregnated strand), tensile strength, MPa	3200	3100	2900
Tensile test according ASTM D-2343 (in epoxy impregnated strand), E-Modulus, GPa	90-94	88-92	86-90
Tensile test according ASTM D-2101 (Basalt monofilament), tensile strength, MPa	4300	4200	4000
Tensile test according ASTM D-2101 (Basalt monofilament), tensile strength, GPa	95	93	92

b. Tensile strength change by the heating of the basalt fiber

Temperature	Tensile strength change
+20°C	100%

+200°C	95%
+400°C	80%

c. Thermal operating range of basalt fiber

Thermal load duration	Temperature range
Permanent	From -260 up to +400°C
(1) Stage 1: amorphous fiber with sizing on the fiber surface	Up to +200°C
(2) Stage 2: burning of sizing (10-15 minutes), amorphous fiber	From +200 up to +350°C
(3) Stage 3: amorphous fiber without sizing on the fiber surface	From +350 up to +400°C
Short time (few minutes)	From +400 up to +850°C
(4) Stage 4: transition of FeO into Fe ₂ O ₃ and beginning of crystallization of Fe ₂ O ₃ . The fiber is becoming less and less amorphous and more and more brittle.	From +400 up to +850°C
Short time (few seconds)	From +850 up to +1250°C
(5) Stage 5: all the Fe ₂ O ₃ is in crystal form, the material is extremely brittle, its mechanical properties are extremely poor but without stress and vibration it continues working as thermo insulation pretty good	From +850 up to +1050°C
(6) Stage 6: sintering temperature	From +1050 up to +1250°C

d. Thermal properties of basalt

Melting range	1460-1500 °C
Crystallization temperature	1250 °C
Sintering temperature	1050 °C

e. Chemical stability

Test	CemFIL	Basalt	E-Glas
Weightlessness in 3-hour boiling in water	-	0.2%	-
Weightlessness in 3-hour boiling in saturated cement solution (pH 12,9)	0,15%	0.35%	4.5%
Weightlessness in 3-hour boiling in 2N solution HCl (hydrochloric acid)	-	2-7%	38.5%
Weightlessness in 3-hour boiling in 2N solution NaOH (sodium hydroxide)	-	6%	-
Weightlessness in 30 minutes and in 180 minutes in H ₂ SO ₄ (sulfuric acid)	-	2% und 6%	14% und 22%

Disclaimer of Liability

This data is offered solely as a guide in the selection of reinforcement. The information contained in this publication is based on actual laboratory data and field test experience. We believe this information to be reliable, but do not guarantee its applicability to the user's process or assume any liability arising out of its use or performance. The user, by accepting the products described herein, agrees to be responsible for thoroughly testing any application to determine its suitability before committing to production. It is important for the user to determine the properties of its own commercial compounds when using this or any other reinforcement.