

TZI BASALT IN YOUR LIFE

TZI PRODUCT CATALOG

Why are we:

TZI is an innovative enterprise in the application of basalt fiber materials for composites.

Our products help create technological systems that are very strong, lightweight, energy efficient compared to traditional materials such as steel or aluminum and also compare favorably with other composite fibers such as carbon or fiberglass.

Our company received a full range of services for the supply of equipment and the turnkey launch of the production of continuous basalt fiber, thin, super-thin fiber and composites based on them.

Our services include preliminary studies, engineering, equipment manufacturing, installation, technical and administrative support, as well as training of customer personnel.

Main technical parameters of raw materials for the production of basalt fibers

Basalt rocks are one-component raw materials enriched, melted and homogenized as a result of ancient volcanic activity. The peculiarity of basalts is that the main energy costs for their preparation for the production of fibers are made by nature in the bowels of the Earth. Basalts have a high natural chemical and thermal resistance, so basalt fibers are of high quality and characteristics.

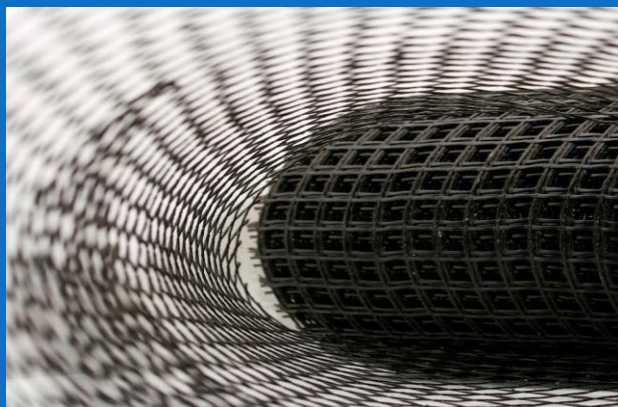
Composition of basalt rocks	Quantity, %
SiO ₂	54.5-55.5
MgO ₂	4.0-4.6
CaO ₂	7.5-8.5
Fe ₂ O ₃ +FeO	10.0-11.5
Al ₂ O ₃	16.5-18.0
TiO ₂	0.9-1.25
ΣR ₂ O	4-5
Li ₂ O	0.1-0.3



Lightweight and high-strength materials have become indispensable for high-tech applications in the aviation, automotive, marine, and entertainment industries. Fiber composites show their advantages especially in composite lightweight structures. The rapidly growing demand for mobility around the world is creating a magnetic effect, attracting materials with new properties and opening up new applications.

This trend is reflected in a significant increase in the production of products using lightweight materials. Lightweight and composite materials remain unrivaled due to the optimal ratio of weight and strength.

Lightweight materials are the materials of the future.



Roving

Basalt fiber is a high modulus product that is superior to glass fiber and provides cost effective additional length and efficiency to wind turbine blades.

It is used for reinforcing thermoplastics and thermosetting polymers, as well as in construction as a reinforcing material in the production of special concretes and polymer matrix composites operating in aggressive environments.

Reinforcement using basalt fibers can be pure basalt composite or can be specifically designed to increase strength, stiffness and impact performance where needed most.

Basalt fiber products are a replacement for conventional glass or carbon fiber. Basalt is easy to process, seamlessly integrated into most manufacturing processes configured for fiberglass materials.

Basalt fiber pairs well with carbon fiber, performs well in extreme temperatures



Roving

Filament diameter	9-22 μm
Line Density	600, 1200, 2400, 4800 tex
Mechanical properties	Value
Tenacity	≥ 600 mH/tex
Tensile Modulus	80 GPa
Elongation at Break	2,0-4,5 %
Moisture contents	$\leq 2\%$
General Property	Value
Fiber Type	Continuous Basalt Filaments
Density by DIN 65569	2.63 g/cm ³
Moisture Content for all sizing	< 0.1%
Loss on Ignition	Values are Sizing Dependent. Typical $\geq 0.4\%$
Sizing Available	Key Sizing Ingredients
Polypropylene, Epoxy	Silane
Vinyl Ester, Polyester	Silane
Polyurethane, Polyamides, PET/PBT	Silane
Packing Stastics	Value
Outer diameter of the spool	230/300 mm
Inner diameter of the spool	150/220 mm
Bobbin height	250/250 mm
Bobbin weight, approx.	9/15 kg
Reel unwinding type	indoor/outdoor



Chopped Fiber

Chopped Fiber is used as an additive in various kinds and types of concrete, asphalt concrete, building mixtures and mortars as a reinforcing additive. The addition of fiber eliminates the formation of shrinkage cracks, reduces the time of production of concrete products.

Advantages: increase in the fire resistance of concrete structures, slow down the delamination of concrete and concrete mortars, increase in the strength of the concrete structure in bending and axial tension, increase in impact strength, does not require additional changes in the technology of preparing building mixtures, durability, corrosion resistance, reduction of time for production cycles, reduction cracking.

Usage: in construction when organizing self-leveling floors, molding concrete products in molds, filler in dry mixes, as well as PP PE and other materials.

Chopped basalt Fiber are replacement of the applied glass and polypropylene.



Chopped Fiber

Chopped Length	(3; 6; 13; 15; 18; 25; 27; 50) ±1,5 mm	
Filament Diameter	(9; 13; 17) ±1,5 µm	
Moisture	≤2,0 %	
Loss of Ignition	≥ 0,3 %	
Uncut Fiber Content	≤5,0 %	
Elastic modulus	9100 – 11000 kg/mm ²	
Coefficient of thermal conductivity	0,031 - 0,038 Wt/mK	
Chemical stability, weight loss, after 3 hours of boiling H ₂ O / 2N NaOH / 2N HCl	2 / 6,0 / 2,2 %	
Application temperature for chopped fiber products	up - 250 to + 850 °C	
Sizing Available	Key Sizing Ingredient	Condition
Concrete and Mortar Application	Silane	Wet or Dry
Polypropylene, Epoxy	Silane	Dry Only
Vinyl Ester, Polyester	Silane	Dry Only
Polyurethane, Polyamides, PET	Silane	Dry Only
Packing Stastics	Values	
Individual sealed package	20 kg	
Handling Details	Do not open until time of use	
Packages per Europallet	Up to 1000 kg per Europallet	



Basalt rebar is a promising composite material, having a wide range of applications in the construction industry.

Specifications allow you to apply for:

1. Structures and infrastructure structures made of reinforced concrete:

- pavement and barriers; - maritime and port facilities; - swimming pools and water parks; - decks and railings of bridges; - objects of melioration, water disposal, control of the level of rivers and reservoirs;

2. Concrete products with prestressed and non-stressed reinforcement:

- lighting poles, power line poles, insulating traverses of power lines; road concrete infrastructure elements; railway sleepers; - outer layers of hybrid (steel-composite) reinforcement cages of concrete structures; - meshes and gratings for shotcrete; shaped products for collectors, pipeline and pipeline utility systems;

3. Pile and micropiling systems for strengthening slopes and banks;

4. Reinforced concrete tanks and storage facilities for treatment facilities, biogas generating and chemical industries, infrastructure elements of chemical enterprises.

5. Heat-saving multilayer walls and enclosing structures, fasteners for thermal insulation of the armored belt.

6. Reinforced concrete ships and floating structures (pontoons, landing stages, ship repair docks, floats of drilling platforms, floating habitable structures, etc.)

7. Reinforcement of wooden glued load-bearing structures.

Basalt rebar



Durable, lightweight and corrosion-resistant, composite rebar has already gained popularity among professional builders. However, many craftsmen who are accustomed to working with classic metal fittings often doubt that basalt fibers can fully replace metal.

Such concerns arise due to the lack of information about the capabilities and characteristics of composite materials. To eliminate this gap, we will provide a comparative description of metal and composite reinforcement according to the most necessary parameters in construction.

Property	Steel	Basalt rebar	Note
Tensile Strength	390 MPa	1000 MPa	The higher this indicator, the greater the load the structure can withstand.
Elastic modulus	High modulus of elasticity	Low modulus of elasticity - vibration is damped quickly and without consequences	The higher the index, the greater the bending load withstands the reinforcement in finished products.
Relative extension	25%	2,2%	An indicator that affects the appearance of cracks in concrete. The lower it is, the less the material stretches, and the less cracks occur during operation.
Density	7 t/m ³	1,9 t/m ³	The higher the density, the greater the weight of the product
Length	6 и 12 m	Any length, possibility of delivery in bays	The longer the length, the less splices on large spans. Delivery in coils makes it possible to almost completely eliminate waste, because you can form rods (rods) of arbitrary length
Thermal conductivity	+	-	A negative value indicates the absence of cold bridges and the preservation of heat
Electrical conductivity	+	-	Being a dielectric, fiberglass fittings do not interfere with cellular communications
Cost	There is an upward trend in metal prices	Cost savings due to smaller diameter and weight both during construction and transportation	

Basalt rebar



Basalt rebar

Equal-strength replacement of steel and basalt reinforcement
Equal strength of diameter is understood as such an outer diameter of basalt reinforcement, in which the strength corresponds to the strength of steel reinforcement of a given diameter.

Steel rebar of class A-III (A400C)			Basalt rebar		
Diameter, mm	Weight l.m. in kg	Quantity m in t	Diameter, mm	Weight l.m. in kg	Quantity m in t
6	0,222	4 505	4	0,03	33 333
8	0,395	2 532	6	0,05	20 000
12	0,888	1 126	8	0,09	11 111
14	1,211	826	10	0,125	8 000
16	1,580	633	12	0,195	5 128

Packing Stastics: Ø 4 – Ø 10 in bight up to 100 l.m.
Ø12 – Ø 24 measured cuts on 11,7 l.m.



Serves for reliable reinforcement of asphalt concrete, distribution of mechanical loads and prevention of deformations. Perceives stresses arising from numerous short-term impacts of wheel load from vehicles.

Prevents excessive horizontal deformation of the elongation of the lower part of the layer of the road structure when it is bent.

Perceives the stresses arising in sections from long-term loads caused by the temperature inhomogeneity of the subgrade and pavement, where there is a redistribution into horizontal stretching.

Prevents excessive horizontal deformation of the layers of the road structure.

Basalt mesh for asphalt concrete

PHYSICAL AND MECHANICAL CHARACTERISTICS				
Conventional designation of basalt mesh		50(25)- 400	100(40)- 400	150(40)- 400
Weight per unit area (g/sq.m.)		250	500	500
Breaking load not less than (kN/m)	Lengthwise	50	100	100
	Across	50	100	100
Elongation at break no more (%)	Lengthwise	3	3	3
	Across	3	3	3
Permissible loss of tensile strength after 25 freeze-thaw cycles, not more than (%)		10	10	10
Mass fraction of substances removed during calcination, not less than (%)		18	18	18
Dimensions of the side of the cells in the lumen (+2%) (mm)		25	40	40
Maximum roll width (+2%) (cm)		540	540	540



Used to stabilize the base by the method of soil reinforcement.

It is used for reinforcing soil structures in the construction of roads, railways, hydraulic structures, pipelines, landfills for waste disposal, strengthening soil bases of foundations, as well as anti-erosion protection of slopes of embankments and pits using vegetable soil and sowing grasses.

It is used to strengthen retaining structures and steep slopes with the help of soil reinforcement.

It is used to eliminate failures of the soil base and strengthen the pile foundations.

Basalt mesh for soil

PHYSICAL AND MECHANICAL CHARACTERISTICS

PHYSICAL AND MECHANICAL CHARACTERISTICS			
Conventional designation of basalt mesh		100 (50)	200 (40)
Weight per unit area (g/sq.m.)		1000	750
Breaking load not less than (kN/m)	Lengthwise	200	150
	Across	200	150
Elongation at break no more (%)	Lengthwise	3	3
	Across	3	3
Permissible loss of tensile strength after 25 freeze-thaw cycles, not more than (%)		10	10
Mass fraction of substances removed during calcination, not less than (%)		18	18
Dimensions of the side of the cells in the lumen (+2%) (mm)		50	40
Maximum roll width (+2%) (cm)		540	540



DESIGNATION OF BASALT MESH		ASPHALT CONCRETE			SOIL		
		50(40x40)	100(40x40)	150(40x40)	50(40x40)	100(40x40)	150(40x40)
Weight per unit area (g/sq.m.)		280	550	850	300	570	870
Breaking load not less than (kN/m)	Lengthwise	50	100	150	50	100	150
	Across						
Elongation at break no more (%)	Lengthwise	4	4	4	4	4	4
	Across						
Permissible loss of tensile strength after 25 freeze-thaw cycles, not more than (%)		10	10	10	10	10	10
Mass fraction of substances removed during calcination, not less than (%)		18	18	18	18	18	18
Dimensions of the side of the cells in the lumen (+2%) (mm)		40	40	40	40	40	40
Maximum roll width (+2%) (cm)		540	540	540	540	540	540

Reinforcement of horizontal joints in wall masonry, masonry made of large-format ceramic stone and cellular blocks with a voidage of more than 30%.

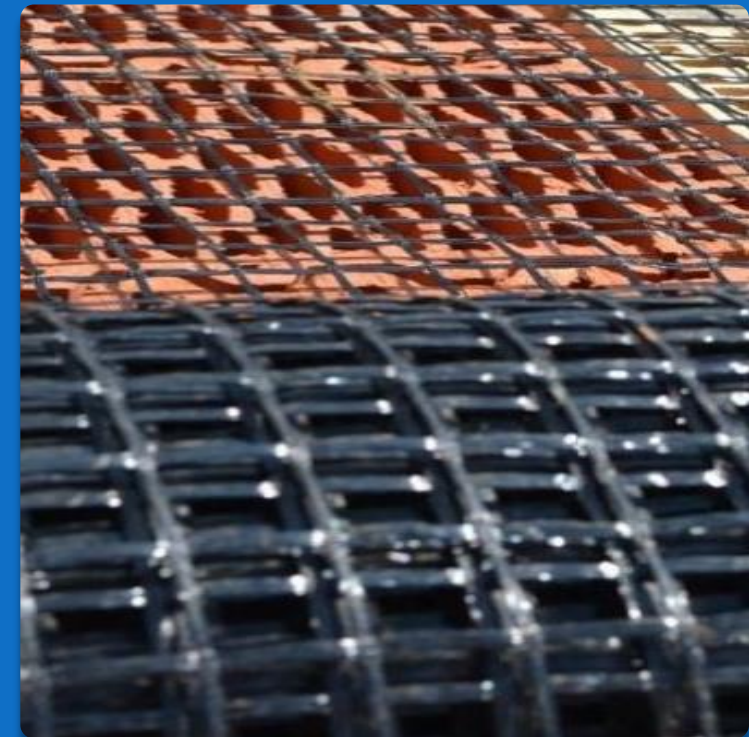
Connection of layers of brick wall cladding with the main layer of large-format stones or cellular blocks.

Basalt masonry mesh has a high coefficient of adhesion with mortar, which means that masonry reinforced with this material will work perfectly and distribute tensile and bending loads. Due to the low thermal conductivity of the basalt mesh, the loss of heat through the walls is reduced, the problem of "cold bridges", which is relevant for the metal mesh, is solved. Basalt masonry mesh is not subject to corrosion, has a high resistance to aggressive environments, unlike metal, this will positively affect the durability of the structure.

Basalt building mesh is easy to use, it is light and quickly cut. The basalt masonry mesh is supplied in rolls, it is easy to deliver it to the construction site and lift it to a height, thanks to these qualities, the construction time is significantly reduced. Basalt masonry mesh and mortar have the same coefficient of thermal expansion, which increases the number of freeze / thaw cycles that the structure will withstand. Basalt mesh is an environmentally friendly material, it does not harm the environment and human health

CHARACTERISTICS	
Cell size	25x8 mm
Breaking loads	50x50 kN/m
Elongation	4 %
Surface density	250 g/m ²
Coefficient of thermal conductivity	0.46 Wt/(m·°C)
Roll Width	0.37 / 0.63 / 1 / 2 / 4 m

Basalt mesh for masonry reinforcement



Reinforcement of horizontal seams of masonry walls erected in seismically hazardous regions in order to increase the bearing capacity of masonry.

Connection of layers of brick wall cladding with the main layer of large-format stones or cellular blocks.

Reinforcement of floor screeds in various climatic conditions.

Reinforcement of the plaster layer of the wall.

Reinforcing garden paths.

Basalt mesh for general construction works (universal)

CHARACTERISTICS	
Cell size	25x25 mm
Breaking loads	50x50 kN/m
Elongation	4 %
Surface density	250 g/m ²
Coefficient of thermal conductivity	0.46 Wt/(m-°C)
Roll Width	0.37 / 0.63 / 1 / 2 / 4 m



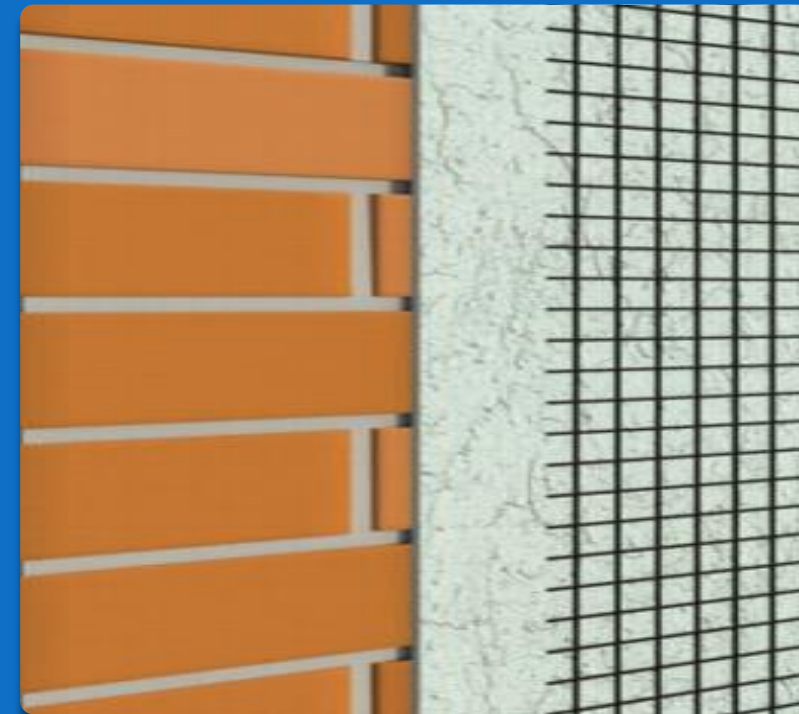
Reinforcement of plaster layers inside and outside the building helps form the internal frame layers and provides excellent retention and protection of the plaster layer.

Vertical reinforcement of walls.

Use to protect building facades and repair damage to exterior finishes or damaged masonry surfaces.

Basalt mesh for reinforcing facade plaster layers

CHARACTERISTICS	
Cell size	7x6 / 25x25 / 50x50 mm
Breaking loads	30x30 kN/m
Elongation	4 %
Surface density	150 g/m ²
Coefficient of thermal conductivity	0.46 Wt/(m-°C)
Roll Width	1 / 2 / 4 m





**Technical
parameters of
building mesh**

DESIGNATION OF BASALT MESH		FACADE		MASONRY		UNIVERSAL	
		30(50x50)	30(25x25)	30(50x50)	30(25x25)	30(50x50)	30(25x25)
Weight per unit area (g/sq.m.)		140	140	140	275	270	270
Breaking load not less than (kN/m)	Lengthwise	30	30	30	50	50	50
	Across						
Elongation at break no more (%)	Lengthwise	4	4	4	4	4	4
	Across						
Permissible loss of tensile strength after 25 freeze-thaw cycles, not more than (%)		10	10	10	10	10	10
Mass fraction of substances removed during calcination, not less than (%)		18	18	18	18	18	18
Dimensions of the side of the cells in the lumen (+2%) (mm)		50x50	25x25	50x50	25x25	50x50	25x25
Maximum roll width (+2%) (cm)		540	540	540	540	540	540

Technical parameters of the road mesh



PP 2005 F

Composite PP 2005 F contains 18% basalt fiber and is intended for the production of polypropylene pipes for hot and cold water supply.

What are the advantages of the FIBER BASALT PLUS pipe over FIBER?

More resistant to pressure (circular strength) at high temperatures up to 50%

Modulus of elasticity +25%

Flexural strength +11%

Temperature resistance up to 90 °C (increased by +20 °C)

Higher throughput up to 20%

At the same time, all other advantages of the FIBER pipe are preserved:

linear expansion is 3 times smaller

no need for stripping before welding



PP 2005 F

Properties	Test method	Units of measurement	Values (deviation)
Polymer base			RPP
Basalt fiber content		%	18
Surface moisture	DIN EN ISO 585	%	0,1
Bulk density	DIN EN ISO 60	kg/m ³	475
Density	DIN EN ISO 1183	g/cm ³	1,06
MFR	DIN EN ISO 1133 (230°C/2,16 kg)	g/10min	0,4
MVR	DIN EN ISO 1133 (230°C/2,16 kg)	cm ³ /10min	0,5
Impact strength(RT)	DIN EN ISO 179-1	kJ/m ²	3,9
Impact strength(-30°C)	DIN EN ISO 179-1	kJ/m ²	2,8
Tensile strength	DIN EN ISO 527-1/2	MPa	29 (1,3)
Elongation tensile strength	DIN EN ISO 527-1/2	%	6,4 (0,9)
Nominal tensile strain at break	DIN EN ISO 527-1/2	%	11,8 (4,8)
Elastic modulus	DIN EN ISO 527-1/2	MPa	2325 (327)



Absorbents

TZI provides a full range of 100% environmentally friendly spill control and response products. 1 gram of product absorbs up to 50 grams of oil compared to traditional polypropylene absorbents which can absorb a maximum of 14 grams with 1 gram of product. Use less to absorb more and save on waste disposal.

Absorption pads:

Available in various sizes and shapes Very high absorption: 1 kg absorbs up to 50 kg of oil
Pillows have high capacity and fast absorbent fill to absorb oils quickly Light net weight allows for easy installation near an oil spill

Granular absorbent:

The product absorbs any liquid within a few seconds. The lightweight absorbent is easy to use without having to carry heavy sandbags or sawdust. After the spill is absorbed, the floor is cleaned. No need to clean it with water Less disposal - waste is kept to a minimum due to extreme absorption capacity compared to clay, sawdust or sand



Logistics services for the delivery of goods from our warehouse in Poland to the customer's warehouse are calculated individually upon request.

In case of deferred payment, the floating price of the goods is applied.

