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TECHNICAL INSULATION



 **TIZOL**[®]

 **TIZOL**[®]

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LARGE PROJECTS USING TIZOL INSULATION

Industrial facilities

- Production buildings AvtoVAZ, Tolyatti (1)
- Beloyarsk NPP, Zarechny
- Yayvinskaya SDPP, Yayva settlement, Perm Krai (Territory)
- Kashirskaya SDPP, Moscow region
- Kursk NPP, Kursk
- Leningrad NPP, Sosnovy Bor, Leningrad region
- North-West TPP, St. Petersburg
- Nizhnevartovsk SDPP, Nizhnevartovsk
- Sochi TPP, Sochi (2)
- Mutnovskaya GeoPP, Kamchatka

Foreign projects

- Tianwan NPP, China (3)
- Bushehr NPP, Iran (4)
- Kudankulam NPP, India (5)
- Ice Arena, Almaty (6)
- Expo 2017, Astana (7)
- Residential district of "Sayaly", Almaty
- "Department of Public Revenue," Aktau
- SEC "Moscow", Almaty (8)

Olympic facilities in Sochi

- Olympic cauldron (9)
- Olympic stadium "Fisht" (10)
- Bobsleigh, luge and skeleton track "Sanki"
- Ski and biathlon complex "Laura"
- Grand Ice Palace (11)
- Ice arena "Shayba" (12)



1



2



3



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9



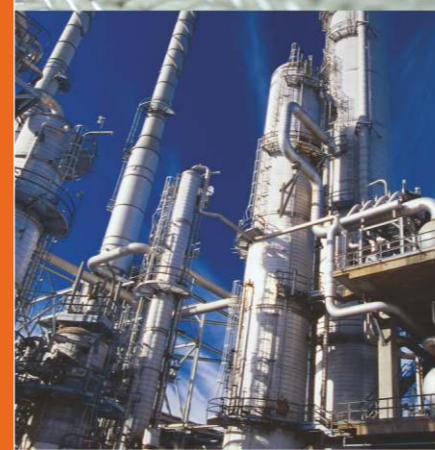
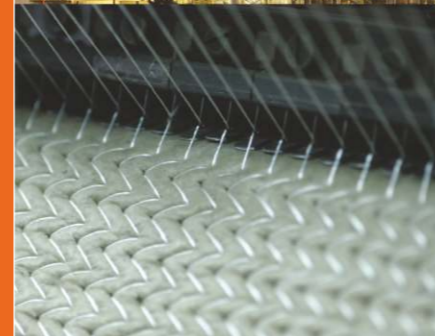
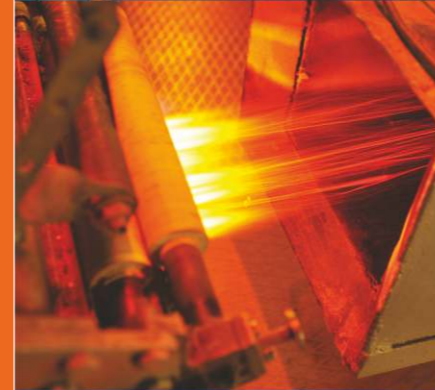
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TIZOL JSC is one of the recognized leaders among Russian manufacturers of non-combustible heat and sound insulating materials and systems of constructive fire protection based on basalt.

For 70 years, our company has accumulated a unique experience for the entire industry, has created a technical and scientific base for training and work of highly qualified specialists. Continuous improvement of technology, modernization of production facilities, its own raw material base, an accredited laboratory guarantee the compliance of manufactured products with international quality standards. The technologies and materials developed at the enterprise are patented and their characteristics are superior to their competitors. For example, our fire protection systems are the most effective in Russia and, to date, are unique even for Europe. This is confirmed by numerous awards of international and domestic exhibitions.

Every year we produce 25 million square meters or 100 thousand tons of non-combustible heat and sound insulation and fire-proof materials.

The developed dealer network ensures timely delivery of our products anywhere in the world. Specialists of the company treat each partner with respect and create comfortable conditions for cooperation.

Brand «TIZOL» is development, stability, integrity and, that is the most important, quality.



*Mikhail Grigoryevich Mansurov
General Director of JSC "TIZOL",
Honored Builder,
Honorary freeman of the town of Nizhnyaya Tura*



BASIC TERMS AND PROPERTIES

TECHNICAL INSULATION

A line of specialized materials for thermal insulation of pipelines, ducts, reservoirs, tanks and other industrial equipment in a wide temperature range.

BASALT FIBER

Artificial inorganic material obtained from natural minerals by melting them and then converting them into fiber. There are two main types of basalt fiber - staple and continuous. One of the most important parameters of staple basalt fiber is the diameter of individual fibers.

Fiber classification according to fiber diameter			
fibers	diameter (mm)	fibers	diameter (mm)
microfine	< 0,6	thickened	15-25
ultrafine	0,6-1,0	thick	25-80
superthin	1-3	rough	80-400
fine	4-15		

Fibre diameter significantly affects the most important properties of its products: thermal conductivity, sound absorption, density.

BASALT SUPER THIN FIBER (BSTV)

A fiber with a diameter of 1-3 microns, produced by melting basalt rock without any impurities. Fibers randomly mixed and bonded to each other by forces of natural cohesion without a binder are called basalt cloth. Basalt cloth made of super thin fiber is considered a high quality cloth. Heat and sound insulating materials are produced from it at the TIZOL enterprise: wired mats (MPB), basalt cardboard (BVTM-K), soft plates (BVTM-PM), basalt fire proof rolled material (MBOR).

DENSITY

Material characteristic, determined by the ratio of the mass of the material to its volume (kg/m³).

COEFFICIENT OF THERMAL CONDUCTIVITY

$\lambda = (W / (m * K))$ The amount of heat that is transmitted through a unit area (m²) of a material layer with a thickness of one meter per unit of time when the temperature changes by one degree. The value of thermal conductivity is influenced by the density of the material, the type, size, location of pores, temperature of the material and its humidity.

INCOMBUSTIBILITY

Ability of the material under the influence of the ignition source (sparks, fire, high temperature) not to ignite and not to burn. All products manufactured by "TIZOL" belong to the group of non-combustible materials and have a fire hazard class KMO.

VIBRATION RESISTANCE

The ability of the product to maintain strength, stability, tightness and performance during and after vibration exposure.

WATERPROOFING

Protection of structures or equipment from penetration of moisture and aqueous solutions of aggressive substances.

SOUNDPROOFING

Reducing the energy of sound waves (noise reduction) emitted by operating equipment. A quantitative measure of sound insulation is expressed in decibels (Rw).

SOUND ABSORPTION

The process of converting the energy of sound waves into other forms of energy during the propagation of sound in a medium or when sound falls on the boundary of two media. The degree of sound absorption is determined by the ratio of reflected sound energy to absorbed (sound absorption index α_w).

CHEMICAL RESISTANCE

The ability of a material to maintain structure when exposed to various chemicals. The thermal insulating materials of TIZOL are not affected by any oil, solvents or moderately acidic media. Water infiltrate from TIZOL materials has a neutral chemical reaction, which means that the material does not cause corrosion on contact surfaces.

BIOLOGICAL SAFETY

Fibres of "TIZOL" materials are not a breeding medium for reproduction of microorganisms and fungi, are not edible for rodents and insects, are safe for humans and animals.

DENSIFYING OF THERMAL INSULATION MATERIAL

Installation characteristic which determines the density of the thermal insulation material after its installation in the design position in the structure. Densifying of materials is characterized by degree of density.

FIELD SEAL FACTOR

A value that is determined by the ratio of the volume of the material or product to its volume in the structure.

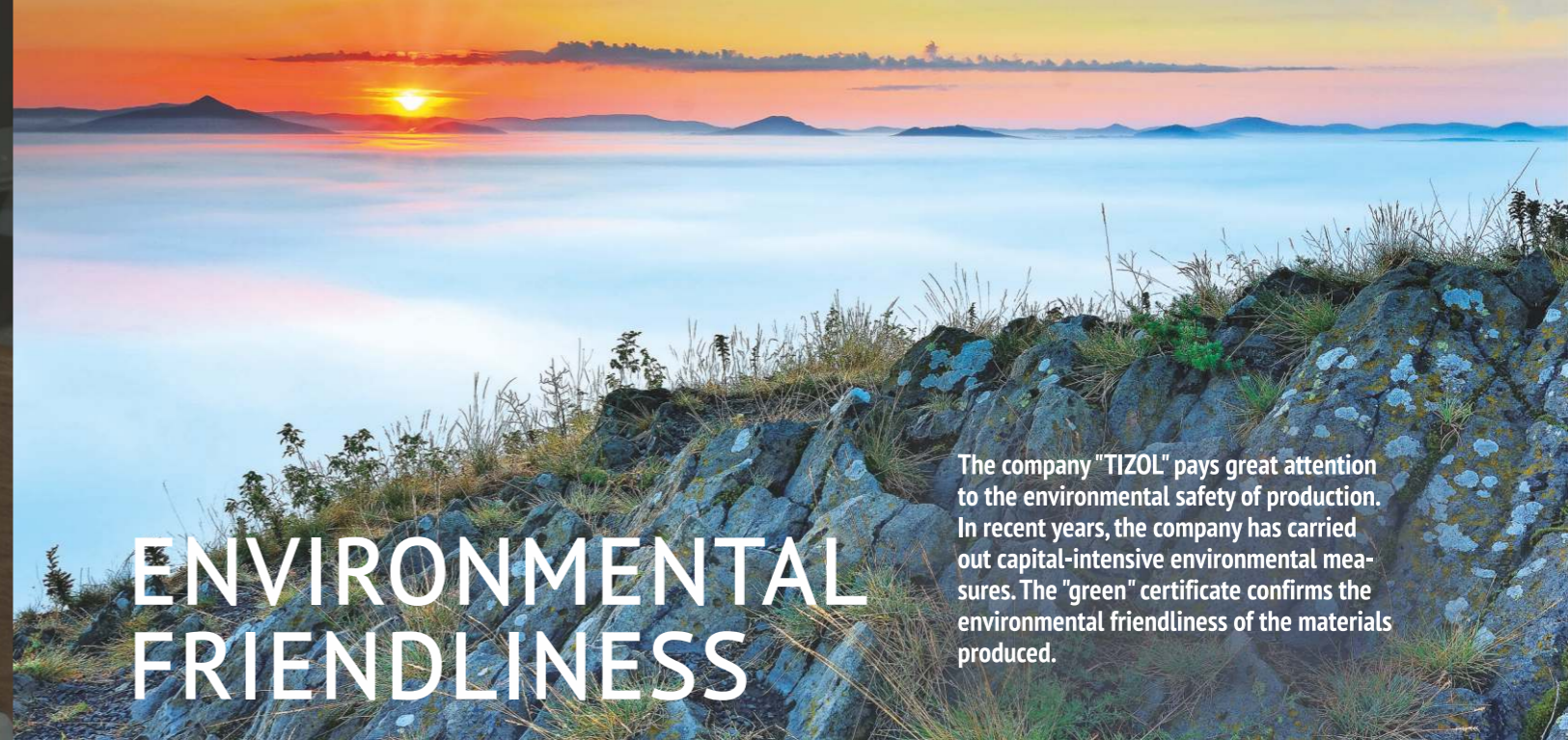
WATER ABSORPTION

The ability of the material to absorb and retain moisture in the pores in direct contact with water. Water absorption of heat-insulating materials is characterized by the amount of water that dry material when placed in water for a certain period of time absorbs (expressed in kg / m²).



Quality management system of JSC "TIZOL", certified according to the international standard ISO 9001: 2015, guarantees high quality products, manufacturability and transparency of all business processes. The presence of our own quarry and an accredited laboratory equipped with the latest equipment, and highly qualified specialists ensure the stability of the chemical and technical and physical parameters of products that are not inferior in terms of characteristics to imported analogues.

QUALITY



ENVIRONMENTAL FRIENDLINESS

The company "TIZOL" pays great attention to the environmental safety of production. In recent years, the company has carried out capital-intensive environmental measures. The "green" certificate confirms the environmental friendliness of the materials produced.



The company "TIZOL" is perfect at having no world analogues technological process for production of basalt superthin fiber and non-combustible insulation based on it. Since 2005, "TIZOL" has been a recognized leader in the Russian market in the field of development, production and sales of fire-proof materials and structural fire protection systems. The company is developing new materials based on basalt rocks and technological processes for their production.

INNOVATIONS



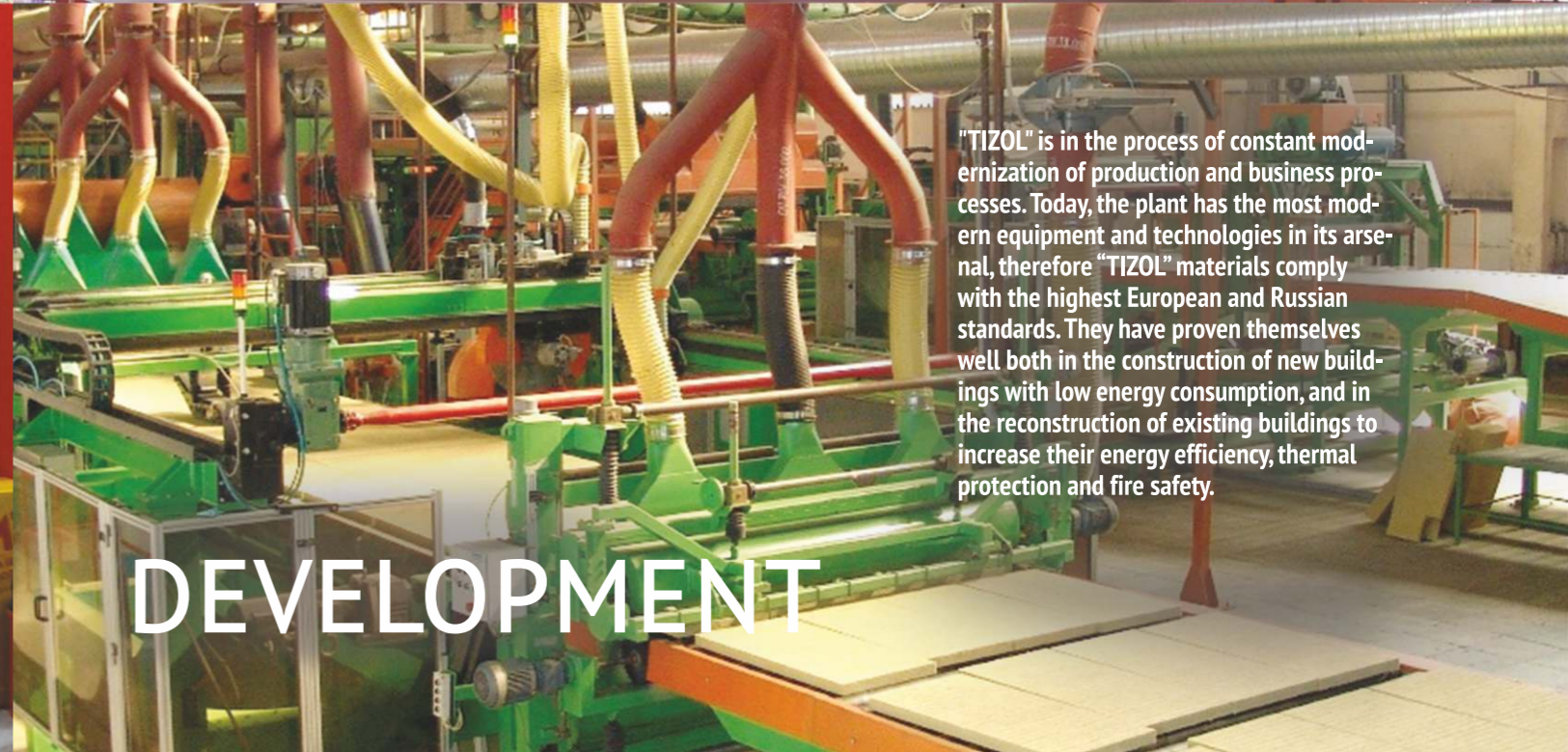
RELIABILITY

Founded in 1949 to provide the USSR nuclear industry with non-combustible heat-insulating materials, the enterprise "TIZOL" not only managed to withstand in the difficult years of perestroika, but now it also holds a high bar of the reliable and stable partner. The plant received a high score in the financial stability rating, which indicates the profitability of the organization and its adaptability to economic fluctuations. Compliance with all requirements of the current legislation of the Russian Federation in the field of product supply allows the company to take part in government orders, programs and business projects as a reliable partner and supplier.



The company "TIZOL" quickly responds to changes in the Russian market of building materials. We keep in touch with our customers, participate in exhibitions, seminars, professional conferences, conduct master classes, presentations and training of employees, provide marketing support for products.

PARTNERSHIP



DEVELOPMENT

"TIZOL" is in the process of constant modernization of production and business processes. Today, the plant has the most modern equipment and technologies in its arsenal, therefore "TIZOL" materials comply with the highest European and Russian standards. They have proven themselves well both in the construction of new buildings with low energy consumption, and in the reconstruction of existing buildings to increase their energy efficiency, thermal protection and fire safety.

TECHNICAL AND INDUSTRIAL INSULATION "TIZOL»

At present, technical (or industrial) insulation finds application in various fields of engineering and construction.

The main purpose of technical thermal insulation for engineering systems and equipment is to minimize unwanted heat exchange between the internal working environment and the external environment. This achieves a reduction in energy costs for heating (cooling) of the coolant (refrigerant) and increases the energy efficiency of the system. Another important task is to protect utilities and equipment from freezing or condensation, and to reduce heat loss. In addition, noise insulation, protection of the microclimate of living and working spaces from unintended influences from thermal or refrigerating equipment and pipelines, as well as safety of accidental contact of a person with a hot or cold surface are additionally provided.

Technical insulation is designed to protect ducts, pipelines, tanks, containers and various equipment. Increased requirements are imposed on heat-insulating materials: they must maintain operational characteristics for a long time in

various climatic conditions, vibrations, and be resistant to aggressive medium.

When equipping internal engineering systems of heating, water supply, ventilation and air conditioning of individual, public, industrial buildings, basalt-based thermal insulation materials turned out to be the most popular. This is due to the fact that they have low thermal conductivity, are able to withstand high temperatures, are resistant to vibration, have an unlimited service life and are reusable.

Technical insulation products of JSC "TIZOL" – cylinders of mineral wool for pipes, basalt cardboard and soft plates, wired mats and rolled materials on the basis of superthin basalt fiber – have all the necessary characteristics for successful use for decades and provide a high level of preservation of a temperature mode for various equipment and utilities.



CHARACTERISTICS OF TECHNICAL INSULATION "TIZOL"



NON-COMBUSIBILITY (GOST 30244-94)

Technical insulation "TIZOL" is made on the basis of a melt of basalt rocks, withstands the effects of high temperatures without ignition, impaired structure, strength and other properties. Our materials belong to the non-combustible group and have a fire hazard class KM0.



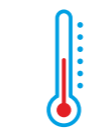
GOOD THERMAL PROTECTION

Due to the light fibrous structure and the random arrangement of the fibers, TIZOL basalt insulation has a low coefficient of thermal conductivity and correspondingly increased heat-insulating properties. Its application guarantees the highest energy efficiency requirements.



SOUND INSULATION

The unique fibrous structure of technical insulation TIZOL effectively reduces the energy of sound waves, absorbs sound and significantly reduces noise level of the equipment.



WIDE TEMPERATURE RANGE

Materials "TIZOL" can be used to insulate surfaces with temperatures from -180°C to +700°C in any climatic areas.



LOW WEIGHT

Insulation "TIZOL" has a low weight (density 30-210 kg/m³) and has a minimum load on the protected equipment and structure.



HIGH VIBRATION RESISTANCE

Technical insulation "TIZOL" retains its properties in conditions of high vibration, under the influence of high temperatures.



DURABILITY

Basalt materials are resistant to high temperatures, mechanical stress and are not subject to decay. The term of effective operation of TIZOL technical insulation, subject to the requirements of transportation, storage and operation, is at least 50 years.



MANUFACTURABILITY

Product quality, operational characteristics, ease of cutting and laying in the structure make it easy to install the TIZOL technical insulation.



COST-EFFECTIVE SOLUTIONS

High-performance insulation materials "TIZOL" are energy-saving technologies that significantly reduce costs, and as a result bring profit.



SAFETY

The environmental safety of products, confirmed by sanitary and epidemiological conclusions, makes it possible to use them safely in all manufacturing sectors (microbiology, radio electronics, pharmaceuticals, food industry and others), as well as in the field of domestic use.



APPLICATION AREA OF MATERIALS

Application area	Shape / diameter	Function of insulation	MPB-30						MPB-50				BYTM				MBOR				EURO-SHELL		EURO-LIGHT		EURO-VENT	
			MPB-30	MPB-30/SS1	MPB-30/ST1	MPB-30/F1	MPB-50	MPB-50/ST2	MPB-50/BT2	MPB-50/KT2	BYTM-PM	BYTM-PM/F	BYTM-K	BYTM-K/F	MBOR	MBOR-S	MBOR-S2	MBOR-F	EURO-SHELL C	EURO-SHELL C/F	EURO-LIGHT 40	EURO-VENT				
Air ducts	Rectangular	Protection against condensation	++	++	++	++	++	++	++	++	++	++					++	++	++	++					+	+
		Thermal insulation	++	++	++	++	++	++	++	++	++	++					++	++	++	++					+	+
		Sound insulation	++	++	++	++	++	++	++	++	++	++					++	++	++	++					+	+
	Round	Protection against condensation	++	++	++	++	++	++	++	++	++	++					++	++	++	++	+	+				
		Thermal insulation	++	++	++	++	++	++	++	++	++	++					++	++	++	++	+	+				
		Sound insulation	++	++	++	++	++	++	++	++	++	++					++	++	++	++	+	+				
Pipelines	< 300 mm	Protection against condensation	+	+	+	+	+	+	+	+	+	+					+	+	+	+	++	++				
		Thermal insulation	+	+	+	+	+	+	+	+	+	+					+	+	+	+	++	++				
		Sound insulation	+	+	+	+	+	+	+	+	+	+					+	+	+	+	++	++				
	> 300 mm	Protection against condensation	++	++	++	++	++	++	++	++	++	++					+	+	+	+	+	+				
		Thermal insulation	++	++	++	++	++	++	++	++	++	++					+	+	+	+	+	+				
		Sound insulation	++	++	++	++	++	++	++	++	++	++					+	+	+	+	+	+				
Equipment and tanks	Flat surfaces	Protection against condensation	++	++	++	+	++	++	++	++	++	++	++	++	++	++	++	++	++						++	++
		Thermal insulation	++	++	++	+	++	++	++	++	++	++	++	++	++	++	++	++	++						++	++
		Sound insulation	++	++	++	+	++	++	++	++	++	++	++	++	++	++	++	++	++						++	++
	Curved surface	Protection against condensation	++	++	++	+	++	++	++	++	++	++	++	++	++	++	++	++	++						+	+
		Thermal insulation	++	++	++	+	++	++	++	++	++	++	++	++	++	++	++	++	++						+	+
		Sound insulation	++	++	++	+	++	++	++	++	++	++	++	++	++	++	++	++	++						+	+

+ – application is possible
 ++ – use is recommended



**BASALT-FIBER HEAT-INSULATING: CARDBOARD (BVTM-K),
SOFT PLATE (BVTM-PM)**
TU 95.2691-98



Heat-insulating boards made of super-thin basalt fiber with the addition of phenolic-free binder and water repellent. They can be produced uncoated or coated with aluminum foil.

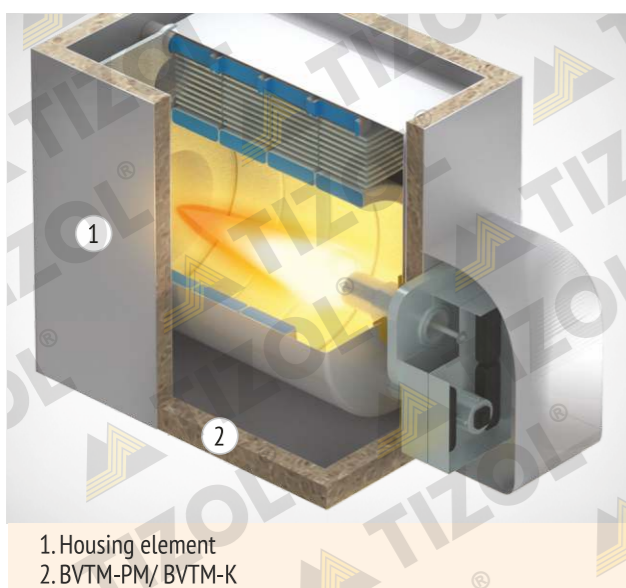
Combustibility group: non-combustible materials (NG).

Application: thermal insulation of surfaces of industrial and household equipment, ventilation systems, heating appliances, stoves, fireplaces, baths, saunas at temperature of the insulated surface from -180°C to +700 °C, as well as in the structures of elevator cabins and doors.

Installation: the material does not dust and does not break, has an exact geometry, is easily cut with a clerical knife, so you can easily cut out the necessary holes in the plates of any shape for seamless installation in the design of the furnace or equipment. The installation procedure and fixing methods depend on the insulation object. For more detailed advice, contact the specialists of the TIZOL company, or see the album of technical solutions on the website www.tizol.com.

Technical specifications														
Name	Covering material	Dimensions (mm)			Density (kg / m ³), not more than	Organic matter content (%), by weight, not more than	Humidity (%), by weight, not more than	Thermal conductivity (W/m * K), °C						
		Length	Width	Thickness				λ 25	λ 125	λ 300				
BVTM-PM soft plate	—	1250	600	10-50	18-40	3	1	0,031	0,051	0,106				
BVTM-PM/F1 soft plate	Foil on one side		460											
BVTM-K cardboard	—		600	5-10							44-80	5-13	0,043	0,093
BVTM-K/F1 cardboard	Foil on one side		460											

INSULATION OF HIGH TEMPERATURE EQUIPMENT



1. Housing element
2. BVTM-PM/ BVTM-K



The number of plates BVTM-PM BVTM-K in the package

Name	Dimensions (mm)	In the package*				
		Pieces	m ²	m ³		
BVTM-PM soft plate	1250x600x10	20	15	0,150		
	1250x600x15			0,225		
	1250x600x20			0,150		
	1250x600x25			0,188		
	1250x600x30	10	7,5	0,225		
	1250x600x35			0,210		
	1250x600x40			0,240		
	1250x600x45			0,270		
BVTM-PM/F1 soft plate with foil covering on one side	1250x600x50	8	6	0,3		
	1250x460x10			0,115		
	1250x460x15			0,138		
	1250x460x20			0,230		
	1250x460x25	16	11,5	0,173		
	1250x460x30			0,161		
	1250x460x35			0,184		
	1250x460x40			0,207		
BVTM-K cardboard	1250x460x45	8	4,6	0,230		
	1250x600x5			40	30	0,150
	1250x600x10			20	15	
	1250x460x5			40	23	0,115
BVTM-K/F1 cardboard with foil covering on one side	1250x460x10	20	11,5			

* At the request of the client, the multiplicity of packaging can be changed. It is possible to manufacture BVTM materials of other sizes, as well as plates with holes, cutouts according to customer drawings.

Reverberation coefficient of sound absorption (a_r)

Name	Thickness (mm)	a _r (H)	Sound absorption class
BVTM-K	10	0,35	D
BVTM-PM	20	0,60	C
	50	1	A



Packing: BVTM-PM, BVTM-K plates are delivered packed in plastic film with the number of plates in the package according to the table above.

Transportation: covered vehicles of all types in accordance with the rules applicable to the transport of this type.

The use of open vehicles is allowed when transporting plates packed and formed into transport packages that exclude moisture.

Storage: the material should be stored packed in closed warehouses or under a canopy. No direct moisture is allowed on the product.



BASALT WIRED HEAT-INSULATING MATS (MPB)

TU 5769-002-08621635-98



Thermal insulation products in the form of mats from basalt superthin cloth wired in the longitudinal direction. They can be produced covered with aluminum foil, fiberglass, basalt, silica or fiberglass fabric on one or two sides or without covering material.

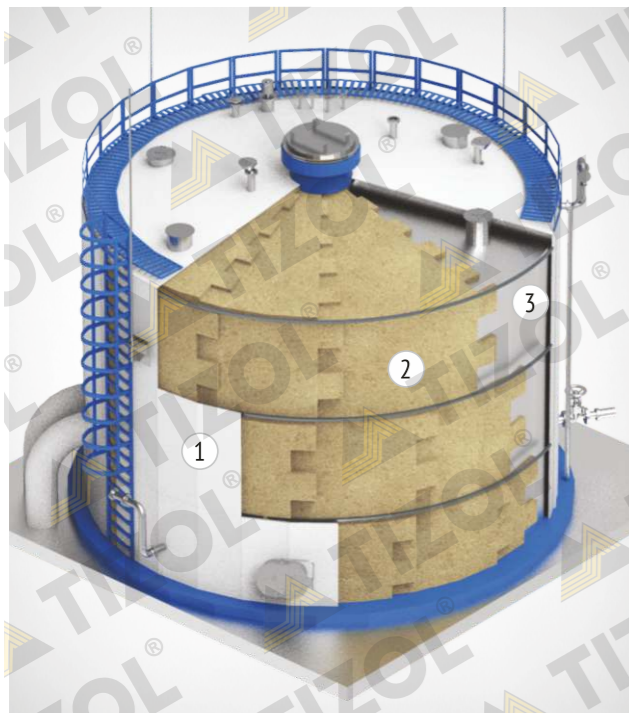
Combustibility group: non-combustible materials (NG).

Application: heat and sound insulation of technical and power engineering equipment, storage tanks for oil products, chemicals, hot and cold water, as well as pipelines of heating networks for hot and cold water supply, technological pipelines of all industries at an insulated surface temperature from -180 °C to + 700 °C (able to withstand short-term effects of temperature up to + 900 °C). MPB are also used in the construction of sea and river vessels as non-combustible heat and sound insulation.

Mounting Seal Ratio

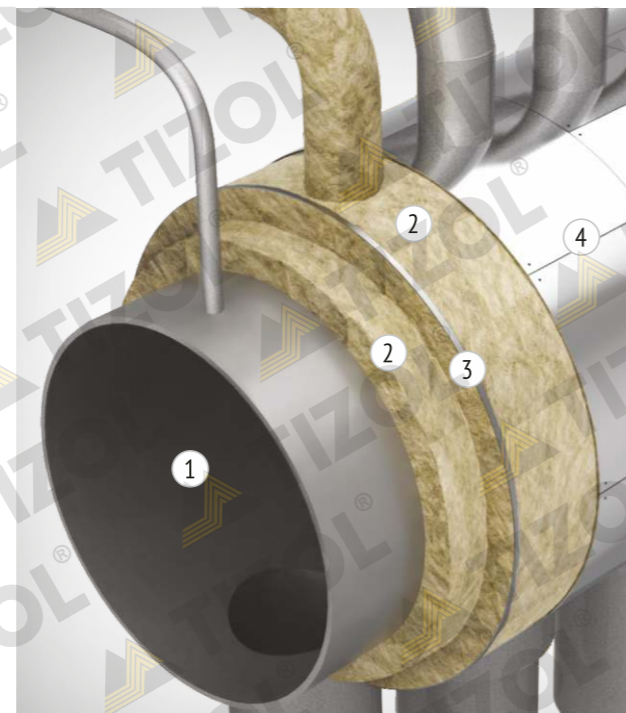
Thermal insulation materials and products	Density (kg / m ³)	Compression ratio (COP)
Wired mats from superthin basalt fiber	MPB-30 25-40	1,5
	MPB-50 41-60	1,3

INSULATION OF VARIOUS PURPOSE TANKS



1. Protective housing
2. MPB
3. Case

INSULATION OF HIGH-TEMPERATURE EQUIPMENT



1. Equipment
2. MPB
3. Housing support structure
4. Protective housing

Technical specifications

Name	Covering material	Dimensions (mm)			Density (kg / m ³), not more than	Compressibility (%), not more than	Humidity (%), by mass, not more than	Thermal conductivity, (W / m * K), °C		
		Length	Width	Thickness				λ 25	λ 125	λ 300
MPB-30	—	1 000-10 000	500, 1 000	30-120	25-40	25	2	0,032	0,042	0,075
MPB-30/F1	Foil on one side	1 700	470	30-120						
MPB-30/SS1	Fiberglass mesh on one side		500	30-80						
MPB-50/ST2	Fiberglass fabric T-13, T-23, EZ-200 on both sides	1 000-10 000	500, 1000	30-120	41-60	25	2	0,032	0,042	0,075
MPB-50/BT2	Basalt fabric TBK-100 on both sides									

By customer's order it is possible to produce MPB materials of other sizes

Acoustic tests of MPB-30 with a density of 30 kg / m³

Mat thickness (mm)	Without covering				Fiberglass fabric covered (source of noise from the fiberglass fabric side)			Foil covered on one side (source of noise from the foil side)				
	Sound Absorption Index (αw)	Absorption class	Airborne sound insulation index (Rw), metal source of noise (dB)	Airborne Sound Insulation Index (Rw), mat source of noise (dB)	Sound Absorption Index (αw)	Absorption class	Airborne sound insulation index (Rw), (dB)	Sound Absorption Index (αw)	Absorption class	Airborne sound insulation index (Rw), (dB)		
30	0,7 (MH)	C	42	43	0,95	A	43	0,7 (M)	C	44		
40				42			45			45		
50				44			44			46	0,75 (L, M)	46
30x2	1	A	46	46	1	A	47	0,8 (L)	B	48		
40x2				46			46			48	0,85 (L)	48
40x2				46			46			48	0,85 (L)	48
50x2				47			47			48	0,9 (L)	49

Measurements sound insulation were carried out with a steel sheet 4 mm thick

Extract from GOST 23499-2009

Absorption class	Sound Absorption Index (αw)
A	0,9; 0,95; 1
B	0,8; 0,85
C	0,6; 0,65; 0,7; 0,75
D	0,3; 0,35; 0,4; 0,5; 0,55
E	0,25; 0,2; 0,15

The presence of specific features in the frequency characteristics of the sound absorption coefficients of the material or product, expressed in higher values of the sound absorption coefficient in certain limited parts of the normalized frequency range, should be indicated by the introduction of special characters L, M, H, called indicators of the shape of the frequency characteristic, where the symbol L - refers to low frequency range (125-250Hz), M - the region of medium frequencies (500-1000 Hz), H - the region of high frequencies (2000-4000 Hz).

Installation: the material is easy to install, easy to cut with a knife.

Installation procedure and fastening methods depend on the protected structure. For more detailed advice, contact the specialists of the TIZOL company, or see the album of technical solutions on the website www.tizol.com.

Packing: MPB mats are delivered packed in polyethylene stretch film or plastic bag, the number of pieces in the pack-

age depends on the geometric dimensions of the mats. **Transportation:** mats must be transported by covered vehicles of all types in accordance with the rules applicable to the transport of this type.

It is allowed to transport mats in open vehicles with mandatory coating with moisture-proof material.

Storage: the material should be stored packed in closed warehouses or under a canopy. No direct moisture is allowed on the product.

CLOTHS FROM BASALT SUPERTON FIBERS (BSTV)
TU 5761-001-08621635-98



Cloths are a layer of entangled fibers bonded together by forces of natural cohesion without a binder and have a clear geometric shape.

Combustibility group: non-combustible materials (NG).

Application: for the manufacture of heat-insulating, fire-proof, sound-absorbing materials and products, filters for cleaning gas-air and liquid media, as well as thermal insulation material in construction, engineering and other industries, at a temperature of the insulated surface from -180°C to + 700°C.

Installation: the material is not dusty, easy to cut with a knife. The installation procedure and methods of fastening heat-insulating BSTV brand materials depend on the object. For more detailed advice, contact the specialists of the TIZOL company, or see the album of technical solutions on the website www.tizol.com.

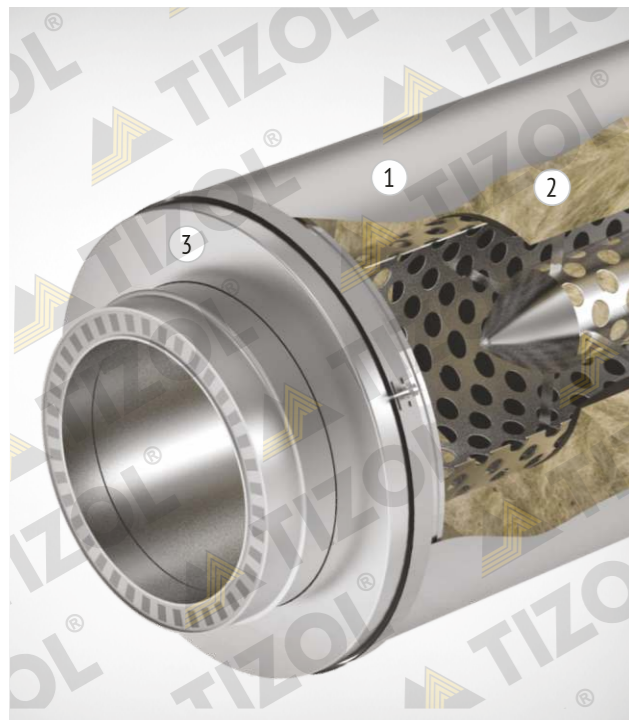
Packing: basalt superthin fiber cloths are packed in 10 kg rolls. They come packaged in plastic wrap.

Transportation: mats must be transported by covered vehicles of all types in accordance with the rules applicable to the transport of this type. When transporting cloths

packed and formed into transport packages that exclude moisture, open vehicles are allowed.

Storage: the material should be stored packed in closed warehouses or under a canopy. No direct moisture is allowed on the product.

SOUND INSULATION OF HIGH-TEMPERATURE EQUIPMENT



1. Protective housing 3. Muffler
2. BSTV



Technical specifications		
Name	The norm for canvas of brands	
	BSTV-ST construction fiber	BSTV-SP special fiber
Dimensions (mm) length width thickness		1 200
		1 000
		300
Average fiber diameter (µm), not more than	3	2
Mass fraction of non-fibrous inclusions larger than 0.25 mm (%), not more than	8	4,8
Density (kg / m ³), not more than	23	20
Thermal conductivity, (W / m * K), °C not more than	λ 25	0,032
	λ 125	
	λ 300	0,042 0,075
Humidity (%), by mass, not more than	2	1
Leachability in terms of Na2O yf 5,000 cm ² (%), not more than	5	5
Mass fraction of chlorine ions per 10 000 cm ² (%), not more than	0,03	0,03
Water resistance (pH), not more	4	4



BASALT FIRE-PROTECTIVE ROLLED MATERIAL (MBOR)

TU 5769-003-48588528-00



baths, saunas, pipelines of heating networks of hot and cold water supply, technological pipelines of all industries at an insulated surface temperature from -180 °C to + 700°C. It is used to add the thickness of the insulating layer, including the old insulation. Material MBOR is also used in structural fire protection systems manufactured by TIZOL to increase the fire resistance of building structures and engineering networks (more on www.tizol.com)

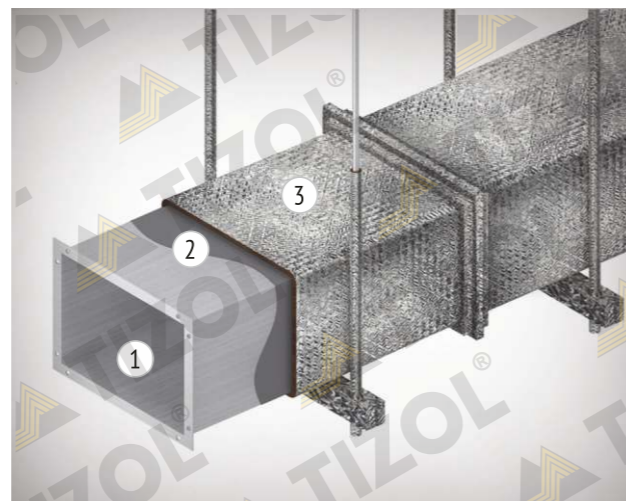
A cloth layer of basalt superthin fibers without a binder, wired with a knitting and stitching method with covering material (fiberglass fabric, basalt fabric, aluminum foil) or without it.

It is available in thicknesses of 5 to 26 mm and is supplied in rolls.

Combustibility group: non-combustible materials (NG).

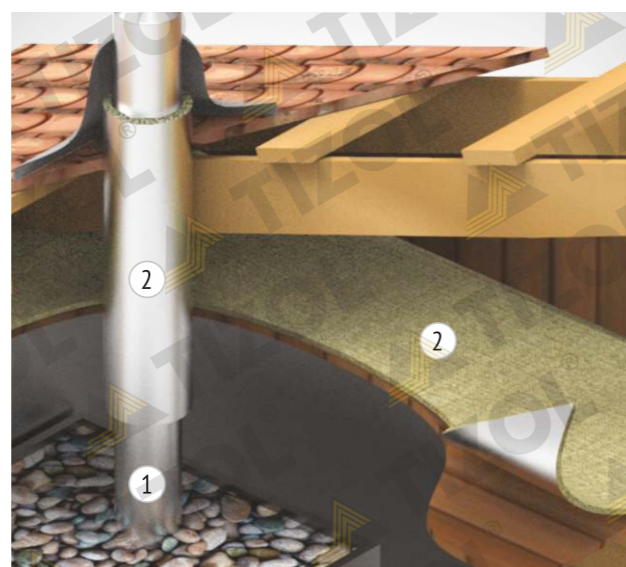
Application: heat and sound insulation of technical and energy equipment, ducts, heating devices, stoves, fireplaces,

VENTILATION INSULATION



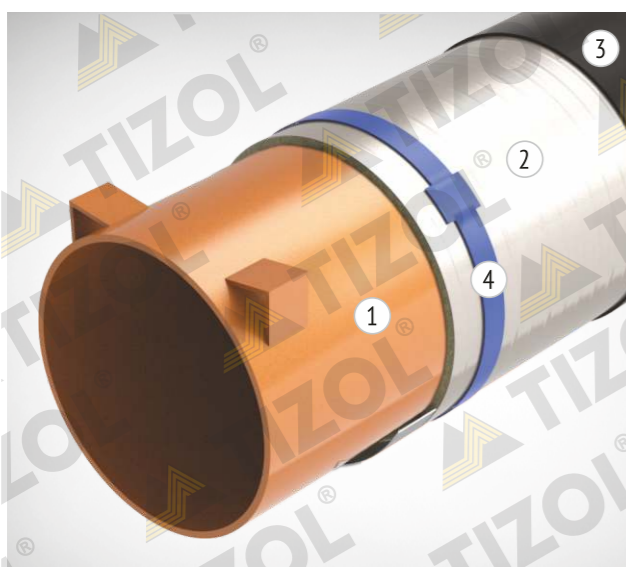
1. Air duct
2. Fire-proof composition "Plazas"
3. Foiled MBOR

INSULATION OF OVERLAPPIINGS AND CHIMNEYS



1. Chimney
2. MBOR

PIPELINE INSULATION



1. Pipeline
2. MBOR
3. Protective coating
4. Draw band

Technical characteristics

Name	Covering material	Dimensions (mm)			The amount of m ² per roll	Surface density (g m ⁻²), not more than	Humidity (%), by mass, not more than	Thermal conductivity, (W / m * K), °C			Sound Absorption Index αw	Air noise insulation index of single wall construction with sheet metal thickness 0.8 mm, R _w , dB	
		Length	Width	Thickness				λ 25	λ 125	λ 300			
MBOR-5	-	30 000	1 500	5	45	500	2	0,033	0,045	0,08	0,4	28	
MBOR-8		20 000		8	30	800					0,45		
MBOR-10		16 000		10	24	1000					0,5		
MBOR-13		10 000		13	15	1400					-		
MBOR-16		16		1700	-								
MBOR-20		20		2100	-								
MBOR-23		8 000		23	12	2415					-		
MBOR-26		26		2615	-								
MBOR-S-5		Fiberglass fabric on one side		30 000	5	45					625	0,35	28
MBOR-S-8				20 000	8	30					915	0,45	
MBOR-S-10	16 000		10	24	1515	0,5	29						
MBOR-S-13	10 000		13	15	1525	-							
MBOR-S-16	16		1815	-									
MBOR-S2-5	Fiberglass fabric on both sides		30 000	5	45	750	-						
MBOR-5F	Foil on one side				615	0,15	29						
MBOR-8F		20 000	8	30	915	0,25							
MBOR-10F		16 000	10	24	1115	0,30							
MBOR-13F		10 000	13	15	1515	0,35							
MBOR-16F		16	1815	-									
MBOR-20F		20	2215	-									
MBOR-23F		8 000	23	12	2515	-							
MBOR-26F		26	2815	-									



Installation: the material does not dust, is easily cut with a knife, bends well, allowing you to insulate structures of complex shape. Installation procedure and fastening methods depend on the protected structure. For more detailed advice, contact the specialists of the TIZOL company, or see the album of technical solutions on the website www.tizol.com.

Packaging: brand MBOR materials are supplied in rolls packed in polyfilm. The number of square meters of material in a roll depends on the thickness of the material (see table "Technical specifications").

Transportation: MBOR rolls must be transported horizontally by all types of covered vehicles in accordance with the rules applicable to this type of transport. It is allowed to transport MBOR materials in open vehicles with a mandatory coating with moisture-proof material.

Storage: the material should be stored packed in closed warehouses or under a canopy. No direct moisture is allowed on the product.

HEAT AND SOUND INSULATION PLATES EURO-LIGHT40, EURO-VENT

TU 5762-010-08621635-2006



Heat and sound insulation plates are made of mineral wool based on basalt rock melt. They are available without coating, or coated with aluminum foil, folma fabric, and white or black fiberglass cloth.

Combustibility group: non-combustible materials (NG).

Application: thermal insulation of storage tanks for petroleum products, chemicals, hot and cold water, industrial equipment, ventilation systems, gas ducts, heating appliances, chimneys at an insulated surface temperature from -70°C to +400°C. Also, this material is used for heat and sound insulation of the inner surface of ventilation ducts, in the construction of slotted and chamber silencers and in the creation of sound-absorbing screens.

Technical characteristics

Name	Density (kg / m ³)	Dimensions (mm)			λ 10	λ 25	λ 125	λ 300
		Length	Width	Thickness				
EURO-LIGHT40	40	1000/1200	500/600	30-200	0,035	0,037	0,054	—
EURO VENT	80			15-200	0,034	0,036	0,052	0,083

Возможно изготовление материалов EURO-ЛАЙТ 40, EURO-ВЕНТ других размеров, а так же плит с отверстиями, вырезами по чертежам заказчика

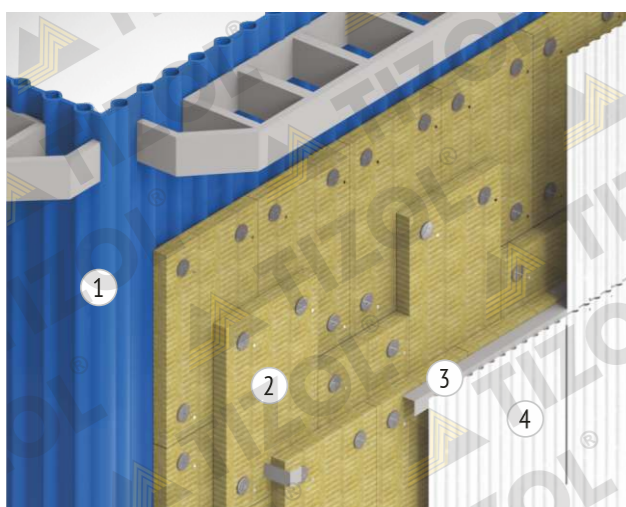
Installation: the material does not break, has an exact geometry, is easily cut. The order of installation and fastening methods depend on the construction that needs insulation. For more detailed advice, contact the specialists of the TIZOL company, or see the album of technical solutions on the website www.tizol.com.

Packing: EURO-LIGHT 40, EURO-VENT plates are delivered packed in polyethylene shrink film. The volume of packaging depends on the selected range and geometric dimensions of the plates.

Transportation: plates must be transported by covered vehicles of all kinds in accordance with the rules applicable to this type of transport. The use of open vehicles is allowed when transporting plates are packed and formed into transport packages that exclude moisture.

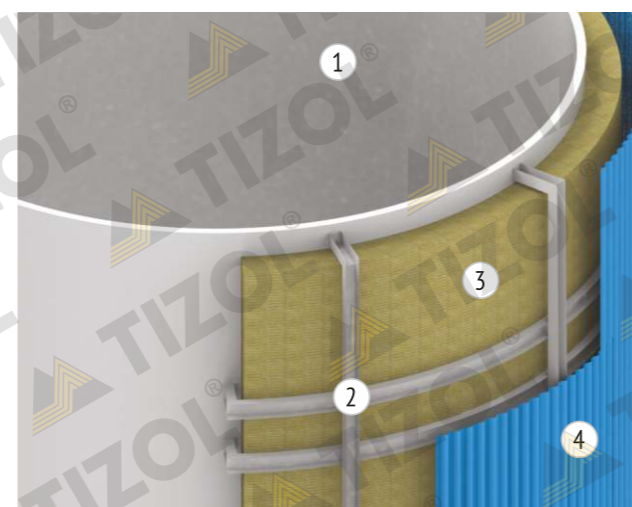
Storage: the material should be stored packed in closed warehouses or under a canopy. No direct moisture is allowed on the product.

BOILER INSULATION



1. Boiler wall
2. EURO-VENT plates
3. Backband
4. Protective housing

TANK INSULATION



1. Tank wall
2. Housing support structure
3. EURO-VENT plates
4. Protective housing

Sound absorption index of plates in the frequency range 100-5000 Hz

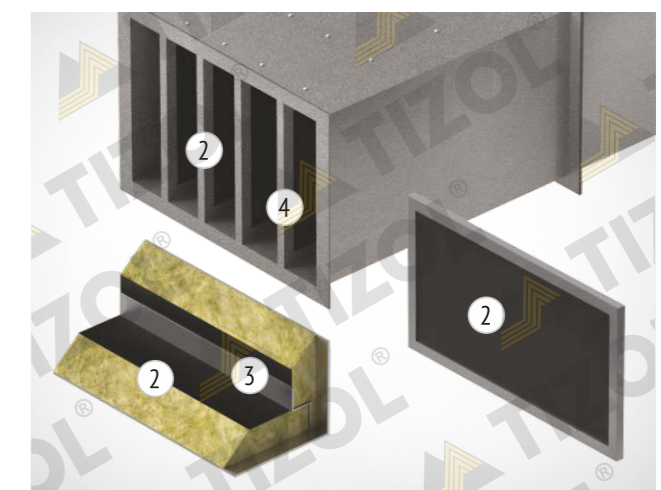
Name	Thickness (mm)	α_w	Sound absorption class	Actual sound absorption coefficient α_p /Hz
EURO-LIGHT40	50	0,8	B	0,8/500; 0,9/1000; 0,97/5000
	100	0,95	A	0,8/250; 0,85/500; 1/1000; 1/4000
EURO-VENT	30	0,7	C	0,7/500; 0,8/1000; 0,8/4000
	50	0,9	A	0,85/500; 0,95/1000; 1/4000
	100	1	A	0,9/250; 1/500; 1/1000; 1/4000



FIREPLACE INSULATION

1. Chimney
2. Chimney box
3. Ventilation grid
4. Fireplace insert
5. EURO-LIGHT 40/F1 plates

SOUND INSULATION OF VENTILATION SYSTEMS



1. Air duct
2. EURO-VENT/GC plates
3. Z-profile
4. Silencer inner panel

MINERAL HEAT-INSULATING CYLINDERS EURO-SHELL

TU 23.99.19-012-08621635-2019



Finished shaped products made of mineral wool based on a melt of basalt rocks. They are made for a specific pipe size and with a given thickness of the insulating layer. They can be produced both uncoated and coated with aluminum foil.

Combustibility group: non-combustible materials (NG).

Application: thermal insulation of pipelines operated at facilities of various industries, in heat supply, ventilation, air conditioning and other technological systems, including river and sea vessels.

ONE AND TWO-LAYER MECHANICAL FASTENING OF PIPELINE INSULATIONS



1. Pipe
2. Pipe shell
3. Cylinders EURO-SHELL / EURO-SHELL /F

ISOLATION OF THE STEEPLY BENT BENDS OF THE PIPELINE



1. Pipe
2. Cylinders EURO-SHELL / EURO-SHELL /F

Installation: the material does not dust, and does not break, has an accurate geometry, is easily cut. Cylinders are installed close to each other with a spacing of horizontal seams and are fixed to the pipe with pipe shell or tying wire. It is recommended to install at least two pipe shells on 1 cylinder with an interval of not more than 500 mm. In the case of foiled cylinders, the longitudinal and transverse joints are glued with aluminum tape "LAMS". For external piping and, if necessary, a protective coating (housing) can be mounted on the cylinders. When using cylinders as an insulating layer on vertical pipelines, unloading structures (support rings) should be provided every 3-4 m to prevent sliding of the insulation. If cylinders are used to insulate pipelines, a vapour barrier

should be provided to prevent moisture condensation. To get more detailed advice, you can contact the specialists of the "TIZOL" company.

Packing: EURO-SHELL cylinders are delivered packed in cardboard boxes, at the request of the client they can be formed into transport pallets. The volume of the package / pallet depends on the selected cylinder range.

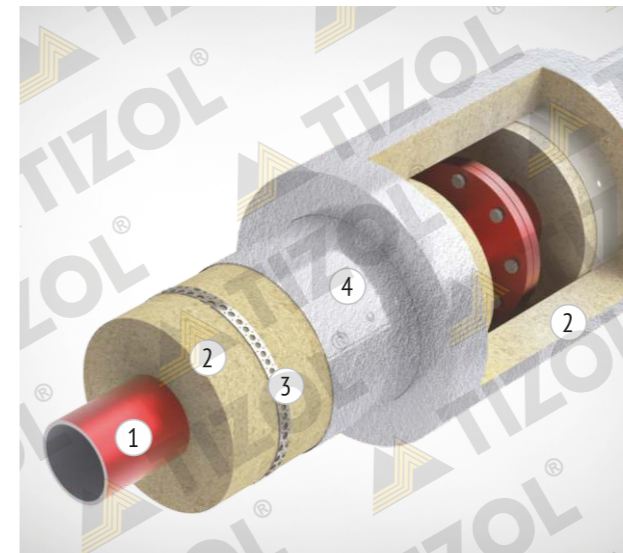
Storage: the material should be stored packed in closed warehouses under a canopy, or in other conditions that protect the product from moisture.

Technical characteristics of heat-insulating cylinders

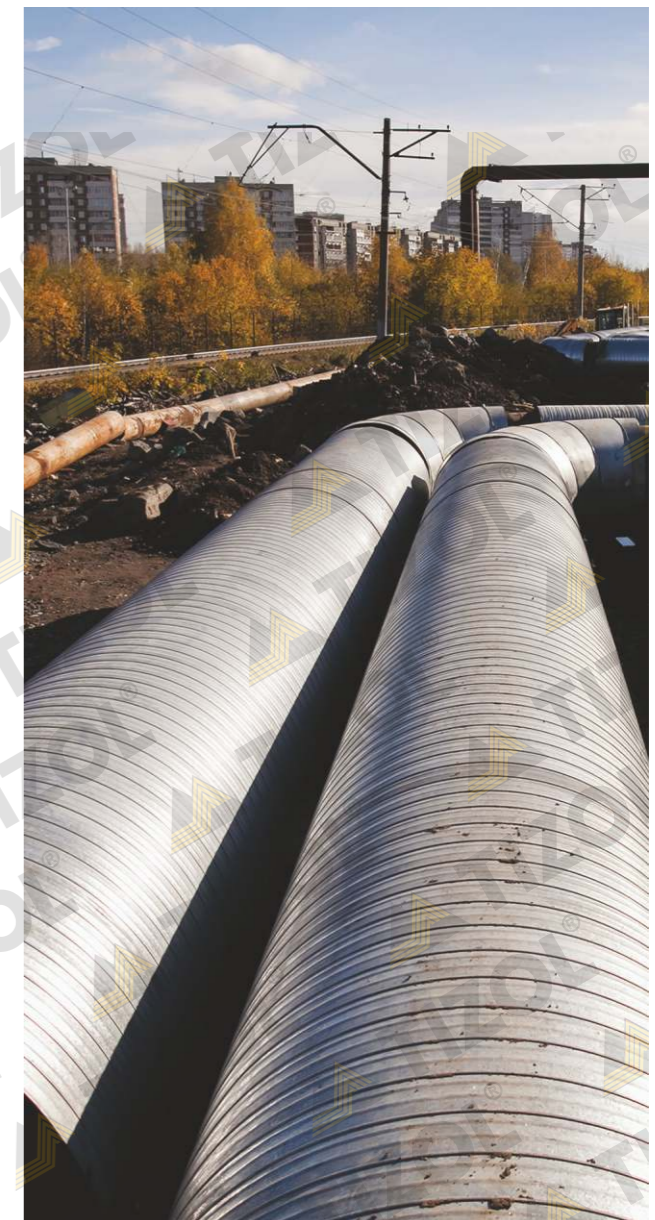
Parameter	Values for the EURO-SHELL brands			
	C 80 C 80/F	C 100 C 100/F	C 120 C 120/F	C 150 C 150/F
Density (kg /m ³)	80±10	100±12	120±15	150±15
Inside diameter (mm)	10-1220			
Length (mm)	1000			
Wall thickness (mm)	20-110			
Thermal conductivity (W/(m *K), max)	λ10	0,034	0,035	0,036
	λ25	0,036	0,037	0,038
	λ125	0,049	0,050	0,051
	λ300	0,081	0,079	0,080
Water absorption at short-term partial immersion (kg /m ²), not more than	1			
Application temperature	от -180 до +650 °C			
Fire classification: fire safety class combustibility group	KMO non-combustible			

Production of shaped products of any profile for insulation of bends, transitions, corners, stop valves is possible. Thus, it will only be necessary to mount the insulating product without additional trimming.

PIPE FLANGE CONNECTION INSULATION



1. Pipe
2. EURO-SHELL cylinders
3. Pipe shell with buckle
4. Protective covering



TECHNICAL INSULATION DEALERS TRADING NETWORK

JSC "Tizol" annually produces more than three million square meters of technical insulation. The products of the enterprise are presented by dealers in Russia, Kazakhstan, Kyrgyzstan, Azerbaijan, Ukraine, China. Dealer network contacts are available at www.tizol.com. Delivery to anywhere in the world is possible

TECHNICAL INSULATION DEALERS TRADING NETWORK



TECHNICAL REQUIREMENTS FOR THERMAL INSULATION MATERIALS IN THE DESIGNS OF HEAT INSULATION OF EQUIPMENT AND PIPELINES

The physical and technical properties of thermal insulation materials have a decisive influence on energy efficiency, operational reliability and durability of industrial thermal insulation structures, the complexity of their installation, and the possibility of repair during operation.

The main indicators characterizing the physical, technical and operational properties of heat-insulating materials are: density, thermal conductivity, temperature resistance, compressibility and elasticity (for soft materials), compressive strength at 10% deformation (for rigid and semi-rigid materials), vibration resistance, form stability, combustibility, water resistance and resistance to chemically aggressive environments, organic matter content and biostability.

The thermal conductivity of the material, ceteris paribus, determines the necessary thickness of the insulating layer, and, consequently, the load on the insulated object, the structural and installation characteristics of the insulating structure. The thermal conductivity increases with the temperature of the protected object. The calculated value of the fibrous heat-insulating materials thermal conductivity coefficient in the structure is determined taking into account operating conditions, the degree of their mounting seal, the presence of seams and fasteners. The required insulation thickness is calculated for the specific operating conditions of each object according to the standards and methods given in SP (Construction Rules) 61.13330.2012 "Thermal insulation".

When choosing a thermal insulation material, the strength and deformation characteristics of the insulated object, the design permissible loads on the supports and other elements of the protected surface are taken into account.

The durability of thermal insulation depends on the design features, the location of the insulated object, the operating mode of the equipment, environmental aggressiveness, mechanical stress, and the presence of vibrations. The durability of the heat-insulating material and the heat-insulating structure as a whole is largely determined by the durability of the coating layer.

At all objects located in the open air, it is necessary to perform a coating layer that protects the thermal insulation from environmental influences and mechanical damage, on the top of the thermal insulation. Indoors, it is possible to use materials lined with aluminum foil without additional coating, provided that the probability of mechanical impact and material damage is excluded.

Sanitary and hygienic requirements are especially important when designing facilities with technological processes requiring high purity, for example, in microbiology, radio electronics, and the pharmaceutical industry. Under these conditions, materials or structures are used that do not allow indoor air pollution. It should include products in fiberglass cladding, sealing the seams of the covering layer or other structural solutions.



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LARGE PROJECTS USING TIZOL INSULATION

Shopping and entertainment complexes, business centers, hotels

- Social and business complex "Lakhta Center", St. Petersburg
- International Exhibition Center Crocus Expo, Moscow (13)
- "Mercury City Tower" International Business Center "Moscow-City", Moscow (14)
- Arena "Uralets" Cultural and Entertainment Complex, Yekaterinburg
- Sports and entertainment complex "Ice Palace," Yekaterinburg
- Waterpark "Limpopo", Yekaterinburg
- Hotel «Hyatt Regency», Yekaterinburg (15)
- Shopping center "Megamart", Kaliningrad
- SEC "Greenwich", 4th stage, Yekaterinburg (16)
- SEC "Alatyr", Ekaterinburg
- SEC "Rodnik", Chelyabinsk
- BC "London", Nizhny Novgorod
- SC "Petrovskiy Fort", St. Petersburg
- SC "MEGA", Yekaterinburg (17)



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Administrative and public buildings

- "Skolkovo" Innovation Center, Moscow (18)
- State residence "Palace of congresses", St. Petersburg (19)
- "Yekaterinburg Arena" Central Stadium, Yekaterinburg (20)
- "Koltsovo" Airport International Terminal, Yekaterinburg (21)
- "Kazan" Airport International Terminal, Kazan (22)
- "Tolmachevo" Airport, Novosibirsk
- State Academic Bolshoi Theatre, Moscow (23)
- "Tsaritsyno" Museum Complex, Moscow (24)
- "Parnas" metro station, Saint Petersburg
- "Gazprom Transgaz Ugorsk" Building, Ugorsk
- Cultural and educational center, island Russky



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