INNOVATIVE SOLUTIONS

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TO INCREASE EFFICIENCY THERMAL INSULATION FROM THE COMPANY

D. G. Belousov, General Director of ZTM LLC

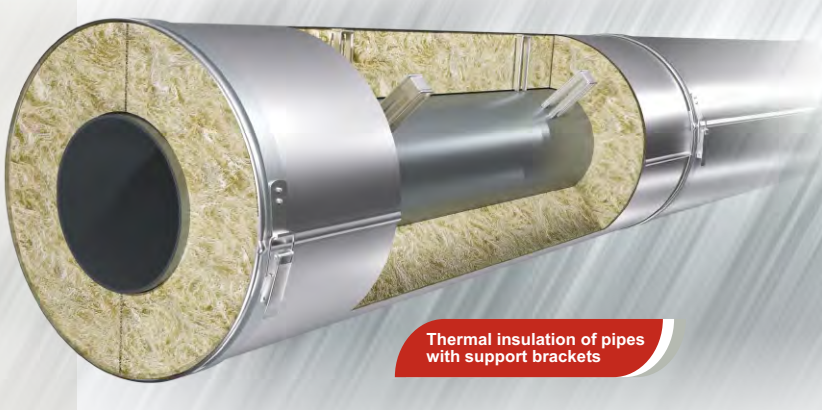
As is known, the structure and properties of mineral wool during the operation of a thermal insulation structure can change significantly as a result of self-sealing, especially during vibration and humidification. The consequence of these factors is the inconstancy of the volume of the thermal insulation structure, instability during vibration and low mechanical strength.

The efficiency of thermal insulation is guaranteed by a more advanced design and competent installation.

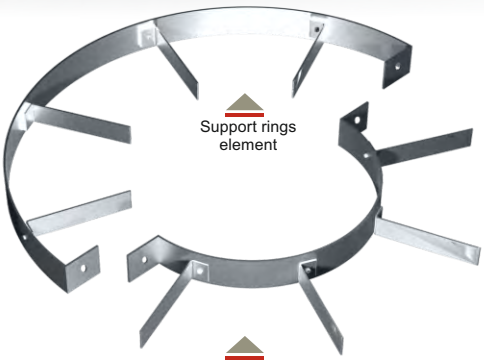
To preserve and improve the efficiency of the thermal insulation characteristics of thermal insulation at a given level, various metal frames are installed, on which protective coatings are mounted:

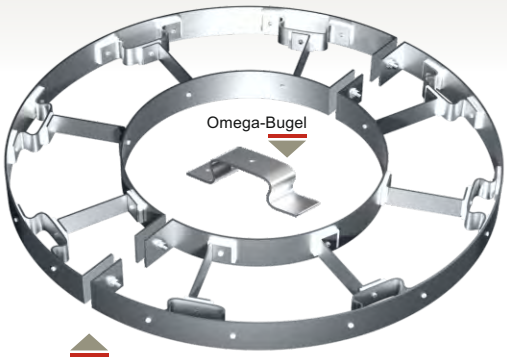
- for pipelines with a nominal diameter of less than 100 mm - support brackets;
- for pipelines with a nominal diameter of more than 100 mm - support distance rings on metal racks.

To solve this problem, special support and unloading structures have been developed, produced on automatic European CNC lines.

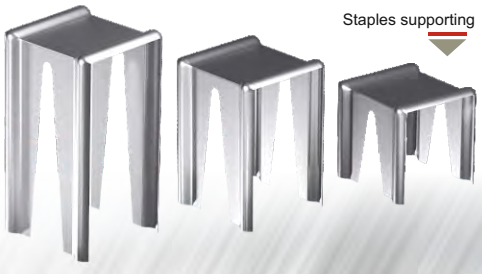


Thermal insulation of pipes with support brackets





Support ring assembly



Thermal insulation of pipes with support rings

SUPPORT RINGS AND BRACKETS PIPEWOOL

The support rings and brackets are designed to maintain load distribution when installing protective shells in the thermal insulation of horizontal pipelines and cylindrical apparatuses in industrial and marine projects. Protective shells should be supported by support rings and elastic elements.

At a temperature of 350°C, the support legs of the structure are made of heat-resistant steel and are attached to the ring with the help of elastic elements «omega-bugel» to compensate for thermal expansion and reduce the vibration transfer of the isolated object.

Unloading structures and elements of the coupling bandage are used to prevent vertical displacement (sliding) of protective coatings on vertical pipelines and apparatuses when using soft thermal insulation materials.

All structures are made of carbon or stainless steel and consist of rings and brackets with intermediate support posts made of carbon or stainless steel located at a certain distance. To reduce heat transfer, the racks are separated from the ring by heat-insulating gaskets. The rings are mounted to the pipeline using a bolted connection.

*** We invite design and contracting organizations to cooperate.**

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SUPPORT RINGS PIPEWOOL

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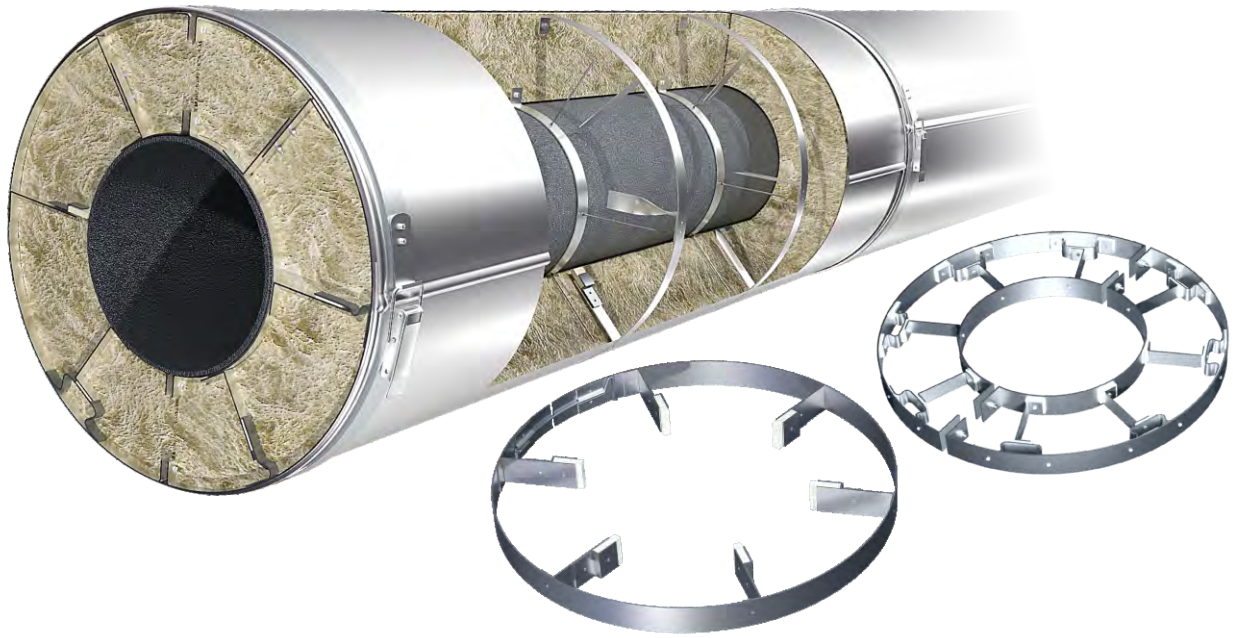

SUPPORT RINGS PIPEWOOL

Product execution (types)	**KO1** Ring (with pin); **KO2** Ring; **KO3** Ring (double); **KO4** Ring (double for springs); **EKO1** Element; **EKO2** Element (double)
Direction	**Horizontal or Vertical for pipelines or tanks**
Product diameter	According to the Customer's specification
Length of distance holders (insulation thickness)	According to the Customer's specification
Metal type of Ring	**Ordinary /galvanized steel (St3 / 08PS / 08KP);** **Stainless steel.** (AISI 301; AISI 304; AISI 403; 12X18H9; St.1.4310; St.S-75); **Aluminum (AMG2; AMG3; AD1H).**
Sizes cross-section of metal tape	**2x30; 3x30; 2x40; 3x40 mm**
Number of product segments	**From 4x (360°) or more** (depending on the diameter of the product and in accordance with the load).
Distance holders	**Assortment** // According to the technical task of the Customer.
Metal type of Paws	**Ordinary /galvanized steel (St3 / 08PS / 08KP);** **Stainless steel.** (AISI 301; AISI 304; AISI 403; 12X18H9; St.1.4310; St.S-75); **Aluminum (AMG2; AMG3; AD1H).**
Metal type of Springs	**Stainless steel. 1.4310.**
Accessories	**Assortment** // According to the technical task of the Customer.
Mounting direction	**They are installed radially directed.**

Product	Manufacturer brand	Ring type	Metal type	Diameter D (мм)	Thermal insulation thickness (мм)	Number of elements (pieces)	Number of paws (pieces)	Ribbon cross section (мм)	Thermal padding	Paws type	Springs type
Support Ring	PIPEWOOL	KO1	St3	219	170	1	3	2x30	T1	H4	
Support Ring	PIPEWOOL	KO2	08PS	1200	100	2	5	3x30	T1	L3	
Support Ring	PIPEWOOL	KO3	S-75	1200	100	2	5	3x30	T2		V1
Support Ring	PIPEWOOL	KO3	AMG3	1200	100	2	5	3x30	T2	L2	Q1

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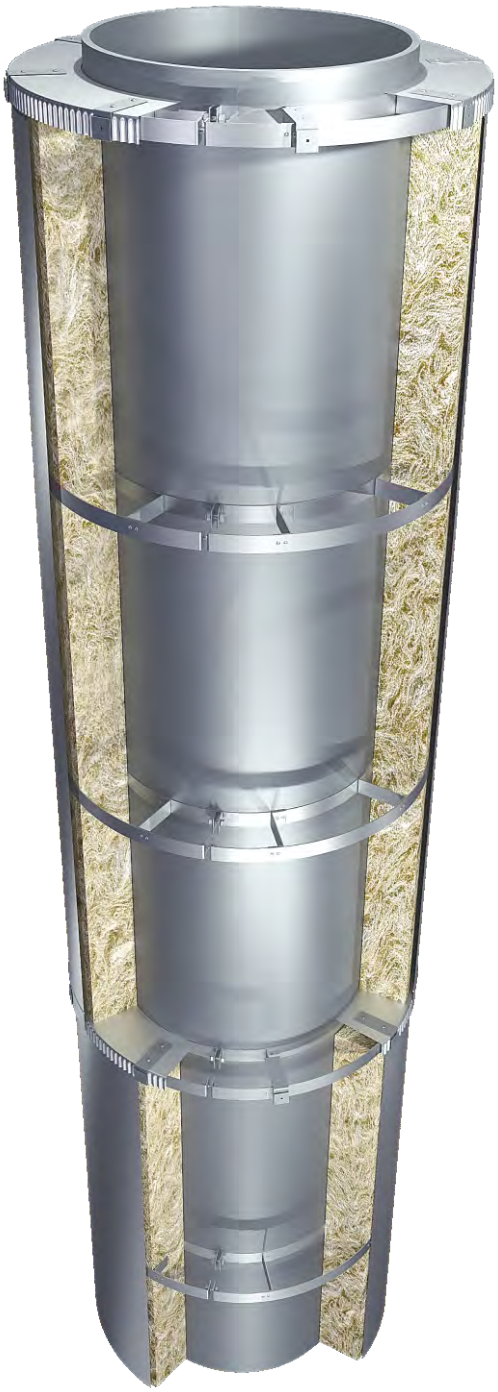
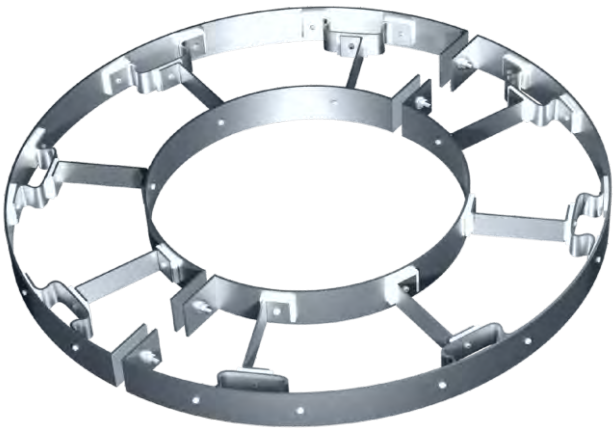
SUPPORT RINGS THAT SIMULTANEOUSLY PERFORM THE FUNCTIONS OF A BINDING BANDAGE ON VERTICAL PIPELINES





Product execution (types)	KO1 Ring (with pin); KO2 Ring; KO3 Ring (double); KO4 Ring (double for springs); EKO1 Element; EKO2 Element (double)
Direction	**Horizontal or Vertical for pipelines or tanks**
Product diameter	According to the Customer's specification
Length of distance holders (insulation thickness)	According to the Customer's specification
Metal type of Ring	**Ordinary /galvanized steel (St3 / 08PS / 08KP); Stainless steel. (AISI 301; AISI 304; AISI 403; 12X18H9; St.1.4310; St.S-75); Aluminum (AMG2; AMG3; AD1H).**
Sizes cross-section of metal tape	**2x30; 3x30; 2x40; 3x40 mm**
Number of product segments	**From 4x (360°) or more** (depending on the diameter of the product and in accordance with the load).
Distance holders	**Assortment** // According to the technical task of the Customer.
Metal type of Paws	**Ordinary /galvanized steel (St3 / 08PS / 08KP); Stainless steel. (AISI 301; AISI 304; AISI 403; 12X18H9; St.1.4310; St.S-75); Aluminum (AMG2; AMG3; AD1H).**
Metal type of Springs	**Stainless steel. 1.4310.**
Accessories	**Assortment** // According to the technical task of the Customer.
Mounting direction	**They are installed radially directed.**

Product	Manufacturer brand	Ring type	Metal type	Diameter D (мм)	Thermal insulation thickness (мм)	Number of elements (pieces)	Number of paws (pieces)	Ribbon cross section (мм)	Thermal padding	Paws type	Springs type
Support Ring	PIPEWOOL	KO1	St3	219	170	1	3	2x30	T1	H4	
Support Ring	PIPEWOOL	KO2	08PS	1200	100	2	5	3x30	T1	L3	
Support Ring	PIPEWOOL	KO3	S-75	1200	100	2	5	3x30	T2		V1
Support Ring	PIPEWOOL	KO3	AMG3	1200	100	2	5	3x30	T2	L2	Q1

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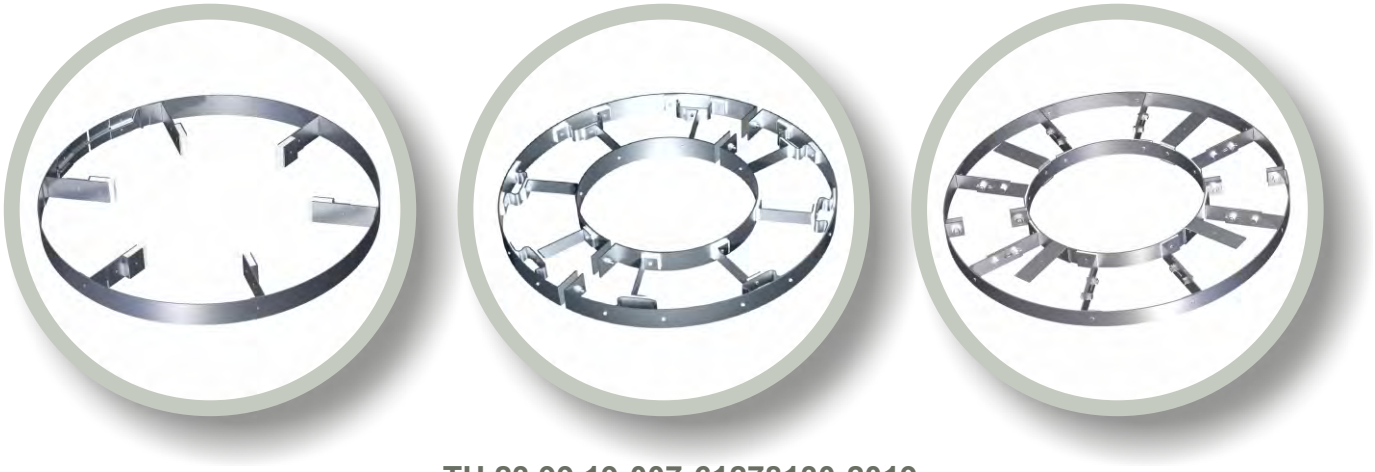
TECHNICAL SHEET 61278130 / 001MK



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Product execution (types)	KO1 Ring (with pin); KO2 Ring; KO3 Ring (double); KO4 Ring (double for springs); EKO1 Element; EKO2 Element (double)
Direction	Horizontal or Vertical for pipelines or tanks
Feature	
Product diameter	According to the Customer's specification
Length of distance holders (insulation thickness)	According to the Customer's specification
Metal type of Ring	Ordinary /galvanized steel (St3 / 08PS / 08KP); Stainless steel. (AISI 301; AISI 304; AISI 403; 12X18H9; St.1.4310; St.S-75); Aluminum (AMG2; AMG3; AD1H).
Sizes cross-section of metal tape	2x30; 3x30; 2x40; 3x40 mm
Number of product segments	From 4x (360°) or more (depending on the diameter of the product and in accordance with the load).
Distance holders	Assortment // According to the technical task of the Customer.
Metal type of Paws	Ordinary /galvanized steel (St3 / 08PS / 08KP); Stainless steel. (AISI 301; AISI 304; AISI 403; 12X18H9; St.1.4310; St.S-75); Aluminum (AMG2; AMG3; AD1H).
Metal type of Springs	Stainless steel. 1.4310.
Accessories	Assortment // According to the technical task of the Customer.
Mounting direction	They are installed radially directed.
Destiny	To increase the service life of the thermal insulation layer in fully assembled complete structures with a metal protective coating. They contribute to the unloading of the metal coating from gravity.

Product	Manufacturer brand	Ring type	Metal type	Diameter D (мм)	Thermal insulation thickness (мм)	Number of elements (pieces)	Number of paws (pieces)	Ribbon cross section (мм)	Thermal padding	Paws type	Springs type
Support Ring	PIPEWOOL	KO1	St3	219	170	1	3	2x30	T1	H4	
Support Ring	PIPEWOOL	KO2	08PS	1200	100	2	5	3x30	T1	L3	
Support Ring	PIPEWOOL	KO3	S-75	1200	100	2	5	3x30	T2		V1
Support Ring	PIPEWOOL	KO3	AMG3	1200	100	2	5	3x30	T2	L2	Q1

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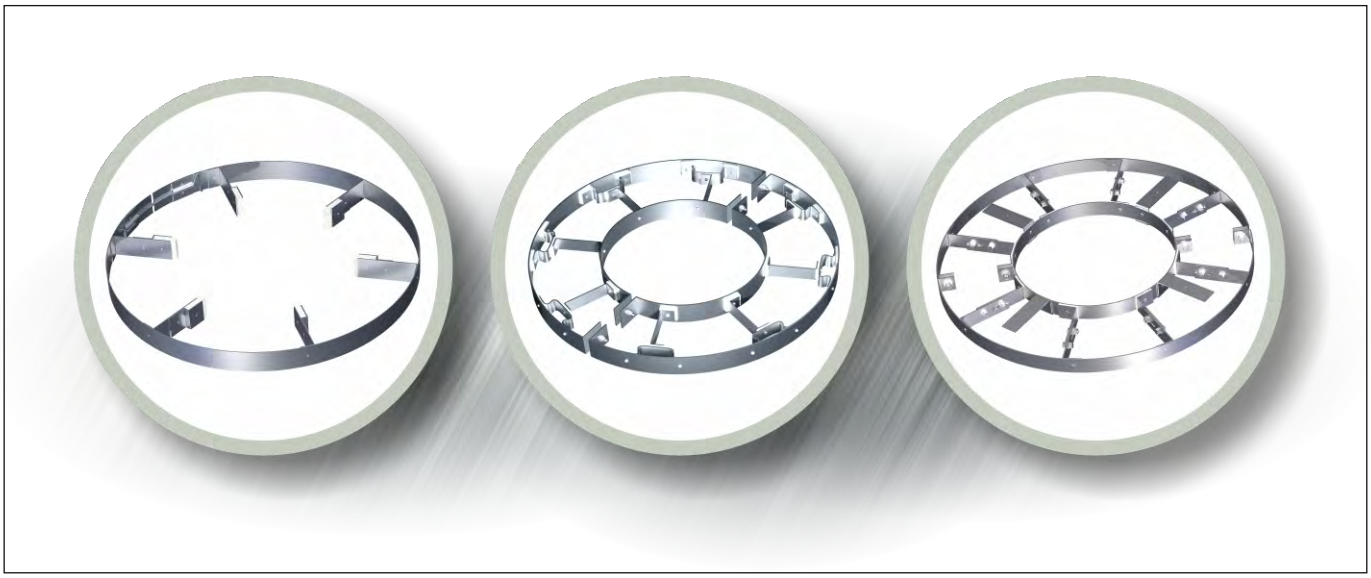
CUSTOMER SURVEY SHEET # _____

Information about the customer.	
Customer?* The company?*	
Object / # Order form / Date	
Phone / Your name?*	
Mail:	



Parameters of the Support ring.	* 000,00 - Fill it out & ☑ mark it.
Product execution (types)	○ KO1 ☐ ○ KO2 ☐ ○ KO3 ☐ ○ KO4 ☐ ○ EKO1 ☐ ○ EKO2 ☐
Direction	Horizontal ☐ Vertical ☐
Metal type of Ring	Ordinary /galvanized steel St3 ☐ 08PS ☐ 08KP ☐ Other ☐
	Stainless steel ☐ AISI 301 ☐ AISI 304 ☐ AISI 403 ☐ 12X18H9 ☐ 1.4310 ☐ S-75
	Aluminum ☐ AMG2 ☐ AMG3 ☐ AD1H ☐
Sizes cross-section of metal tape	2x30 ☐ mm 3x30 ☐ mm 2x40 ☐ mm 3x40 ☐ mm
Diameter D (mm)	External diameter ☐ mm Pipeline diameter ☐ mm
Number of products (pcs)	of Elements of the support ring ☐ pcs (*from 4x on 360° or more) of Paws ☐ pcs
Length Paws (insulation thickness)	☐ mm Insulation ☐ - One layer ☐ - Two layers

Parameters of the Distance holders.	* 000,00 - Fill it out & ☑ mark it.
Type of paws / springs	Type of paws ☐ Type of springs ☐ St.1.4310
Metal type of Paws	Ordinary /galvanized steel St3 ☐ 08PS ☐ 08KP ☐ Other ☐
	Stainless steel ☐ AISI 301 ☐ AISI 304 ☐ AISI 403 ☐ 12X18H9 ☐ 1.4310 ☐ S-75
	Aluminum ☐ AMG2 ☐ AMG3 ☐ AD1H ☐
Thermal pads T	NOVAPRESS ☐ ISOPLAN ☐ ☐ 2 mm ☐ 3 mm ☐ 5 mm ☐ 8 mm ☐ 10 mm

Calculation of components.	* 000,00 - Fill it out & ☑ mark it.	
Number of support rings KO	☐ pcs (*formula N1)	☐ pcs (*formula N1)
Number of EKO elements	☐ pcs (*formula N2)	☐ pcs (*formula N2)
Number of paws for KO	☐ pcs (*formula N3)	☐ pcs (*formula N3)
Number of pins for SB	SB1 ☐ pcs (*formula N4-1) ESB1 ☐ pcs (*formula N4-1) ESB2 ☐ pcs (*f.N4-3)	

Formula N1	Formula N2	Formula N3	Formula N4-1	Formula N4-2
$N1 = \frac{L}{1000mm} + 1$	$N2 = \frac{D*3,14}{2500mm}$	$N3 = \frac{D*3,14}{500mm} + 1$	$N4 = \frac{D*3,14}{250mm} + 1$	$N4 = \frac{R*3,14}{250mm} + 1$

SURVEY SHEET • SUPPORT RINGS PIPEWOOL

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