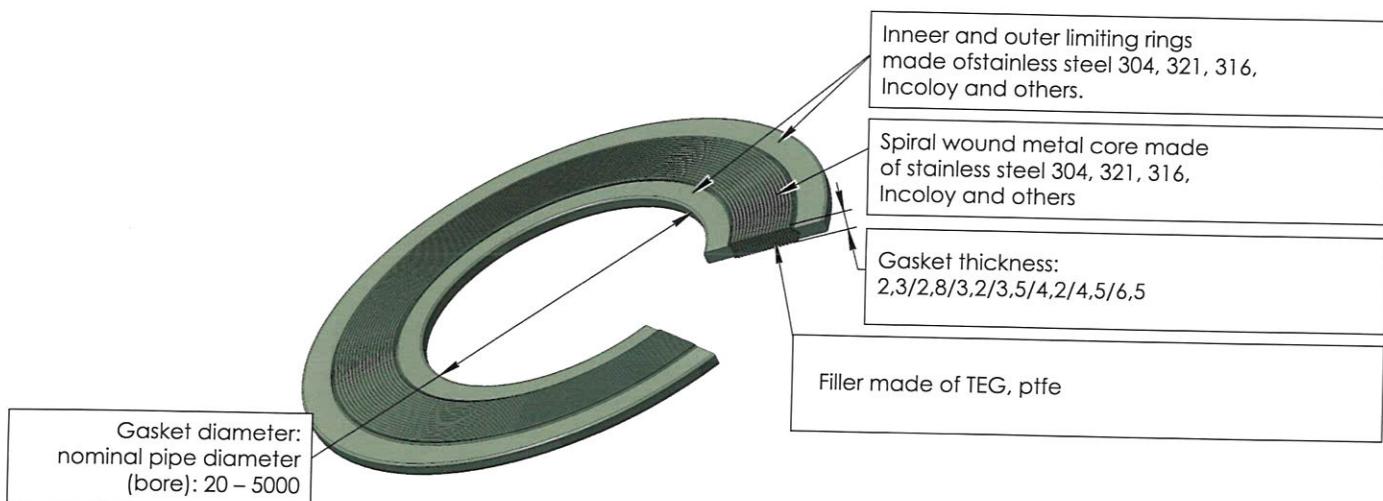


# SPIRAL WOUND GASKET (SWG)

## APPLICATION

SWG is designed to seal the standard types of mating surfaces (flange joints, "male-female", "tongue-groove", "plain surface-groove") of flange joints in valves, pipelines, vessels, pumps and other equipment used in nuclear, thermal power generating industries, chemical, oil refinery, gas, metallurgy industries as well as in aviation and shipbuilding.



	Operating pressure MPa from $13,6 \times 10^7$ to 40 MPa		Operating temperature from -253 to +650°C		Material Compressibility $\leq 30\%$		Restorability rate $\leq 15\%$		Durability 12 years
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Compensation of the depth defect on the flange sealing surface (in relation with the gasket thickness), %	$\leq 5$ , not more than 0,2mm
Compensation of nonflatness in flange joints (in relation with the gasket thickness), %	$\leq 7$ , not more than 0,45mm

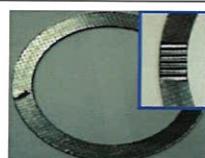
## ADVANTAGES

- Applicable for wide temperatures range;
- High chemical resistance;
- Can be used to seal flat joints in pipelines with A and B hazard type of media in 1st Category units, to seal flat flanges of vessels of group I, II.

# TEG (THERMAL-EXPANDED GRAPHITE) TAPE APPLICATION

TEG Tape is widely used in thermal and nuclear energy sphere, chemical, oil refinery industry as well as in, aircraft and aerospace engineering, electrical engineering, automotive, medical and food industries. The TEG tape is applied to seal of static detachable joints in valve flange connections and joints in pipeline units and non-standard flange connections.

## Basic Purposes and Applications:

01	02	03	04	05
Repairing metal rings with oval / octagonal cross-section	Attaching (forming) the gasket on flange	Repairing the damaged sealing material (spiral wound gasket)	Repairing the damaged flange surface	Sealing of the thread
				

DEPENDING ON THE PURPOSE AND APPLICATION, THE FOLLOWING TAPE MARKS ARE RECOMMENDED:

TAPE MARK	DESCRIPTION AND APPLICATION
• GL-2008 (GT* - Graphite tape)	 Finely corrugated self-adhesive non-reinforced TEG tape. Applicable for the purposes 1 3 4
GL-2004	 Corrugated self-adhesive non-reinforced TEG tape. Applicable for the purposes 2 3 4
GL-2601	 Smooth TEG tape reinforced with polymer film. Applicable for the purpose 5. Py (nominal pressure) ≤40,0MPa at temperature of up to 550°C
GL-2302	 Smooth, self-adhesive TEG tape, reinforced with fiberglass. Applicable for the purpose 5. Provided that the thread diameter >20mm. Py (nominal pressure) ≤20,0MPa at temperature of up to 550°C.

TEG (Thermal-Expanded Graphite) Tape					APPLICATION
TAPE DESCRIPTION	MARKING/GRADE	THICKNESS (mm)	WIDTH (mm)	DENSITY (g/cm³)	
Self-adhesive corrugated	GL-2004	0,4 – 0,7	5,0 – 50,0	0,9 – 1,1	Repairing the damaged sealing material, mounting surfaces, Repairing the damaged flange surface, instead of soft gaskets
Self-adhesive finely corrugated	GL-2008	0,4 – 0,7	5,0 – 50,0	0,9 – 1,1	Reconditioning of mounting surfaces of "Armko" rings
Smooth tape reinforced with polymer film	GL-2601	0,1 – 0,2	5,0 – 50,0	1,1 – 1,2	Sealing of the thread, Py ≤40,0MPa, T≤550°C.
Self-adhesive smooth tape reinforced with fiberglass	GL-2302	0,15 – 0,25	5,0 – 50,0	1,1 – 1,2	Sealing of the thread with diameter >40mm Py ≤20,0MP, T≤550°C.

1. Lifetime: at least 10 years

Working temperature from -240 C to +550 C, in the water steam to + 650 C? in nitrogen to +2000 C

## ADVANTAGES

- Applicable for wide temperatures range;
- Possesses high chemical resistance;
- Allows making the gaskets with required size that properly fits to the flange at the mounting area.

# TEG (THERMAL-EXPANDED GRAPHITE) SEALING RINGS

## APPLICATION

TEG sealing rings are produced from the cold pressed TEG tape (in some cases from the TEG tape with reinforcing material layers); from multiple layer Graphite Sheet Materials (by means of blanking or cutting with further forming); from braided gland packing with further forming (manufacturing methods and rings structure correspond to technical standard TU 5728-001-93978201-2008).

TEG rings are used to seal static and movable detachable joints in valve and pipeline units, vessels and pump systems. TEG sealing rings find its vast application in the similar equipment used in nuclear, thermal power generating industries, chemical, oil refinery, gas and other industries as well as in shipbuilding, in the units of hot and cold utility and drinking water supply, including drinking water systems.

## TECHNICAL CHARACTERISTICS



OPERATING  
PRESSURE  
From  $13,6 \times 10^7$   
to 40 MPa



VALVES  
SEALABILITY  
10000 Cycles



OPERATING  
TEMPERATURE  
- 253 °C to + 650  
°C  
Inert atmosphere  
Nitrogen: +2000 °C



DENSITY  
1,3-1,7 g/cm<sup>3</sup>



FRICTION  
COEFFICIENT  
ON STEEL  
Air: 0,1-0,15  
Water/water  
steam: 0,01-0,02

## ADVANTAGES

- Applicable for wide temperatures range;
- Ensures sealability of joints and connections under pressure and thermocyclic load conditions;
- Adjustable to the customer's required designs and features;
- Keeps the worn valve units in working condition by means of the rings' sets with anti-extrusion elements



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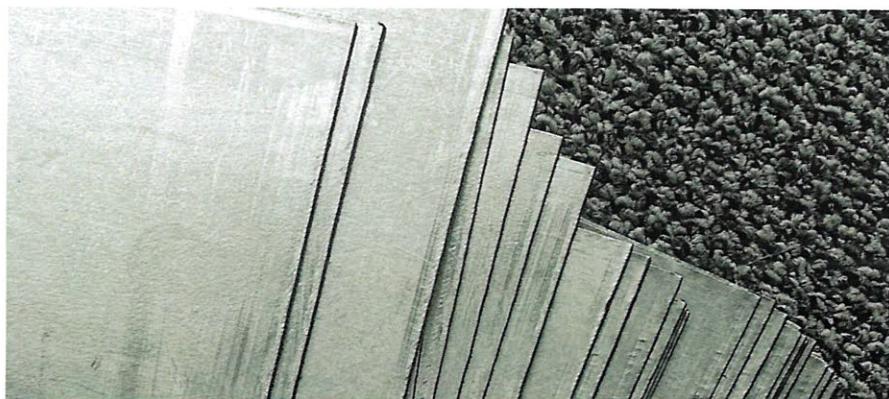
# GRAPHITE SHEET MATERIAL (GSM)

## APPLICATION

Manufactured in accordance with technical standard TU 5728-004-93978201-2007, Graphite Sheet Material (GSM) is used in production of sealing gaskets applied in static connections and joints of pipelines, valves, vessels and pump systems, cylinder blocks of ICE, gas-turbine units and other equipment.

Graphite Sheet Material (GSM) is extensively used in power generating, chemical, oil refinery and gas industry as well as in shipbuilding, aircraft and aerospace engineering, electrical engineering, automotive and other industries. It is applied both in internal and external sewage system units, land melioration, in the units of hot and cold utility and drinking water supply, including drinking water systems.

## TECHNICAL CHARACTERISTICS



OPERATING  
PREASSURE  
**up to 20MPa**



MATERIAL  
COMPRESSIBILITY  
**≤ 50%**



AVERAGE  
DURABILITY  
**12 years**



STORAGE LIFE  
**40 years**



RESTORABILITY  
RATE  
**≤ 17%**



OPERATING  
TEMPERATURE  
**From - 253 °C  
to + 650 °C**

Compensation of the depth defect on the flange sealing surface (in relation with the gasket thickness):  
**< 20 %, but no more than 1,0 mm**

Compensation of nonflatness in flange joints (in relation with the gasket thickness):  
**< 25 %, but no more than 1,2 mm**

## ADVANTAGES

- Applicable for wide temperatures range;
- High chemical resistance;
- Requires no special processing equipment.



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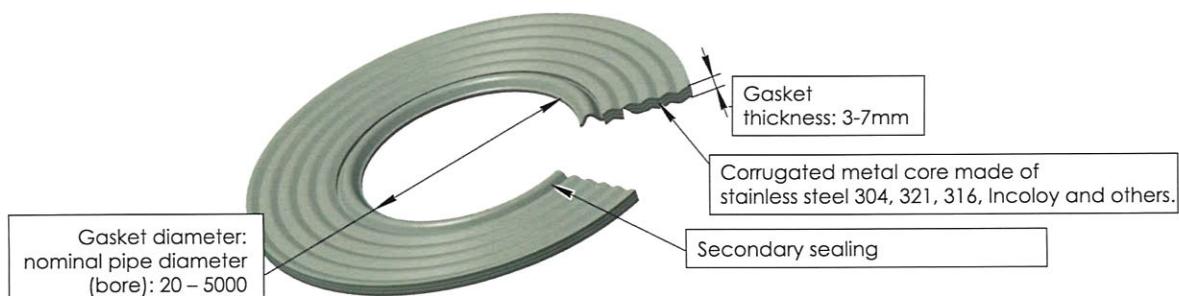
# TEG (THERMAL-EXPANDED GRAPHITE) SEALING GASKETS WITH CORRUGATED METAL CORE

## APPLICATION

Sealing Gaskets with Corrugated Metal Core and secondary sealing, cladded with TEG. The gasket in a form of flat metal rings with concentric wave-like form, in cross section appears like sine curve. Depending on the application, gaskets are cladded with two layers of flexible graphite material of different thickness. Owing to this design, the gasket has high compressive and flex strength, which is crucial for transportation, mounting and operation. Secondary wave structure prevents avalanche type leakages under non-standard conditions and protects the gasket from breaking.

The gaskets are designed to seal flange joints in valves, heat exchangers, pipelines and vessels. Gaskets find its vast application in the similar equipment used in nuclear, thermal power generating industries, chemical, oil refinery, gas metallurgy and other industries.

Sealing Gaskets with Corrugated Metal Core are produced in accordance with ASME B16.21, BS EN (DIN) 1514.4, BS EN 12560-4 standards and other technical documentation for flange joints – GOST Standard 12815-12822, GOST Standard 28759, GOST Standard P 54432, ASME B16.5, ASME B16.47, BS EN (DIN) 1092.1, BS EN 1759-1.



	Operating pressure MPa from to $13,6 \times 10^7$ to 40 MPa		Operating temperature from -253 to +650°C		Material Compressibility $\leq 44\%$		Restorability rate $\leq 13\%$		Durability 12 years
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Compensation of the depth defect on the flange sealing surface (in relation with the gasket thickness), %	$\leq 15$ , not more than 0,7mm
Compensation of nonflatness in flange joints (in relation with the gasket thickness), %	$\leq 25$ , not more than 1,3mm
Max flange gapping at 2,5MPa without leakage (in relation with the gasket thickness), %	$\leq 2,9$ , not more than 0,1mm

## ADVANTAGES

- Applicable for wide temperatures range;
- High chemical resistance;
- Various shape configurations;
- High compensation rate of the depth defects on the flange sealing surface;
- Stable sealability of joints and connections under pressure and thermocyclic load conditions;
- In accordance with GOST Standard 33259-2015 the product can be used to seal A and B type surfaces (applicable for 1,2,3 Hazard class toxic substances according to GOST Standard 12.1.007, for fire-dangerous and highly explosive materials according to GOST Standard 12.1.044

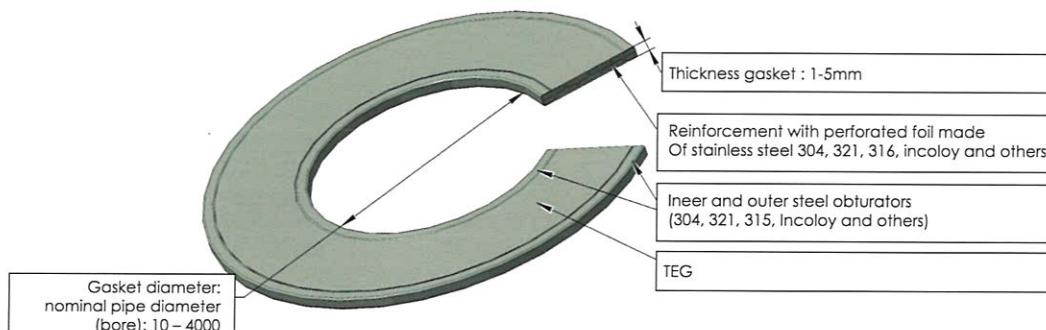
# GLAND PACKING

	GP (Graphite Packing)	PP (PTFE Packing)	AP (Aramid packing)	CP (Carbon packing)	PAP (PTFE Aramid Packing)
<b>Info-graphic</b>					
<b>Description</b>	Braided gland packing made of reinforced graphite yarn	Braided gland packing made of expanded PTFE yarn	Braided gland packing made of aramid fibers	Carbon Braided gland packing made of thermal stabilized PAN yarn	Graphite – carbon, graphite – aramid, graphite - PTFE, PTFE - aramid packing
<b>Advantages and Application</b>	Applicable for wide temperatures range. High resilience and thermal conductivity rate. High plasticity and stable sealability features under high pressure. Reduces the leakages, decreases operating costs and prolongs gland units durability.	High chemical stability, applicable for operation in corrosive environments, protects gland units from corrosion. High plasticity, static, non-toxic.	High mechanical strength, saves the structure under extremely high pressures and vibration loads with big gapping. Applicable for sealing the units in most polluted crystallizing environments where other packing cannot be used.	High mechanical strength, abrasive-resistant, high chemical stability. Recommended to be used as end rings and abrasive fender rings with other types of packing.	Reinforcing with aramid, PAN fibers enhances high pressure resistance and insures stable sealability under pressure and thermocyclic loads and abrasive, crystallizing conditions, high durability in constant start-stop modes.
<b>Operating parameters</b>	pH: 0-14, T: -200 +650° P: 250MPa (Valves) 3,5MPa (pumps)	pH: 0-14, T: -200 +260° P: 14MPa (Valves) 2,0MPa (centrifugal pumps)	pH: 2-12, T: -100 +280° P: 20MPa (Valves) 3,5MPa (centrifugal pumps) 15MPa (plunger pumps)	pH: 0-14, T: -200 +280° P: 35MPa (Valves) 2 - 5MPa (centrifugal pumps) 10 - 27MPa (plunger pumps)	
<b>Images</b>					

# TEG (THERMAL-EXPANDED GRAPHITE) SEALING GASKETS

## APPLICATION

TEG Sealing Gaskets are manufactured from both Graphite Sheet Material (GSM), non-reinforced or reinforced with perforated stainless steel foil. The gaskets are designed to seal the standard flange joints (GOST 12815, GOST 28759, ASME16.5), as well as to seal the units with oval, rectangular and other complicated configurations (horizontal connector segments of steam units). Owing to better technical characteristics in terms of operating temperature, compressibility/restorability, stable chemical properties and ability to seal the flanges with defects, TEG gaskets can effectively substitute paronite and other non-asbestos sealing materials that are widely used.



<b>p</b>					
Operating pressure g/cm <sup>2</sup> 0,8-1,5	Operating Pressure up to 20 MPa	Operating temperature from -253 to +650 °C	Material Compressibility ≤50 %	Restorability rate ≤17 %	Durability 12 years

Compensation of the depth defect on the flange sealing surface (in relation with the gasket thickness), %	≤20, not more than 1,0mm
Compensation of nonflatness in flange joints (in relation with the gasket thickness), %	≤25, not more than 1,2mm
Max flange gapping at 2,5MPa without leakage (in relation with the gasket thickness), %	≤1,85, not more than 0,07mm

## ADVANTAGES

- Applicable for wide temperatures range;
- High chemical resistance;
- Various shape configurations;
- Gasket can have split structure without sealability losses, applicable for units that cannot be completely disassembled.



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