



«GRAPHTRADE»

www.grefseal.com



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About Company:

Correspondence address: ul. Griaznova 4a, Zaporizhzhia city, 69002 (registered office);
ul. Stefanova 46, Zaporizhzhia city, 69068 (operational office);

E-mail: grefseal.office@gmail.com;

Web: www.grefseal.com;

Company Chief Executive Officer: Director General Anna Mikhailovna Naumenko;

Brief history of the Company:

'Graphtrade' Ltd started its operations on 9 December 2003. In accordance with the current legislation of Ukraine, business activity of 'Graphtrade' Ltd is not subject to compulsory licensing.

The enterprise manufactures sealing products with its own trademark: Grefseal.

Trade mark of the manufacturing enterprise has been certified by State Intellectual Property Service of Ukraine, Certificate No. 64151 of 17.07.2006.

Products manufactured by 'Graphtrade' Ltd are mainly consumed by enterprises of energy industry, chemical and oil refining industry, coal mining industry, metallurgical industry as well as mining and processing integrated plants.

Our enterprises manufactures sealing products in accordance with the following specially developed and formally approved technical specifications:

1. TU U 26.8-32786757-001:2008 - 'Grefseal Graphite Packings' (for nuclear power stations);
2. TU U 26.8-32786757-002:2011 - 'Grefseal Flanged Sealing Gaskets';
3. TU U 28.1-32786757-002:2012 - 'Grefseal Sealing Rings and Sealing Ring Sets';
4. TU U 29.1-32786757-001:2004 - 'Grefseal Asbestos-Free Packings';
5. TU U 28.1-32786757-003:2012 - 'Grefseal Asbestos-Free Sealing Sheets and Gaskets from Asbestos-Free Sealing Sheets';
6. TU U 26.8-25323997-001:2007 - 'Foil and Pressboard from Thermally Expanded Graphite';
7. TU U 28.2-32786757-004:2013 - 'Grefseal Double Jacketed and Waved Flanged Gaskets';

In March 2006 'Graphtrade' Ltd received Russian Maritime Register of Shipping Certificate of Type Approval No. 06.61049.184 of 03.03.2006 for graphite packing that was later prolonged under No. 11.61039.184 of 25.02.2011. This Certificate permitted manufacture and installation of packing for stern gears of all types of navigation ships.

In November 2006 the enterprise was awarded with International IQNet System Certificate and Certificate of Russian Register Certification System for compliance of the effective enterprise quality management system with ISO 9001:2000 International Standard.

Certificate No. 06.527.026 of 2 November 2006; in November 2009 2008 the enterprise quality management system was re-certified by Russian Register for compliance with ISO 9001:2008 International Standard.

In 2008 NNEG 'Energoatom' and State Nuclear Regulatory Inspectorate of Ukraine approved the enterprise's technical specifications for manufacture and delivery of sealing products for nuclear power stations and in April 2009 'Graphtrade' Ltd was confirmed as manufacturer and supplier of sealing products for nuclear power stations (Resolution on Approval No. 3Ш-П. 1.21.08-09).

In December 2008 'Graphtrade' Ltd also obtained expert findings No. 63.2-03-4959.08 'Conclusion report on possibility to use Grefseal flanged gaskets from thermally expanded graphite manufactured under TU U 26.8-32786757-002:2005, foil and pressboard from thermally expanded graphite manufactured under TU U 26.8-25323997-001:2007 and asbestos-free packings manufactured under TU U 29.1-32786757-001-2004 in the environment of chemical and oil refining industry of Ukraine' issued by 'UkrNIIkhim mash' OJSC Ukrainian Scientific Research Institute.

In 2018 Certificate of compliance with ISO 9001:2015 Quality Management System was obtained.

Heat-insulating cords with the through section

Grefseal HC-1



Components: Fiberglass roving.

Description: Glass wool woven by the through weaving method.

Characteristics:

Application temperature: +700 ° C;

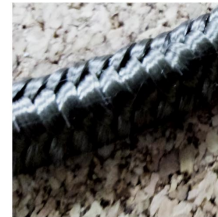
Thermal conductivity at +600 degrees Celsius: 0.22 W/mK;

Loss on ignition: 1.5%;

Section dimensions: 4 to 80 mm;

Forms of sections: Round, square, rectangular.

Grefseal HB-2



Components: Basalt fibers.

Description: Basalt fibers woven by the through weaving method.

Characteristics:

Application temperature: +900 ° C;

Thermal conductivity at +600 degrees Celsius: 0.24 W/mK;

Loss on ignition: 2%;

Section dimensions: 4 to 80 mm;

Forms of sections: Round, square, rectangular.

Grefseal HK-31



Components: Mullite silica fibers, glass-roving.

Description: Woven of mullite silica fibers with reinforcement of glass wool by the method of through weaving.

Characteristics:

Application temperature: +1000 ° C;

Thermal conductivity at +600 degrees Celsius: 0.22 W/mK;

Loss on ignition: 15%;

Section dimensions: 6 to 80 mm;

Forms of sections: Round, square, rectangular.

Grefseal HK-36



Components: Mullite silica fibers, high-temperature metal thread.

Description: Woven of mullite silica fiber with reinforcement made of high-temperature metal thread by through weaving.

Characteristics:

Application temperature: +1250 ° C;

Thermal conductivity at +600 degrees Celsius: 0.26 W/mK;

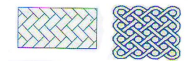
Loss on ignition: 17%;

Section dimensions: 6 to 80 mm;

Forms of sections: Round, square, rectangular.

Types of through weaving:

Square section:



Round section:



Rectangular section:



Application fields:

These cords are intended for sealing and heat insulating of fixed joints; they are also used as thermal insulation system elements. Several types of cords can also be used for movable system elements when applying certain impregnation compounds.

Advantages of use of cords with the through-section:

High density, long service life, application temperature of up to +1250 degrees Celsius, these cords do not burn, are asbestos-free, have low thermal conductivity coefficient and variety of shapes and sizes.

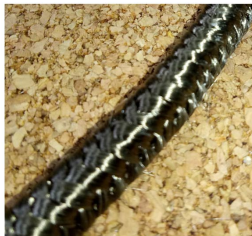
Heat-insulating cords in a thick braid

Grefseal SCHK-31



Components: Mullite silica fibers, glass-roving.
Description: Soft core of mullite silica fibers and glass-roving braid.
Characteristics:
Application temperature: +950 ° C;
Thermal conductivity at +600 degrees Celsius: 0.17 W/mK;
Loss on ignition: 2%;
Section dimensions: 10 to 120 mm;
Forms of sections: Round, square, rectangular.

Grefseal SCHB-2



Components: Basalt fibers.
Description: Soft core of basalt fibers and basalt fiber braid.
Characteristics:
Application temperature: +900 ° C;
Thermal conductivity at +600 degrees Celsius: 0.24 W/mK;
Loss on ignition: 2%;
Section dimensions: 10 to 120 mm;
Forms of sections: Round, square, rectangular.

Grefseal SCHK-36



Components: Mullite silica fibers, heat-resistant steel thread.
Description: Soft core of mullite silica fibers and mullite silica fiber braid reinforced with heat-resistant steel thread.
Characteristics:
Application temperature: +1250 ° C;
Thermal conductivity at +600 degrees Celsius: 0.16 W/mK;
Loss on ignition: 14%;
Section dimensions: 12 to 120 mm;
Forms of sections: Round, square, rectangular.

Grefseal SCHK-34



Components: Mullite silica fibers, silica fibers.
Description: Soft core of mullite silica fibers and silica fiber braid.
Characteristics:
Application temperature: +1350 ° C;
Thermal conductivity at +600 degrees Celsius: 0.18 W/mK;
Loss on ignition: 2%;
Section dimensions: 10 to 120 mm;
Forms of sections: Round, square, rectangular.

Application fields:
 Soft core and solid braid ensure high strength as well as softness and flexibility of a cord thus enabling to use them for sealing joints of high-temperature insulation system elements.

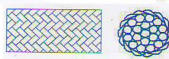
Advantages of use of cords with the through-section:
 Easy installation and use, low thermal conductivity, asbestos-free materials, wide range of operating temperatures (up to + 1350 degrees Celsius), variety of cord shapes, modest cost.

Types of through weaving

Square section:



Round section:



Rectangular section:



Soft and twisted heat-insulating cords

Grefseal MSCH-31



Components: Mullite silica thread, glass-roving.
Description: Consists of a soft core made of mullite silica fibers in a glass-roving reinforcing net.
Characteristics:
Application temperature: +900 ° C;
Thermal conductivity at +600 degrees Celsius: 0.14 W/mK;
Loss on ignition: 1.9 to 2.1 %;
Section dimensions: from 8 to 120 mm;
Forms of sections: Round.

Grefseal VSCH-31



Components: Mullite silica thread, glass-roving.
Description: Twisted cord made of mullite silica fibers reinforced with fiberglass thread.
Characteristics:
Application temperature: + 1000 ° C;
Thermal conductivity at +600 degrees Celsius: 0.23 W/mK;
Loss on ignition: 18%;
Section dimensions: 4 to 120 mm;
Forms of sections: Round.

Grefseal VSCH-36



Components: Mullite silica fibers, thread from a heat-resistant alloy.
Description: Cord woven from mullite silica fibers reinforced with a heat-resistant alloy thread.
Characteristics:
Application temperature: +1250 ° C;
Thermal conductivity at +600 degrees Celsius: 0.25 W/mK;
Loss on ignition: 15%;
Section dimensions: 4 to 120 mm;
Forms of sections: Round.

View of a soft cord



Application fields:

Soft cords have high suppleness and flexibility while remaining low priced which in turn creates a wider range of application in different branches of industry, for example, in pipeline repair and in construction works.

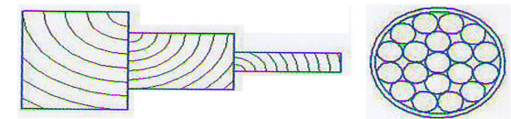
Advantages:

Easy installation and use, low cost, asbestos-free materials, low thermal conductivity coefficient, operating temperature up to +1250 degrees Celsius.

Disadvantages:

Modest strength, looseness, round section only.

View of a twisted cord



Application fields:

Twisted cords are an alternative to SCHAON cords. They are manufactured by method of twisting of high-temperature threads.

Advantages:

Low thermal conductivity, easy installation and use, operation at high temperatures up to + 1250 degrees Celsius, asbestos is not used in cords manufacture.

Disadvantages:

Looseness, round section only.

Heat-insulating hoses Fire-proof adhesive



Grefseal NPSCH heat-insulating hoses



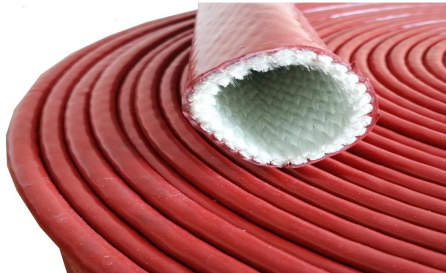
Grefseal heat-insulating hoses consist of high-temperature non-asbestos fibers. They are used to protect cables, pipes and high-pressure hoses from high temperatures, sparks and droplets of molten metals, punctures, erasures and other undesirable external factors. It is also possible to add various impregnation compounds to increase the density of the sleeve walls. Impregnation compounds allow to increase the service life, simplify the work when installing the hose, and also increase the chemical resistance of the hose.

Advantages of Grefseal NPSCH hoses:

They are asbestos-free, have long service life, are easy to install, have wall thickness of 0.5 to 22 mm; diameters of produced hoses range from 5 to 120 mm, the hoses are chemically inert.

Application fields:

Metallurgical, power, chemical, construction, machine building, automotive, shipbuilding branches of industry, protection of cables and hydraulics, HHP and hydraulic insulation.



KO-1200 fire-proof adhesive



KO-1200 fire-proof adhesive is a single-component system of nonorganic elements with additives based on metal oxides that is able to harden in normal conditions without temperature action.

Intended use: lining works during furnace bricklaying, refractory setting of boilers and other thermal equipment, sticking of heat-insulating cords on different surfaces of thermal systems, furnaces and other units, gluing together high-temperature ceramics, burner blocks, heat-insulating fabrics, full-scale repair of worn-out furnace and equipment lining, gluing together and laying of lightweight and ultra-lightweight heat-insulating and refractory materials, plates and products when performing lining works in heating furnaces and other types of thermal equipment.

Characteristics:

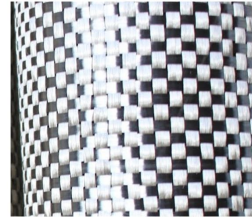
Density, g/cm³: 1.43;

Application temperature: up to 1200 degrees Celsius;

Tensile strength, kgs/cm³: 42.

Heat-insulating fabrics

Grefseal TTI-1



Components: Fiberglass roving.

Description: Consists of fiberglass roving.

Characteristics:

Application temperature: +700 ° C;

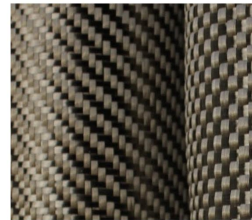
Thermal conductivity at + 20 degrees Celsius: 1.5 W/mK;

Loss on ignition: 1.5%;

Thickness: 0.2 to 10 mm;

Density: 100 to 5000 g/m².

Grefseal TTI-2



Components: Basalt fibers.

Description: Consists of basalt fibers.

Characteristics:

Application temperature: +900 ° C;

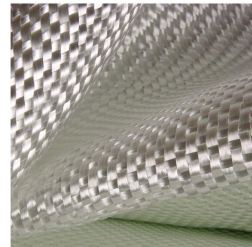
Thermal conductivity at + 20 degrees Celsius: 0.24 W/mK;

Loss on ignition: 2%;

Thickness: 0.2 to 10 mm;

Density: 100 to 5000 g/m².

Grefseal TTI-31



Components: Mullite silica fibers, glass-roving.

Description: Consists of mullite silica fibers with reinforcement of glass-roving.

Characteristics:

Application temperature: +1000 ° C;

Thermal conductivity at + 20 degrees Celsius: 0.20 W/mK;

Loss on ignition: 15%;

Thickness: 1 to 10 mm;

Density: 1000 to 5000 g/m².

Grefseal TTI-36



Components: Mullite silica fibers, high-temperature metal thread.

Description: Consists of mullite silica fiber with reinforcement made of high-temperature metal thread.

Characteristics:

Application temperature: + 1250 ° C;

Thermal conductivity at + 20 degrees Celsius: 0.26 W/mK;

Loss on ignition: 18%;

Thickness: 1 to 10 mm;

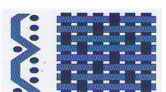
Density: 1000 to 5000 g/m².

Types of weaving:

Cloth



Satin



Sarge



Advantages of use of heat-insulating fabrics:

- Thermal shock resistance;
- High strength;
- High application temperature;
- Low thermal conductivity;
- Extended service life;
- Easy installation and removal;
- Good dielectric;
- Made of asbestos-free materials

Grefseal heat-insulating blankets

Excellent thermal, mechanical, resiliency, flexibility and strength properties ensure great popularity of this material. These materials are very popular in all branches of industry associated with high temperatures, as well as in manufacture and repair of furnaces and boilers.

Application fields:

Lining of industrial furnaces, thermal insulation of boilers and flues, insulation of welded joints for stress relief, high temperature gaskets, seals for high temperature compensation joints, heat insulation of high temperature pipelines, reusable insulation of steam and gas turbines, fire protection systems, filtration media at high temperatures.

Advantages:

Thermal stability (resistance of fibers to recrystallization), low thermal conductivity and heat capacity, resistance to thermal shock, high tensile strength, stable density and low shrinkage, high elasticity and flexibility, preservation of characteristics during heating, ease of installation.

Grefseal MT-1

Application temperature: + 1250 °C;

Density: 96 to 160 kg / m³;

Coefficient of thermal conductivity at 1000 °C: 0.26 W / mK;

Linear shrinkage after 1 day of heating at 1000 °C: 3.5%;

Tensile strength at 128 kg / m³: 0.09 to 0.12 MPa;

Heat capacity at 1000 °C: 1130 J;

Dimensions (Length x Width x Thickness): 14640x610x12.5 mm;
7320x610x25 mm;
3600x610x50 mm.

Grefseal MT-2

Application temperature: + 1260 °C;

Density: 96 to 160 kg / m³;

Coefficient of thermal conductivity at 1000 °C: 0.27 W / mK;

Linear shrinkage after 1 day of heating at 1000 °C: 3%;

Tensile strength at 128 kg / m³: 0.09 to 0.12 MPa;

Heat capacity at 1000 °C: 1130 J;

Dimensions (Length x Width x Thickness): 14640x610x12.5 mm;
7320x610x25 mm;
3600x610x50 mm.

Grefseal MT-3

Application temperature: + 1400 °C;

Density: 96 to 160 kg / m³;

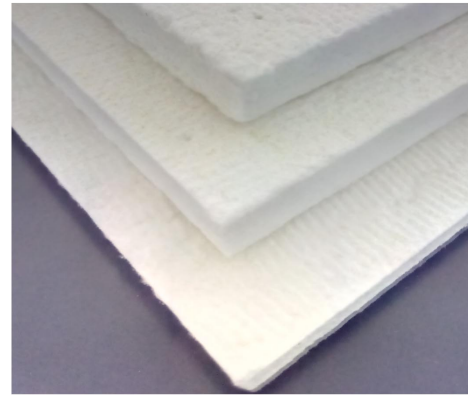
Coefficient of thermal conductivity at 1000 °C: 0.28 W / mK;

Linear shrinkage after 1 day of heating at 1350 °C: 3%;

Tensile strength at 128 kg / m³: 0.09 to 0.12 MPa;

Heat capacity at 1000 °C: 1130 J;

Dimensions (Length x Width x Thickness): 14640x610x12.5 mm;
7320x610x25 mm;
3600x610x50 mm.

Grefseal heat-insulating plates

Heat-insulating plates consist of ceramic fibers, have a huge range of applications, and therefore they are highly demanded in enterprises associated with high temperatures. Plates are rigid and due to this they can be processed for further operations with heat-insulating material.

Application fields:

Heat insulation of thermal furnaces, heat-compensating layers of lining, heat-insulating materials for insulation, kilns for ceramics, glass industry, reforming furnaces, catalysis furnaces, heat insulation of flues and chimneys, furnaces in aluminum industry, fire protection systems.

High compressive strength, bending, durability, easy installation and low labor costs, dimensional accuracy, smooth surface, resistance to erosion and flame, no brittleness in homogeneous structure, low thermal conductivity and low thermal capacity, resistance to thermal shocks.

Grefseal PT-1

Application temperature: 1050 °C;

Density: 220 kg / m³;

Coefficient of thermal conductivity: 0.12 W / mK;

Linear shrinkage after 24 hours of heating at 900 °C: 2.5%;

Specific heat at 1000 °C: 1130 J;

Ultimate strength: for compression, more than 400 kPa
for bending, more than 600 kPa.

Grefseal PT-2

Application temperature: 1250 °C;

Density: 300 kg / m³;

Coefficient of thermal conductivity: 0.17 W / mK;

Linear shrinkage after 24 hours of heating at 1000 °C: 2%;

Specific heat at 1000 °C: 1130 J;

Ultimate strength: for compression, more than 400 kPa
for bending, more than 600 kPa.

Grefseal PT-3

Application temperature: 1420 °C;

Density: 300 kg / m³;

Coefficient of thermal conductivity: 0.21 W / mK;

Linear shrinkage after 24 hours of heating at 1350 °C: 3%;

Specific heat at 1000 °C: 1130 J;

Ultimate strength: for compression, more than 400 kPa
for bending, more than 600 kPa.

Grefseal refractory paper

Grefseal high-temperature refractory paper made of ceramic fibers is produced using a special technology that provides high mechanical strength, homogeneity of structure, flexibility, smooth surface, a large range of sizes with low thermal conductivity.

Application fields:

Heat-insulating pads, heat insulation in steel ladles, temperature compensation joints, thermal insulation in steel casting molds, insulation of induction furnaces, heat shields, electrical insulating linings, lining of melting pots, lining of glass casting molds, fire protection equipment.

Advantages:

Flexibility and elasticity, low density, low thermal conductivity, accuracy of standard sizes, the possibility of obtaining die molds, easy installation and cutting, high tensile strength, resistance to thermal shock and thermal cycling.

Grefseal BTO-1 heat-insulating paper

Application temperature: +1260 °C;

Density: 200 kg / m³;

Coefficient of thermal conductivity at +1000 °C: 0.22 W / mK;

Loss on ignition: 10%;

Tensile strength: more than 300 kPa;

Linear shrinkage after 24 hours of heating at 1000 °C: less than 3%;

Dimensions (Length x Width x Thickness): 40000 x 610 x 1 mm; 40000 x 1200 x 1 mm;
30000 x 610 x 2 mm; 30000 x 1220 x 2 mm;
20000 x 610 x 3 mm; 20000 x 1220 x 3 mm;
20000 x 610 x 4 mm; 20000 x 1220 x 4 mm.

**Grefseal heat-insulating cardboard**

Grefseal heat-insulating cardboard is made of high-temperature non-asbestos fibers, mineral binders and various fillers. It is used to protect equipment from the effects of high temperature and packing material.

Application fields:

Thermal insulation of equipment, fire protection of cables, lining of furnaces, high-temperature gaskets, lining of combustion chambers, as well as metallurgical, energy, chemical, machine building, automotive, shipbuilding and household branches of industry.

Advantages:

High application temperature, no asbestos, long service life, chemical inertness, easy installation, wide range of dimensions and thicknesses.

Grefseal KTO-1 heat-insulating cardboard

Application temperature: +1200 °C;

Loss on ignition: not more than 15%

Density: up to 1120 kg / m³;

Thermal conductivity at +600 °C: 0.12 W / mK;

Dimensions of heat-insulating cardboard (Length x Width): 1000 x 1000 mm;

Thicknesses: 5 to 10 mm.



Grefseal thermosealing tape



Grefseal LTU fire-resistant thermosealing tape with self-adhesive layer is one of the best fireproof sealers, it is used to seal gaps and increase fire resistance of fire doors, gates, manholes, smoke valves, flange connections of air ducts, lift shafts, fireproof safes, etc.

Operation principle

At the moment of fire breaking-out and under the influence of high temperatures (from 150 °C) graphite-based flame retardant material used to manufacture thermosealing tape seals the gaps between the canvas and the frame of fire-proof door (or other fire-fighting structure), thereby preventing the penetration of fire and smoke to the adjacent room.

Grefseal LTU thermosealing tape is perfect for sealing gaps and slots in your house, garage, shop, office, workshop or production premises. Self-adhesive tape is made of high-quality fire-resistant material: graphite coming into reaction at a temperature of +150 °C and insulating adjacent rooms from fire and smoke propagation. Thermosealing tape can hold the flame during the period of up to 4 hours. In addition, its advantages are resistance to water and friction, non-toxicity and durability.

Grefseal heat-insulating tape

Grefseal refractory and heat-insulating tapes consist of high-temperature non-asbestos fibers. They are used for thermal insulation of various surfaces with operating temperatures of up to +1350 degrees Celsius, for curtains protecting from the impact of hot gases, sparks and drops of molten metal, etc.

The tapes have a sticky layer on a paper base for easier installation and operation.

Before installation it is necessary to remove the paper base of the adhesive layer.

This design provides density and enables tighter sealing of a unit.

There can be the following types of fibers wave construction:

- 1) 'Sarge';
- 2) 'Cloth';
- 3) 'Satin';



Tape temperature conditions depend on materials used to manufacture Grefseal heat-insulating tapes:

- 1) LTI-1 (fiberglass roving): application temperature +700 °C;
- 2) LTI-2 (basalt fibers): application temperature +900 °C;
- 3) LTI-31 (mullite silica fibers, glass-roving): application temperature +1100 °C;
- 4) LTI-35 (mullite silica fibers, heat-resistant steel thread): application temperature +1250 °C;
- 5) LTI-4 (silica fibers): application temperature +1350 °C.



«Graphtrade» Ltd
ul. Gryaznova 4-a,
Zaporizhzhia city, Ukraine, 69002
Phone: + 38 094 920 92 60
Phone: + 38 094 920 92 61
Web: www.grefseal.com
E-mail: grefseal.office@gmail.com

Contact information of your manager:



