Burgmann Packings

Product Portfolio
Packings and Gaskets

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Sealing expertise you can trust

Burgmann Packings is a privately owned manufacturer of metallic gaskets, compression packings and graphite rings with operations in China, Ireland, Turkey and headquarters in Germany.

With over 130 years experience Burgmann Packings sealing products can be found in all industry sectors on a global basis. With our worldwide manufacturing locations Burgmann Packings can meet the most demanding quality and delivery expectations globally.

Burgmann Packings is at the forefront in developing new sealing solutions using high performance raw materials. In combination with our own research and development facilities we collaborate with leading test institutes and universities to provide most up-to-date solutions for operating processes and environmental protection. With all our products we aim to provide the best sealing solutions. We strive to meet customer requirements in safety, reliability, performance and optimised life-cycle costs.

Growing from our German manufacturing base all of our facilities are equipped with advanced production technologies. Our production sites are certified to ISO 9001 and are able to manufacture according to international standards such as ASME and EN as well as to specific customer requirements. Our products are exported to more than 30 countries worldwide and have an excellent reputation with customers.

Burgmann Packings is
a member of the European
Sealing Assiciation e.V.

European
Sealing
Association e.V.

Facts and Figures

130

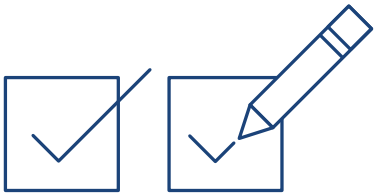
130 years of experience in sealing technology

Leading manufacturer of metallic gaskets, packings and graphite rings

30

Certified according to globally accepted Quality and HSE standards

Our products are exported to more than 30 countries worldwide

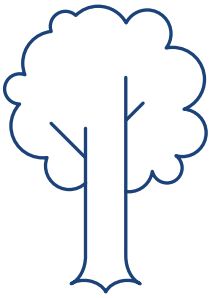


Single source for gaskets and packings

300

More than 300 skilled and dedicated employees

Strategically located production hubs in China, Ireland, Turkey and headquarters in Germany



Pioneer in development and manufacturing of low fugitive emission technologies


BPG DN40
BPG DN40 PN10-

Fugitive Emission Management

Burgmann Packings offers the complete range of low fugitive emission sealing products – for both new valves and retrofits. Especially when combined with an application specific live-loading system they achieve leakage rates which are consistently lower than those required by legislation. This is why our "Best Available Technology" (BAT) products are approved at leading end users and OEM manufacturers.

Environmental protection with Burgmann Packings sealing products:

Valves, especially control valves, account for approximately 60 % of the leakage loss in a plant. For processes containing hazardous fluids conventional packings can be replaced with low emission sealing sets.

Fugitive Emission Control Sealing Technology helps to:

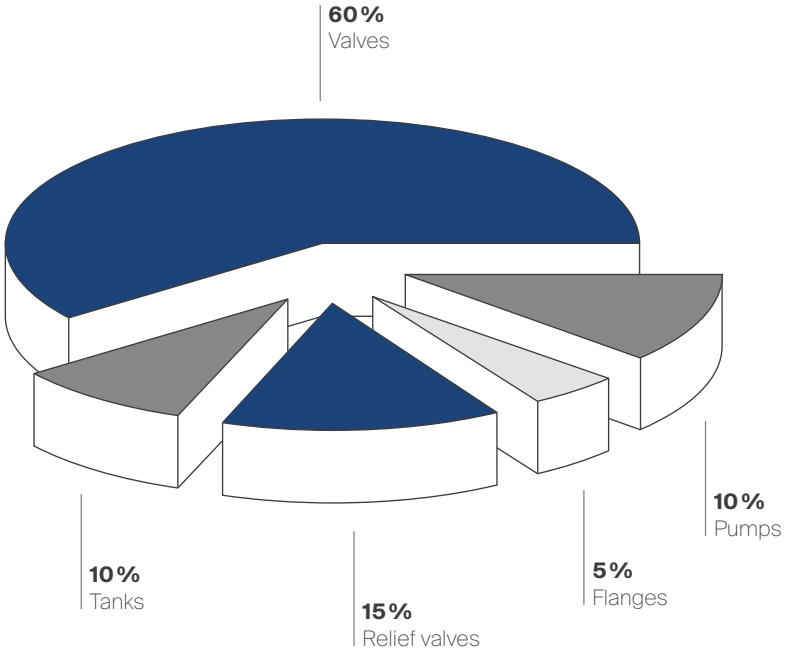
1. Increase plant safety
2. Protect our environment
3. Increase plant efficiency and throughput
4. Improve your bottom line
5. Meet strictest emission standards worldwide

Relevant standards:

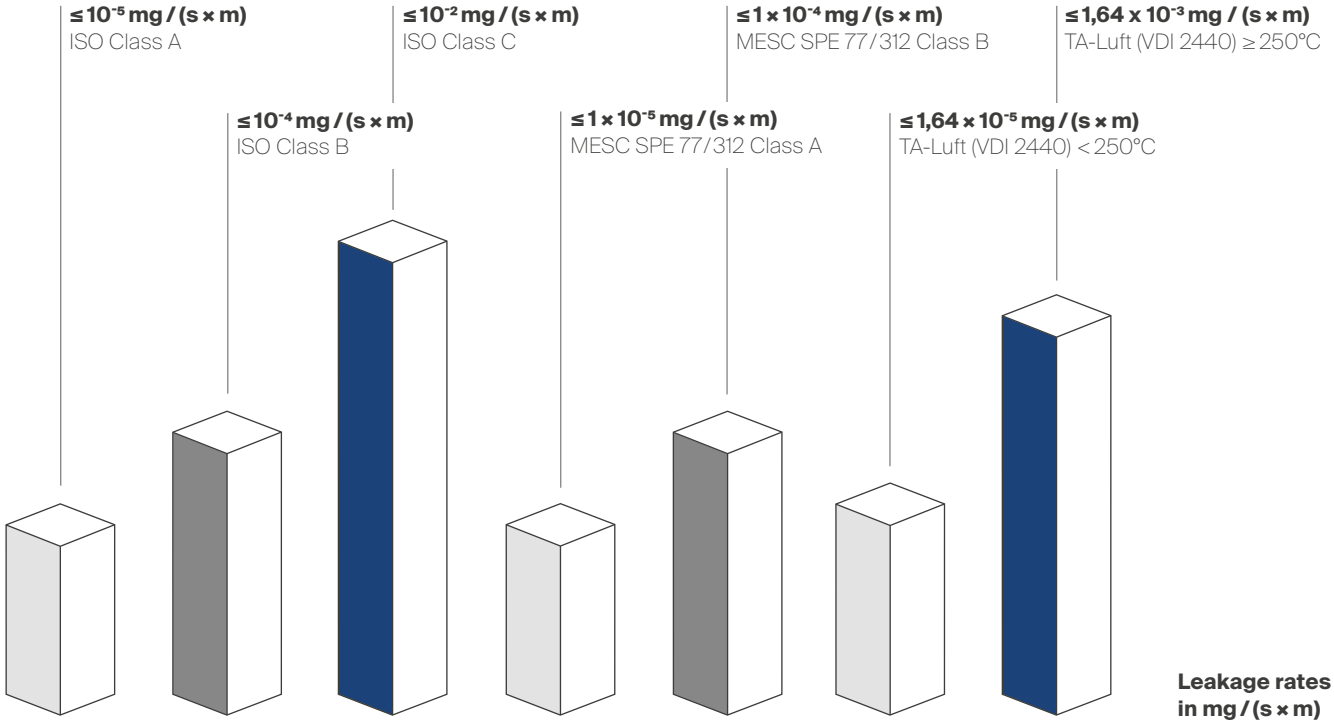
ISO 15848 (Parts 1 and 2), Clean Air Act, API 622, API 624, VDI 2440, TA-Luft

Fugitive Emission Control

Sources of Emissions
Besides unsealed equipments in processing plants the majority of Fugitive Emissions are caused by the components shown above.



Comparison of Emission Standards
Global emission standards differentiate as testing procedures, media, threshold values and leak detection methods are not harmonized. Burgmann Packings engineers will support to meet both, global standards and customer specific regulations.



Fugitive Emission Standards

ISO 15848
ISO 15848 regulation describes measurement, test and qualification procedures for fugitive emissions at industrial valves. The regulation is separated into 2 parts:

- ISO 15848-1: Classification system and qualification procedures for type testing of valves
- ISO 15848-2: Specifies production acceptance test of valves for valve manufacturer

ISO 15848 categorises three tightness classes:

Grade	Measured leakage rate	Remarks
A	$\leq 10^{-5}$ mg / (s × m)	Typically achieved with bellow seals or equivalent spindle / shaft gasket system for swivel valves
B	$\leq 10^{-4}$ mg / (s × m)	Typically achieved with packing system based on PTFE or elastomer materials
C	$\leq 10^{-2}$ mg / (s × m)	Typically achieved with packing on flexible graphite basis

TA-Luft (VDI 2440)
The German Fugitive Emission Control Legislation refers in TA-Luft regulation to VDI 2440 for defining leakage rates, test and measuring methods.

VDI 2440 defines following maximum leak rates for harmful VOC's (Volatile Organic Compounds) for valves:

Temperature rate	Measured leakage rate
< 250°C	$\leq 10^{-4}$ mbar × l / (s × m)
≥ 250°C	$\leq 10^{-2}$ mbar × l / (s × m)

Flange connections according to VDI 2200, VDI 2440 and TA-Luft
According to TA-Luft and VDI 2440 flange connections must comply with maximum leakage rate of 10^{-m} mbar × l (s × m) at test pressure of 1 bar. VDI 2200 defines the selection, calculation, design and assembly of bolted flange connections as well as test procedures and refers to VDI 2440 regarding permissible leak rates. VDI 2200 also defines criteria for "Blow-out" safety test for gaskets. Aim of this Blow-out test is to avoid a sudden leakage through seal burst.

Clean Air Act
The Clean Air Act defines maximum leakage levels for flange connections, valves, pumps and agitators in the USA. Leakage test has to be done according to EPA Method 21 (sniffing method) with methane.

API 622
API 622, 2nd Edition is an international performance test for packing materials considering several factors such as temperature, pressure, thermal and mechanical cycling.
2nd Edition of API 622 defines 1510 mechanical cycles and 5 thermal cycles. High temperature test shall be performed from ambient temperature to 260°C (500 °F) and pressures from 0 to 600 psig (0 – 41 barg). Permissible leakage level is 100 ppm with test medium methane.

API 624
First edition of API 624 is a type testing of rising stem valves equipped with graphite packing for Fugitive Emissions. The standard covers rising and rising-rotating stem valves up to 24" diameter and has to be performed at original valves. The test procedure requires 310 mechanical cycles and three thermal cycles to 260°C (500 °F). Allowable leakage is 100 ppm maximum. It requires that the tested valve packing be previously tested according to API 622 and be suitable for use at service temperatures –29°C to +538°C (–20 °F to 1000 °F).

Fugitive Emission Control Packings

BPG 7200

Properties

- Made from high grade impregnated non-woven materials
- The rings consist of aramid non-woven fibers with a special PTFE impregnation
- Suitable for Low Emission applications

Applications

Valves

Operation Parameters

speed: 2 m / s
temperature: –200°C ... +280°C
pH value: 0 ... 14
pressure: 25 MPa

Media

Most chemicals (solvents, hydrocarbons, acids, lyes), alcohols, water, oils etc.
Exceptions: highly concentrated acids and lyes, fluorine and some fluorine compounds

Industries

Valve OEM's, MRO in Gas, Oil, Process and General Industry

Certificates / Approvals

TA-Luft, ISO 15848

Benefits

- Extremely low leakage rate
- High cross sectional density and stability
- Excellent low friction properties
- Suitable for applications which require high cleanliness

BPG 7250

Properties

- State of the art sealing technology by combination of two non-woven materials
- End rings of non woven fibers with a high carbon content
- Intermediate rings consist of aramid non-woven fibers with special PTFE impregnation

Applications

Valves

Operation Parameters

speed: 2 m / s
temperature: –200°C ... +280°C
pH value: 0 ... 14
pressure: 25 MPa

Media

Most chemicals (solvents, hydrocarbons, acids, lyes), alcohols, water, oils etc.
Exceptions: highly concentrated acids and lyes, fluorine and some fluorine compounds

Industries

Valve OEM's, MRO in Gas, Oil, Process and General Industry

Certificates / Approvals

TA-Luft, ISO 15848

Benefits

- Ideally suited for control valves in fugitive emission applications
- Excellent resistance against gap extrusion

BPG 7290

Properties

- Based on braided end rings of expanded pure graphite reinforced with carbon yarn corners
- High density expanded graphite disks with permeation barrier
- Uniquely impregnated high density expanded graphite adapter rings and low density expanded graphite sealing ring with special friction-reducing coating

Applications

Valves

Operation Parameters

speed:	2 m / s
temperature:	–200°C ... +400°C (most media) –200°C ... +550°C (steam)
pH value:	0 ... 14
pressure:	30 MPa

Media

Most chemicals (solvents, hydrocarbons, acids, lyes), steam, alcohols, oils etc.

Industries

MRO in Gas, Oil, Process and General Industry

Certificates / Approvals

TA-Luft, ISO 15848, API 622, API 598 (Fire Safe)

Benefits

- Up to 80 % lower friction compared to standard sealing systems made of expanded graphite
- Very low spindle torques at high temperature
- Low compression required due to optimized force deflection

BPG 6559

Properties

- Braided from high purity expanded graphite material (C-content > 99 %) over knitted with Inconel wire
- It contains a special high temperature impregnation and a corrosion inhibitor

Applications

Valves

Operation Parameters

speed:	2 m / s
temperature:	–200°C ... +450°C (most media) –200°C ... +650°C (steam)
pH value:	1 ... 14
pressure:	45 MPa

Media

Hot water, steam, gases, oils, acids and alkalis.
Exceptions: strongly oxidising acids like sulphuric acid and nitric acid in high concentrations

Industries

MRO in Gas, Oil, Process and General Industry

Certificates / Approvals

TA-Luft, ISO 15848, API 622, API 598 (Fire Safe), Chevron and Texaco Test

Benefits

- High pressure resistance
- Excellent performance for fugitive emission and TA-Luft valves
- Quick repair for all valve dimensions

BPG 7300

Properties

- The sealing set contains five packing rings made from laminated carbon non-woven and expanded graphite foil
- Additionally coated with a special high temperature impregnation

Applications

Valves

Operation Parameters

value:	2 m / s
temperature:	–200°C ... +400°C (most media) –200°C ... +550°C (steam)
pH value:	0 ... 14°C
pressure:	25 MPa

Media

Most chemicals (solvents, hydrocarbons, acids, lyes), steam, alcohols, oils etc.
Exceptions: strongly oxidising acids like sulphuric acid and nitric acid in high concentrations

Industries

Valve OEM's

Certificates / Approvals

TA-Luft, ISO 15848, API 598 (Fire Safe)

Benefits

- Very low leakage rates compared to standard expanded graphite rings
- Minimized adhesion and sticking of graphite particles on the spindle due to the carbon non-woven layer on the inside of the ring
- Lower friction forces in comparison to expanded graphite rings

Packings

Plunger Pump Rotary Pump Valve

BPG 4313

Properties

- Rotary pump packing
- Diagonal braided from fine cotton yarn
- Impregnated with a mineral lubricant with graphite

Density

1.15 g / cm³

Applications

Rotary pumps

Operation Parameters

speed: 6 m / s
temperature: –20°C ... +100°C
pH value: 6 ... 9
pressure: 1.6 MPa

Media

Cold water, hot water, air etc.

Variations

- BPG 4314 -with a red grease impregnation
- BPG 4315 -with a light colour grease impregnation

Benefits

- Cost effective packing for rotary pumps
- Soft and flexible, no scoring on shaft
- Can prevent overheating during running in period

BPG 4586

Properties

- Economical packing for rotary and plunger pumps
- Braided from ramie yarn
- Intense PTFE impregnation

Density

1.30 g / cm³

Applications

Rotary pumps, plunger pumps

Operation Parameters

speed: 13 m / s, 2 m / s
temperature: –40°C ... +120°C
pH value: 5 ... 11
pressure: 4 MPa, 100 MPa (Installation with anti-extrusion rings)

Media

Cold and warm fresh / sea water, drinking water, solutions with solid particles, oil, solvents etc.

Certificates / Approvals

- FDA

Benefits

- Extremely wear resistant
- Water resistant, will not swell or rot
- High chemical resistant
- Long service life
- Low friction and low volume loss
- Excellent pressure resistant
- Economical

BPG 6130

Properties

- Ideal for drinking water applications
- Braided from acrylic yarns
- Special PTFE impregnation
- Silicon oil lubricant

Density

1.25 g / cm³

Applications

Rotary pumps, valves

Operation Parameters

speed: 12 m / s, 2 m / s
temperature: –50°C ... +150°C
pH value: 2 ... 12
pressure: 2 MPa, 10 MPa

Media

Drinking water, warm and cold fresh / sea water, fluids containing solid particles, oil, solvents etc.

Certificates / Approvals

- WRAS / BS 6920:2000

Benefits

- Wear resistant
- Flexible
- Smooth running, low friction
- Approved for use with drinking water

Packings

BPG 6215

Properties

- Universal packing for abrasive media and shaft deflection
- Braided from aramid yarn
- Special PTFE impregnation
- Silicon-free lubricant

Density

1.32 g / cm³

Applications

Rotary pumps, valves

Operation Parameters

speed: 26 m / s, 2.5 m / s
temperature: –50°C ... +280°C
pH value: 1 ... 13
pressure: 2.5 MPa, 10 MPa

Media

Cold and hot water, salt solutions, organic solvents, hydrocarbons, oil, greases etc.

Variations

- BPG 6204 -without lubricant for static and valve applications
- BPG 6209 -braided from multi filament aramid yarn

Benefits

- Robust and durable
- Extremely wear resistant against abrasive media
- Long service life
- Very resilient and flexible
- Suitable for sealing against shaft deflection
- Very resistant against temperature and chemical fluctuations

BPG 6216

Properties

- Pump packing for high shaft speeds and abrasive media
- Braided from PTFE-graphite compound yarn with wear resistant multifilament aramid yarn in corners
- Silicon-free lubricant

Density

1.35 g / cm³

Applications

Rotary pumps, plunger pumps

Operation Parameters

speed: 25 m / s, 2 m / s
temperature: –50°C ... +280°C
pH value: 1 ... 13
pressure: 2.5 MPa, 25 MPa

Media

Hot water, salt solutions, alkalis, organic solvents, hydrocarbons, acids etc.

Variations

- BPG 6211 -high pressure plunger pumps
- BPG 6212 -variant with white PTFE yarn

Benefits

- Thermally stable and smooth running surface, very good heat conductivity
- Excellent sliding characteristics, very low friction to protect shaft
- High stability and anti-extrusion protection
- Excellent sealing performance against abrasive media

BPG 6224

Properties

- Rotary pump packing
- Special braiding structure of a dense and smooth running graphite-filled PTFE yarn in combination with a strong aramid yarn
- Silicon oil lubricant

Density

1.52 g / cm³

Applications

Rotary pumps

Operation Parameters

speed: 20 m / s
temperature: –50°C ... +280°C
pH value: 1 ... 13
pressure: 2.5 MPa

Media

Hot water, alkalis, organic solvents, salt solutions, hydrocarbons, oils, greases, medium concentrated acids

Benefits

- Robust and wear resistant
- Dry running is possible for short time
- Strong aramid yarn provides high resistance against abrasive media
- Anti-extrusion stability against high pressure
- PTFE / graphite yarn provides smooth running and low wear

Plunger Pump Rotary Pump Valve

BPG 6250

Properties

- Diagonally braided from a white meta-aramid yarn
- Silicon-free lubricant

Density

1.35 g / cm³

Applications

Rotary pumps, also suitable for mixers, kneaders and refiners

Operation Parameters

speed: 25 m / s
temperature: –50°C ... +250°C
pH value: 1 ... 13
pressure: 2.5 MPa

Media

Cold and hot water, salt solutions, organic solvents, hydrocarbons, oil, greases

Certificates / Approvals

- FDA

BPG 6313

Properties

- Ideal packing in the food processing and chemical industry
- Braided from pure PTFE yarn
- Additional PTFE impregnation
- Silicon-free lubricant

Density

1.72 g / cm³

Applications

Rotary pumps

Operation Parameters

speed: 8 m / s
temperature: –100°C ... +250°C
pH value: 0 ... 14
pressure: 1.5 MPa

Media

Almost all chemicals including concentrated and hot acids and alkalis.
Exceptions: molten alkali metals, fluorine and some fluorine compounds

Certificates / Approvals

- FDA

BPG 6323

Properties

- Braided from graphite-filled PTFE yarn
- Silicon oil lubricant

Density

1.60 g / cm³

Applications

Rotary pumps, valves

Operation Parameters

speed: 20 m / s, 2 m / s
temperature: –100°C ... +280°C
pH value: 0 ... 14
pressure: 2.5 MPa, 25 MPa

Media

Alkalis, solvents, bitumen, almost all acids.
Exceptions: highly concentrated nitric acid, oleum

Certificates / Approvals

- FDA

Variations

- BPG 6329 -braided from 100 % GFO© yarn

Benefits

- Strong and smooth yarn
- Extrusion resistant and gentle on shaft
- High elasticity
- Low maintenance
- High cross-sectional density for excellent sealing performance

Benefits

- Universal suitable for all chemicals
- Very pliable and dense when installed
- Very low leakage

Benefits

- Very low thermal expansion
- Low friction characteristics
- Ability to run at high speeds
- Long service life
- Low leakage with a minimum of gland pressure

Packings

BPG 7000

Properties

› Extruded packing
› Made of PTFE graphite compound

Density

1.80 g / cm³

Applications

Rotary pumps, valves

Operation Parameters

speed: ⊛ 6 m / s, ⏃ 2 m / s
temperature: –30°C ... +250°C
pH value: 0 ... 14
pressure: ⊛ 16 MPa, ⏃ 2.5 MPa (Installation with anti-extrusion rings)

Media

Alkalis, solvents, alcohols, ketones, esters, oils, acids, hot water, boiler lye, brine, ammonia.
Exceptions: strongly oxidising acids

Benefits

› Very high density
› Both pliable and volumetrically stable
› Self-lubricating
› Resistant to gas permeation
› Easy installation and long service life
› Ideal for sealing abrasive media
› Can run "dry" in some applications

BPG 6303

Properties

› Braided from graphite-filled PTFE yarn

Density

1.45 g / cm³

Applications

Valves, plunger pumps

Operation Parameters

speed: ⏃ 2 m / s, ⏁ 2 m / s
temperature: –200°C ... +280°C
pH value: 0 ... 14
pressure: ⏃ 25 MPa, ⏁ 80 MPa (Installation with anti-extrusion rings)

Media

Steam, condensate, alkalis, solvents, almost all acids.
Exceptions: highly concentrated nitric acid and oleum

Certificates / Approvals

› FDA
› FDA, BAM approval for gaseous oxygen (3MPa up to 60°C)

Benefits

› High graphite content
› High chemical and pressure stability
› Excellent thermal conductivity
› Suitable for use in nuclear power stations

BPG 6375

Properties

› Braided from pure PTFE yarn
› Additional PTFE impregnation

Density

1.75 g / cm³

Applications

Valves, plunger pumps

Operation Parameters

speed: ⏃ 2 m / s, ⏁ 2 m / s
temperature: –200°C ... +280°C
pH value: 0 ... 14
pressure: ⏃ 25 MPa, ⏁ 50 MPa (Installation with anti-extrusion rings)

Media

All chemicals including concentrated hot acids and alkalis.
Exceptions: molten alkali metals, fluorine and some fluorine compounds

Certificates / Approvals

› FDA
› BAM approval for gaseous oxygen (3 MPa up to 60°C)

Benefits

› Particularly tight braid and dense structure
› High degree of dimensional stability and compressibility
› Very low leakage rates
› Very low setting rates
› Suitable for use in nuclear power stations

Plunger Pump Rotary Pump Valve

BPG 6562

Properties

- Braided from pure expanded graphite yarn
- Aramid yarn reinforced corners
- Silicone-free running-in lubricant

Density

1.25 g / cm³

Applications

Rotary pumps

Operation Parameters

speed: 40 m / s
temperature: –100°C ... +280°C
pH value: 1 ... 13
pressure: 4 MPa

Media

Hot water, steam, gases, oils, acids and alkalis. Exceptions: strongly oxidising acids like sulphuric acid and nitric acid in high concentrations

BPG 6565

Properties

- Braided from pure expanded graphite yarn

Density

1.20 g / cm³

Applications

Valves, rotary pumps

Operation Parameters

speed: 2 m / s, 25 m / s
temperature: –200°C ... +450°C (most media)
–200°C ... +650°C (steam)
pH value: 0 ... 14
pressure: 25 MPa, 2.5 MPa

Media

Hot water, steam, gases, oils, acids and alkalis. Exceptions: strongly oxidising acids like sulphuric acid and nitric acid in high concentrations

Variations

- BPG 6569 -with Inconel reinforcement and corrosion inhibitor suitable for valve applications. API 589 Fire Safe approval

BPG 6567

Properties

- Made of expanded flexible graphite yarn with carbon yarn corners

Density

1.15 g / cm³

Applications

Valves, rotary pumps

Operation Parameters

speed: 2 m / s, 25 m / s
temperature: –200°C ... +450°C (most media)
–200°C ... +550°C (steam)
pH value: 0 ... 14
pressure: 45 MPa, 2.5 MPa

Media

Hot water, steam, gases, oils, acids and alkalis. Exceptions: strongly oxidising acids like sulphuric acid and nitric acid in high concentrations

Benefits

- Suitable for high shaft speeds
- High temperature and chemical resistance
- Resistant against abrasive media
- Excellent thermal conductivity

Benefits

- High temperature and chemical resistance
- Excellent sealing effect and constant elasticity
- Dense and resilient
- Ideal for quick repair service

Benefits

- Excellent thermal and chemical resistance
- High elasticity
- Excellent extrusion resistance
- Can be used in reworked valves with larger clearances
- Packing does not damage the shafts or stems
- Flexible and easy to install

Packings

BPG 6550

Properties

› Made of flexible carbon yarn and a special graphite-based impregnation

Density

1.22 g / cm³

Applications

Valves

Operation Parameters

speed: 2 m / s
temperature: –30°C ... +400°C (most media)
–30°C ... +550°C (steam)
pH value: 0 ... 14
pressure: 30 MPa

Media

Hot water, hot air, steam, acids and alkalis.
Exceptions: heavily oxidising acids such as hot sulphuric acid and nitric acid

Variations

› BPG 6555 -braided from flexible graphite core with a wear resistant cover made from pure carbon yarn
› BPG 6570 -braided from graphite yarn which is obtained from carbon yarn

Benefits

› Very high temperature resistance
› Reduced friction, longer service life
› High strength carbon yarn
› Used as anti-extrusion and wiper end ring

BPG 6587

Properties

› Made of high purity, pre-impregnated carbon yarn
› Silicon-free running in lubricant

Density

1.45 g / cm³

Applications

Rotary Pumps, also refiners and agitators

Operation Parameters

speed: 25 m / s
temperature: –50°C ... +300°C
pH value: 0 ... 14
pressure: 2.5 MPa

Media

Cold and hot water, steam, aqueous solutions, almost universally against acids and lyes.
Exceptions: strongly oxidizing salt solutions, concentrated sulphuric and nitric acid

Benefits

› Ideal in pulp and paper industry
› High volumetric stability and minimal shrinkage
› Kind to shafts
› Low coefficient of friction
› Excellent abrasion resistance
› Can often run without lantern flush

BPG 6588

Properties

› Carbonised yarn with a special PTFE-graphite impregnation
› Silicon-free running in lubricant

Density

1.32 g / cm³

Applications

Rotary pumps

Operation Parameters

speed: 25 m / s
temperature: –50°C ... +280°C
pH value: 1 ... 13
pressure: 2.5 MPa

Media

Cold water, hot water, steam, aqueous solutions, diluted acids and alkalis

Benefits

› Very good heat dissipation due to high carbon content
› Strong, flexible yarn
› Excellent pressure and extrusion resistance
› The impregnation maintains an excellent bond to the yarn over the complete life of the packing
› The thermal and volumetric stability provides superior sealing performance

Plunger Pump Rotary Pump Valve

BPG 6401

Properties

- Made from high quality silicid-acid yarn
- Special high temperature resistant impregnation

Density

1.05 g / cm³

Applications

Static applications

Operation Parameters

temperature: –50°C ... +1100°C
pH value: 5 ... 9
pressure: 1 MPa

Media

Neutral and dry gases

Benefits

- Very high temperature resistance
- Good sealing ability because of special impregnation
- High mechanical strength and excellent physical properties
- No restrictions on fibres
- Fibres have no associated health risks

BPG 6450

Properties

- Glass fibre packing made with a special graphite impregnation

Density

1.10 g / cm³

Applications

Static applications

Operation Parameters

temperature: –50°C ... +550°C
pH value: 5 ... 9
pressure: 1 MPa

Media

Neutral and dry gases

Variations

- BPG 6447 -round E-glass packing without impregnation
- BPG 6449 -square E-glass packing without impregnation

Benefits

- High temperature resistance
- High flexibility
- Superior sealing effect even under varying conditions
- The graphite impregnation increases the cross-sectional density of the packing

BPG 6452

Properties

- Special engineered very high temperature glass yarn packing with Inconel reinforcement
- Additional high temperature impregnation

Density

1.50 g / cm³

Applications

Static applications

Operation Parameters

temperature: –50°C ... +750°C
pH value: 5 ... 9
pressure: 1 MPa

Media

Neutral and dry gases

Benefits

- Thermally stable glass yarn
- Very high temperature resistance
- Good sealing ability
- Good packing stability as well as pressure resistance due to Inconel reinforcement

Graphite Rings

Properties

- BPG graphite rings are manufactured from permanently elastic graphite material
- Nuclear grade with carbon purity level ≥ 99.85 %
- Industrial grade with carbon purity ≥ 98 %
- The raw material is a natural graphite flake, which is chemically and thermally treated and then transformed into an expanded graphite
- Due to their expanded structure the voluminous graphite particles can be compressed into permanently elastic sealing elements without a bonding agent

Operation Parameters

temperature:	–200°C ... +550°C (almost all media and air)
	–200°C ... +700°C (steam)
	–200°C ... +2500°C (inert gas)
pH value:	0 ... 14
pressure:	100 MPa

Applications

General valves, control valves, boiler and high pressure valves

Media

Hot water and feed water, steam, heat transfer oils, hydrocarbons and many other media.
Exceptions: strongly oxidising media

Design

- BPG graphite rings are specially manufactured according to specification and application requirements
- Media pressure (MPa) and dimension (ID, OD) are the key operating factors which determine the correct design
- More details on request

Certificates / Approvals

BAM approval for gaseous oxygen (45 MPa up to 60°C; 22 MPa up to 200°C)

Benefits

- High level of chemical resistance and thermal stability
- Excellent sealing ability and good elasticity
- Not subject to cold flow, shrinkage or ageing
- BPG 6501 fulfils the purity requirements for seals in nuclear power station valves (content of soluble chlorides < 20 ppm)

Availability

- BPG graphite rings are supplied in different graphite purities and densities
- Depending on requirements BPG graphite rings are available as endless rings with angle or straight cut or split into two half rings

Other graphite rings are available on request

Graphite Cover Seals

Properties

- Cover Seals are supplied as pre-formed rings and offer proven high performance, especially in heavy-duty valves or high-pressure feed water pre-heaters
- They remain elastic even with fluctuating temperatures and seating stress up to 200 MPa
- Clearances of up to 0.3 mm can be sealed without difficulty. Larger gaps can be controlled by BPG graphite rings reinforced with stainless steel springs integrated into the corners or full metal caps

Operation Parameters

temperature:	–200°C ... +550°C (almost all media and air)
	–200°C ... +700°C (steam)
	–200°C ... +2500°C (inert gas)
pH value:	0 ... 14
pressure:	100 MPa

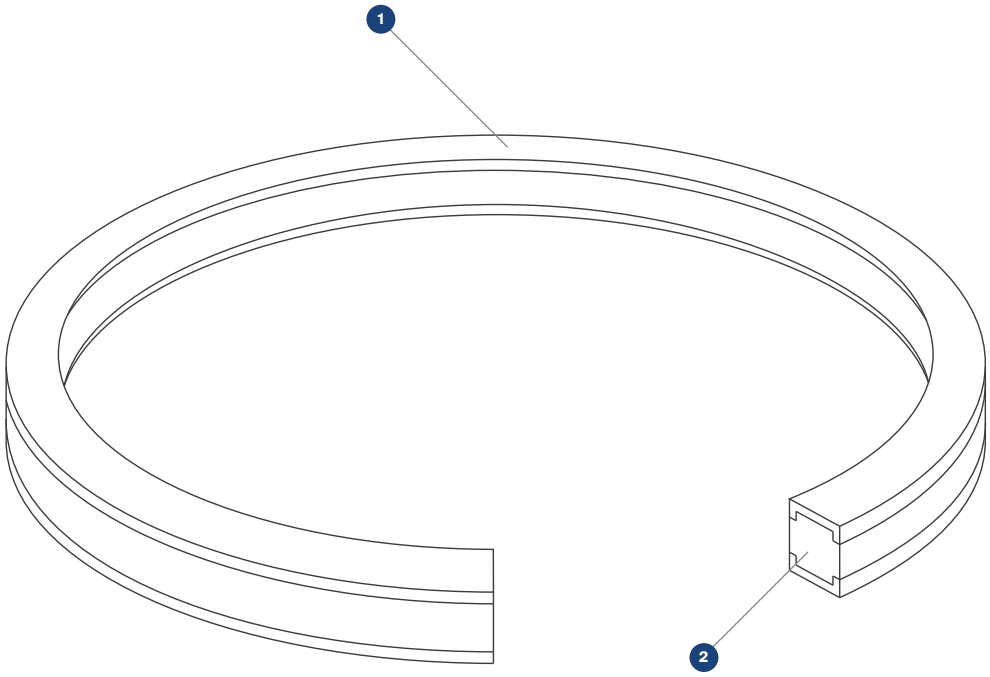
Applications

Heavy-duty valves, high pressure feed water preheaters

Media

Hot water and feed water, steam, heat transfer oils, hydrocarbons and many other media.
Exceptions: strongly oxidising media

1 Metal caps
2 Graphite ring



Design

- BPG Cover Seals are specially manufactured according to specification and application requirements
- Media pressure (MPa) and dimension (ID, OD) are the key operating factors which determine the correct design
- More details on request

Certificates / Approvals

BAM approval for gaseous oxygen (45 MPa up to 60°C; 22 MPa up to 200°C)

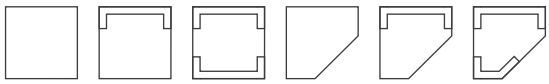
Benefits

- High level of chemical resistance and thermal stability
- Excellent sealing ability and good elasticity
- Not subject to cold flow, shrinkage or ageing
- Fulfils the purity requirements for seals in nuclear power station valves (content of soluble chlorides < 20 ppm)
- BPG Cover Seals are very adaptable, reliable and maintain their elasticity which offers potential savings in costs and time

Availability

- Standard density of 1.6 g / cm³
- With 99.85 % C-content in nuclear quality and 98 % industrial quality
- In a wide range of variations (see Styles) e.g. rectangular, with inside or outside angle, with integrated extrusion protection in form of metal caps
- Additional designs available on request

Styles

Type	Standard variants
Graphite Cover Seals	

Additional styles available on request

Spiral Wound Gaskets

Properties

- Spiral Wound Gaskets are manufactured of special V-shape metallic strips and a soft filler material wound together in a special process
- They are available with several material combinations for steel and filler materials as well as different designs

Materials

Carbon Steel, 304, 316, 316L, 316Ti, 321, Monel

Applications

BPG 9336 Spiral Wound Gaskets are widely used for flange sealing in high temperature and high pressure applications. Spiral Wound Gaskets show excellent performance in load-bearing as well as non-load-bearing installations.

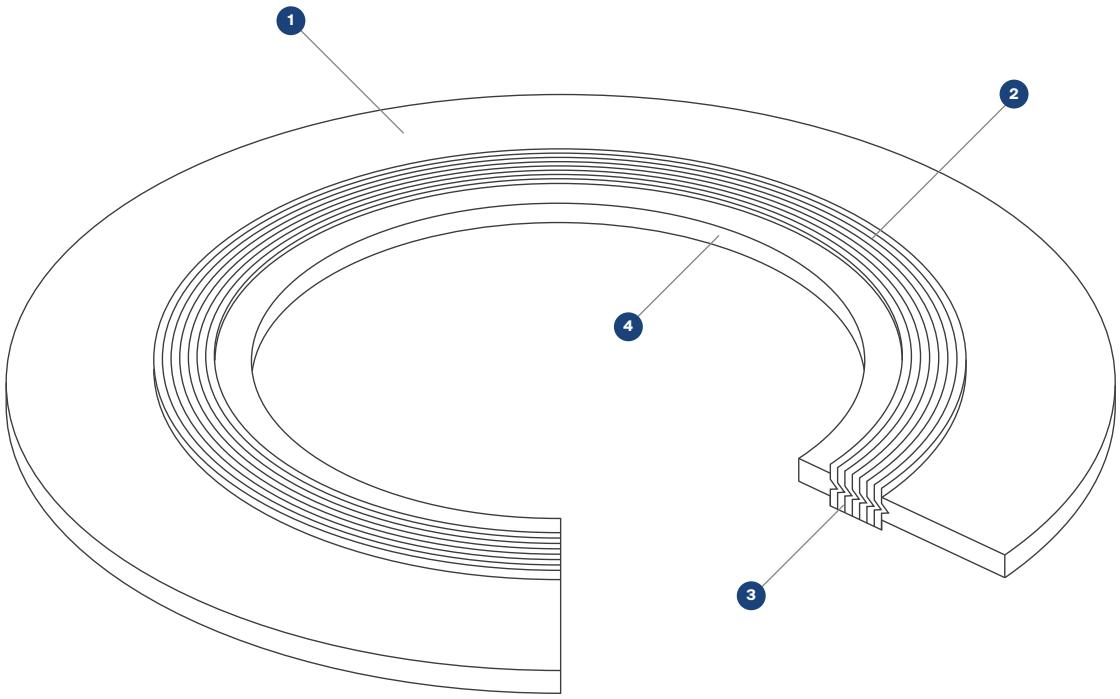
Standards

ASME B 16.20, ASME B 16.47, DIN EN 1514-2, DIN EN 12560-2
We also can manufacture Spiral Wound Gaskets according to customer specification.

Operation Parameters

Filler	Temperature	Pressure
Graphite (purity 98 % or 99.8 %)	–30°C ... +550°C	40 MPa
PTFE	–200°C ... +280°C	40 MPa
Mica	+600°C ... +1000°C	1 MPa

1 Outer ring
2 Winding
3 Filler
4 Inner ring



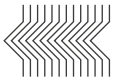
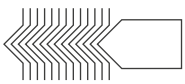
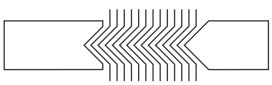
Certificates / Approvals

TA-Luft (VDI 2440)

Benefits

- Very good elastic recovery (up to 10 %)
- High reliability
- Solid construction
- Stability and sealability under fluctuating temperatures and pressure cycles
- Easy installation

Styles

Type	Article number	Standard variants	Standard thickness
Spiral only	BPG 9336S		3.2 mm, 4.5 mm, 6.5 mm
With inner ring	BPG 9336SI		3.2 mm, 4.5 mm, 6.5 mm
With outer ring	BPG 9336SC		3.2 mm, 4.5 mm, 6.5 mm
With inner and outer ring	BPG 9336SIC		3.2 mm, 4.5 mm, 6.5 mm

Kammprofile Gaskets

Properties

- Kammprofile gaskets are manufactured of a solid corrugated metal core covered by a soft sealing material on both sides
- Kammprofile gaskets give exceptional sealing performance and very high reliability even at low minimum surface compression
- Several soft sealing materials (Graphite 98 % or 99.85 %, PTFE) can be supplied as well as different steel material grades

Materials

Carbon Steel, 304, 316, 316L, 316Ti, 321, Monel

Applications

Kammprofile gaskets can be used in flange connections, heat exchangers, pipe connections, manholes, covers or other applications. BPG 9470 has been used very successfully in all areas of industry, especially chemical and petrochemical industries, power plants, process industries, oil and gas industries

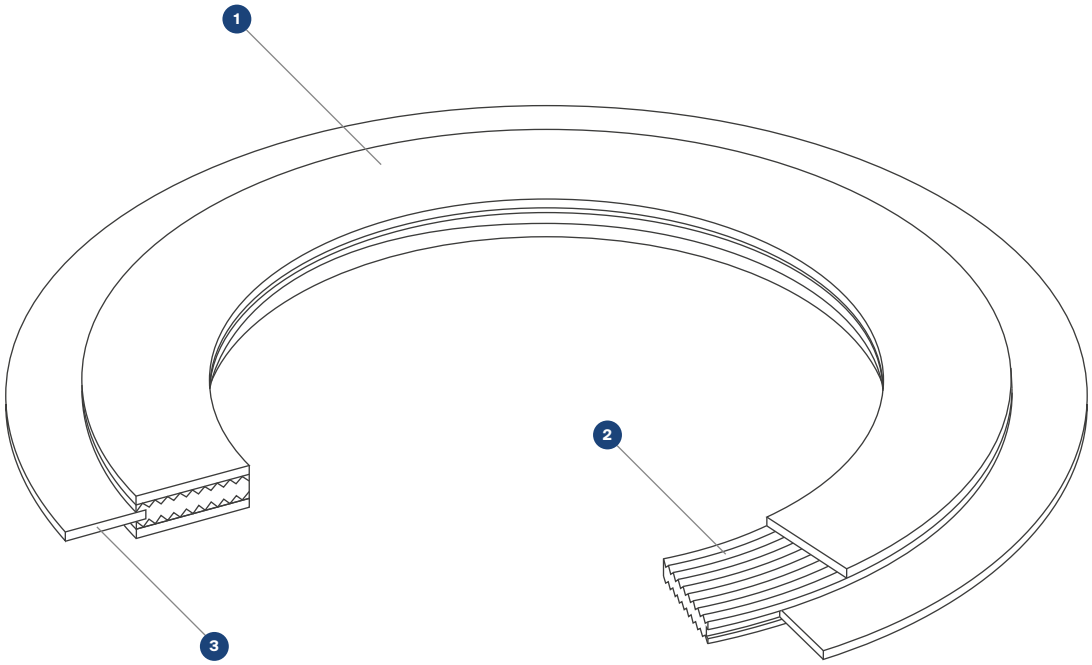
Standards

ASME B16.20, DIN EN 1514-6, DIN EN 12560-6
We also can manufacture Kammprofile Gaskets according to customer specification

Operation Parameters

Filler	Temperature	Pressure	pH value
Graphite (Purity 98 % or 99.8 %)	–30°C ... +550°C	40 MPa	0 ... 14
PTFE	–200°C ... +280°C	40 MPa	0 ... 14

1 Soft sealing material
2 Serrated metal carrier
3 Loose centering



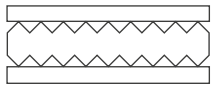
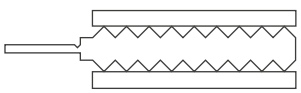
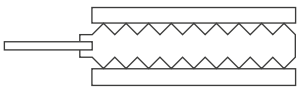
Certificates / Approvals

TA-Luft (VDI 2440)

Benefits

- Very solid gasket, easy to handle
- High reliability, easy installation
- Special serrated design
- Stability and sealability under frequent temperature and pressure cycles
- Covering a very wide seating stress range
- Different material combinations available
- Excellent chemical and temperature resistance

Styles

Type	Article number	Standard variants
Kammprofile	BPG 9470	
Kammprofile with integral centre ring	BPG 9470F	
Kammprofile with lose centre ring	BPG 9470L	

Metal Jacketed Gaskets

Properties

- The construction of BPG 9381 Metal Jacketed Gasket is a non-metallic soft filler material jacketed with an outer metal shell made of various metal materials such as stainless steel, tinplate or red copper
- Different filler materials such as non-asbestos sheets, NBR or flexible graphite can be used
- The metal jacketed gasket increases the stability and strength of the joint

Applications

BPG 9381 Metal Jacketed Gaskets are mainly used in heat exchanger applications or pressure vessels, autoclaves, boilers, pipe flanges and process equipment. The filler material provides the resilience of the gasket while the metal jacket protects the filler and resists pressures, temperatures and medium attack. Double jacketed gaskets can be produced in different forms and with integral or welded bars according to customer specification

Materials

Tinplate, Red copper, 304, 316, 316L, 321

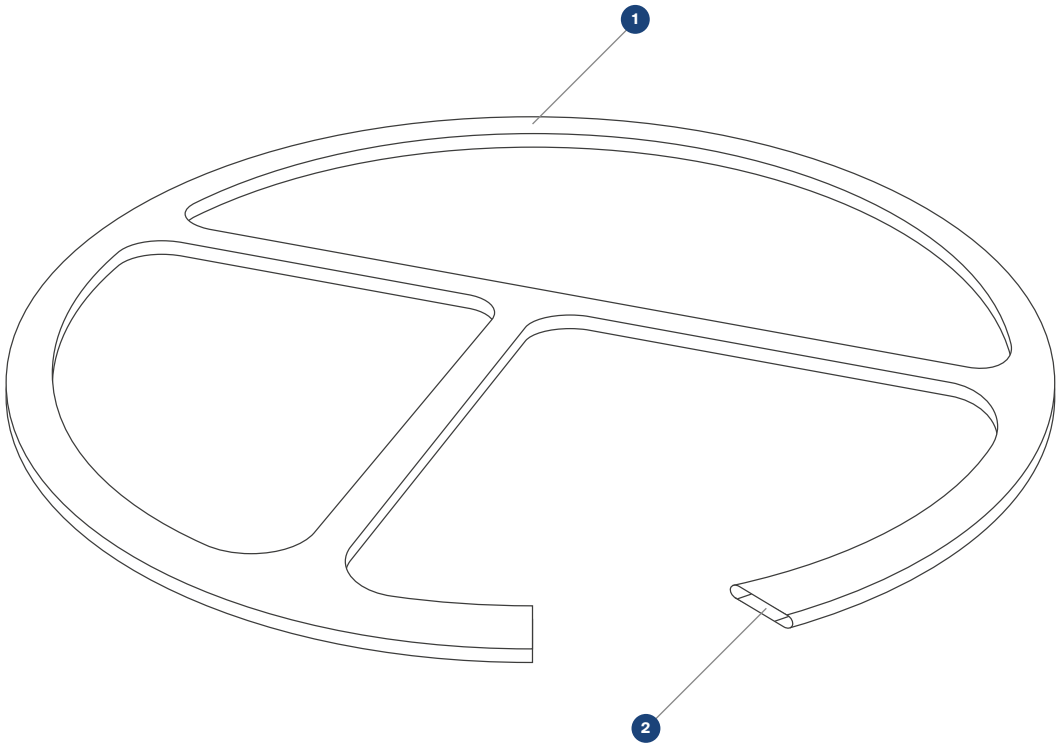
Standards

ASME B16.20, DIN EN 1514-7, DIN EN 12560-7
We also can manufacture Metal Jacketed Gaskets according to customer specification

Operation Parameters

Jacketed material	Maximum temperature
Tinplate	+450°C
Red copper	+400°C
304	+600°C
316	+650°C
316L	+700°C

1 Metal shell
2 Non-metallic soft filler material



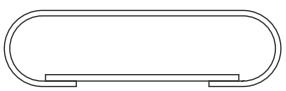
Design

Metal jacketed gaskets can be manufactured in a variety of shapes and designs. When ordering your gaskets please provide the equipment drawing especially if the gasket is used on a heat exchanger with reinforcing ribs

Benefits

- Very solid gasket, easy to handle
- High reliability, easy installation
- Different material combinations available
- Excellent chemical, corrosion and temperature resistance

Styles

Type	Article number	Standard variants
Double Jacketed Gasket	BPG 9381	

Technical Information

Availability
- Packings can be supplied on KG-creels, as pre-cut metre lengths or as pre-pressed / pre-formed rings (single or in ready to install sealing sets)
- Packings are available in standard sizes 3 to 25 mm
- Other shapes or sizes on request

Packing size	Weight
≤ 6.4 mm	1 kg / creel
7 – 10 mm	2 kg / creel
11 – 12.7 mm	3 kg / creel
14 – 24 mm	5 kg / creel
≥ 25 mm	10 kg / creel

Packing installation
The ideal way to pack a stuffing box is with die-formed rings. Also pre-cut lengths or self cut lengths can be used. If cutting lengths from a creel a packing cutter can be used. By wrapping the cut packing around the shaft or spindle it can be checked if the length is correct. Alternatively the packing can be directly wound around the shaft from the creel and cut accordingly.

A diagonal cut helps to produce a better sealing effect than a straight cut. When cutting packings which tend to fray adhesive tape should be placed on appropriate side of the area to be cut, prior to cutting, in order to prevent fraying.

Install each ring into the stuffing box, ensuring the ends are placed together and inserted first followed by the rest of the ring. The joints of the individual packing rings should be staggered by 90°. The packing set should initially be tightly compressed, so that it will mould and seat itself into the stuffing box. The gland nut should then be lossened and retightened to an appropriate setting.

Installing die-formed rings
Die-formed rings with exact dimensions should be handled with care in order to retain the advantages that these rings offer. If the rings have to be opened to fit onto the shaft then the ring ends should only be opened axially so far that the ring will fit over the shaft. Bending the ring radially deforms the ring and makes installation more difficult.

Pre-compression of packings
The correct compression of packing set is dependent of the type of packing and application. If a torque wrench or a similar tool is available the necessary gland pressure can be adjusted precisely.

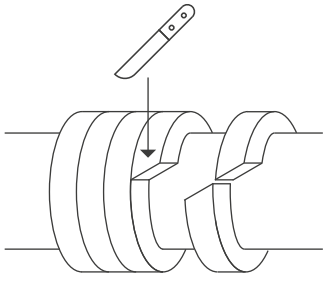
Pre-compression for pumps
Pump packings should be compressed with a gland pressure of 1.05 to 2 times the media pressure. A minimum compression of 0.5 to 1.5 MPa is necessary.

Pre-compression for valves
Valve packings should be compressed with a gland pressure of 2 to 5 times the media pressure. A minimum compression of 5 MPa is necessary.

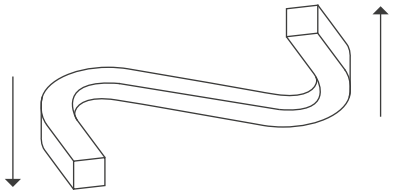
“Running-in” of new packings
Pump packings are particularly susceptible to damage through high temperature during the run-in period. If the packing is running dry it will get too hot and the pump must be stopped. After a short cooling down period a regular leakage drip should appear and the pump can be restarted. It may be necessary to repeat this procedure several times until regular leakage appears.

Recommended surface
The recommended surface roughness for the stem or spindle should be Rz < 1.6 µm. For increased sealing effect and longer service life the surface roughness can be reduced to Rz < 0.6 µm. The permissible eccentricity on centrifugal pumps should be less than 0.001 of the shaft diameter. In the interest of reduced leakage the eccentricity must not exceed 0.01 of the packing width. The permissible extrusion gaps between shaft and gland or housing are 0.02 of the packing section. If the gaps are larger or the packing in question is inclined to extrude, suitable anti-extrusion rings should be fitted.

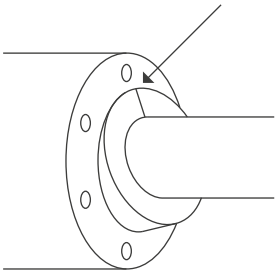
Cutting and installation of rings



Step 1
Cutting packing at a 45° angle

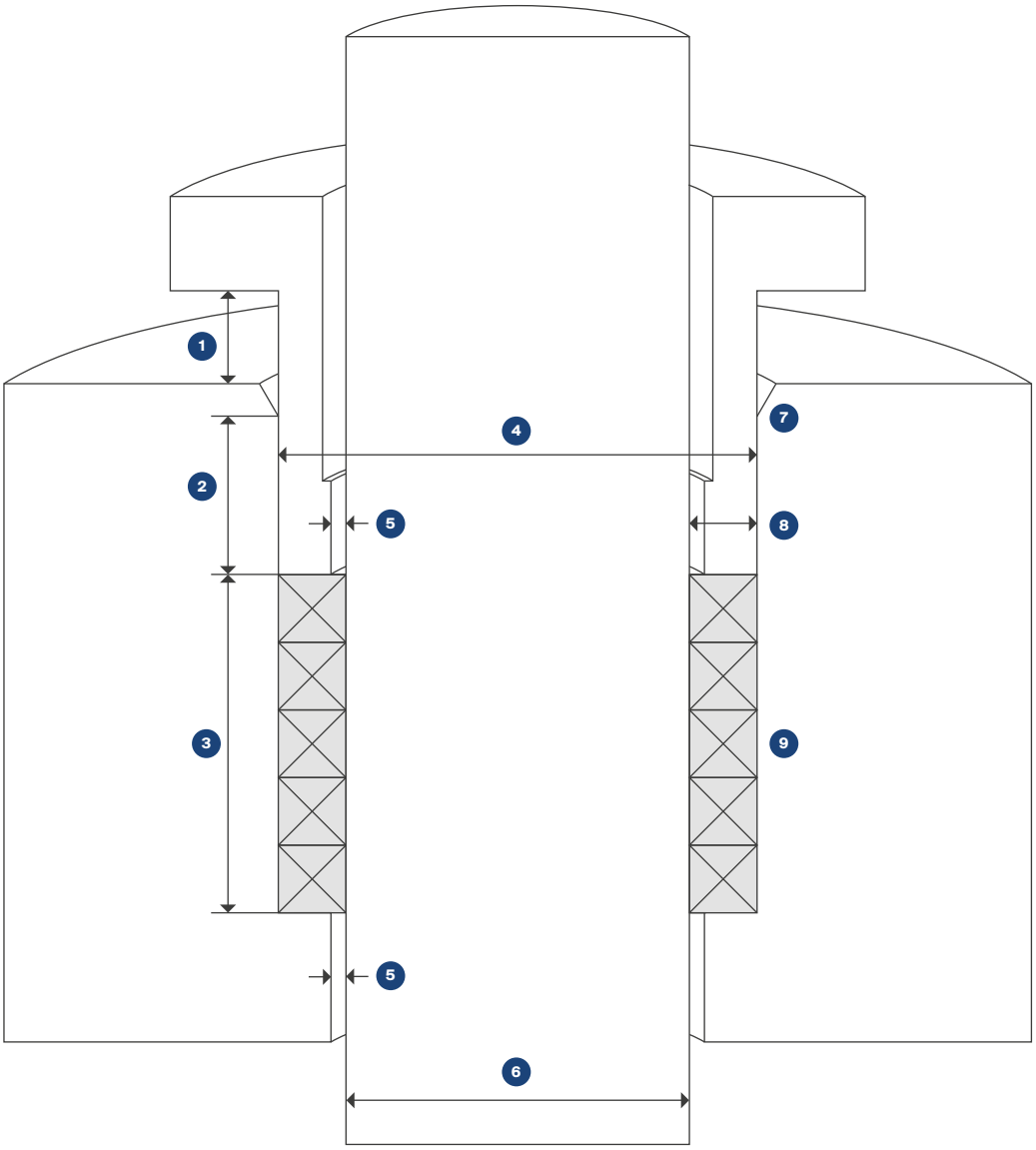


Step 2
First open axially, then radially



Step 3
Introduce the joint end first

Stuffing Box Details



1 Adjustment travel for gland 20 to 30 % of packing set height
2 Min. insert depth for gland 0.5 × packing width
3 Packing set height
4 Housing diameter
5 Clearance max. 0.02 × packing width
6 Stem / Shaft diameter
7 Chamfer 2 × 30°
8 Packing width
9 Stuffing box packing

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