Fabric expansion joints

HKS fabric expansion joints are manufactured from high-quality materials and have proven their suitability in decades of practical application. The continuous new and further development of our fabric expansion joints ensures the targeted adaptation to the current requirements of our customers. This results in powerful, reliable fabric expansion joints with a long service life. Our development and design department is available for technical consultation for our customers, engineering and solutions for project-oriented challenges.

Areas of application

HKS fabric expansion joints are suitable for gaseous media such as air, flue gas, exhaust gas and solvent fumes. In addition, they can be used for processes below the dewpoint (even where substances with a certain acid content are present) and for gases containing abrasive substances (e.g. coal dust or cement dust).

In piping, apparatuses and machines they are primarily used for:

- Compensation of expansions and movement
- Reducing the transfer of noise, vibration and oscillations
- Compensation of installation inaccuracies

HKS fabric expansion joints are primarily used in the following industries:

- Plant engineering
- Chemical plants
- Energy suppliers/power plants
- Waste incineration plants
- Cement works
- Steel industry
- Conveyor technology
- Refineries
- Offshore industry

Model variants

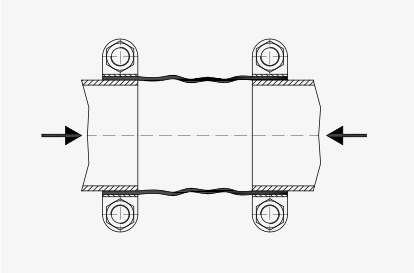
Our fabric expansion joints differ in the following properties:

- Bellows shape (single convolution or cylindrical fabric expansion joints)
- Bellows cross section (circular, oval or rectangular)
- Wall structure (single-ply, multi-layered, multi-layered with insulation)
- Structure of the support layers (adapted to pressure and temperature resistance)
- Quality of the materials and coating of the fabric bellows (depending on the media used)
- Connection type of the piping (backing flanges, band clamps, etc.)

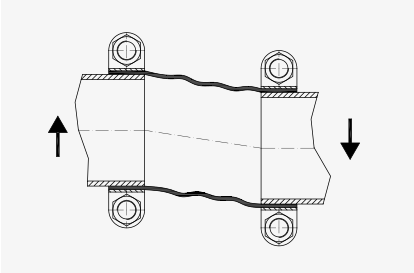
In addition to the standard fabric expansion joints listed here, we also develop and manufacture our fabric expansion joints completely on the basis of individual customer requirements. Connecting parts are available to DIN, ISO, ANSI, BS, ventilation standards or customer requirements.

Movement absorption

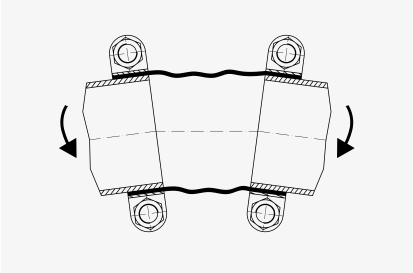
Axial, lateral, angular and a combination of different types of movement absorption are possible.



Axial movement absorption



Lateral movement absorption



Angular movement absorption

Fixpoints

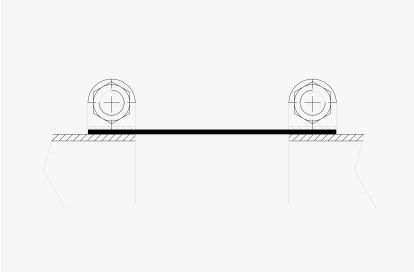
Stable piping fixpoints are required for absorbing axial forces and for professional pipeline installation.

Design of the fabric bellows

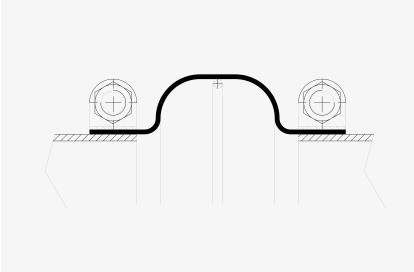
HKS fabric bellows are often manufactured from a variety of high-quality materials to ensure optimised and flexible fabric bellows for any application.

Three bellows shapes are available as a standard, depending on the required movement absorption:

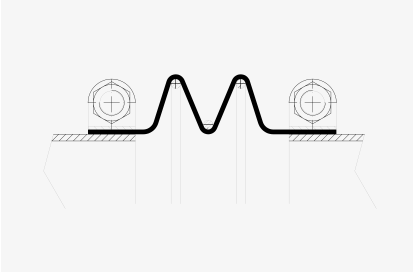
- Cylindrical fabric bellows (circular, oval or rectangular)
- Single convolution fabric bellows (circular, oval or rectangular)
- Multi convolution fabric bellows (circular, oval or rectangular)



Cylindrical



Single convolution



Two convolutions

HKS fabric bellows usually have a multi-layered design. The different layers have different functions.

Temperature reduction: Corrosionresistant and temperature-resistant insulating fabric

Sealing layer: Gas-tight films, foils or composite materials made from materials such as Teflon® (PTFE), silicone, Hypalon®, Inconel or aluminium

Weather protection: UV-resistant and water-resistant materials

Pressure absorption: Support layers such as glass, polyester or aramid fabrics

Abrasion protection: Wire mesh as mechanically stable layers

The following lists the material properties and areas of application for the material qualities most often used by us:

Materials for sealing and coating layers	Material properties	Areas of application
CSM Chlorosulfonated polyethylene (rubber) (Hypalon®)	› CSM has a high resistance to acids › Temperature in continuous operation: -25 °C to +100 °C	Acids
CR Polychloroprene (Neoprene®, Baypren®)	› CR has good resistance to oil, weather and flames, very good ageing resistance › In addition it is resistant to different inorganic and organic chemicals › Impermeable to gas for hydrocarbons Temperature in continuous operation: -30 °C to +90 °C › Resistance to hot water up to +70 °C	Faeces, cooling water, coking plant gas, lyes, air, acids and seawater
Stainless steel foil 1.4435 2.4816	› Stainless steel foil has a high temperature resistance › 1.4435: Temperature in continuous operation up to +500 °C › 2.4816: Temperature in continuous operation +800 °C	Lyes and solvents
EPDM Ethylene propylene diene monomer rubber (Buna AP®, Keltan®, Vistalon®)	› EPDM has good resistance to heat and weather › EPDM is particularly resistant to highly oxidising media and a great number of chemicals (but not oil-resistant) › Temperature in continuous operation: -40 °C to +100 °C	Pickling solutions, steam, hot water, hypochlorite solutions, lyes, acids and water
FPM Fluoro rubber (Viton®)	› FPM has very high resistance to acids › Temperature in continuous operation: -40 °C to +200 °C	Acids
PTFE Polytetrafluorethylene (Teflon®, Hostaflon®, Fluon®, Polyfluron®)	› PTFE has good resistance to heat and weather › PTFE has excellent chemical resistance to aggressive media › Very good electrical insulation properties › Temperature in continuous operation: -50 °C to +210 °C	Bleaching agents, chlorides, gases, halogens, hydraulic oil, lyes, solvents, mineral oil, organic and inorganic acids, peroxides, sulphates and fuels
VMQ Silicone rubber (Silopren®, Elastosil®)	› Good resistance to weather, ageing, ozone and radiation › Temperature in continuous operation: -45 °C to +180 °C	Alkalines, hot water, weak acids and water
Materials for support layers	**Material properties**	**Areas of application**
Aramid fabric	› Aramid fabrics have high tensile strength, abrasion resistance and vibration resistance › Temperature in continuous operation up to +150 °C	Gases (incl. air)
GF, GM Glass fabric	› Glass fabrics have good tensile strength, good chemical resistance and good insulating properties › Temperature in continuous operation up to +600 °C	Gases (incl. air), lyes, acids
PEBA Polyester fabrics	› PEBA has high tensile strength, abrasion resistance and vibration resistance › Temperature in continuous operation up to +150 °C	Gases (incl. air)
Silicate fabric	› Silicate fabrics have very high resistance to acids › Temperature in continuous operation up to +1000 °C	Gases (incl. air), lyes, acids
Materials for insulation	**Material properties**	**Areas of application**
Rock wool	› Rock wool has good temperature resistance and good insulation properties › Temperature in continuous operation up to +500 °C	Gases (incl. air)
Ceramic wool	› Ceramic wool has very high temperature resistance and good insulation properties › Temperature in continuous operation up to +1100 °C	Gases (incl. air)

Connection types

As a rule, HKS fabric expansion joints are connected to pipes, ducts etc. using flanges, band clamps or clamping strips. The fabric expansion joint connections are standardised and fit commercial pipes and flanges. The band clamps are made of unalloyed steel S235JR (1.0038) and are galvanised. Where increased corrosion protection is required, stainless steel is used. Flanges or band clamps consist of unalloyed steel S235JR (1.0038) and are finished with a corrosion protection primer. Other corrosion protection (e.g. special paint, hot galvanising, coating, etc.), other materials or special connections are available on customer request.

Band clamps

Band clamps are used to fix HKS fabric expansion joints to round or oval pipes which are only subject to low internal pressure levels.

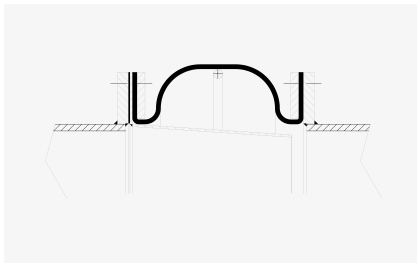
Clamping strips

Clamping strips are used to fix HKS fabric expansion joints to round, oval or rectangular pipes and ducts which are only subject to low internal pressure levels.

Flanges

For higher internal pressures up to 2 bar, HKS fabric expansion joints are equipped with backing clamping flanges. All common standards are supported with regard to holes and pitch circles in the flanges: e.g. EN 1092, ANSI (ASA) or BS.

Fabric expansion joint with rectangular flanges



Single convolution with inner sleeve, vacuum support ring and flanges

Combination of connection types

On customer request, different connection types (e.g. band clamp on one side and flange on the other) can be combined.

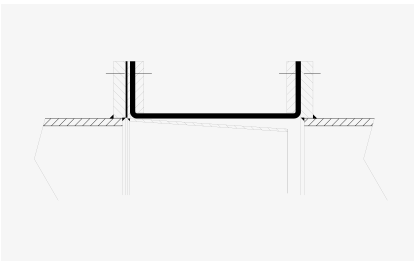
Accessories

The following accessories (optional) are available for HKS fabric expansion joints

- Inner sleeves
- Vacuum support rings for inner sleeves

Inner sleeves

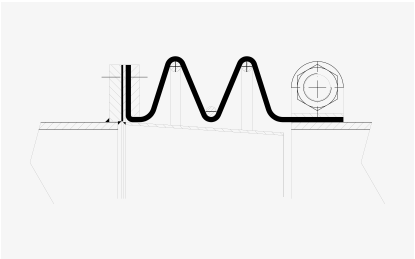
Inner sleeves are used for high flow rates (> 10 m/s) to avoid pulsating or fluttering or for abrasive solids to avoid mechanical abrasion on the bellows which results in a prolonged service life of the fabric expansion joint. Bearing this in mind, we recommend the use of inner sleeves as a rule. The inner sleeves provided by HKS are usually made of unalloyed or stainless steel. For exclusively axial movements, cylindrical inner sleeves are used and conical inner sleeves for lateral and/or angular movements.



Cylindrical with inner sleeve

Vacuum support rings

If HKS fabric expansion joints are operated with negative pressure, vacuum support rings have to be inserted on the inner bellows wall. Support rings are usually made of stainless steel.

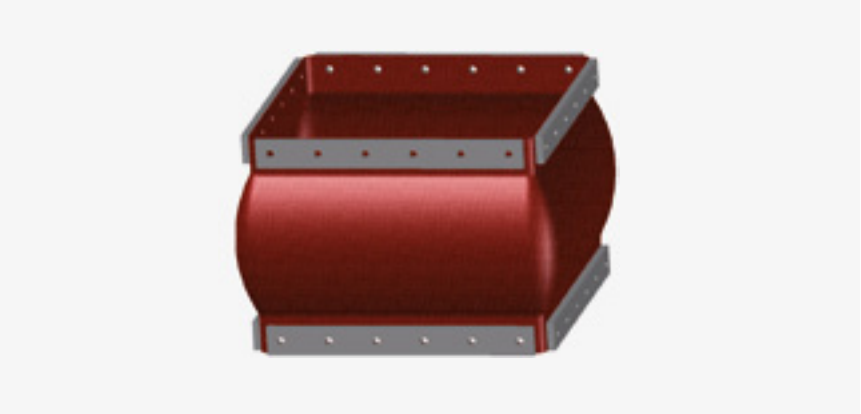


Two convolutions with vacuum support rings and inner sleeve

FABRIC EXPANSION JOINT

Type GW-1

FABRIC EXPANSION JOINT single convolution, rectangular DN 100 - DN 5000



Movement absorption

The permitted axial, lateral and/or angular movement absorption depends on the wall structure of the fabric bellows and the installation length (pipe spacing).

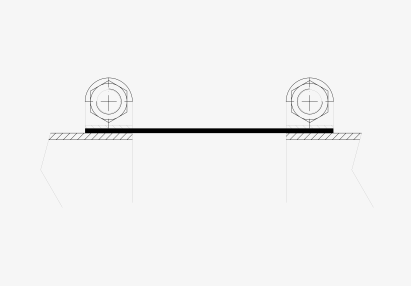
Special versions and ancillary equipment

- Guide sleeve, vacuum support rings
- Conical version: different connection diameters
- Different connection cross sections: rectangular connection on one side and circular connection on the other

Version

Self-sealing HKS fabric expansion joint; **cross section variants:** circular, oval or rectangular; **longitudinal section variants:** cylindrical, single convolution or multiple convolutions; **wall structure:** The material selection and the design stipulations for the wall structure (sealing and coating layers, pressure support layers and possibly insulation) depend on customer requirements for operating pressure, medium, operating temperature and movement absorption.

Operating (nominal) **pressures**	bis PN 0.2
Operating temperature	bis 700 °C



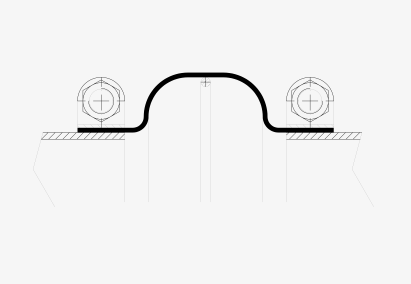
Cylindrical with band clamps

Areas of application

Suitable for gaseous media. If other media are to be used, design changes in the clamping area are necessary.

Reduction of thermal and mechanical tensions, vibration and noise reduction, absorption of axial, lateral and angular movements, compensation of installation inaccuracies.

Plant engineering, dust removal and filter technology, ceramics industry, waste incineration plants, steel industry, drying technology, cement works

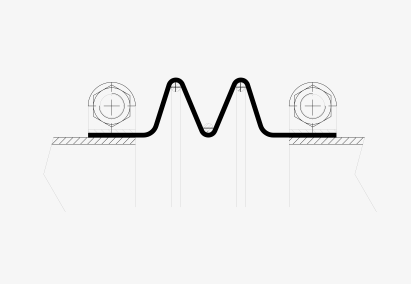


Single convolution with vacuum support ring and band clamps

Connection types

On one side band clamp made of material S235JR (1.0038), galvanised, or of stainless steel or band clamp made of material S235JR (1.0038), primed, or of stainless steel. As a custom version, clamping strips are also available hot galvanised, with special paint or special coating.

On the other side flange made of material S235JR (1.0038), galvanised, or of stainless steel. As a custom version, flanges are also available hot galvanised, with special paint or special coating.

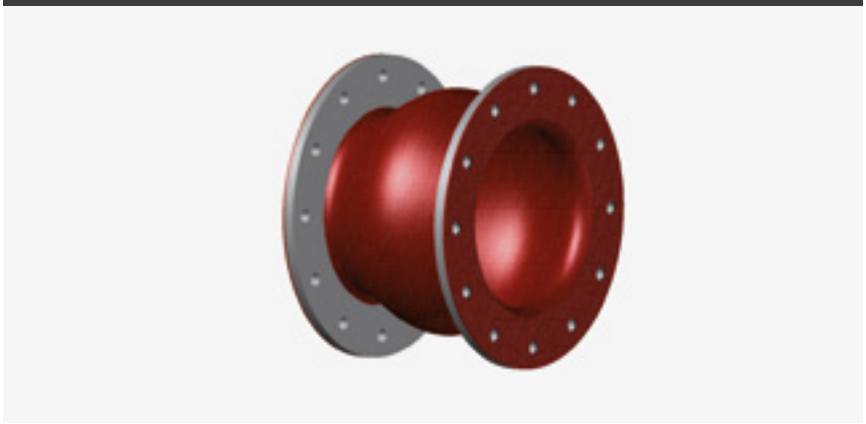


Double convolution with vacuum support rings and band clamps

FABRIC EXPANSION JOINT

Type GW-2

FABRIC EXPANSION JOINT single convolution, round DN 100 - DN 5000



Movement absorption

The permitted axial, lateral and/or angular movement absorption depends on the wall structure of the fabric bellows and the installation length (pipe spacing).

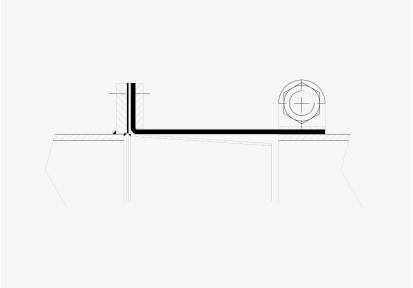
Special versions and ancillary equipment

- Guide sleeve, vacuum support rings
- Conical version: different connection diameters
- Different connection cross sections: rectangular connection on one side and circular connection on the other

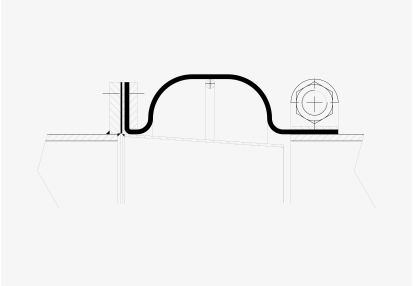
Version

Self-sealing HKS fabric expansion joint; **cross section variants:** circular, oval or rectangular; **longitudinal section variants:** cylindrical, single convolution or multiple convolutions; **wall structure:** The material selection and the design stipulations for the wall structure (sealing and coating layers, pressure support layers and possibly insulation) depend on customer requirements for operating pressure, medium, operating temperature and movement absorption.

Operating (nominal) **pressures**	bis PN 0.2
Operating temperature	bis 700 °C



Cylindrical with inner sleeve, flange on one side, band clamp on other side



Single convolution with inner sleeve and vacuum support ring, flange on one side, band clamp on other side

Areas of application

Suitable for gaseous media. If other media are to be used, design changes in the clamping area are necessary.

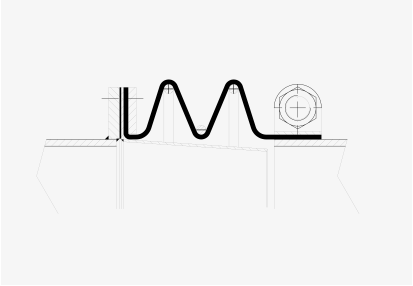
Reduction of thermal and mechanical tensions, vibration and noise reduction, absorption of axial, lateral and angular movements, compensation of installation inaccuracies.

Plant engineering, dust removal and filter technology, ceramics industry, waste incineration plants, steel industry, drying technology, cement works

Connection types

On one side band clamp made of material S235JR (1.0038), galvanised, or of stainless steel or band clamp made of material S235JR (1.0038), primed, or of stainless steel. As a custom version, clamping strips are also available hot galvanised, with special paint or special coating.

On the other side flange made of material S235JR (1.0038), galvanised, or of stainless steel. As a custom version, flanges are also available hot galvanised, with special paint or special coating.

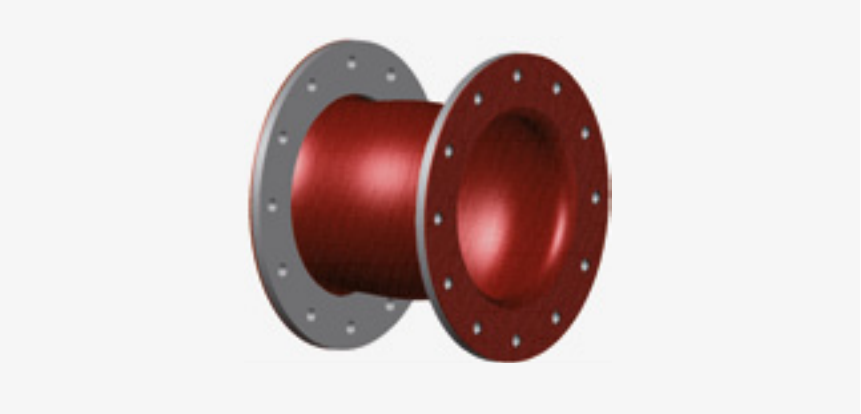


Double convolution with inner sleeve and vacuum support rings, flange on one side, band clamp on other side

FABRIC EXPANSION JOINT

Type GW-3

FABRIC EXPANSION JOINT cylindrical, round DN 100 - DN 5000



Movement absorption

The permitted axial, lateral and/or angular movement absorption depends on the wall structure of the fabric bellows and the installation length (pipe spacing).

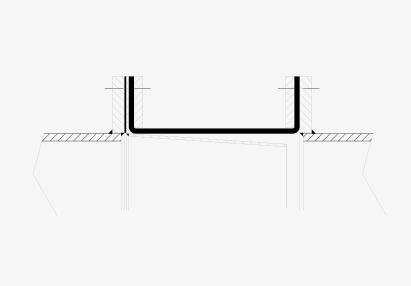
Special versions and ancillary equipment

- Guide sleeve, vacuum support rings
- Conical version: different connection diameters
- Different connection cross sections: rectangular connection on one side and circular connection on the other

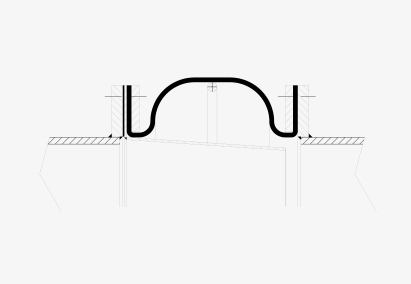
Version

Self-sealing HKS fabric expansion joint; **cross section variants:** circular, oval or rectangular; **longitudinal section variants:** cylindrical, single convolution or multiple convolutions; **wall structure:** The material selection and the design stipulations for the wall structure (sealing and coating layers, pressure support layers and possibly insulation) depend on customer requirements for operating pressure, medium, operating temperature and movement absorption.

Operating (nominal) **pressures**	bis PN 2
Operating temperature	bis 500 °C



Cylindrical with inner sleeve and flanges



Single convolution with inner sleeve, vacuum support ring and flanges

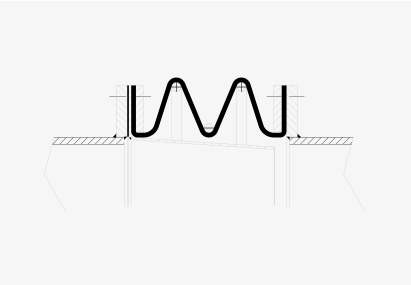
Areas of application

Suitable for almost all media. Reduction of thermal and mechanical tensions, vibration and noise reduction, absorption of axial, lateral and angular movements, compensation of installation inaccuracies.

Plant engineering, chemical industry, dust removal and filter technology, energy technology, conveyor technology, ceramics industry, waste incineration plants, steel industry, drying technology, cement works.

Connection types

On both sides flanges made of material S235JR (1.0038), galvanised, or of stainless steel. As a custom version, flanges are also available hot galvanised, with special paint or special coating.



Double convolution with inner sleeve, vacuum support rings and flanges