

# Fabric Expansion Joints

Involved In Expansion



## FABRIC EXPANSION JOINTS

The LBH manufacturing range of fabric expansion joints consists of customized and twenty-eight standard types divided into five categories:

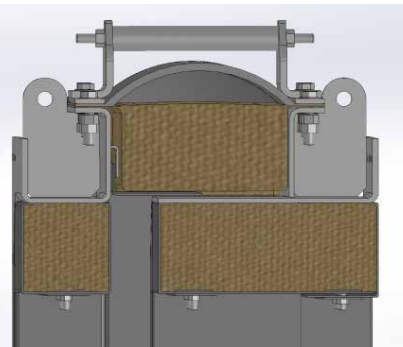
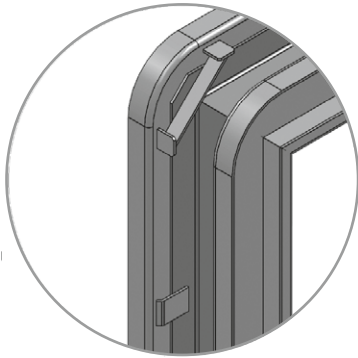
- **Type LN:** for clean air systems
- **Type MN:** for Flue Gas with low acid content
- **Type RN:** for Flue Gas with high acid content
- **Type HD:** for applications requiring optimal resistance against chemical attack or high pressure
- **Type GTX:** Gas turbine expansion joints

Temperature, pressure and media are all decisive factors for the selection of fabric expansion joints.

The temperature capabilities range from  $-50^{\circ}\text{C}$  to  $+1000^{\circ}\text{C}$

for standard types and it can reach more than the above temperatures with special customized products. The pressure range from  $-50$  kPa to  $+50$  kPa. Along with the standard types, numerous special designs are custom made.

LBH offers tailor made fabric expansion joint in all sizes and shapes for any application from single-ply bellows for ventilating systems to highly sophisticated multi-layer expansion joints for gas turbine exhaust. The common factor is always the craftsmanship, engineering and the use of superior materials.



TEMP.											
$^{\circ}\text{C}$	0	100	200	300	400	500	600	700	800	900	
LN		LN 200	LN 300	LN 400	LN 500		LN 700		LN 1000		
		LN 100									
MN		MN 250	MN 300	MN 400	MN 500		MN 700		MN 1000		
RN		RN 250	RN 300	RN 400	RN 500		RN 700		RN 1000		
HD		HD 250	HD 300	HD 400	HD 500		HD 700		HD 1000		
GTX		GTX-A GTX-B GTX-C									
$^{\circ}\text{F}$	32	212	392	572	752	932	1112	1292	1472	1652	



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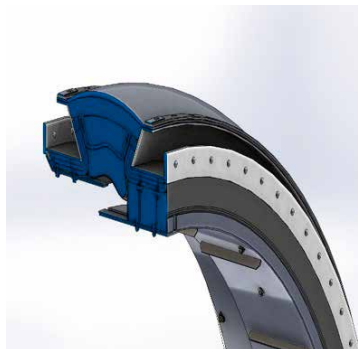


**LBH INTERNATIONAL A/S**

Kohaven 9, DK-5300 Kerteminde, Denmark  
Tel. Int.: +45 65 32 46 11 | Fax Int.: +45 65 32 45 11  
<http://www.lbhint.com> | E-mail: [sales@lbhint.com](mailto:sales@lbhint.com)

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## SCOPE OF SUPPLY

LBH fabric expansion joints can be supplied either endless or open ended, including a complete assembly kit for closing of the expansion joint on site. Insulation bolsters are available in a large number of designs, based on the operational data.

Installed in the cavity between the inner sleeve and the expansion joint, insulation bolsters reduce the temperature exposure to the expansion joint and protect against damage caused by particles in the gas.

Metal parts such as flanges, inner sleeves etc. are designed and manufactured in accordance with project specifications.

LBH can also provide 3D models and FEA analysis to the steel structure of the expansion joint.

## EXPANSION JOINT UNITS

LBH expansion joint units are delivered ready for installation in the ductwork. The flexible components and steel parts are pre-assembled ensuring fast and simple installation.

The expansion joint, insulation bolster and steel parts are designed for optimal durability based exactly on the operational conditions in the part of the ductwork where the unit is installed.

LBH has the engineering, design and manufacturing ability to provide any technical solution involving expansion joints.

Our team of engineers at LBH in Denmark along with our representatives around the world stand at your disposal with advise during any phase of a project.

## INSTALLATION

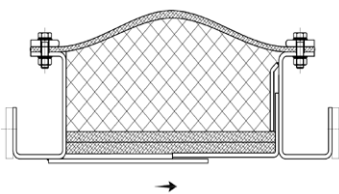
LBH expansion joints are available in the five standard profiles shown, together with a substantial customized number of special designs. The choice of profile and building length is determined by media temperature, pressure, required movement absorbtion and site conditions.

## SPECIAL DELIVERIRS

LBH is also able to provide urgent deliverreis within 24 hours based on the customer urgency and site requirements.

## APPLICATION

Oils and gas, petrochemicals, power, exhaust ducts, gas and steam turbines, steel industry, cement, oems, offshore.



**Profile I**  
Clamped directly to the pipeline.

MAX. TEMP.: 400°C.



**Profile II**  
Installed by means of angle flanges and backing flanges.  
For positive pressure.

MAX. TEMP.: 525°C.



**Profile III**  
Installed by means of angle flanges and backing flanges.  
For negative pressure.

MAX. TEMP.: 525°C.



**Profile IV**  
Installed by means of parallel flanges and backing flanges.  
For positive pressure.

MAX. TEMP.: 1000°C



**Profile IV**  
Installed by means of parallel flanges and backing flanges.  
For negative pressure.

MAX. TEMP.: 1000°C.

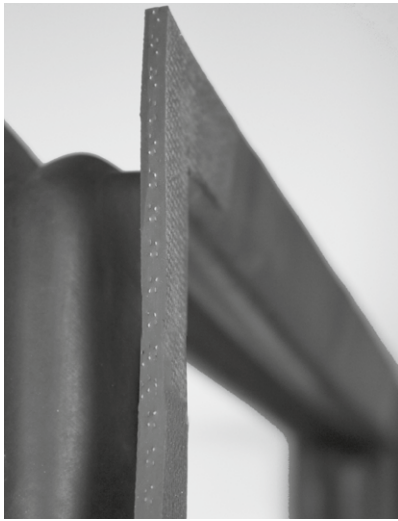


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# Elastomeric Expansion Joints

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## EXPANSION JOINTS

LBH manufactures an extensive range of flexible joints and bellows, designed to reduce stresses in ducting and piping systems caused by thermal expansion movements and vibration. Every joint is individually fabricated by hand for its specific application.

For the elastomeric joints, the company specialises in the larger diameters, non-standard lengths and awkward shapes and configurations not covered by rubber companies' standard ranges.

This leaflet describes LBH's elastomeric expansion joints, which are suitable for continuous temperatures up to 200 C. Each joint is made from a single elastomeric material, some are laminated with one or more reinforcement layers and then vulcanised to form a solid, integral component.

Three different elastomers are included in LBH's standard range:

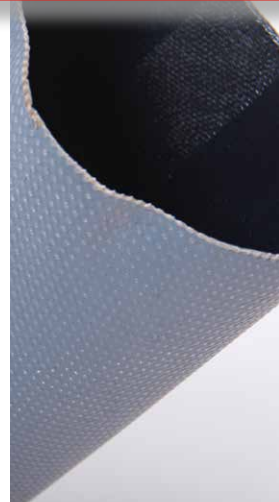
- **EPDM**, Ethylene PropyleneDiene Terpolymer
- **FKM**, Fluorocarbon Elastomer
- **SI**, Silicone Rubber

## APPLICATIONS OF THE JOINTS

LBH Elastomeric Expansion Joints provide an effective and durable solution to the problems of handling hot gases and associated condensates in hot air and flue gas systems. Unlike metal joints, elastomeric joints can easily absorb multidirectional expansion movements and vibrations and compensate for resulting misalignment.

## EPDM EXPANSION JOINTS

are suitable for wet and dry chemical service at higher continuous temperatures (up to 120°C) and higher pressures (up to 50 kPa). The material – an ethylene propylene diene terpolymer – resists hot air, non-oily flue gases and extreme weather conditions, and in power-generating service withstands the acid attack of fly-ash deposits and scrubber-treated gases. However, joints are not suitable for extended exposure to oils, hydrocarbons or concentrated mineral acids.



ISO 9001 = ISO 14001  
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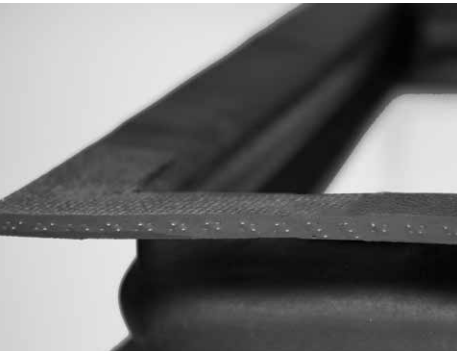


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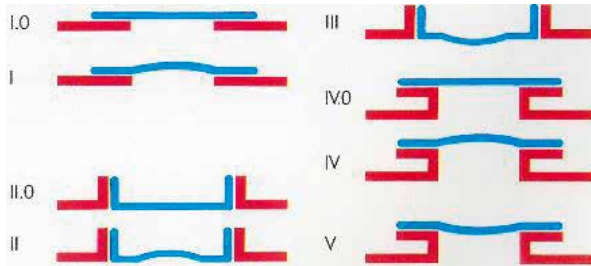


## FKM EXPANSION JOINTS

are made from Viton B, a fluorocarbon elastomer with exceptional chemical resistance and outstanding thermal and sealing properties. The fluorelastomer combines temperature resistance and thermal cycling resistance with fluid resistance, compression-set resistance and retention of designed hardness. Joints are suitable for wet and dry service at continuous temperatures up to 200° C – with higher peak values – and pressures to 50 kPa. Chemically, the elastomer has excellent resistance to mineral acids, oils, weather and ozone attack.

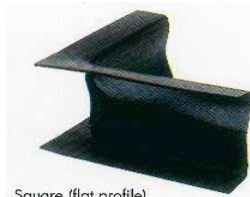
## STANDARD DESIGNS

LBH offers two basic styles of expansion joint –the **Belt Type** and the **Flange Type**. Both can be made with a flat, convex or concave profile; for round or square ducting; and to any required length and diameter. The normal range of wall thicknesses is from 1 to 6 mm.



## CORNER DESIGN

Expansion joints for square ducting have a continuous design which eliminates splicings in the corner itself.



Square (flat profile)



Square (convex profile)



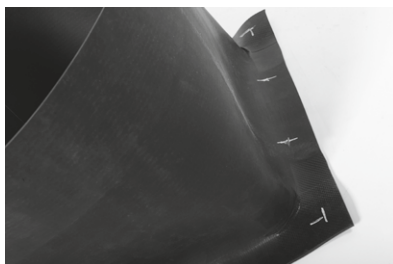
Rounded (convex profile)

## SI EXPANSION JOINTS

have thermal properties comparable to FKM joints and show stable mechanical performance over a very wide range of temperatures. Silicone rubber is favoured by the food-processing industries because it has no taste or smell and is physiologically acceptable to animal tissue. Joints are suitable for wet and dry service of continuous temperatures up to 200°C (with higher peak values) and pressures to 20 kPa.

## MOVEMENT HANDLING CAPABILITY

Elastomeric expansion joints have an exceptional ability to absorb large movements and misalignments created by thermal expansion, in any combination. These movements may be linear (in all three planes), angular or torsional.

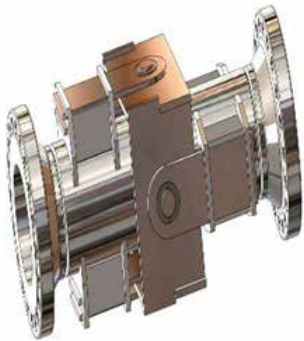
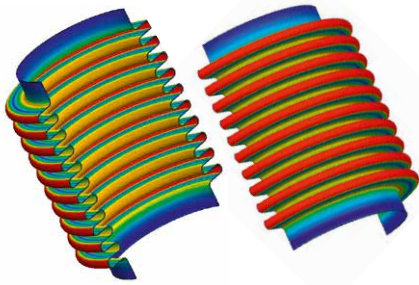


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## WHY CHOOSE LBH INTERNATIONAL AS YOUR SUPPLIER

Choosing the right bellows supplier is of outmost importance, no matter how complicated or simple your design is. Safety and operational performance is crucial, irrespective if you design a new plant or replace existing joints. By choosing LBH International A/S, you can be assured that you will get a supplier, that can support you all the way from design to installation, making sure you will get the exact correct solution for your needs.

LBH International A/S has engineered, manufactured and supplied thousands of metal expansion joints to clients all over the world. Solutions ranging from the simple to the most complex designs. LBH International A/S, has assisted customers with expansion joints tailored for their exact needs. During the years LBH International has built up a large number of satisfied customers all over the world, with its reputation as a first class provider of customized expansion joint solutions.

Our state-of-the-art solutions are monitored and recognized by 3rd party notify bodies. LBH is also a member of the European Technical Committee for EN14917, regulating the calculation, design and manufacturing of steel Bellows.

### LBH International A/S is recognized by:

- State of the art engineering and design support
- High quality in products
- Expansion joints designed by our design team in Denmark.
- Very competitive pricing, due to manufacturing setup in Poland and Hungary.
- Documentation as per customer requirements

## PRODUCT CAPABILITIES

Size: From DN50-DN5000

Pressure: Up to 250bar (or more if required)

Materials: All stainless steel & High alloyed stainless steel (Including Inconel, Incoloy, Hastelloy, Duplex, Titanium, Tantal-coated & PTFE coated bellows)

Design codes: EN 14917, EN 13480, EN 13445, PED 2014/68/EC, EJMA, ASME VIII, Div. I, ASME B31.1, ASME B31.3 & AD2000

Company approvals: EN ISO 9001:2015, EN ISO 14001:2015, PED 2014/68/EU Module H, TR CU 032/2013, Transfer marking within EN 10204 3.1B PED/AD-M W, DNV-GL, Bureau Veritas, RINA etc. approvals as per request.



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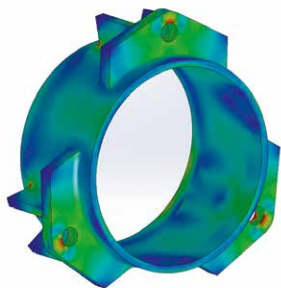


## DOCUMENTATION

LBH International A/S treats the documentation of their products, as a vital part of the supply, meaning it we also treat this with highest respect.

We can supply all documentation that is requested by the client, including ITP, welding logs, pressure test certificates, material certificates, FEA, X-ray reports etc.

We also have cooperation with 3rd party inspectors such as Lloyds, RINA, Bureau Veritas etc. if requested. If you have any special request regarding your documentation, we will be open to discuss how this can be met.



## HOW CAN LBH INTERNATIONAL ASSIST YOU

Through the years LBH International A/S have been supporting clients, in making customer specific designs. LBH will be able to give advice in all aspects of the design (including FEA-analysis etc.)

With its dedicated team of experienced engineers, LBH International A/S can assist you, from the earliest stages of your design or help to troubleshoot, if you have a design with life expectancy shorter than expected etc.

LBH International is experienced working with clients ranging from small local companies, to big international world leading companies. No matter if you are a small or big company, we always strive to give you the best possible support.

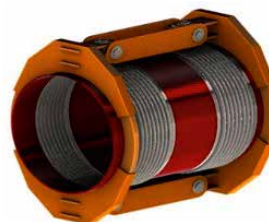
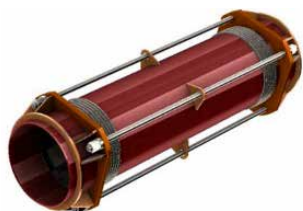
## APPLICATIONS

- Oil and Gas
- Petrochemicals
- Power
- District heating and cooling
- Gas and Steam turbines
- Steel Industry
- Tank Farms
- Water
- Cement
- OEMs



## REFERENCES

SABIC, Shell, Belfinger, ESSAR, Babcock Borsig  
Steinmüller, Siemens, CLYDE BERGEMANN, GE-Alstom, GE,  
LURGI, STATOIL, RAFAKO



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# Site Service

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LBH offers a full service package when installing and supervising on site. The installation comes with a firm knowledge of how to achieve the best results with LBH products.

Qualified and trained LBH engineers are always available during:

- **Assembly and/or erection of expansion joints**
- **Pre-instructions for installation and maintenance**
- **Training and supervision of Site Personnel**
- **Supervision during installation**
- **Site inspection and survey**

Over the years LBH International has developed the technology and the know-how to make it one of the leaders in the expansion joints business, and to provide our customers with the best site service solutions.

Our site service team is ready to support our customers all over the world.

## HOW TO ORDER

To place an order or for more information regarding our products and services, please call **+4531188504** and one of our customer service representatives will gladly assist you.

You may also email our sales team at [sales@lbhint.com](mailto:sales@lbhint.com) or visit us online at [www.lbhint.com](http://www.lbhint.com)



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