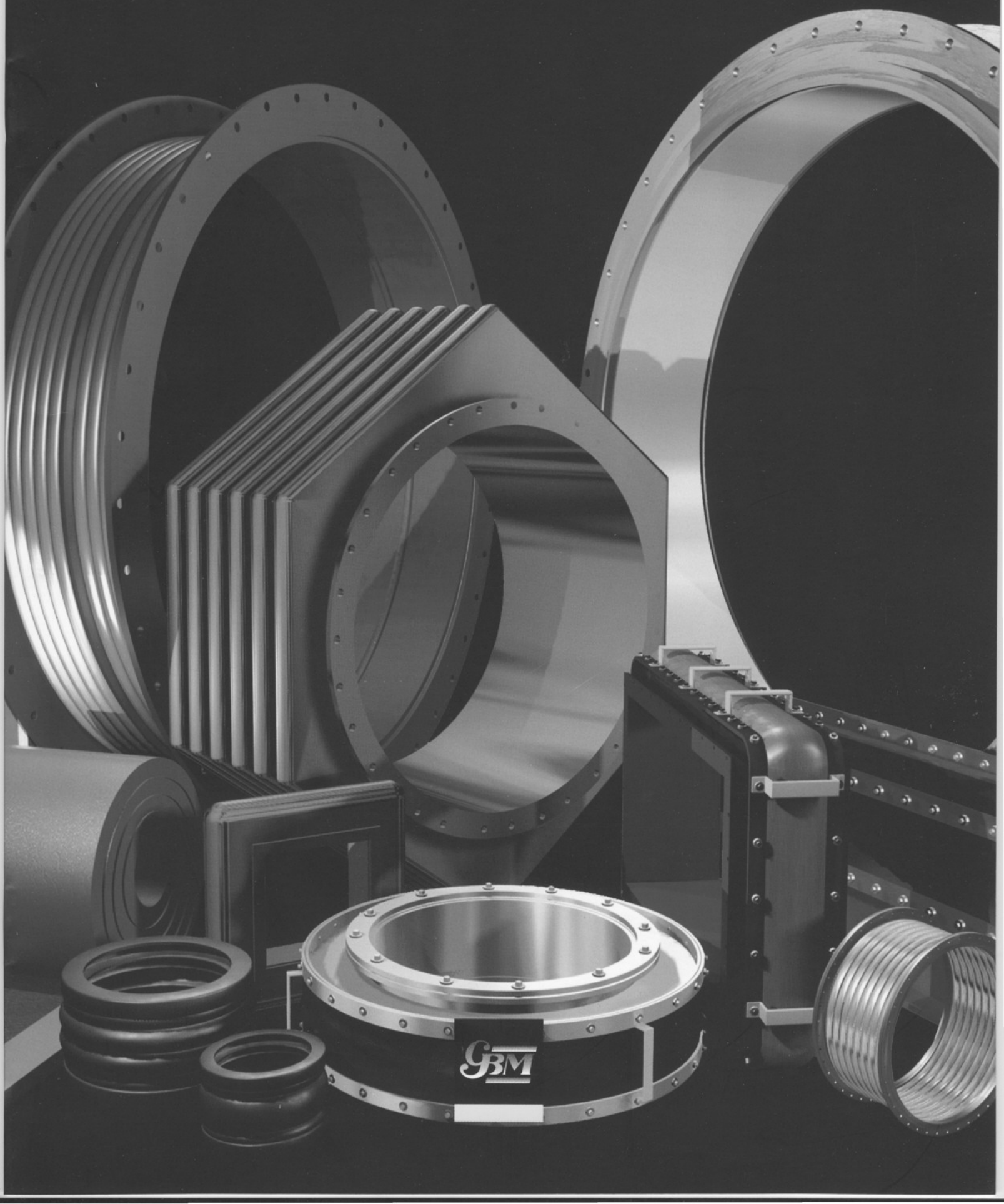
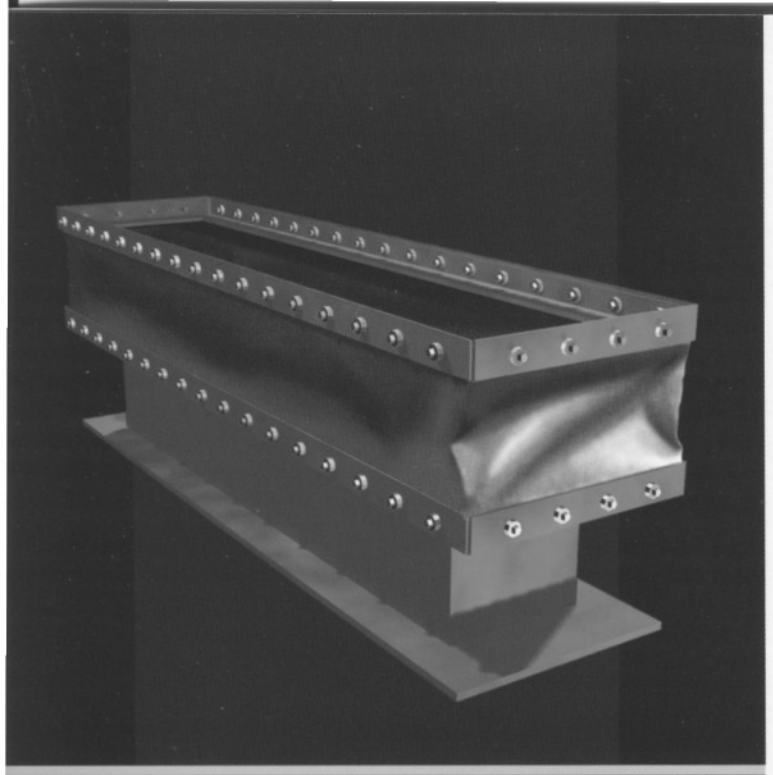
GBFlex Expansion Compensators

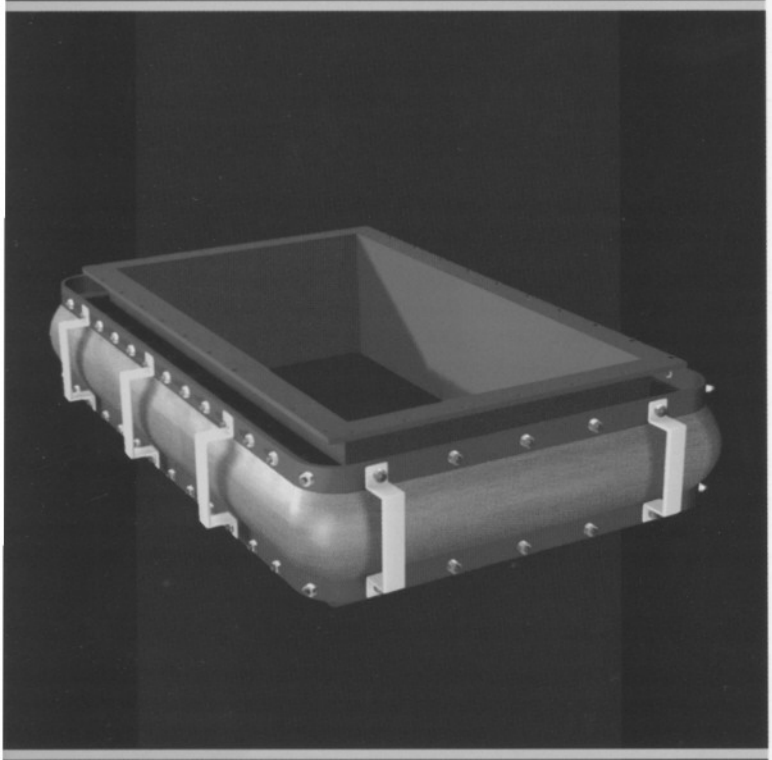


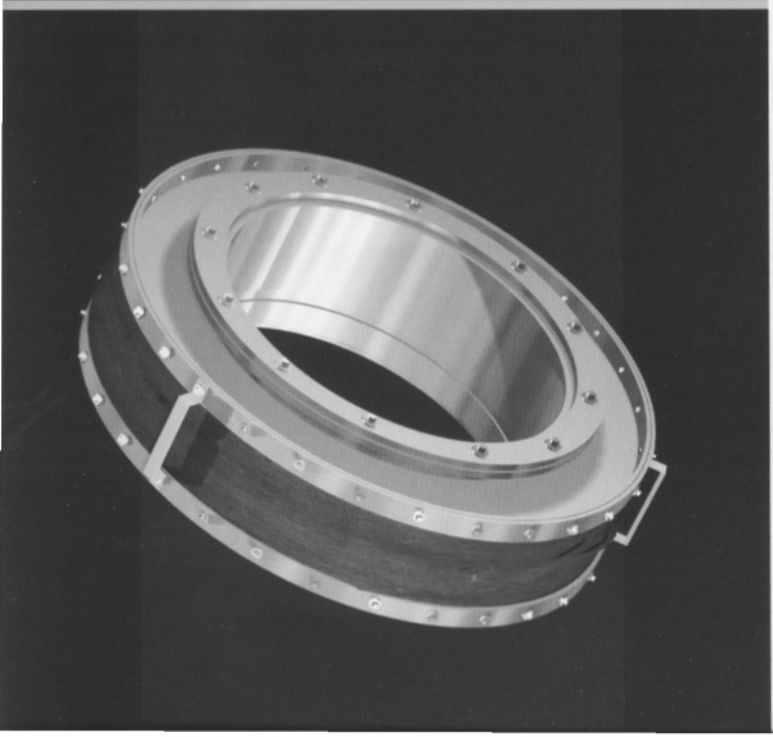
GBFlex Expansion Compensators

Compensators are vital components in most industrial plants.

They are installed as flexible connections in air and flue gas duct systems to compensate for the inevitable expansions in the metal due to heat or minor misalignments in the system, which might otherwise cause or contribute to costly breakdowns in production.







In choosing the right type of compensators, a number of factors have to be taken into account including working conditions of the necessary chemical or thermal resistance, need for noise reduction and absorption of vibrations, GB Flex offers fabric compensators of different quality and specifications. The products range from flexible single-layer connections used in power plants, cement plants, petrochemicals, refineries, fertilizer plants etc. to multilayer connection.

The GBM is manufacturing range of fabric expansion joints consist of twenty-six standard types divided into four categories, :-

Type **CL**	For clean air systems
Type **RGL**	For flue gas with low acid content
Type **RGH**	For flue gas with high acid content
Type **HPC**	For applications requiring optimal resistance against chemical attack of high pressure

GB Flex Compensators absorb thermal expansions, vibrations and small misalignment in duct system

The GB Flex range covers most operating conditions in air and flue gas ducts. The type of GB Flex is chosen by referring to maximum operating temperature and the chemical composition of the medium. The compensators are normally suitable for a maximum pressure of -200mm WG.

One advantage of this type of compensator is that the extent of dust depositions can be physically estimated during plant operation by pressing the fabric layer from the outside. A hard interior indicates heavy to very heavy dust

deposition which needs to be cleaned up

GB Flex compensators are manufactured individually to suit specific dimensional requirements and can be circular, rectangular, conical or a combination of these shapes. They can be supplied with different flange arrangement for particular installations, which make allowance for operating conditions:

Vibrations

Expansions

Misalignment

GB Flex is used in different types of low pressure or, low temperature systems.

GB Flex can be delivered with loose clamps or with integral flanges for bolting on duct or equipment.

The basic idea of GB Flex expansion joint is to blend the advantages of Steel Bellows and the flexibility of fabric joint is achieved by using acid / alkali resistant fabrics and insulating materials on a Stainless Steel Wire Mesh to give controlled movement.

Temp°C	0 100 200 300 400 500 600 700 800 900 1000							
Air	CL 70 LN 100	CL 200	CL 300	CL 400	CL 500	CL 700	CL 1000	
Exhaust gas / weak acid density		RGL 250	RGL 300	RGL 400	RGL 500	RGL 700	RGL 1000	
Flue gas / strong acid density		RGH 250	RGH 300	RGH 400	RGH 500	RGH 700	RGH 1000	
Heavy duty		HPC 250	HPC 300	HPC 400	HPC 500	HPC 700	HPC 1000	
Temp° F	32 300 600 900 1200 1500 1800							

The outer layer of the joint is leakproof and weatherproof.

The metalic internal Sleeve protects the fabrics from coming into direct contact with fluid media, thereby, protecting the fabrics from abrasive and corrosive dust/gas. The internal sleeve is suitably chosen and designed to suit service conditions. It also prevents dust accumulation.

The number and composition of fabric layer to be used depend upon the service parameters (i.e. temperature, pressure, dust loading, media to be handled, dust characteristics, etc.) GB Flex Expansion Joints are individually designed and manufactured as integral construction, laminated with insulating layers and an outer sealing of coated fabrics. The insulating layer

thickness is suitably selected to reduce the outer surface temperature, within the continuous dry heat rating of the outer sealing fabric.

Our designing, manufacturing, quality control methods have ensured us the approval of reputed consultants such as Holtec, Uhde, Lurgi, Tata Projects, M N Dastur, Mecon, ACC, L&T etc.

Our experienced technical staff are always at your disposal which demand extreme working and installation conditions. They are always available to offer after-sales service through out the country at short notice.

For equipments of fabric compensators, contact GBM or visit our web site: www.gbmcoupling.com

Specification

GB Flex joint can be manufactured in round and rectangular shapes to almost any size. The length depends upon the expansion/construction to be accommodated in the axial/lateral direction.

Economical Advantages

It is easy to install being light weight. GBFlex imposes negligible load on duct work, thereby, permitting lighter structural sections, resulting in economy. For the same application, a standard GB Flex is 20-25% cheaper than any conventional metalic expansion joint, without sacrificing performance or service life.

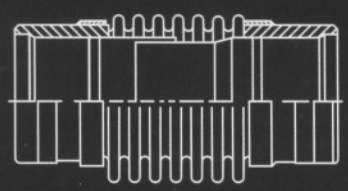
Quality Control

Every GB Flex joint undergoes vigorus quality control checks supported by inspection procedures. All the raw materials required for GB Flex also undergo pre-production quality test in laboratory at regular interval.

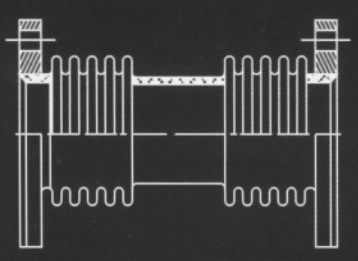
The proven performance of GB Flex can be ascertained from installation, where they have been use for years.

Delivery

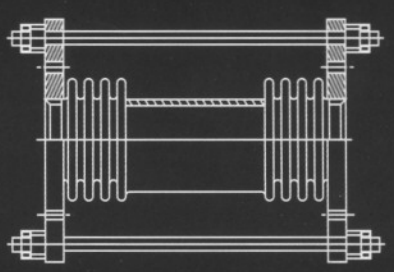
Due to the short manufacturing lead time as compared to Metalic Expansion Joint, delivery can be made quickly.



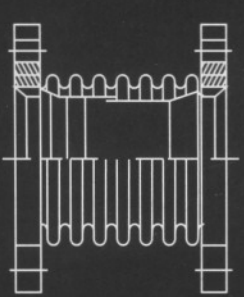
Axial Bellows with weld end sockets and telescopic type internal sleeve



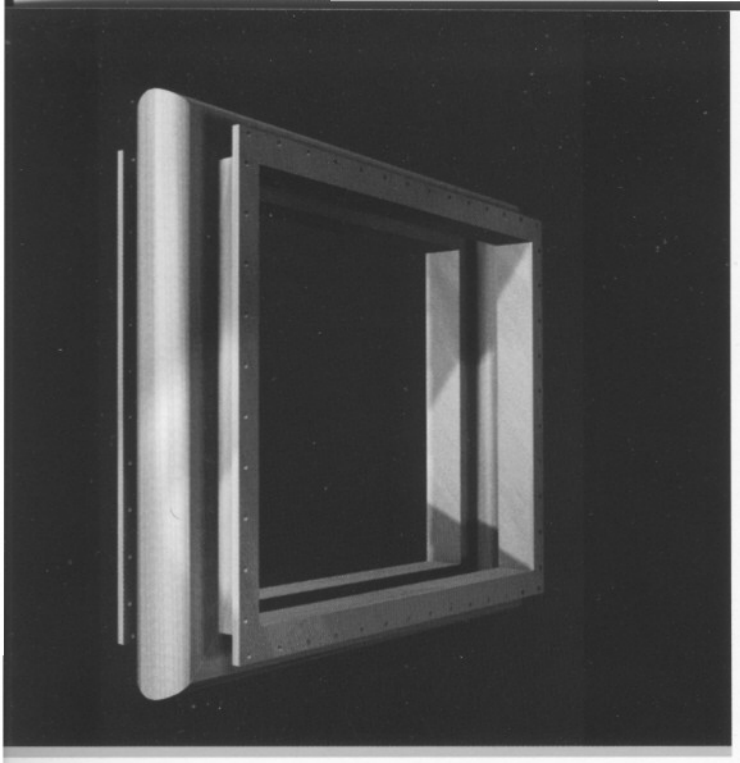
Universal bellows with fixed flanges

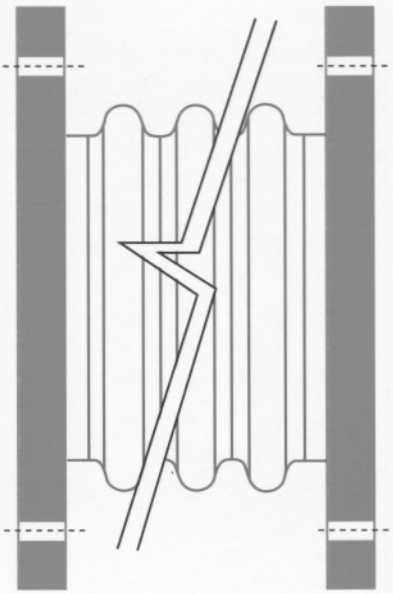


Universal Expansion Joints with Tie Rods and flanges



Axial Bellows with fixed flanges and internal sleeve





Metallic Expansion Joints

These are generally utilised where higher pressure ratings are encountered in the duct lines. Our Metallic Expansion Bellows are fabricated out of carbon Steel/Mild Steel/Stainless Steel material depending upon service conditions. These are generally designed as per EJMA standards. These have been supplied to eminent customers by us under stringent inspection carried out by reputed agencies. These are also subjected to stringent quality control checks whereby every joint is inspected for leakage as per recommendations. In special cases, dye penetrant and radiographic examination of Weld Joints are also conducted GB Flex Expansion Joints are the result of intensive development. They satisfy the need for a quick, economical, long life expansion joint used to absorb thermal expansion and vibration in hot gas duct work.

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Standard Roll Sizes

W: 200 mm, 300 mm & 400 mm. L: 12.5 m, 25 m & 50 m. Stock delivery.

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W: 200 mm, 300 mm & 400 mm. L: 12.5 m, 25 m & 50 m. Stock - other widths to order

Design and installation

GBM engineers are always available to discuss and recommend the correct technical and more economical solution to duct expansion problems, whether they are new applications or replacement of faulty expansion joints. To ensure the correct fitting of the joints and to maximise their working life, a team is available to install expansion joints in India or abroad

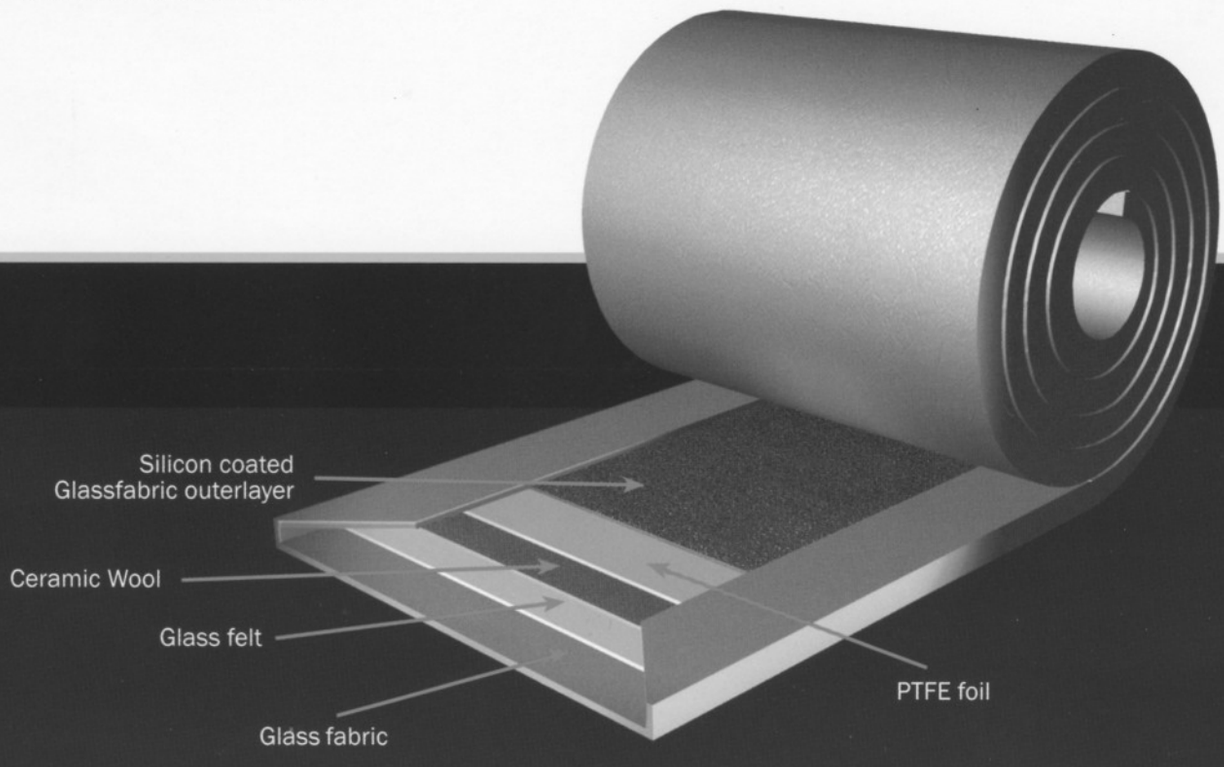
Choosing the right roll

GBM engineers will be pleased to assist in selecting the right roll for your application. However it will speed up the process if you already have the following data.

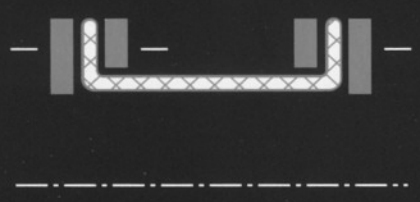
- Gas temperature
- Application
- Pressure-negative or positive
- Expansion/movement (if replacement joint, size of gap to be filled)
- Environment - Dust Concentration

Temperature	Gas comp	Construction
-20°C to 250°C	Flue gas	Silicon coated glassfabric-outer layer PTFE foil (acid resistant)-middle layer Glassfabric-middle layer
-20°C to 500°C	Flue gas	With 12mm thick special ceramic wool between glassfabric and PTFE foil
-20°C to 600°C	Flue gas	With 25mm thick special ceramic wool between glassfabric and PTFE foil

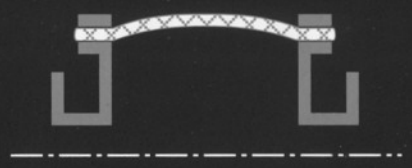
ExpansionJoints in Roll Form



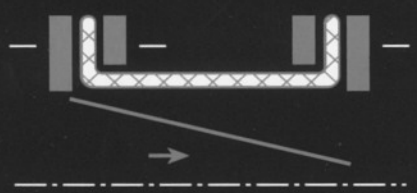
Profile



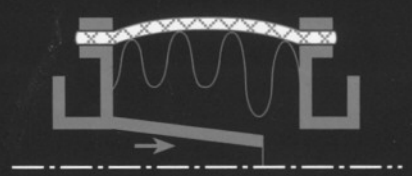
Profile I



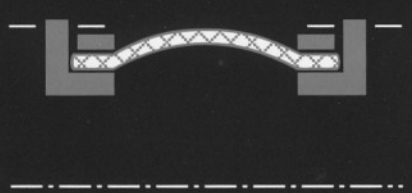
Profile IV



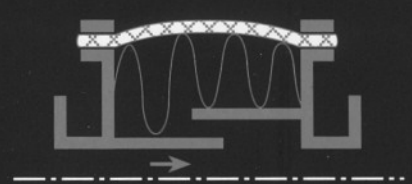
Profile IA



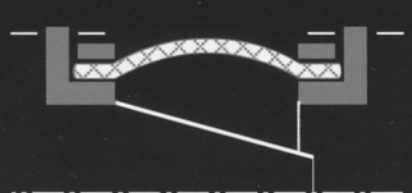
Profile V



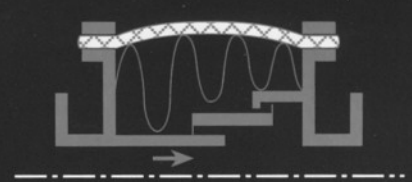
Profile II



Profile VI



Profile III

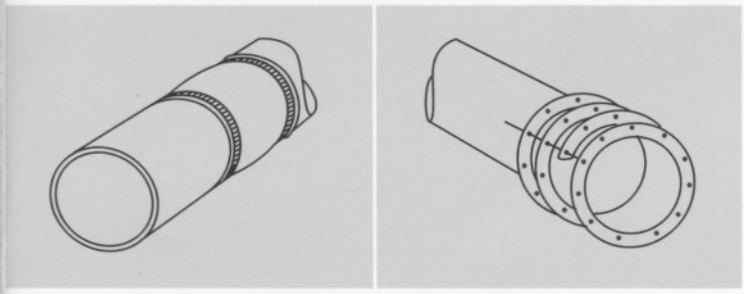


Profile VII

Rubber Bellows are one of the essential products which are used for Hydraulic Ram Protections, Fluid Filling System, Chemical Plants, Vibrating Arrangements and to accommodate misalignments in the Duct line. The materials used to manufacture the Bellows are Rubber, Rubberised Canvas, Rubberised Synthetic Fibres with various stiffeners for reinforcement to withstand desired pressure.

The Bellows can be given any shape -rectangular, square, round as per the shape of the system with calculated length. The Bellows compressed, length and free length depend upon the transversing zone. Flanges are incorporated as easy fittings.

The Bellows can be used under acidic or alkaline conditions. They can also be made to withstand a temperature of 250°C.



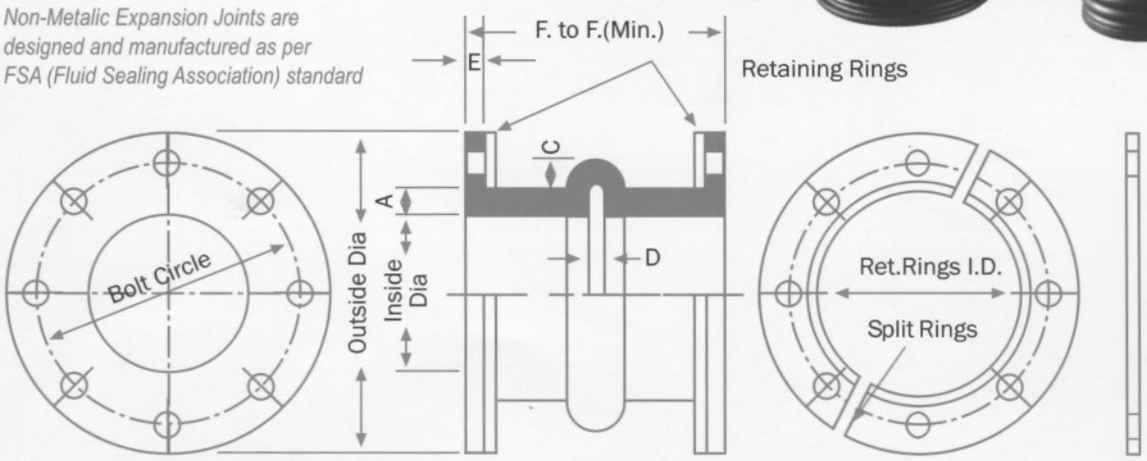
Expansion Joints are made from hypalon, chlorosulphonated polyethylene rubber with excellent resistance to oxidation. Joints are suitable wet and dry chemical service at temperature up to 100°C and pressures up to 30 kpa.The materials an ethylene proplyne dienneterpolymer (EPDM)- resist hot air, non-oily fuel gases and extreme weather conditions, and in power-generating service withstands the acid attack of fly-ash deposits and scrubber treated gases. Expansion Joints made from Viton B. a fluorocarbon elastomer with exceptional chemical resistance and outstanding thermal and sealing properties.

The fluorelastomer combines temperature resistance and thermal cycline resistance with fluid resistance, compression-self resistance and retention of designed hardness . Joints are suitable for wet and retention of designed hardness. Joints are suitable for wet and dry service at continuous temperatures up to 200°C. Chemically the elastomer has excellent resistance to mineral acids, oils, weather and ozone attack. In power-generating service, joints can withstand the acid attack of fly-ash deposits, scrubber-treated gases and acidic flue gases condensates and are unaffected by the sulphur content of coal or oil fuels, being used to seal ducting against high temperature leakage of SO_2 and H_2S silicon rubber or polyurethene is favored by the food-processing industries because it has no taste or smell and is physiologically acceptable to animal tissue.

The material is unaffected by atmospheric exposure and extreme weather conditions and shows no ozone cracking: it is chemically inert to most food products but has very limited resistance to acids, oils and abrasion. Joints are suitable for wet and dry service at continuous temperatures up to 200°C (with higher peak values) and pressures to 20 kpa.

RubberBellow

Non-Metalic Expansion Joints are designed and manufactured as per FSA (Fluid Sealing Association) standard



Advantages of non-metallic expansion joints over metallic expansion joints

1. Large movement capacity

   Total number of expansion joints in a duct work may be reduced for better economy in duct design.

2. Ability to accommodate axial, internal torsional & angular movement

   Duct system can be greatly simplified.

   The usage of costly toggles, supports, structures and guides can be extensively reduced.

   Duct work erection is simplified since too much care not be taken for alignment.

3. Negligible spring rates, very low spring forces during movement

   Duct support structures are simpler and lighter.

   No reaction force on fixed support.

4. Corrosion-resistant by use of suitable fabric combination

   Life of joints increase. Low material cost compared to corrosion-resistant special metals

5. high-temperature withstanding capability

   Low material costs compared to high-temperature-resistant special metals.

6. Vibration isolation and sound dampening properties

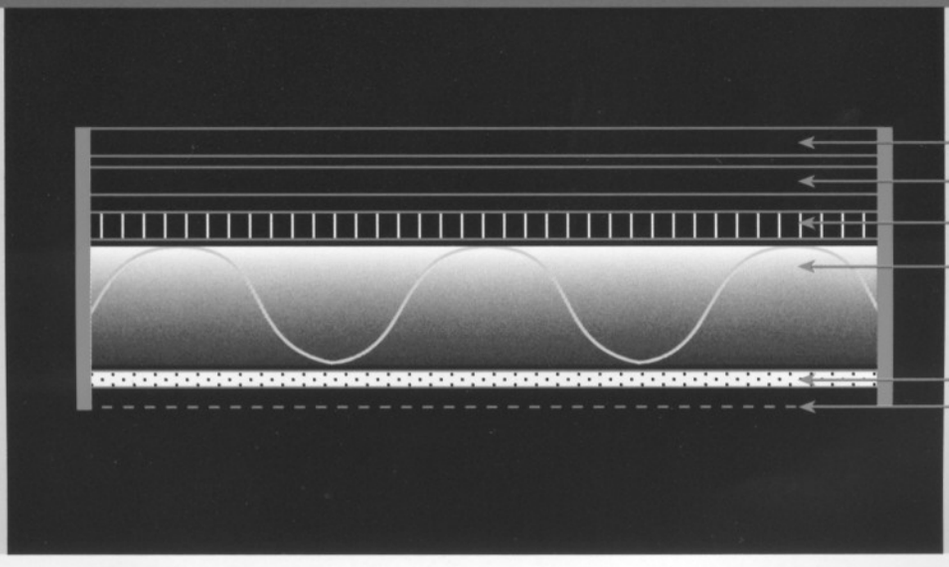
   Prevention of premature system-degradation due to vibrations.

   Protection from noice pollution

   Easy replacement of fabric part in case of any failure.

   Minimum downtime for maintenance

Construction details



A typical power-plant ducting system, showing the positions of expansion joints.