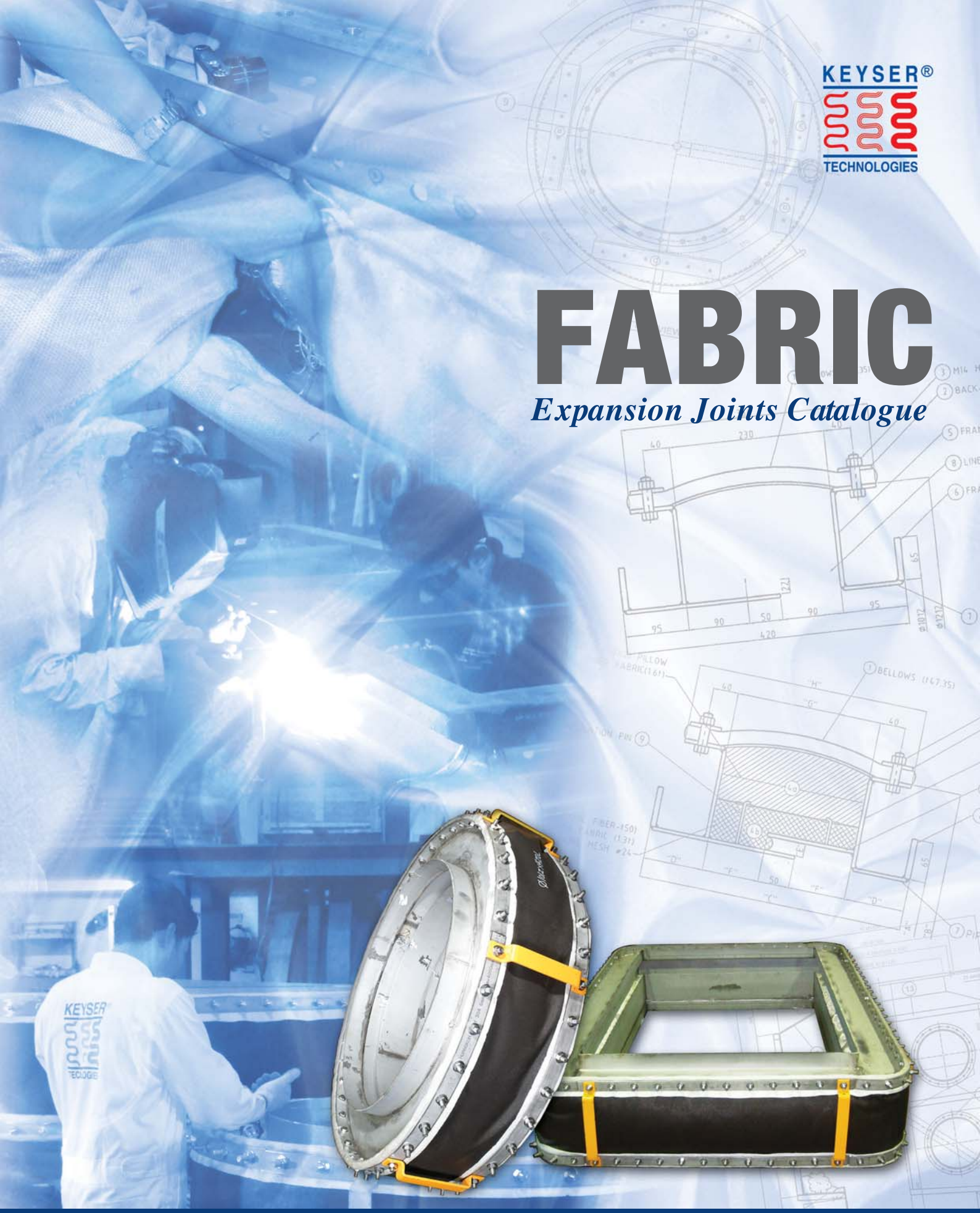
KEYSER®
TECHNOLOGIES

FABRIC

Expansion Joints Catalogue

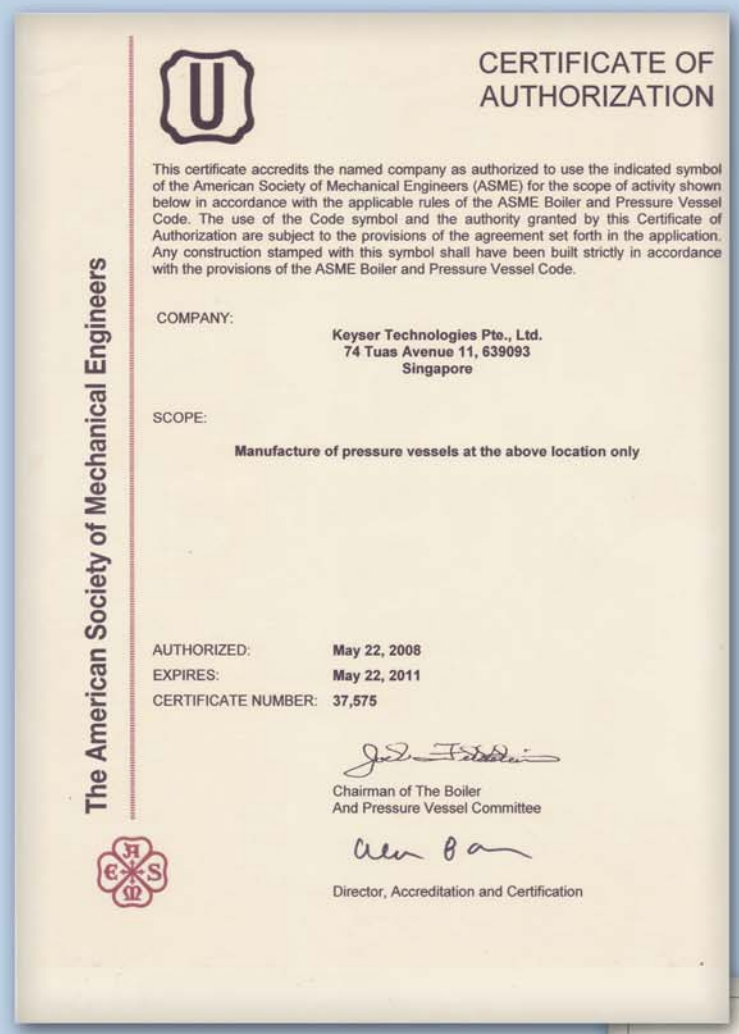


American Society of Mechanical Engineers
"U" Stamp Accredited

DNV
UKAS QUALITY MANAGEMENT 013

KEYSER TECHNOLOGIES PTE LTD
(DESIGN, MANUFACTURE OF EXPANSION JOINTS & ASSOCIATED STEEL FABRICATION WORKS)

Catalogue compiled and printed in 2009



The American Society of Mechanical Engineers

CERTIFICATE OF AUTHORIZATION

This certificate accredits the named company as authorized to use the indicated symbol of the American Society of Mechanical Engineers (ASME) for the scope of activity shown below in accordance with the applicable rules of the ASME Boiler and Pressure Vessel Code. The use of the Code symbol and the authority granted by this Certificate of Authorization are subject to the provisions of the agreement set forth in the application. Any construction stamped with this symbol shall have been built strictly in accordance with the provisions of the ASME Boiler and Pressure Vessel Code.

COMPANY:

Keyser Technologies Pte., Ltd.
74 Tuas Avenue 11, 639093
Singapore

SCOPE:

Manufacture of pressure vessels at the above location only

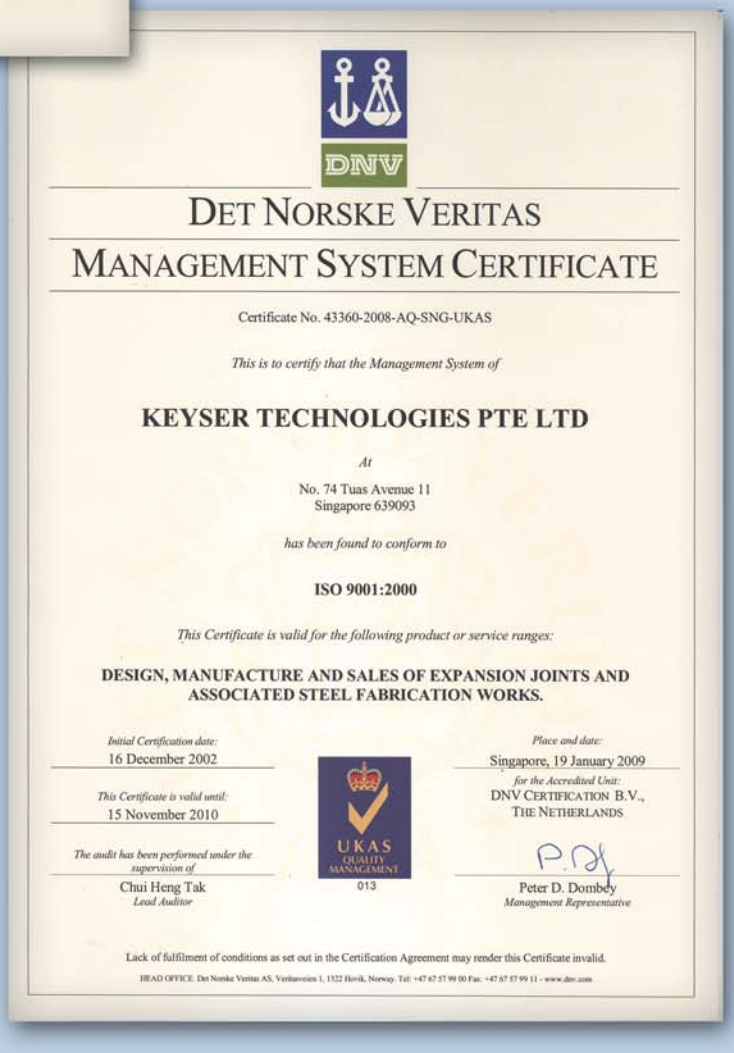
AUTHORIZED: **May 22, 2008**
EXPIRES: **May 22, 2011**
CERTIFICATE NUMBER: **37,575**

Chairman of The Boiler
And Pressure Vessel Committee

Director, Accreditation and Certification

The ***American Society of Mechanical Engineers (ASME)*** is a professional society focused on mechanical engineering known for setting codes and standards for mechanical devices. The ASME was founded in 1880 by Alexander Lyman Holley, Henry Rossiter Worthington, John Edison Sweet and Matthias N. Forney in response to numerous steam boiler pressure vessel failures. The ASME conducts one of the world's largest technical publishing operations through its ASME Press, holds numerous technical conferences and hundreds of professional development courses each year, and sponsors numerous outreach and educational programs.

As of 2006, the ASME has 120,000 members.



DNV

DET NORSKE VERITAS

MANAGEMENT SYSTEM CERTIFICATE

Certificate No. 43360-2008-AQ-SNG-UKAS

This is to certify that the Management System of

KEYSER TECHNOLOGIES PTE LTD

At

No. 74 Tuas Avenue 11
Singapore 639093

has been found to conform to

ISO 9001:2000

This Certificate is valid for the following product or service ranges:

DESIGN, MANUFACTURE AND SALES OF EXPANSION JOINTS AND ASSOCIATED STEEL FABRICATION WORKS.

Initial Certification date: 16 December 2002

This Certificate is valid until: 15 November 2010

The audit has been performed under the supervision of
Chui Heng Tak
Lead Auditor

UKAS QUALITY MANAGEMENT
013

Place and date: Singapore, 19 January 2009

for the Accredited Unit:
DNV CERTIFICATION B.V.,
THE NETHERLANDS

Peter D. Dombey
Management Representative

Lack of fulfilment of conditions as set out in the Certification Agreement may render this Certificate invalid.

HEAD OFFICE: Det Norske Veritas AS, Veritasveien 1, 1322 Hovik, Norway. Tel: +47 67 57 99 00 Fax: +47 67 57 99 11 - www.dnv.com

Stiftelsen Det Norske Veritas or DNV, established in 1864 in Norway, is a classification society organized as a foundation, with the objective of "Safeguarding life, property, and the environment". It was established in Norway to inspect and evaluate the technical condition of Norwegian merchant vessels.Together with Lloyd's Register and American Bureau of Shipping, DNV is one of the three major companies in the classification society business. DNV has its headquarters in Norway and has 300 offices in 100 countries, with 8,400 employees.

Important industries where the company operates include ship transport, energy, aviation, automotive, finance, food, heath care and information technology. It also conducts research in several fields where it operates.

KEYSER®
TECHNOLOGIES

VISION STATEMENT

Together, we will be the recognised leader in our industry for quality, service and responsiveness to customer needs.

MISSION STATEMENT

Our mission is to provide the highest quality products and services to our customers. We will do this through investments in technology, product innovations, production processes, and the people, who are our asset to growth and profitability. Keyser Technologies shall continually improve the effectiveness of the company's quality management system.

OUR VALUES

- Respect for individuals
- Superior Customer Service
- Pride in craftmanship
- Honesty and Integrity
- Teamwork
- Strong Work Ethic
- Simplicity
- An atmosphere of open communications

INTRODUCTION

Keyser Technologies Pte Ltd specializes in the Manufacturing of Thermal Expansion Joints in Singapore. Keyser was established in Year 1995, solely as a Trading Service Company in various products. In Year 1999, Keyser entered into Metal Expansion Joints Industry and ventured with full steam into the Manufacturing of Metal Expansion Joints. This is where the first KEYFLEX bellow was produced. Since then, Keyser has progressively grown and expanded into many sectors of industry in Singapore, Asia and Pacific regions.

Keyser Technologies Pte Ltd is a diversified company where our main activity is to supply Expansion Joints in Metal, Rubber and Fabric types. We also provide a wide range of services, such as fabrication work and trading services. For Quality ASSURANCE, Keyser obtained the Quality System Standard, as an ISO 9001:2000 Company in Singapore, certified by Det Norske Veritas (DNV). We are also accredited to ASME Stamp by Association of Mechancial Engineers (ASME). With respect to ISO 9001:2000 certification and America Society of Mechanical Engineering (ASME) U Symbol Stamp, Keyser is recognized in Designing, Manufacturing and Sales of Thermal Expansion Joints and Associated Steel Fabrication Works. From achieving of ISO 9001:2000 certification, Keyser holds a very strong stand in:

- Supplying high quality products;
- Prompt & efficient delivery;
- Providing premium services to our customers.

Keyser Technologies leads the region in the design and manufacture of a comprehensive range of fabric expansion joints for all industries. Stringent tests and quality control measures ensures that the fabric expansion joints are of the highest quality. They are used extensively in industries like power plants, steel mills and smelters.

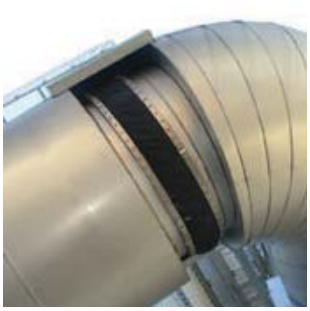
Keyser Fabric Expansion Joints are fabricated from a variety of non-metallic materials such as fabrics and insulation materials. Problems that are caused by mechanical and thermal stresses are solved with the use of Fabric Expansion Joints. They are customized according to clients' specific request and requirements.

KEYSER FABRIC EXPANSION JOINTS ARE USED IN A VARIETY OF INDUSTRIES SUCH AS:

- Fossil fired power plant
- Oil & Gas
- Fire Protection
- Steel Mills
- Pulp & Paper industry
- Refuse incineration
- Smelters
- Cement Plant
- Heat / Dust Recovery
- Food-processing
- Marine Offshore








Key Advantages For The Use Of Keyser Fabric Expansion Joints:

1. No transmission of stress
2. No transmission of sound & vibration
3. Larger movement allowances
4. Lower loads
5. High resistance to corrosion
6. High Temperature (over 2000 ºF)
7. Higher efficiency at lower cost
8. Ease of Installation

TYPES OF FABRIC EXPANSION JOINTS

A) Single Layer Type:

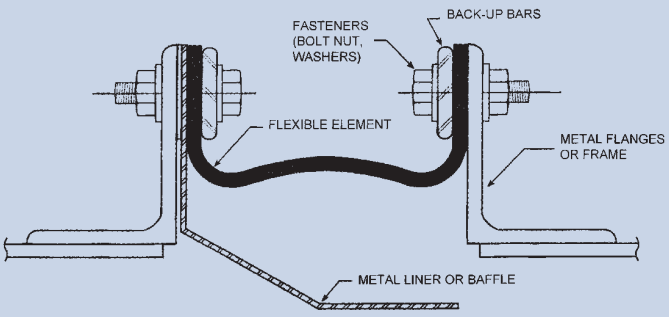
This comprises with one or more reinforcement plies with coating of elastomers or fluoroplastics to form a homogenous material.

B) Composite Type:

This consists of various plies of materials which are laid one over another, usually bonded, sewn or joint together in the clamped flange area.

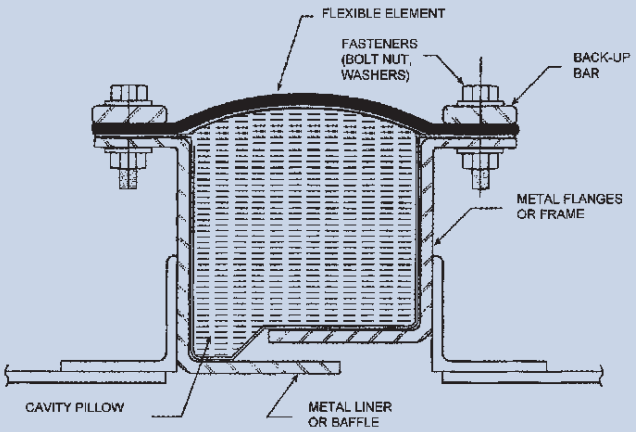
C) Anatomy of Type

1) F Type : Integrally Flanged Type Expansion Joint



INTEGRALLLY FLANGED TYPE EXPANSION JOINT

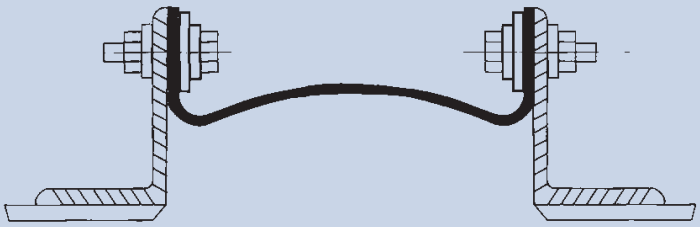
2) B Type : Belt Type Expansion Joint



BELT TYPE EXPANSION JOIN

KEYSER OFFERS DESIGNS FOR A VARIETY OF APPLICATIONS

KF-01

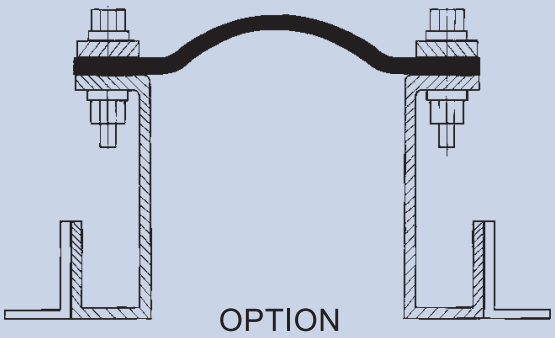


OPTION (flow liner)

Standard Internal Flanged Type (F Type) Expansion

- Low to moderate temperatures application
- Primary used for field installation application
- Lower initial cost and shipping cost
- Molded corners provided for rectangular

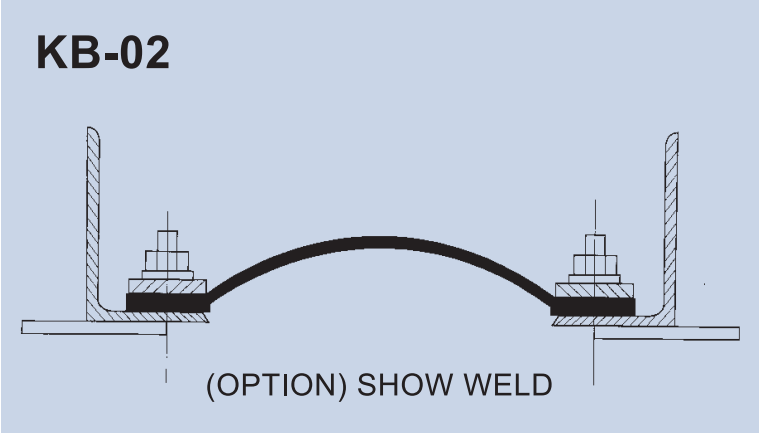
KB-01



OPTION

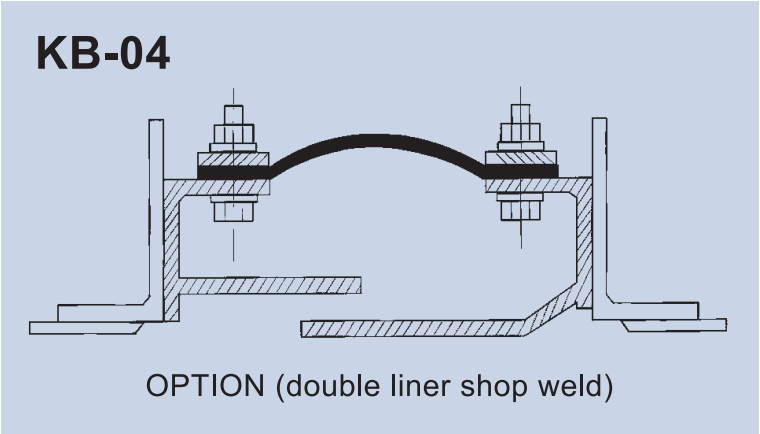
Economic Belt Type Expansion Joint

- High temperature duct work application
- Pre-fabricated flame reduce cost
- Large lateral movement
- Outside belt assembly



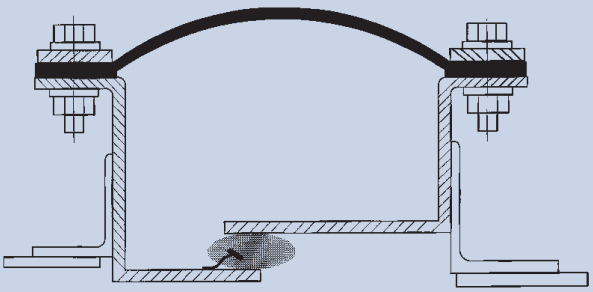
Belt Type Expansion Joint

- Suitable normality temperature applications
- Frequent fan application
- Economic and Standard frame
- Facilitate belt replacement



- Low temperature application with low level
- Future belt replacement
- Used frequently with fan application
- Shop welded flow liner

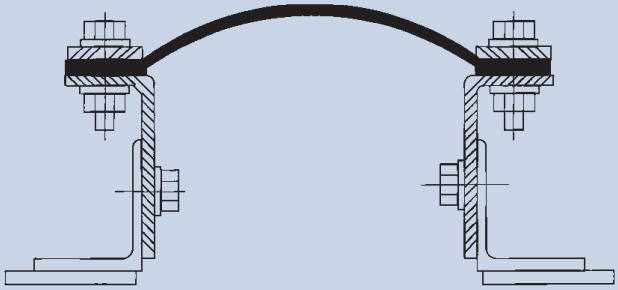
KB-05



OPTION (braid ceramic seal)

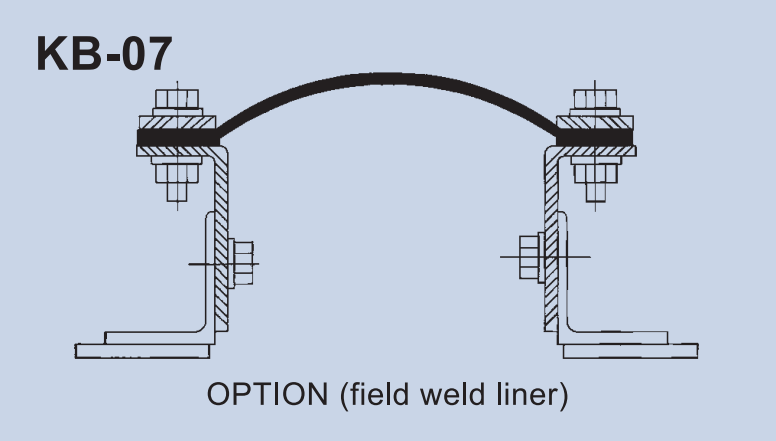
- High temperature application and high level
- Large Lateral Movements
- Integral telescopic flow liners
- Provide protection for belts and pillows
- Pillow design

KB-06



OPTION (field weld liner)

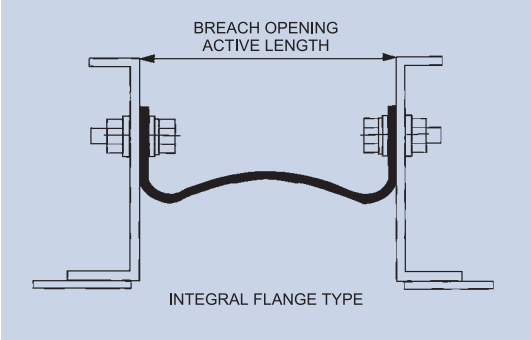
- Single integral-flow liner
- Low level and vertical duct work applications
- Provide protection for belts and pillows
- Future belt and pillow replacement
- Large lateral movements

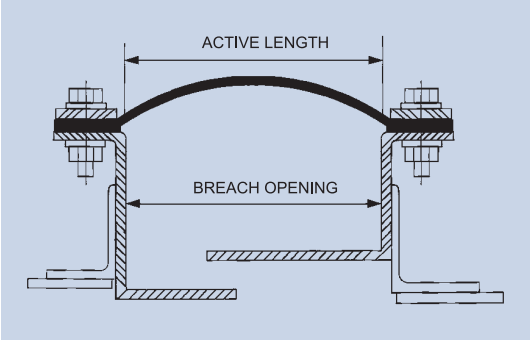


- Well suitable field assembly installation
- Utilized for all temperature ratings
- Economic frame
- Facilitates field assembly

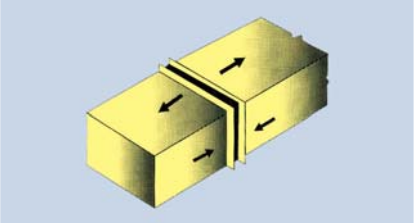
MOVEMENT CAPABILITIES

Non-metallic ducting movements can be calculated on the design and maximum excursion temperatures. One unit of fabric expansion joint is able to handle combined axial, lateral, angular and torsional movements. The expansion joint are carefully placed to minimize the number of expansion joints required while absorbing all of the duct movements.

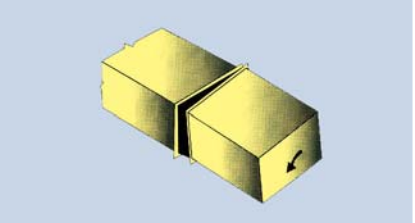




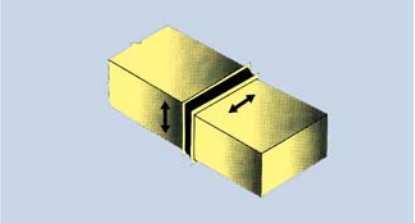
FABRIC EXPANSION JOINTS MOVEMENTS



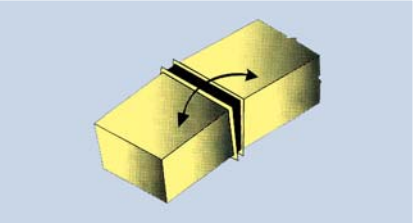
AXIAL COMPRESSION Extension



LATERAL Movement



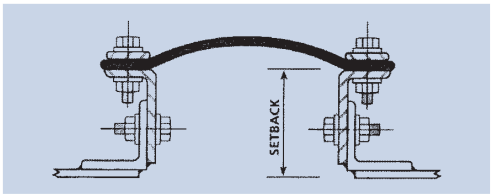
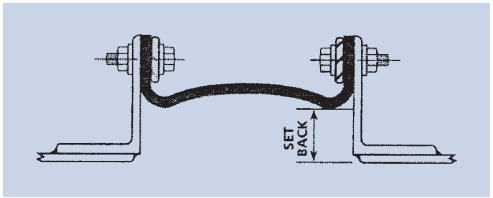
TORSIONAL Deflection



ANGULAR Deflection

Set Back Requirements:

Proper setback reduces the thermal transfer effect on the inner face of the expansion joint from particles in the gas steam. The expansion joint is moved outward from the gas stream to prevent the joint from protruding into the gas stream when operating under negative pressures.

Active Length		6” (150mm)	9” (230mm)	12”(305mm)	16”(405mm)
Illustration	Pressure				
		3” (75mm) 4”(100mm)	3” (75mm) 6” (150mm)	4” (100mm) 6” (150mm)	6” (150mm) 7” (175mm)
		1” (25mm) 2” (50mm)	11/2” (38mm) 3” (75mm)	2” 950mm) 4” (100mm)	2 1/2” (63mm) 5” (125mm)

Active Length:

Greater movements can be achieved by increasing the active length of the expansion joint.

Typical Movement Chart

Belt Type	Active Length	Axial Compression	Axial Extension	Laterial Movement
Single Layer Elastomer or Fluoroplastic Flexible Element	6” (150mm) 9” (230mm) 12” (305mm) 16” (405mm)	2” (50mm) 3” (75mm) 4” (100mm) 5” (125mm)	1/2” (13mm) 1/2” (13mm) 1” (25mm) 1” (25mm)	+/-1” (25mm) +/-1 1/2” (38mm) +/-2” (50mm) +/-2 1/2” (63mm)
Composite Type Flexible Element	6” (150mm) 9” (230mm) 12” (305mm) 16” (405mm)	1” (25mm) 2” (50mm) 3” (75mm) 4” (100mm)	1/2” (13mm) 1/2” (13mm) 1” (25mm) 1” (25mm)	+/-1/2” (13mm) +/-1” (25mm) +/-1 1/2” (38mm) +/-2” (50mm)

PROPERTIES OF ELASTOMERS AND FLUOROPLASTIC

	Elastomers						Fluoroplastics	
	Neoprene	Hypalon	EPDM	Chlorobutyl	Fluoroelastomer	Silicone	Poly Tetra Fluoro Ethylene	Fluoro Ethylen Propylene
ASTM Designations	(CR)	(CSM)	(EPDM)	(CIR)	(FKM)	(SL)	(PTFE)	(FED)
Material temperature			(ALL Temperatures °F)					
1. Minimum	-40°	-40°	-60°	-40°	-40°	-60°	-110°	-110°
(low temperature Brittle Point)	180°	225°	300°	300°	400°	450°	500°	400°
Continous								
**Intermittent	250°	250°	350°	350v	550°		700°	500°
Operating Temperature	168hrs	2,600hrs	200hrs	150hrs	240hrs		75hrs	100hrs
(Accumulative Time in Hours)		350° 70hrs			600° 48hrs 650° 16hrs *700° 4hrs *750° 2hrs			
2. Chemical Resistance H_2O_4 Acid Hot(+)Less Than 50% Concentration	B-C	A	A	A	A	C	A	A
H_2O_4 Acid Hot(+)over 50% Concentration	C	B	B-C	B-C	A	C	A	A
HCL Acid Hot(+) less than 20% Concentration	C	B	B	B	A	C	A	A
HCL Acid Hot(+) over 20% Concentration	C	C	C	C	A-B	C	A	A
Anhydrous Ammonia	A	B	A	A	C	C	A	A
NAOH								
Less than 20% concentration	A	A	A	A	A	A	A	A
Over 20% concentration	A	A	A	A	B	B	A	A
3. Abrasion Resistance	A	A	A	A	A	A	C	C
4. Environmetal Resistance								
Ozone	B	A	A	A	A	A	A	A
Oxidation	B	A	A	A	A	A	A	A
Sunlight	B	A	A	A	A	A	A	A
***Radiation	A	A	A	C	B	B	B	B

* Fluoroelastomers when reinforced with nonreactive materials have an intermittent temperature capability of 4 hours at 700ºF and 2 hours at 750ºF

** Excursions at high temperatures will have a detrimental effect on useful life of the product.

*** Any nuclear application should be referred to expansion joint manufacturer for specific elastomer recommendation.

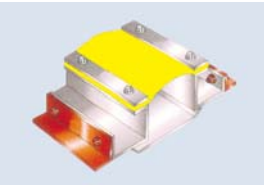
Rating Code: A= Little or no effect
B= Minor to moderate effect
C= Severe effect

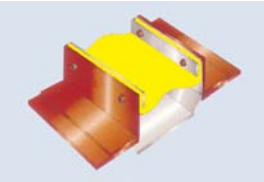
COMMONLY USED REINFORCING MATERIAL & THEIR PROPERTIES

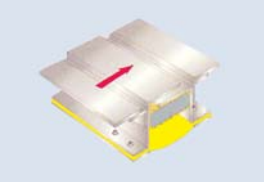
Reinforcing Materials	Aramid	Fiberglass	Corrosion Resistan Alloy Wire	Polyester	Ceramic
(*) Temperature Capability(°F)	450	700-1000	2500	250	1800
Chemical Resistance					
Dilute H_2SO_4	B	B	A	B	A
Concentrad H_2SO_4	C	C	B	C	A
SO_2 and SO_3	B	B	A	B	A
Caustic	B	B	B	B	C

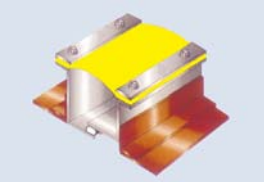
Rating Code: A= Little or no effect
B= Minor to moderate effect
C= Severe effect

(*) These temperatures are the maximum continuous temperatures that the reinforcement material can handle.









CONSTRUCTION OF KEYSER FABRIC EXPANSION JOINT:

1. Reinforcement added in the flange area, protects and isolates the Expansion Joint in areas that are in contact with steel parts.

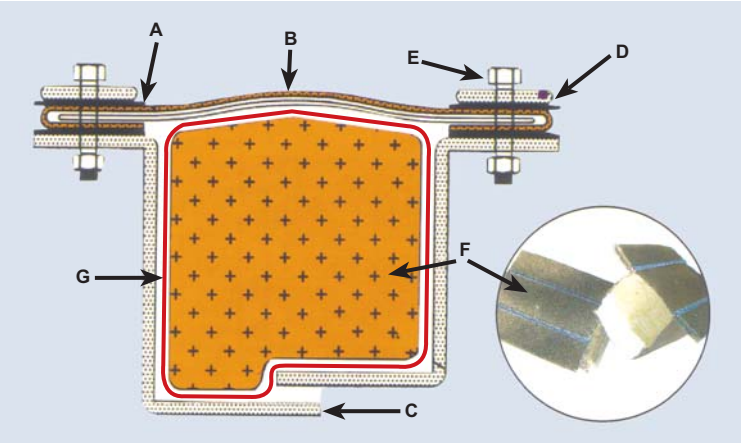
2. Materials such as stainless steel or Incoloy wire mesh are used for the construction of the Expansion Joint. This further reinforces the unit with increased stability.

3. Life span of the Expansion Joint is increased with the use of internal sleeves. This gives extra mechanical protection to the unit well as the insulation bolster.

4. Back flanges may be supplied together with the Expansion Joints.The specification is dependent on the type of Expansion Joint required and their working environment.

5. Bolts & nuts may be supplied together.

6. The insulation bag/bolster is installed in the space left between the Expansion Joint and the inner sleeves. It is formed by an external folder made of wire mesh or fabric material. The insulation bag protects the Expansion Joint from mechanical damage. The protection against high temperatures and reduction of noise levels are other advantages. The insulation bags are designed separately to suit different operating conditions.



A: Reinforcement

B: Fabric Layer

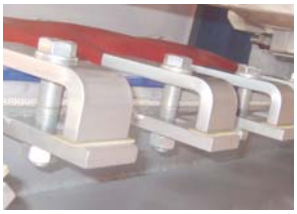
C: Stainless Steel Shell

D: Flange

E: Stud Bolt and Nuts

F: Isolation Mat (Thermo Isolation)

G: Internal Sleeve

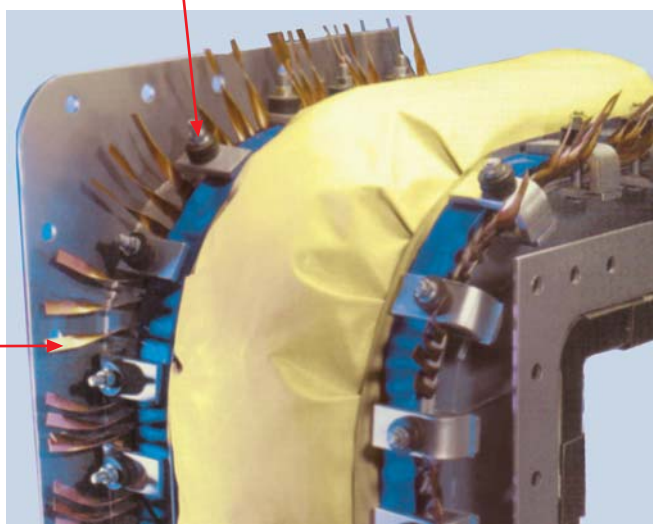


MATERIALS USED FOR KEYSER FABRIC EXPANSION JOINTS:

The performance of Fabric Expansion Joints for systems is determined by the severity of the environment and by the selection of the materials for each component of the expansion joint. Fundamental requirements and temperature as well as chemical are important factors as well.

Fabrics are used for the reinforcement of elastomers and other coatings to yield the mechanical properties necessary to withstand the movements and pressures exerted. Insulation materials are used to reduce temperatures, optimize the performance and the life span of the elastomeric or coated material in the gas seal layer.Metal Flanges are used to connect the flexible element to the ductwork. Metal flow liners are used to protect the gas seal membrane and insulation layers of the flexible element from abrasive particles.

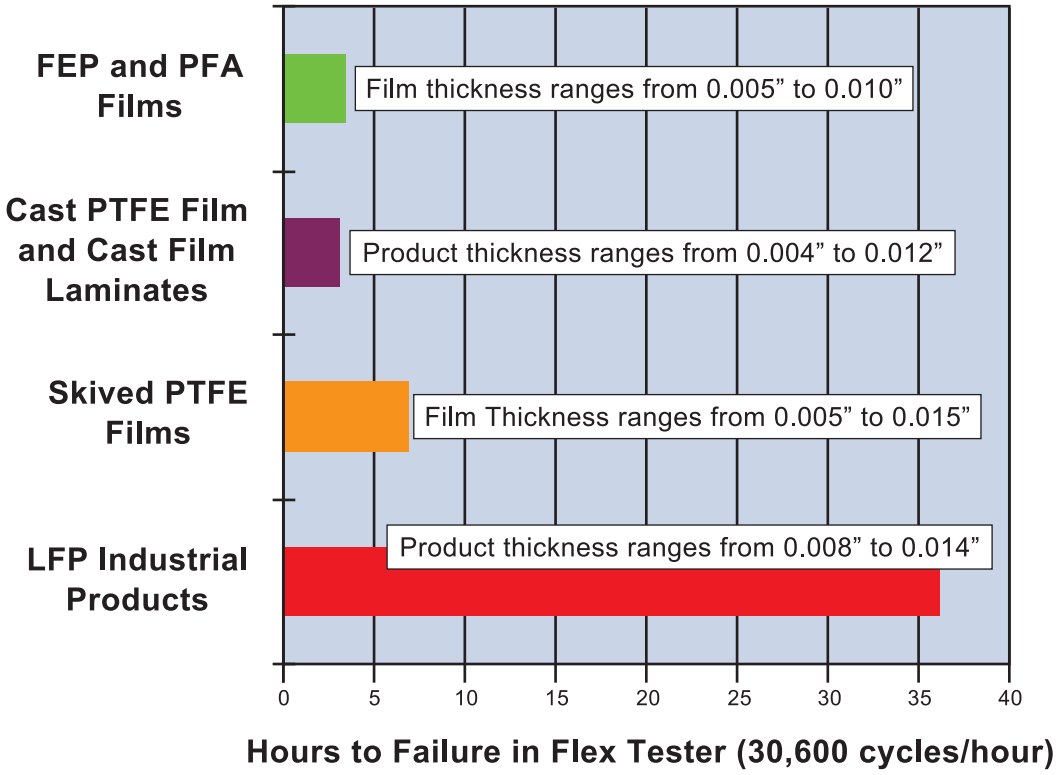
KEYSER Technologies work with reputable fabric manufacturers around the globe to produce the most reliable and high quality fabric expansion joints.

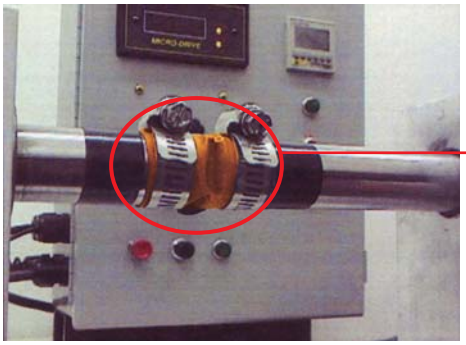


FLEX TEST FOR CORROSION BARRIERS

Flex Cycles To Failure For Thin Perfluoroplastic Products

In Accordance With International Standard ISO 7854-1984 (E):
Rubber-or plastics-coated fabrics — Determination of resistance to damage by flexing (dynamic method).

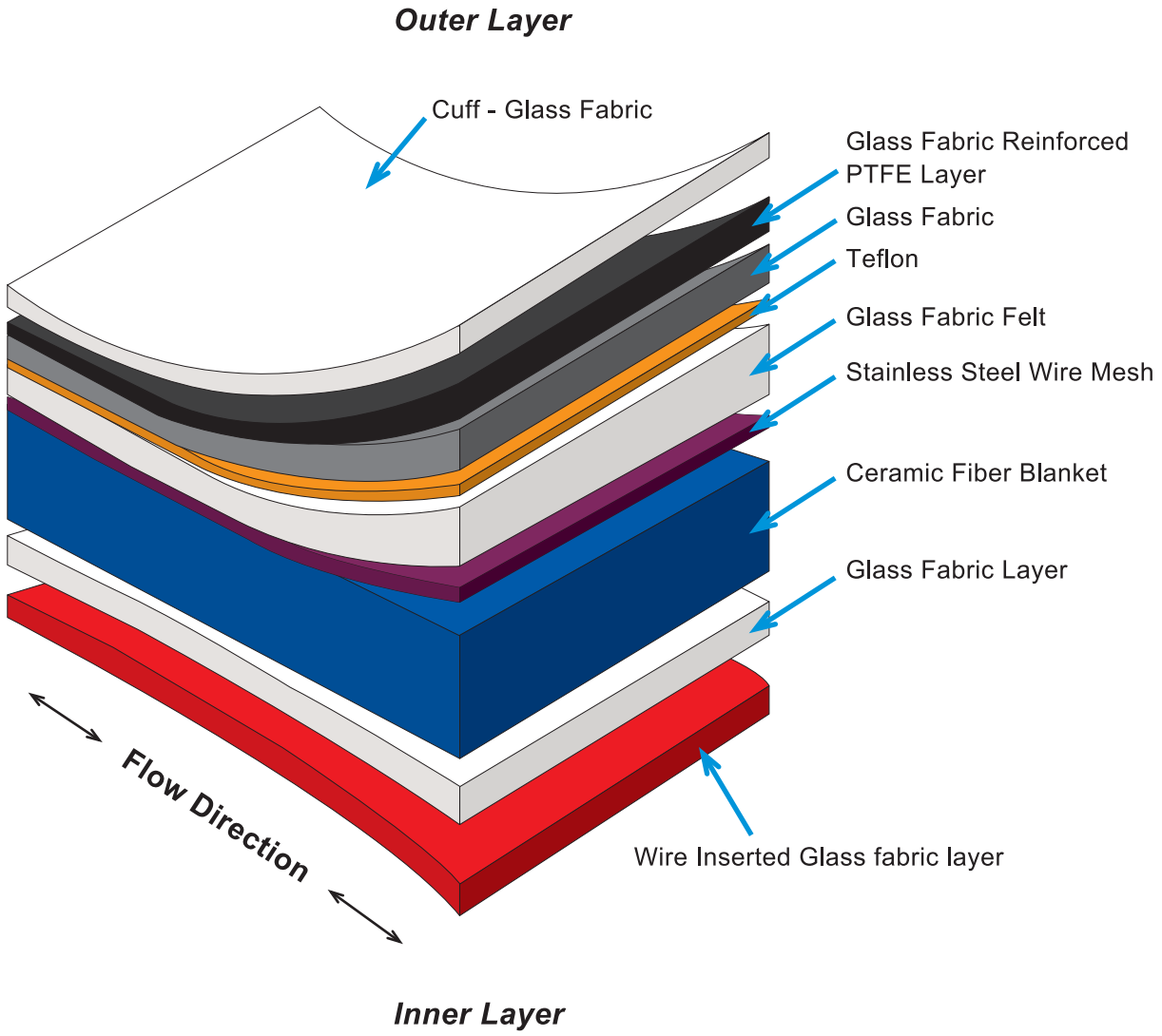




Please note: A orange pigmented specimen was used in this photo for visual clarity

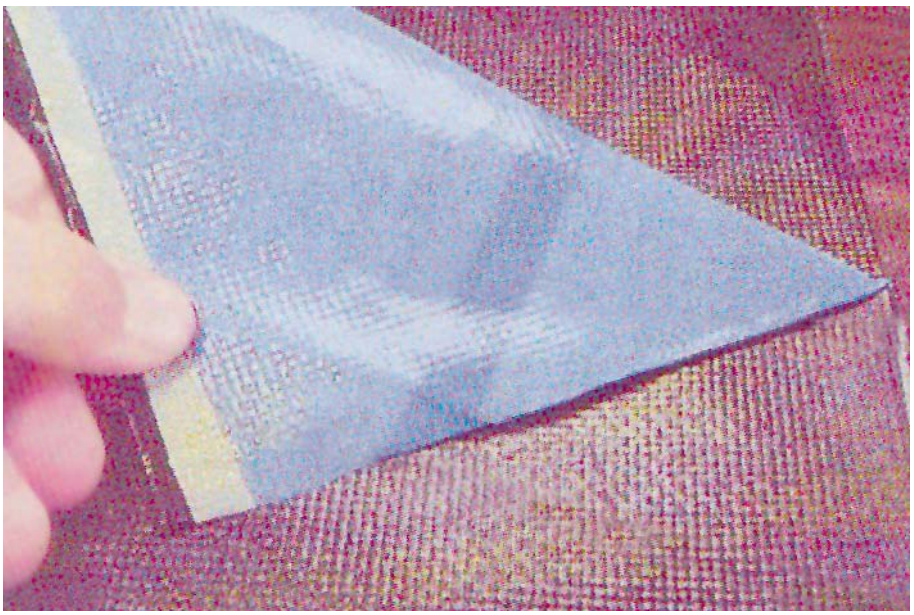
FABRIC EXPANSION ILLUSTRATED COMPOSITION

All fabric expansion joints are fully customized according to client's request and application requirements. The below diagram is an example of a typical expansion joint design.



FABRIC EXPANSION MATERIAL COMPOSITION

Glass Fabric Reinforced PTFE Layer



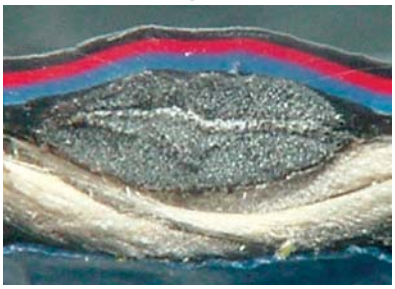
Description

1. KeyFlex Film 14-7 is a 1.2mm thick with 0.23mm LFP Multiple – Inter Layer material. It can bear high load under high temperature. One of the main advantage is its high resistance to tear.

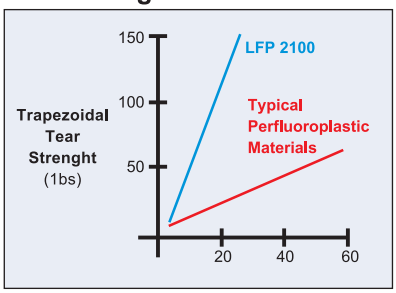
2. KeyFlex Film 14-7 is a 100% pure PTFE material that is capable of resisting the stress-cracking caused by flexing and severe temperature fluctuation in expansion joint applications. The multi-diction strength and durability of LFP allows it to function as a crack free and flexible surface. The picture above show the two components not laminated for half the sample.

3. The toughness of the KeyFlex Film is proven by successful performance of the material in many industrial applications as a “stand-alone” product.

Cross-section picture

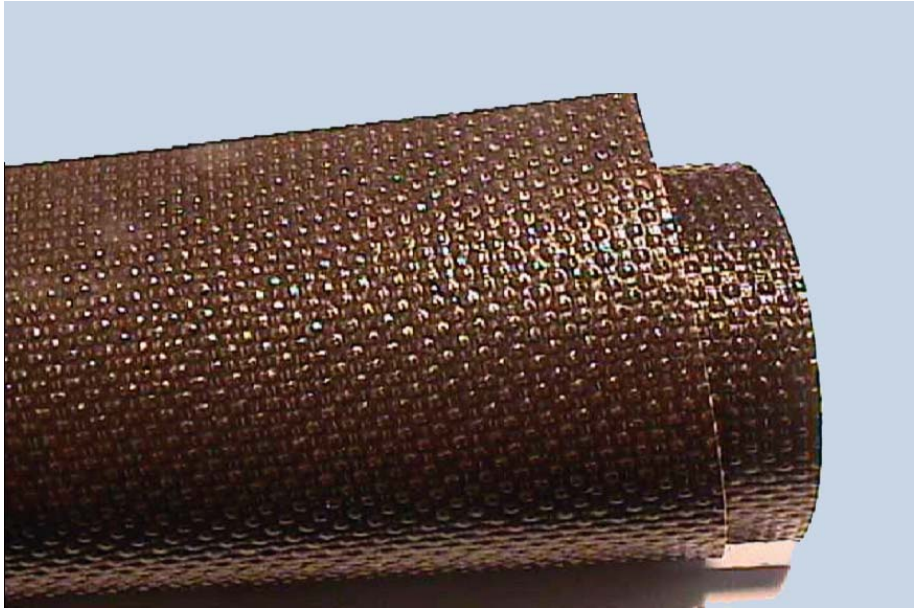


Tear Strength vs. Thickness



Cross Technology: Breakthrough technology now permits thick PTEF liners to be used in expansion joint service without the fear of stress cracking due to severe operating conditions, As witnessed by the chart, LFP is a different perflouroplastric altogether. Ensure safety by using thick ***CrossFilm*** Technology and see why one judge for chemical Processing’s Vaaler Award concluded, “This is the first major improvement in the fluoroplastic industry since its introduction some 40-odd years ago.”

KEYFLEX 1405



Description

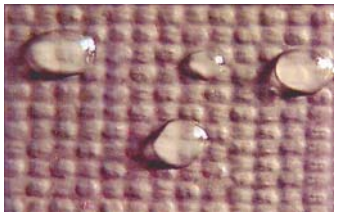
1. KEYFLEX 1405 is one of our most honored products in expansion joint materials with a thickness of 1.14mm. This product consist of fiberglass — typically a 42% resin content. When two films of PTFE are laminated to a fiberglass fabric layer, thus the films receive the foundation that it must have to survive in the expansion joint sealing service.

2. KEYFLEX 1405 is a composition of designed fiberglass and PTFE layer. This material is suitable for flexible expansion joint application.

3. KEYFLEX 1405 is extremely thin and flexible. But its distinguish thickness and flexibility does not change the properties of our high — quality products.

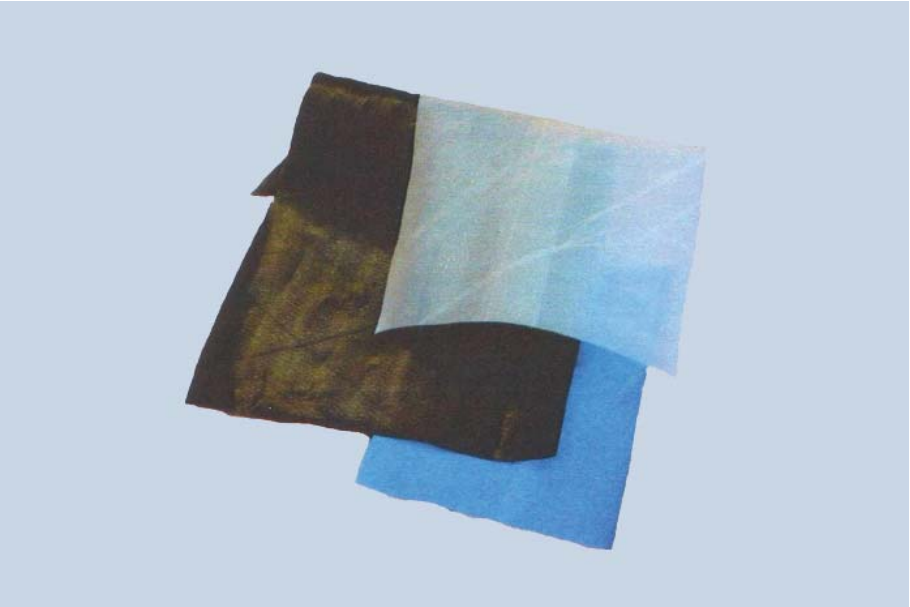
Advantages:

- Successfully used in expansion joint service for almost 20 years
- Proven coating and lamination technology for industrial fabrication
- Excellent mechanical behavior
- Ease of use & packing
- Excellent chemical resistance
- Less thickness than KEYFLEX 14-7
- Higher PTFE content than KEYFLEX 14-7
- Similar mechanical behavior as KEYFLEX 14-7



Product Close-up

Teflon Layer



Description

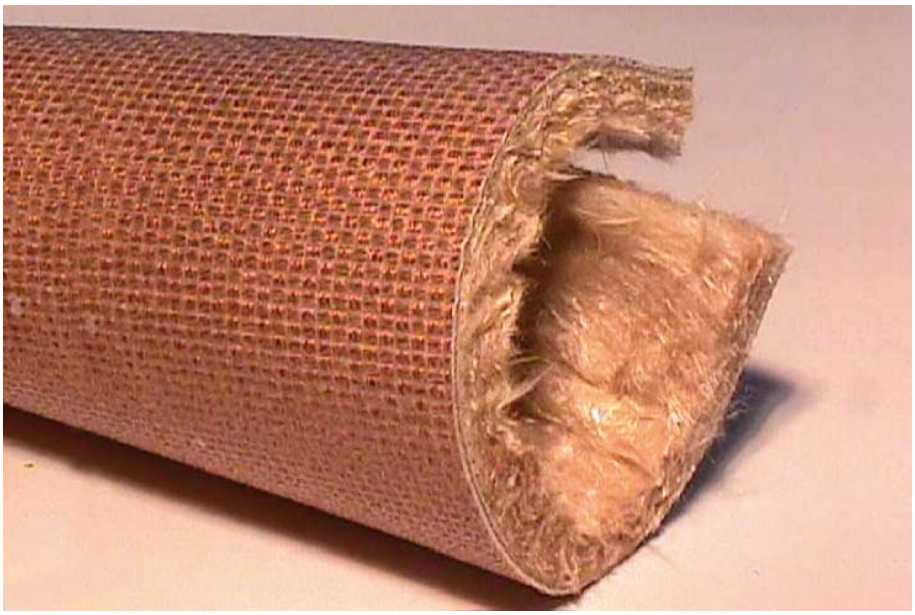
1. Teflon layer is an exceptionally thin, high strength, PTFE laminate with a thickness of 0.13mm.

2. KeyFlex LFP 2105 is targeted for challenging thermo and chemical applications, this layer shows excellent gas seal behavior in flue duct expansion joints.

3. KeyFlex LFP 2105 consists solely PTFE, which means the material is, essentially, chemically inert. The product can operate in temperatures higher than 300°C. The non-porous membranes can be readily fabricated using a variety of heat sealing techniques. KeyFlex LFP 2105 is available in variety of colors and in a conductive or non-conductive construction.

   * We have a wide range of thickness, specifications & colors available.
   Please check with us for more details.

Thermalam 50/1406

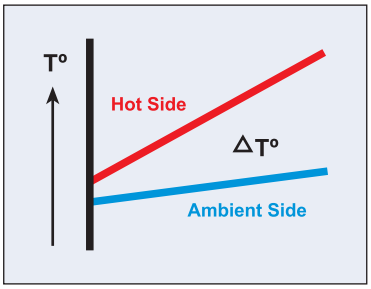


Description

1. This product is a high temperature expansion joint material designed for applications requiring an upper use continuous temperature of 1000°F (538°C). A half non-woven insulation material is laminated to KEYFLEX 1406.

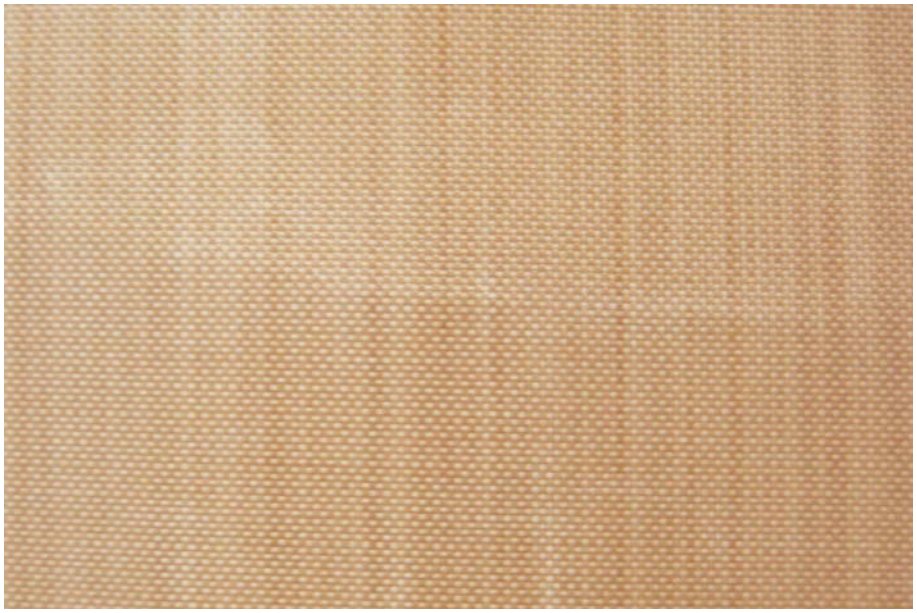
2. The laminated insulation component acquires strength and resiliency from the load bearing per-fluoroplastic composite. The added integrity extends the life of the insulation and helps to prevent "hot spots" from forming on the belt.

3. Installation also becomes easier with a laminated insulation component. This product can be fabricated into numerous expansion components. This product can be fabricated into numerous expansion joint shapes and sizes.



This plot shows the capability of **THERMALAM** 50-1406 resting on a hot plate in an ambient temperature environment.

KEYFLEX Texcoat 5 PTFE Coated Fiberglass



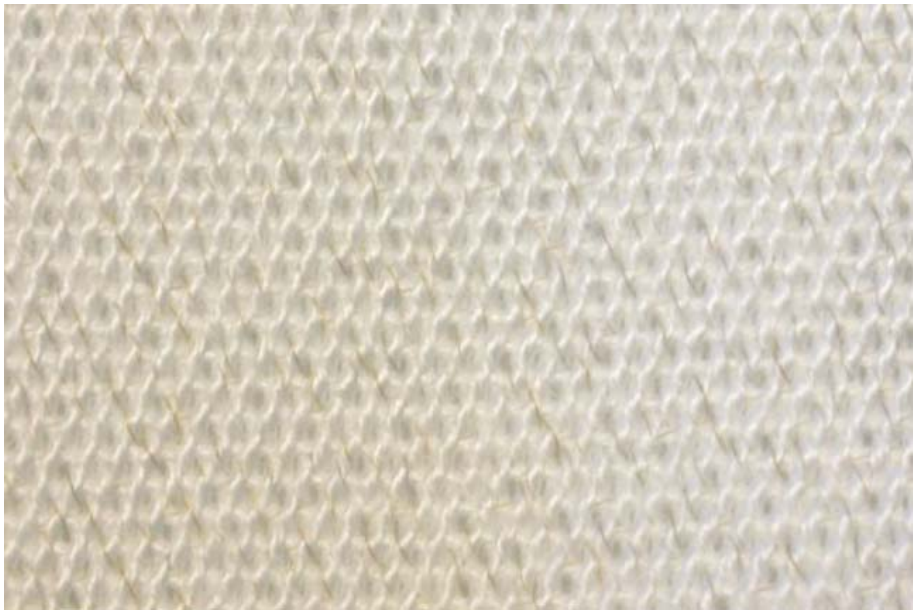
Description

1. KEYFLEX is one of our most honored products in expansion joint materials. This product consist of fiberglass—typically a 35% to 45% resin content. When a film is laminated to a KEYFLEX product, the film receives the foundation that it must have to survive in the flue duct seal service.

2. KEYFLEX material 5 PRIMARY/STANDARD is a composition of designed fiberglass and PTFE layer. This material is suitable for flexible expansion joint application.

3. KEYFLEX material 5 PRIMARY/STANDARD is extremely thin and flexible. But its distinguish thickness and flexibility does not change the property of our high—quality products.

Wire Inserted Glass Fabric Layer



Description

1. SS Wire Insert Glass textile is manufactured from fiberglass yarn capable of resisting heat up to 450°.

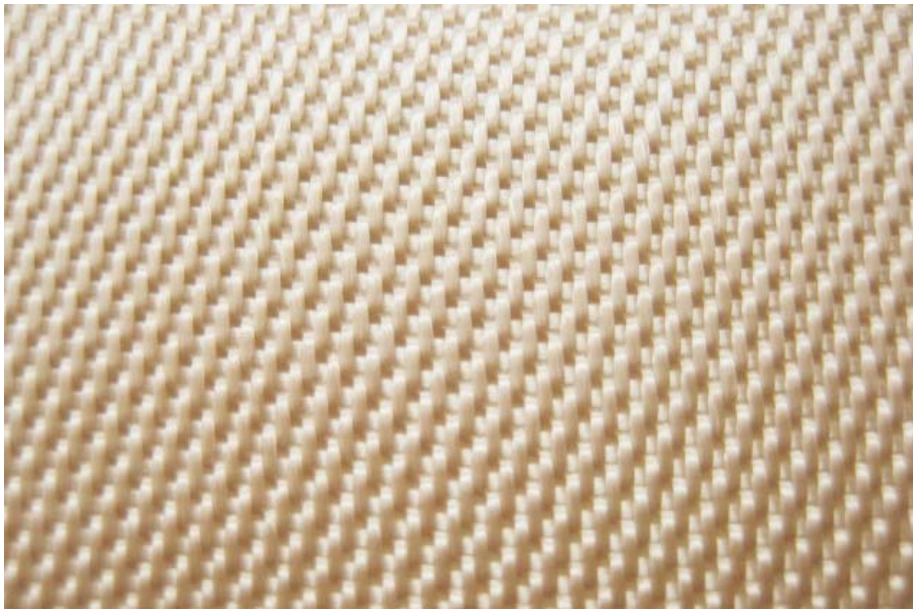
2. This layer provides the advantages of asbestos products without the risk of use.

3. It is also stronger than general glass fiber fabric (UTS>1000MPa) due to the inserted SS Wire.

5. It will not burn, smolder, shrink and mildew.

6. At high temperature, this material shows chemical resistant and dielectric strength properties.

Silica Fabrics



Description

1. This is designed to provide protection from extreme heat and molten materials.

2. It has excellent thermal insulation characteristics and it is capable of withstanding temperatures of up to 3000ºF.

3. Used for personal & equipment protection, stress-relief blankets, fire & furnace curtains and heat shield applications for marine, industrial and aerospace industries.

Advantages:

- High chemical resistance
- Additional treatments available to enhance performance as well as flexibility
- Can be specified with other coatings to meet specific performance requirements
- Minimum 96% silicon dioxide content
- Available in ropes, fabrics, sleeving, tape, mat and yarn
- High resistance to most corrosive fluids
- Does not generate any fumes/smoke even under extreme heat conditions

Glass Fabric Layer

Description

1. Glass Fabric Layer is manufactured from fiberglass yarn capable of resisting heat up to 450°C.

2. This layer provides the advantages of asbestos products without the risk of use.

3. It is a soft, flexible cloth. It features excellent draping qualities, and is ideal for industrial protective curtains and blankets etc. This finish may contain a small amount of processing starch, which burns off at around 240°C.

4. At high temperature, this material shows chemical resistant and dielectric strength properties.

Ceramic Fiber Blanket

Description

1. Ceramic Fiber Blanket is a low iron, high purity ceramic fiber blanket developed especially for use of in highly reducing atmospheres.

2. It is light weight, flexible and suitable for operating temperature up to 1260° (in our design, this maximum working temperature is far higher than the design temperature). It is a highly efficient insulator having low heat storage capacity and complete resistance to damage from thermal shock.

3. It has excellent resistance to oxidation and reduction and can withstand most corrosive agents, **except hydrofluoric and phosphoric acid**.

4. It has excellent strength, both hot and cold. If wet, steam or oil, thermal and physical properties remain **unaffected after drying**, it sound absorption ability is greater than dense or insulation refectories and it stores some 90% less heat then dense fiber brick and about 78% less than insulation brick.

Advantages:

- Low thermal conductivity
- Excellent thermal stability (Much higher than that of the Glass Fabric)
- Low heat storage
- Resistance to thermal shock
- Excellent corrosion resistance

Pyrogels

Description

1. This is a high temperature insulation blanket Pyrogel® XT is a high-temperature insulation blanket formed of silica aerogel reinforced with a non-woven, glass-fiber batting.

2. Pyrogels achieves excellent thermal performance in a flexible, environmentally safe, and easy-to-use product and is strongly recommended for the use of insulating piping, vessels, tanks, and equipment.

Advantages:

- Excellent thermal performance
- Ease of use & packing
- Reduced thickness
- Excellent fire protection
- Environmentally-friendly

Glass Fabric Felt

Description

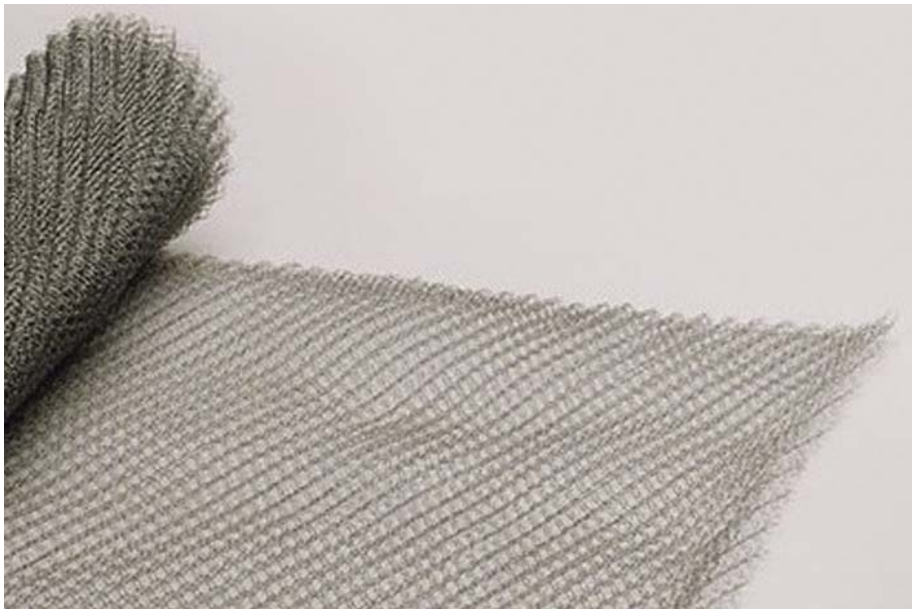
1. Glass Fabric Felt is a mechanically bonded glass fiber insulating felt in grade of 0.5”(12.5mm) for application up to 600°C.

2. It is manufactured entirely in long textile glass fiber and conditions on binders, thereby assuring insulation efficiency during extended exposure of temperature.

Advantages:

- Non-combustible
- For thermal insulation
- Provide mechanical shock resistance
- Sound absorption properties
- Non-contribute to metal corrosion

KEY-KNITTED Wire Mesh



Description

1. Constructed entirely from metal wire, KEY-KNITTED Wire Mesh is one of the most durable insulation coverings available.

2. Flexibility is achieved through a unique knitted construction process that produces a circular mesh of interlocking loops.

3. Since the loops remain unattached to one another, movement is permitted between them without distortion to the individual wires

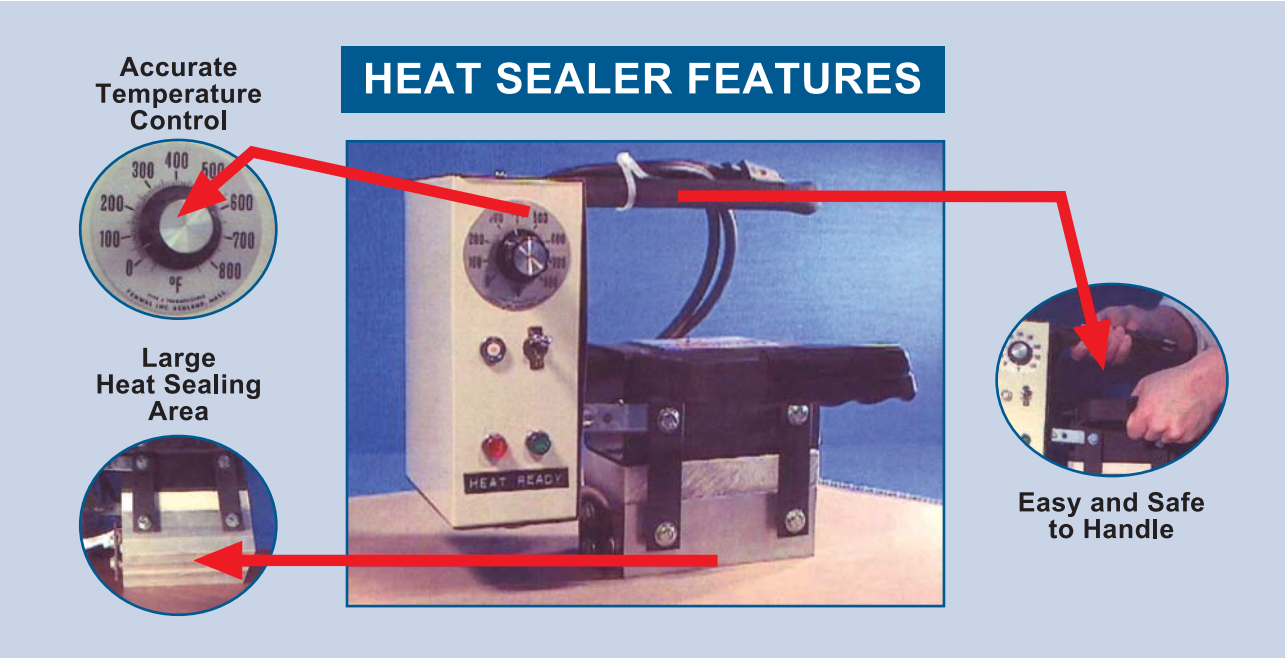
HEAT SEALER EQUIPMENT

Keyser manufactures high-performance PTFE materials for industrial applications. These materials often require thermal welding (heat sealing) in field service. Cost effective and easy-to-use heatsealers are provided by Keyser for use with Keyser materials.

Equipment Description

The main function of a heat sealer is to introduce enough heat to allow a proper bond between PTFE surfaces of Keyser material. The melting point of PTFE is more than 300°C. However, the setting of a heat scaling iron is determined by factors like ambient temperature, thickness of bonding materials, and the surface upon which you heat seal.

Applying pressure can help facilitate a good bond, but in order to achieve a correct bond, the melting point of the Keyser materials must be reached.

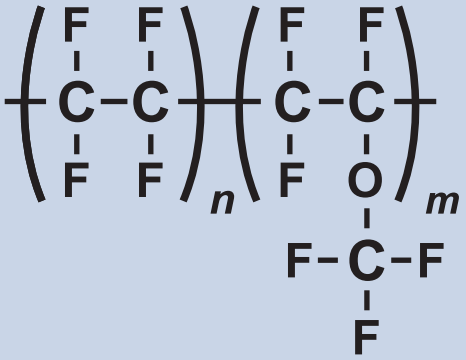


PFA

A Perfluoroalkoxy, Teflon-PFA adhesive is recommended for best sealing performance with Keyser materials. Place the PFA between the two surface to be sealed. For difficult angles, it may be easier to tack or staple the PFA in place. PFA thickness of 0.127mm (0.005”) or 0.255mm (0.010”) are typically used.

PFA Property

PFA is a type of fluoro’polymer with properties similar to poly’tetra’fluoro’ethylene (PTFE)



PFA	
Density	2150 kg/m^3
Flexural modulus (E)	586 MPa
Tensile strength ($_t$)	24 MPa
Elongation @ break	300%
Folding endurance	No break
Notch test Melting point	305 °C
Maximum operating temperature	260 °C
Water absorption (ASTM)	<0.03 % after 24 hours
Dielectric constant (Dk) at 1MHz	2.1
Dissipation factor at 1MHz	0.0001
Arc resistance	< 180 seconds
Resistivity at 50% R.H.	> 10^{16} Ω m

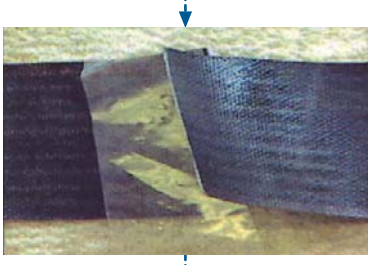
INSTRUCTIONS

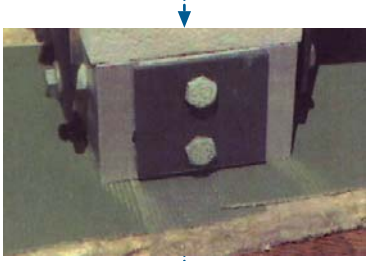
Step 1

Prepare a surface that will not CONDUCT AWAY the heat. The thermo insulation material shown in the picture is ideal for this purpose.

Step 2

A Keyser adhesive thin film is recommended for best sealing performance with Keyser materials. Place the adhesive layer between the two surface to be sealed. For difficult angles, it may be easier to tack or staple the Keyser adhesive layer in place. Keyser adhesive layer thickness of 0.127mm or 0.255mm is typically used.



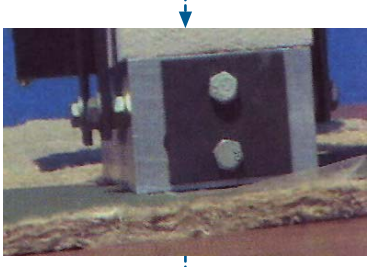


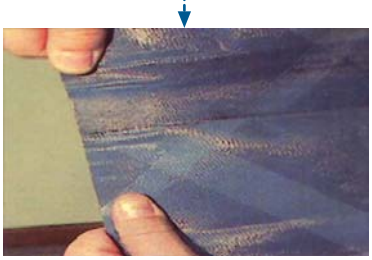
Step 3

Bring the heat sealer in contact with the splice area. Make sure the heat sealer has reached the set point temperature around 380°C before using.

Step 4

Applying pressure will achieve a better bond in a shorter time period. Residence time for a heat seal is a function of the material and the ambient conditions. Around five minutes will typically work for standard products in a normal plant setting. For wide splices or special geometry shapes, heat seal in sections, allowing a slight overlap from one section to the next to ensure a continuous bond.





Step 5

When the heat seal has been completed, remove the sealer. Allow the spice to cool to room temperature before handing.

ACCESSORIES

1) Teflon Coated Fiberglass Sewing Thread

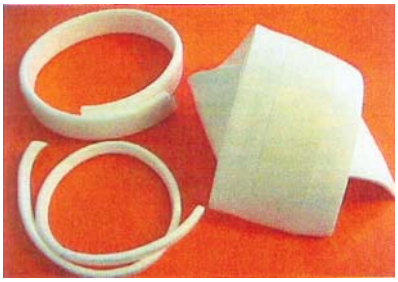
a. This is a machine sewing thread with a left-hand twist made from 100% fiberglass yarns coated with Teflon.
b. Available in other diameters other than the standard 0.021”.
c. High tensile strength of 25.

2) KEY SEAL (Joint Sealant & Gasket Tape)

KEY SEAL is a 100% Virgin PTFE production. KEY SEAL Joint Sealant and Gasket Tape is a widely tested and proven way to seal liquids and gases of any kind in wet or dry service.

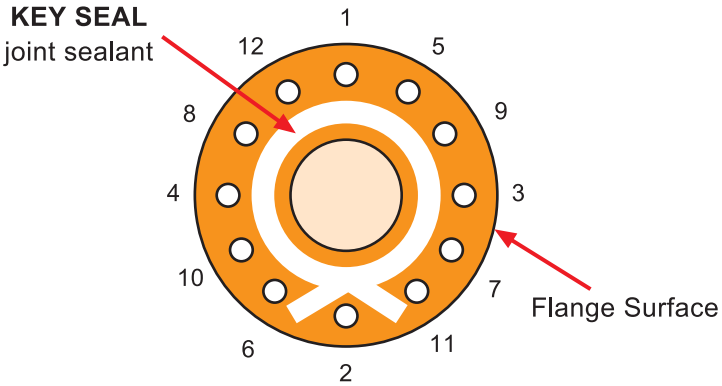
This highly fibrillated expanded PTFE exhibits flexibility, compressibility, stability under high temperatures, and high-tensile strength. The chemically inert product resists creep relaxation and maintains a seal even at extreme temperatures.

KEY SEAL Joint Sealant is ideal for worn flanges of all sizes. KEY SEAL Gasket Tape is a flat sealant designed for surfaces requiring a strip or full-face gasket.



Ease Of Use

Use scissors to cut to the desired length. The adhesive holds the sealant in place while positioning around the flange inside the bolt circle to isolate the flow media. The nonstick properties of PTFE allow the flanges to separate freely. The recommended size is about 40%-50% of the sealing surface. Remove the backing of the adhesive and loop it around the inside of the bolt circle, then overlap the ends of the joint sealant about 3/4" – 1" on either side of a bolt hole.

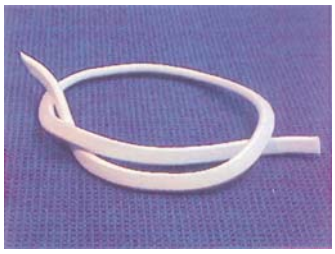


TORQUE

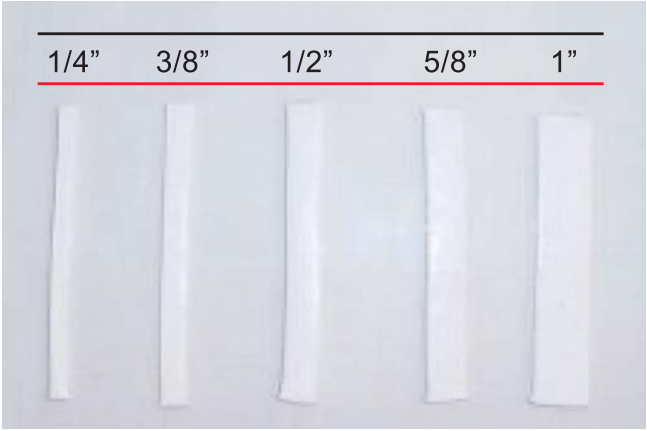
KEY SEAL Advantages:

- 100% Virgin PTFE
- Resistant to Cold Flow Compressibility
- Easy to Install / Remove
- Stable at High Temperatures
- No Decay with Age
- No Flow Contamination
- Non-Toxic
- Non-Flammable
- Never Fray
- FDA Suitable (Biological inert at Room Temperature)





Standard sizes being used in different industries:



KEY DUCT

A flexible ducting product line engineered for high temperature & chemical usage.

A “PTFE” flexible duct has the following advantages:

- Superior chemical resistance, thermal stability and mechanical strength
- Durable & impervious interior
- Exterior LFP corrosion barriers are available in different thickness
- Other special and unique features
- Contains a strong laminated seal that encapsulates a rugged spring coil and joins the two LFP corrosion barriers

We have a wide range of sizes for different applications. Please check with us for more details.

Flexible Duct

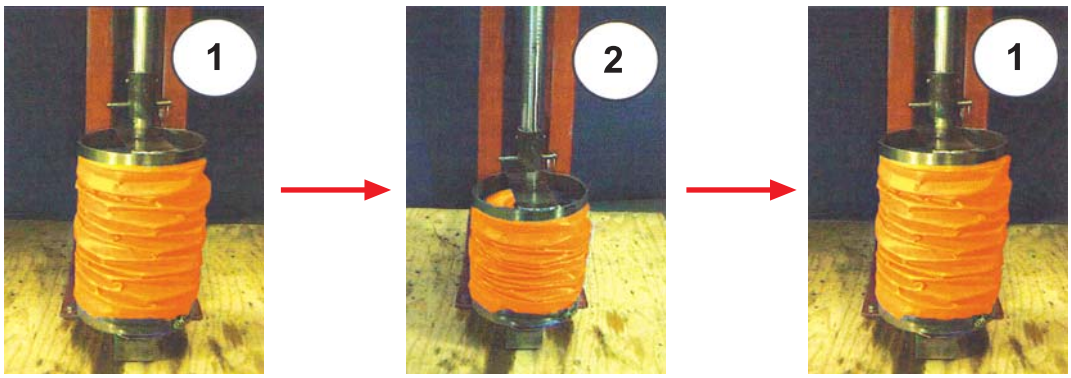
Secondary Containment Liner

Robot Covers

“Drop in” Tank liner

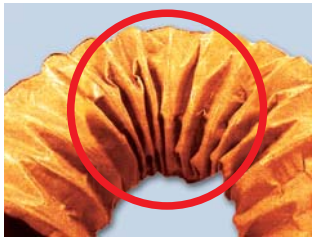
Flex Test For KEY DUCT

6” ID x 1’ duct compressed to 6” at a rate of 70 cycles per minure



Benefits

- Lightweight
- Positive and negative pressure capability
- Excellent nonflammability properties
- Excellent chemical resistance
- Wide temperature range -100ºF To 500ºF (-73ºC To 260ºC)
- Wide range of duct diameters and lengths
- Many Special Features:
  - Flanges
  - Colors
  - Conductivity
  - Cuffs
  - Wear strip / for abrasion resistance
  - Etc.



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TECHNOLOGIES

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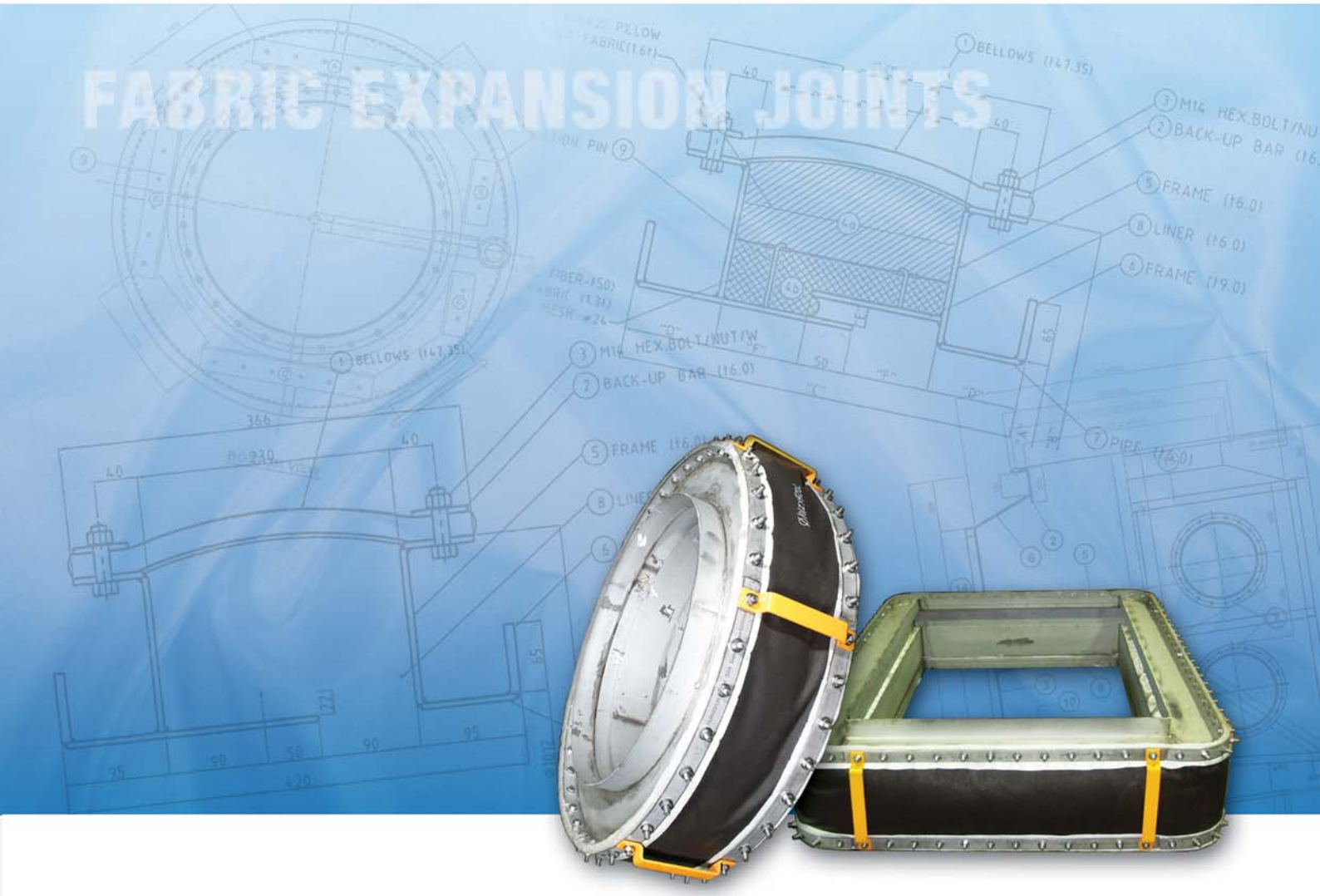

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