



NATURE & HUMAN

YONGKWANG FLEXIBLE

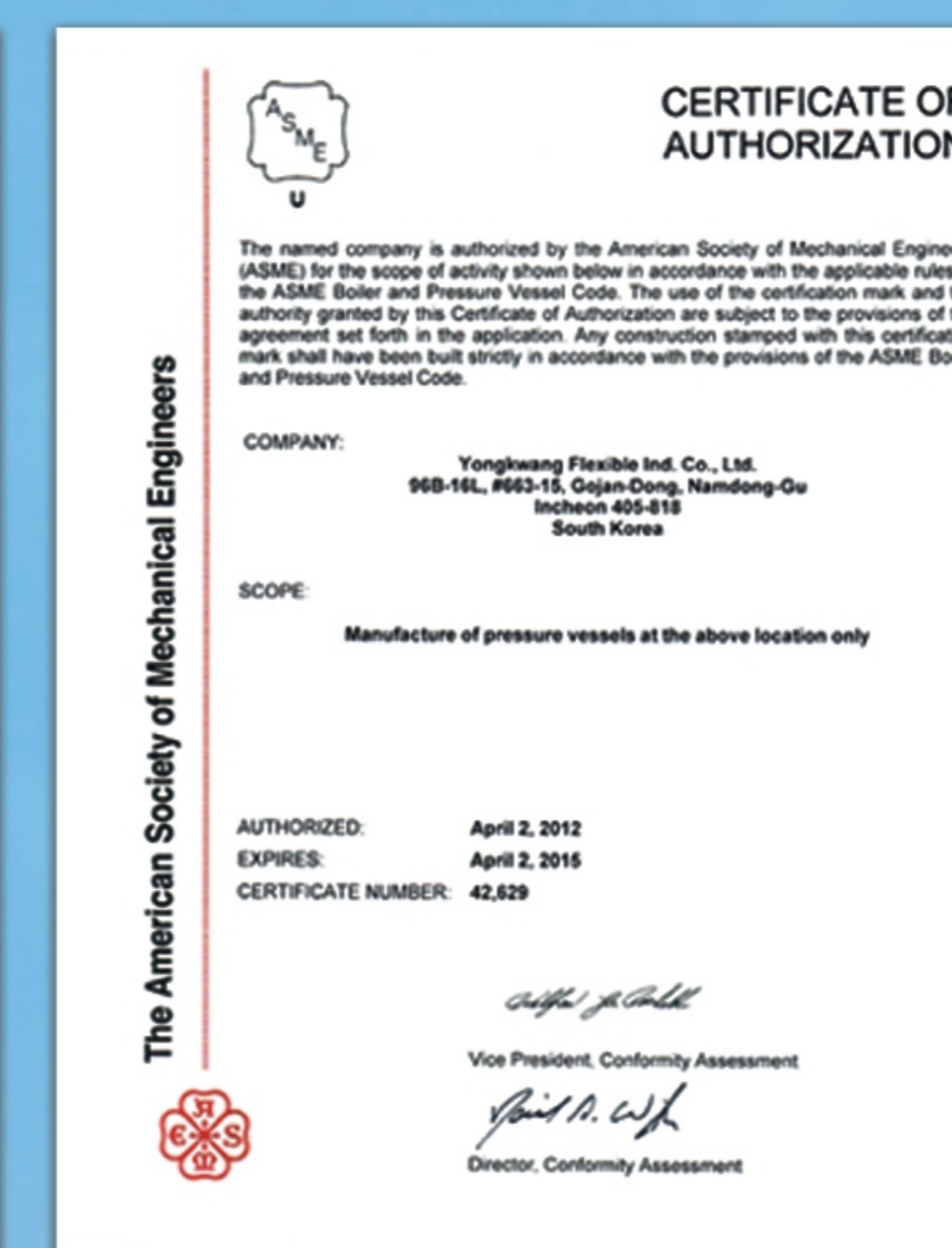
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ISO - 9001



ISO - 14001



ASME - "U" STAMP



ASME - "S" STAMP



NB CERT

Metallic Expansion Joint



1. Single Expansion Joint

The single expansion joint has a bellows element with end connections as like flange, weld end, landing bar and others. It is the lowest price type and it can absorb all movements in any direction or plane. This expansion joint can't resist any deflections with any force except the resistance of the bellows, which is a function of the spring rate times the deflection amount.



2. Universal Expansion Joint (PEM-UNI/UT)

The universal expansion joint consists of two bellows connected by a center spool piece with flange, pipe ends and others. The universal expansion joint absorbs greater axial, lateral and angular movements than a single expansion joint. The amount of lateral deflection of the universal expansion joint is a function of the amount of angulation of each bellows and the distance between the bellows.

The universal expansion joints can be supplied with or without tie rods. The rods connect the ends of the expansion joint to each other and resist the pressure thrust load.



3. Externally Pressurized Expansion Joint (PEM-EF)

The externally pressurized expansion joints are suited for piping systems that require large amounts of axial compression or extension. In externally pressurized expansion joints, the bellows elements are arranged so that the media flow is on the external surface of the bellows. Externally pressurizing the bellows eliminates pressure instability and permits the absorption of large amounts of axial expansion.



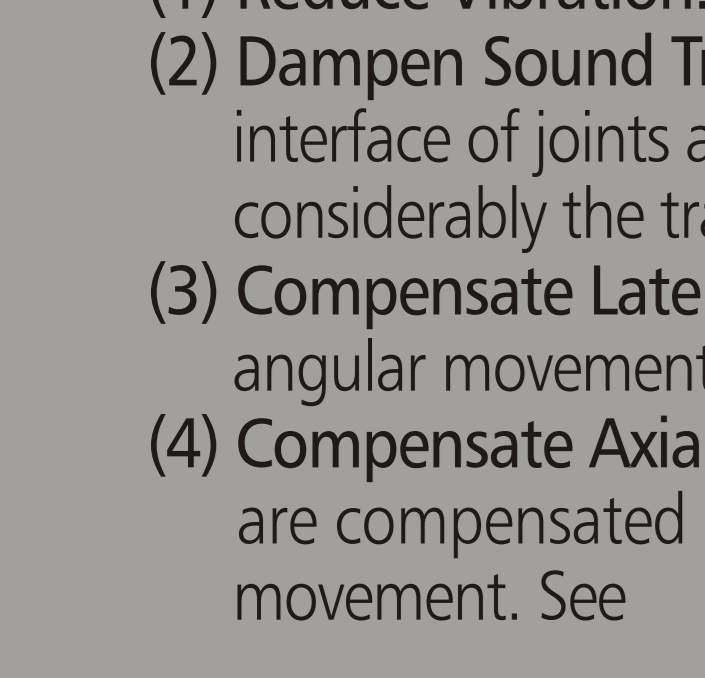
4. Hinged Expansion Joint (PEM-HS/HD)

The hinged expansion joints have hinges or pivots which allow the device to bend in a single plane. These devices are designed to restrict axial movement, either in extension or compression and to resist full pressure thrust and shear loads, such as from the weight of adjacent piping. The slotted hinge pin holes may be designed to permit limited axial travel. These slotted hinged expansion joints will not resist pressure thrust forces, and anchoring must be provided.



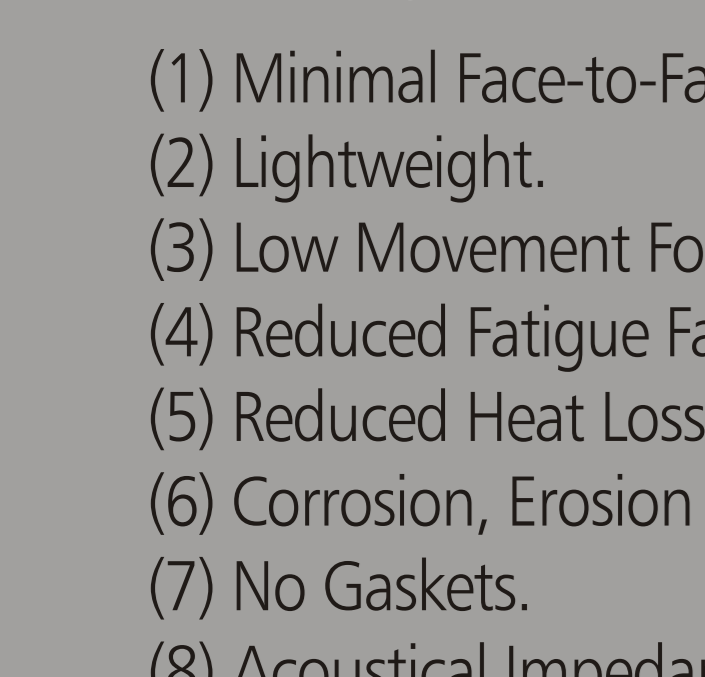
5. Gimbal Expansion Joint (PEM-GS/GD)

The gimbal expansion joint is basically the same as the hinged expansion joint, except that instead of being limited to deflection in only one plane, the gimbal expansion joint can accept bending or angulation in any plane. This expansion joint contains two sets of hinge pins or pivots, the axis of each set perpendicular to the other. Each set of pins is connected to each other with a central gimbal ring or band. This device provides the same type of restraint and resistance to axial forces, such as the pressure thrust, and to shear forces as the hinged expansion joint.



6. Pressure Balanced Expansion Joint (PEM-BS/BL)

This type of expansion joint is really a combination of several types. Its purpose is to retain and balance the pressure thrust so that main anchoring of the pipe or adjacent equipment is not required, and forces and movements on attachment flanges of delicate equipment, such as turbines, are kept to acceptably low levels. The deflections to be accepted are handled by the proper type of expansion joint, which normally, is a tied universal type to accept lateral movements.



7. Rectangular Metallic Expansion Joint (PEM-RE)

The rectangular metallic expansion joints have a variety of applications in the power, petrochemical, refining, chemical, and steel industries. Every rectangular metallic expansion joint is custom-designed to absorb the thermal movements of the system in which it is installed. The rectangular metallic expansion joints absorb three types of movement (axial, lateral and angular) as like circular expansion joints.

Rubber Expansion Joint

1. Function of Rubber Expansion Joint

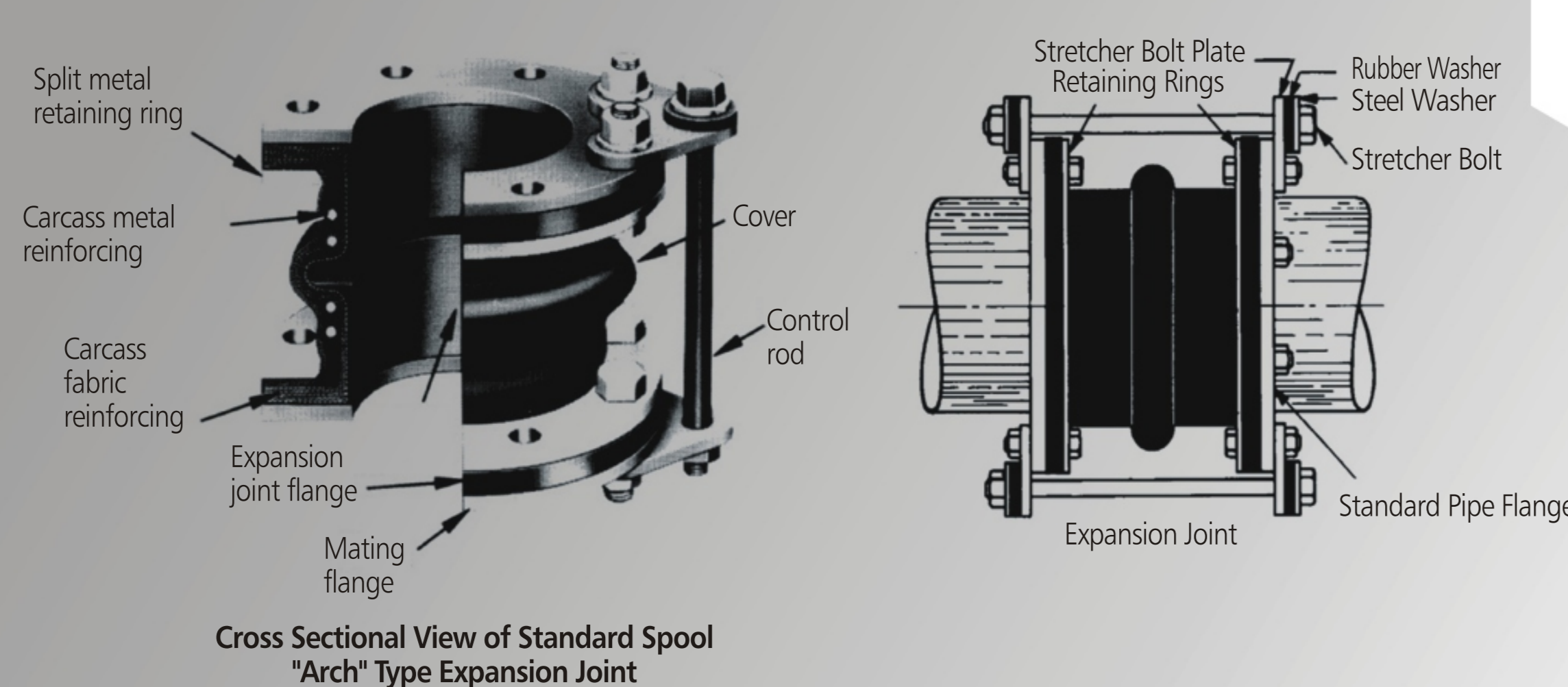
[Functions]

- 1) Reduce Vibration. Rubber expansion joints isolate or reduce vibration caused by equipment.
- 2) Dampen Sound Transmission. Rubber expansion joints tend to dampen transmission of sound because of the steel rubber interface of joints and mating flanges. Thick-wall rubber expansion joints, compared with their metallic counterparts, reduce considerably the transmission of sound.
- 3) Compensate Lateral, Torsional and Angular Movements. Rubber expansion joints compensate for lateral, torsional and angular movements -preventing damage and undue downtime of plant operations.
- 4) Compensate Axial Movements. Expansion and contraction movements due to thermal changes or hydraulic surge effects are compensated for with strategically located rubber expansion joints. They act as helix springs, compensating for axial movement. See

2. Advantages of Rubber Expansion Joint

- 1) Minimal Face-to-Face Dimensions.
- 2) Lightweight.
- 3) Low Movement Forces Required.
- 4) Reduced Fatigue Factor.
- 5) Reduced Heat Loss.
- 6) Corrosion, Erosion Resistant.
- 7) No Gaskets.
- 8) Acoustical Impedance..
- 9) Greater Shock Resistance.

3. Construction Details of Rubber Expansion Joint Component



Cross Sectional View of Standard Spool "Arch" Type Expansion Joint

4. PTFE Expansion Joint

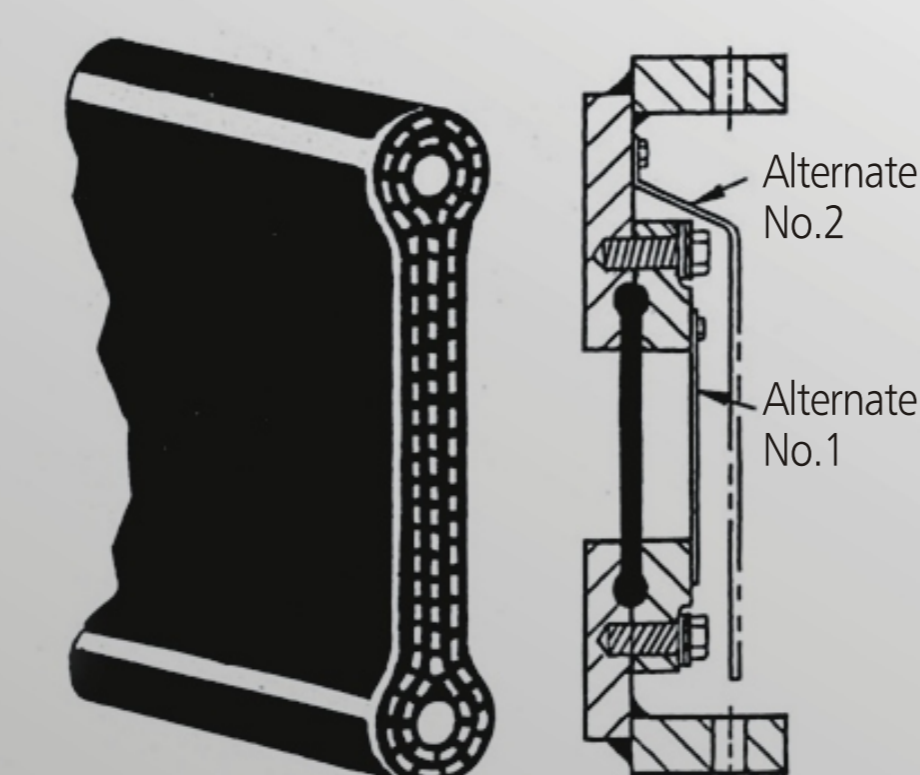
Another non-metallic type of expansion joint is available, manufactured of Teflon. This type of expansion joint has been used with highly corrosive medias, with glass or plastic piping or in heating, ventilating and air conditioning applications, where space is a premium. A flexible Teflon pipe connector is a 2, 3, or 5 convolution expansion joint consisting of a Teflon FEP, PTFE or PFA, reinforced with metal rings and attached with ductile iron flanges, designed to absorb movement and vibration in a piping system.

- 1) Coupling(PEM-TC). A two-convolution connector designed for minimum movements.
- 2) Expansion Joint(PEM-TE). A three-convolution connector designed for easy movement and ease of system installation.
- 3) Bellows(PEM-TB). A five-convolution connector designed for maximum movements and vibration elimination.

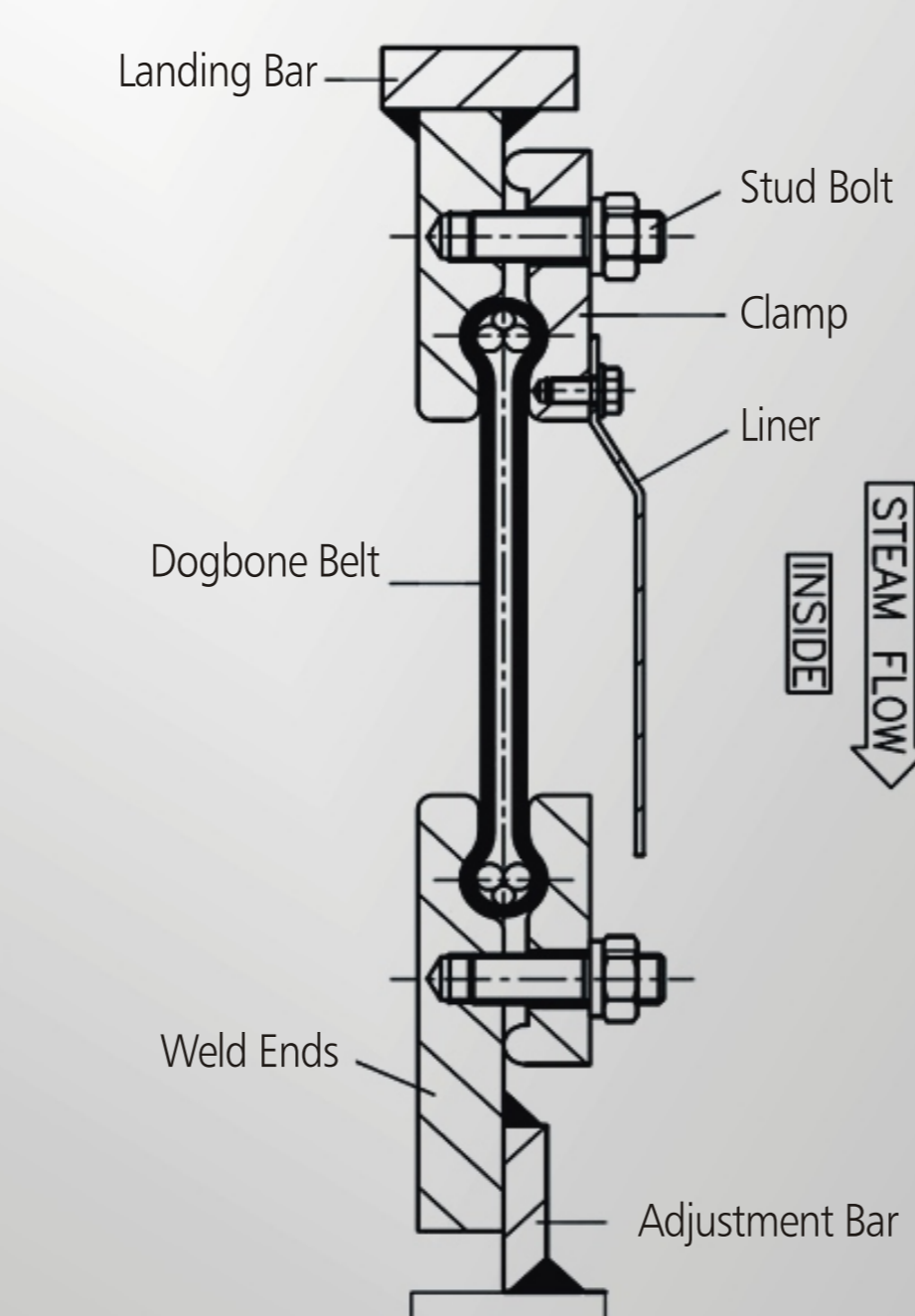
5. Dog Bone Expansion Joint

A molded construction of plies of rubber-impregnated fabric, rubber covered and spliced endless, to a specified peripheral dimension is used as a flexible connection in central power stations on condensers and designed for compression and lateral movements for full vacuum service and a maximum pressure of 15 PSIG. This expansion joint must be used with special clamping devices normally supplied by the condenser equipment manufacturers.

The dogbone expansion joint maintains a flexible connection and seal between the low pressure turbine and the condenser exhaust hood. It is made of rubber and reinforcing fabric, and seals the condenser vacuum (28" HG.) from the external atmosphere.



Alternate No.2
Alternate No.1



Landing Bar
Stud Bolt
Clamp
Liner
Dogbone Belt
Weld Ends
Adjustment Bar

HRSG Penetration Seal Expansion Joint



FABRIC EXPANSION JOINT



METALLIC EXPANSION JOINT



PRE-FORMED EXPANSION JOINT

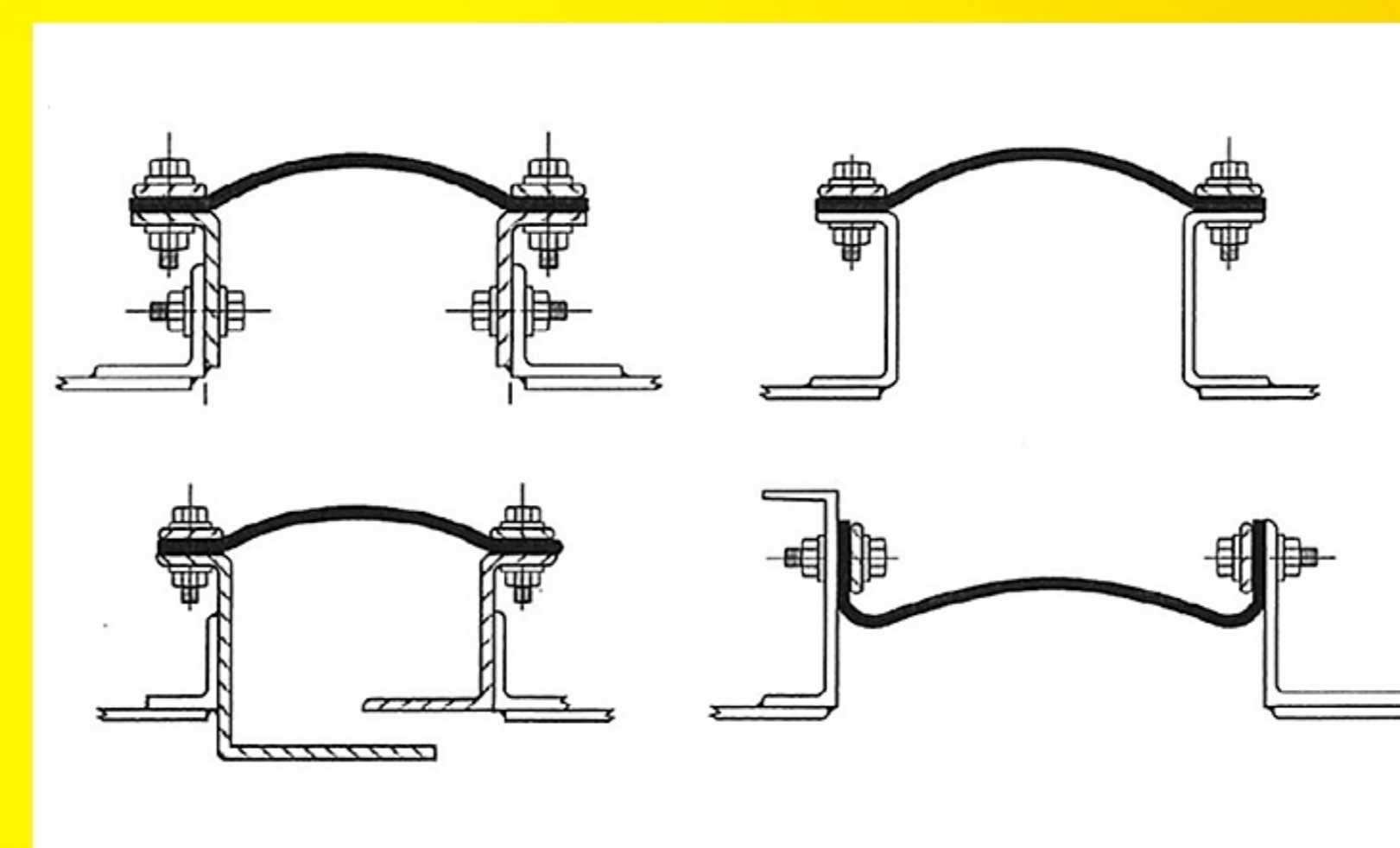


FABRIC EXPANSION JOINT

Precision Expansion Joint for Vacuum



Methods of attachments
(a) Bolt frame to mating flange
(b) Weld frame to mating flange
(c) Weld to raw duct end



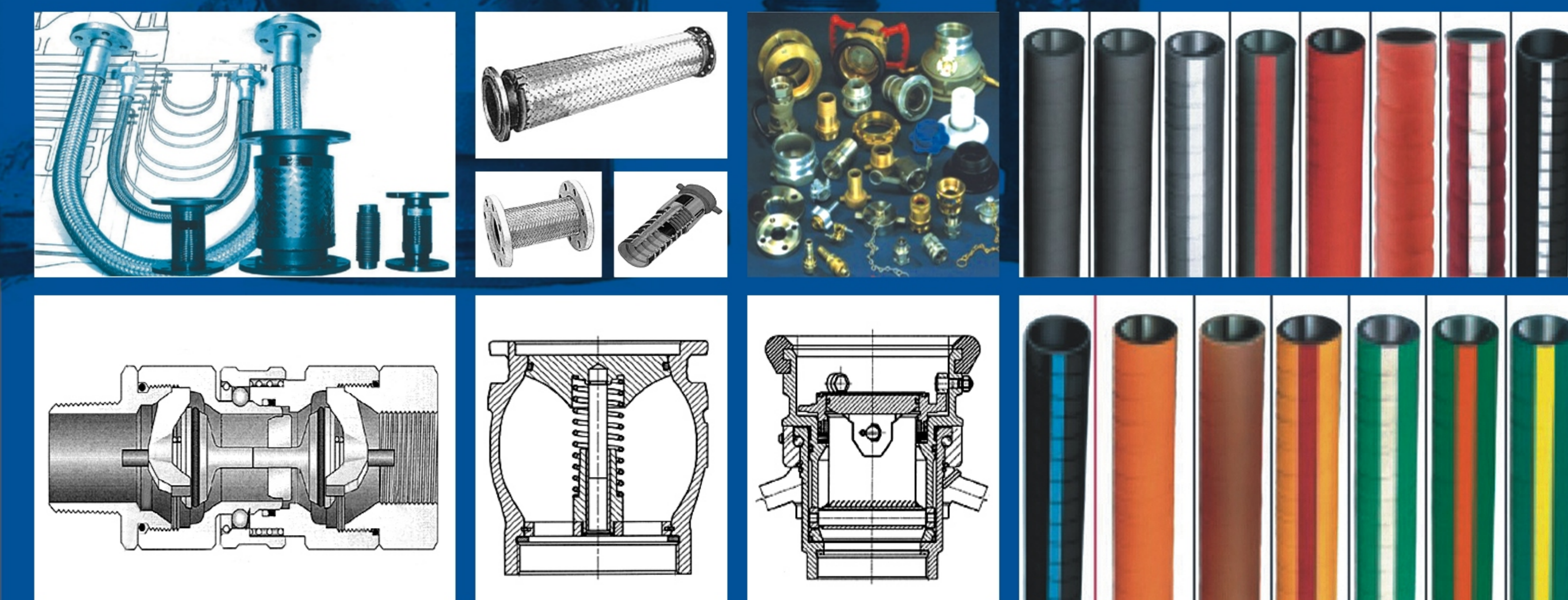
Flexible Hose & Coupling

1. Flexible Hose & Coupling Selection

Size of Connecting Pipe.
Temperature of Operation in Relation to Pressure and Material.
Media in Relation to Corrosion of Hose Material.
Pressure - Operating, Test and Burst Needed for the Application.
Motion Type Affecting Hose and Amount of Motion.
Length of Hose Needed to Absorb Motion in Relation to Space Available.
Fittings Needed to Connect to Existing Connections Compatible with Media, Temperature, and Pressure.
Flow Velocity.

2. Installation of Flexible Hose

- Avoid torque.
- Prevent out-of-plane flexing in an installation.
- Avoid overbending.
- Avoid careless handling of the hose assembly.
- Always support the piping.

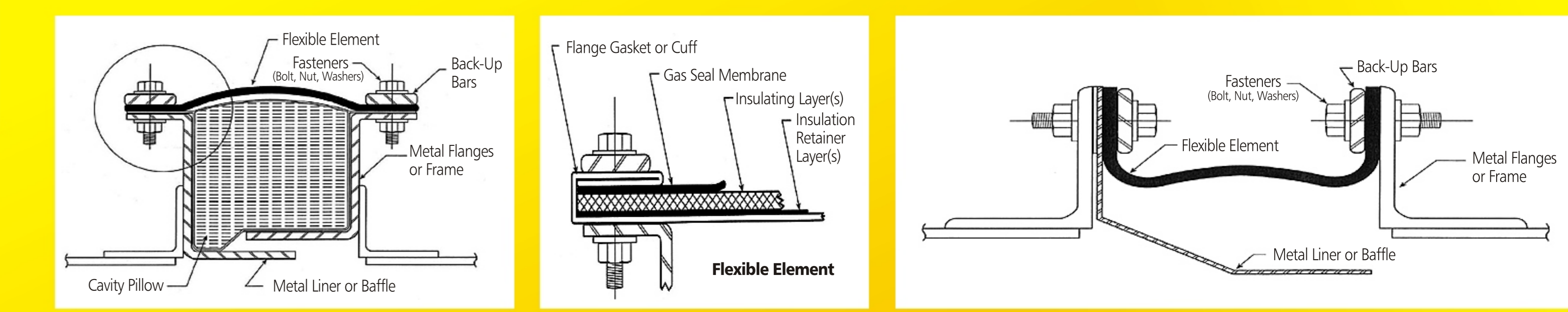


Non-Metallic Expansion Joint

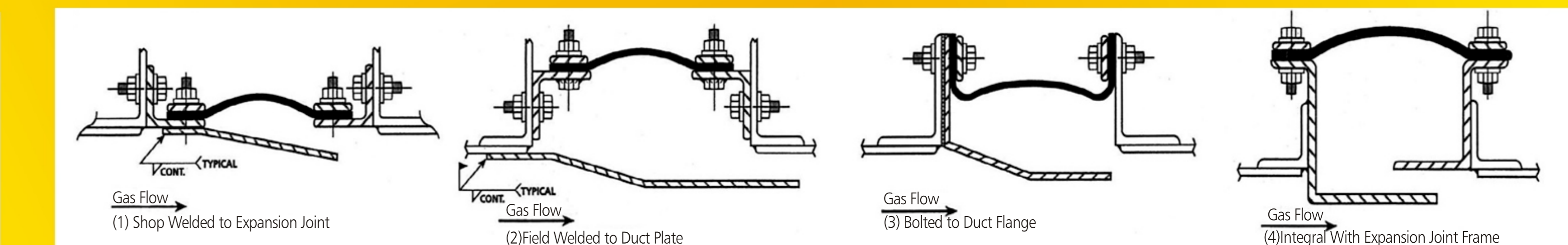
1. Definition of Non-Metallic Expansion Joint

Non-metallic expansion joints are flexible connectors designed to provide stress relief in ducting systems by absorbing movement caused by thermal changes. They also act as vibration isolators, shock absorbers and in some instances to make up for minor misalignment of adjoining ducting or equipment. They are fabricated from a wide variety of non-metallic materials, including synthetic elastomers, fabrics, insulation materials and fluoroplastics, depending on the designs.

2. Function of Non-Metallic Expansion Joint Component



- 1) The Flexible Element is the portion of the expansion joint which absorbs vibration and the thermal movements, of the ductwork. The flexible elements should consist of a gas seal membrane with optional insulating layer(s), insulation retainer layer(s) and flange gasket. The optional layers are required where the system temperature exceeds the temperature range of the gas seal membrane.
- 2) The Back-up Bars are metal bars used for the purpose of clamping the flexible element of the expansion joint to mating Ductwork flanges or to metal adapter flanges. Standard size back-up bars are 2" x 3/8". Back-up bar selection depends upon the bolt spacing, bolt hole size and expansion joint flange height or width.
- 3) The Cavity Pillow fills the cavity between the flexible element and the metal liner or baffle and helps prevent the accumulation of particulate matter, and in some applications unburned fuel, from becoming trapped in the expansion joint cavity
- 4) The Metal Liners or Baffles are metal shields designed to protect the flexible element and cavity pillow (if present). Metal liners or baffles also reduce fluttering caused by the air turbulence as it passes over the flexible element. They can also be employed as a heat deflector component of an overall thermal protection system.



- 5) The Metal Flanges or Frames are required to connect the flat belt type flexible element to the ductwork. Metal flanges or frames can be designed in a wide range of geometric profiles which can fit any existing or new ducting system.
- 6) Gasket
Single ply fluoroplastic and fluoroplastic belt designs require flexible chemically inert gaskets. Cutt tape can also be applied in this area to protect the belt from conducted frame heat and movement abrasion.