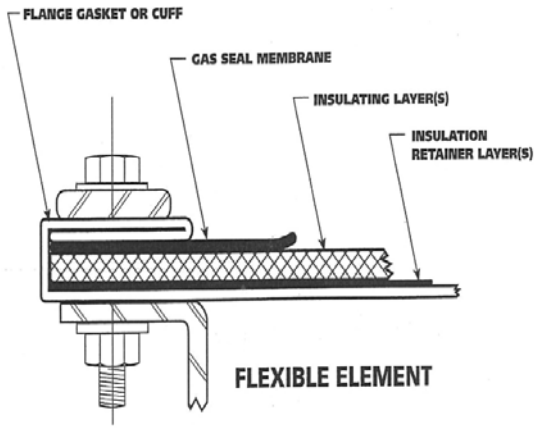
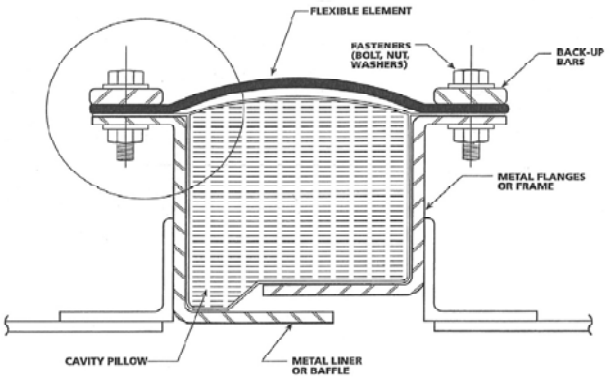
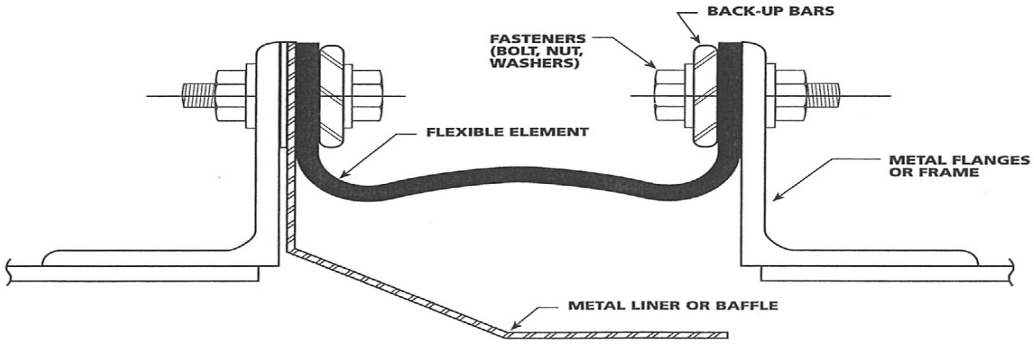
Non-Metallic Expansion Joint

3. Function of Non-Metallic Expansion Joint Component





BELT TYPE EXPANSION JOINT



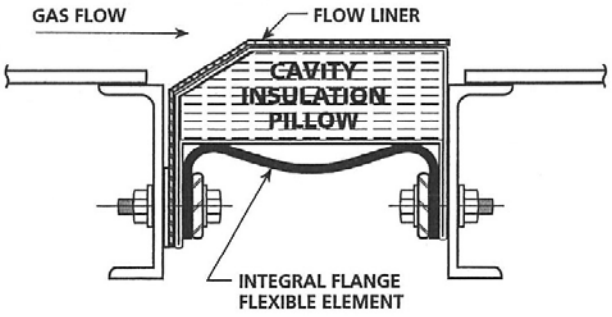
INTEGRALLY FLANGED TYPE EXPANSION JOINT

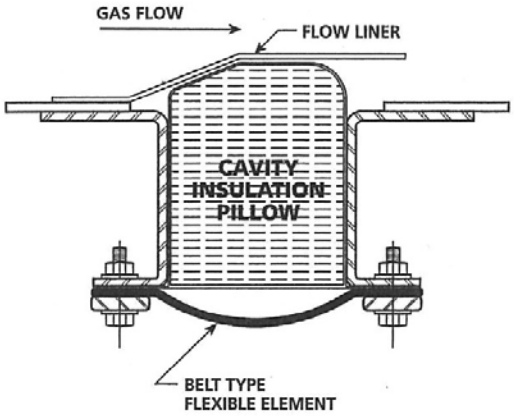
1. The Flexible Element is the portion of the expansion joint which absorbs vibration and the thermal movements, of the ductwork. The flexible elements should consist of a gas seal membrane with optional insulating layer(s), insulation retainer layer(s) and flange gasket. The optional layers are required where the system temperature exceeds the temperature range of the gas seal membrane.
   (a) The Gas Seal Membrane should be designed to handle the internal system pressure and resist chemical attack. Gas seal membrane flexibility is crucial in order to handle the thermal movements of the ductwork. Since the present gas seal membranes used in flue duct applications have temperature limitations, additional thermal protection may be required. Please refer to Section E for assistance in selecting a suitable gas seal membrane.
   (b) The Insulating Layers provide a thermal barrier to ensure that the inside surface temperature of the gas seal membrane does not exceed its maximum service temperature. Insulation can also help reduce and/or eliminate condensate problems.
   (c) The Insulation Retainer Layer(s) keep the insulating layers in place and provide protection during handling and system operation. Proper selection of suitable materials capable of withstanding system temperatures and chemical attack is critical to a successful design.
   (d) The Flange Gasket or cuff protects the gas seal membrane on a multi-layered flexible element from thermal degradation caused by hot metal flanges and back-up bars. Due to the low "Coefficient of Friction" property of fluoroplastics, a flexible, chemically inert gasket is required between the metal attachment flange and the fluoroplastic gas seal membrane in order to provide an adequate seal.

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.
   All sharp edges which may come in contact with the flexible element should be ground smooth or radiused to prevent damage to the flexible element.
   Bolt hole spacing is standardized at four (4) inch or six (6) inch center-to-center distance. This allows for proper sealing of flexible element at the duct flanges.

   Bolts Size: 1/2” Bolts Flange Bolt Hole Spacing: 4 inch Center to Center
   Bolts Size: 5/8” Bolts Flange Bolt Hole Spacing: 4 or 6 inch Center to Center
   A "CORNER HOLE" IS REQUIRED ON ALL INTEGRALLY FLANGED RECTANGULAR EXPANSION JOINTS.

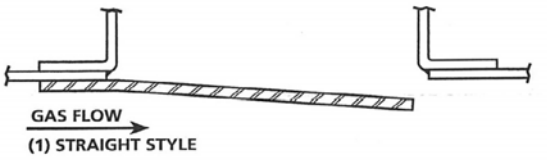
3. The Cavity Pillow fills the cavity between the flexible element and the metal liner or baffle and helps prevent the accumulation of particulate matter, and in some applications unburned fuel, from becoming trapped in the expansion joint cavity. If there is no cavity pillow, fly ash or other solid particulates can accumulate in the expansion joint cavity in such quantities that they can cause damage to the flexible element if they solidify to a cementatious state. Also, certain non-cementatious particles (fly ash) can create a severe corrosive (acidic) environment when subjected to cooling (below H_2SO_4 dew point) during a maintenance outage.

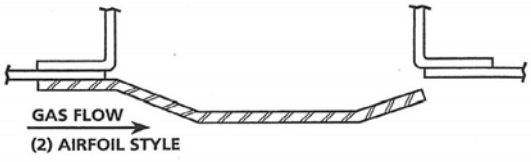


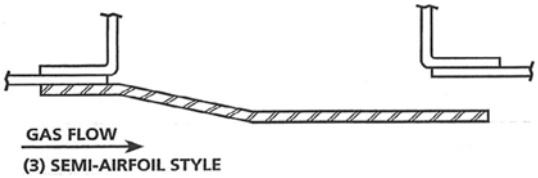


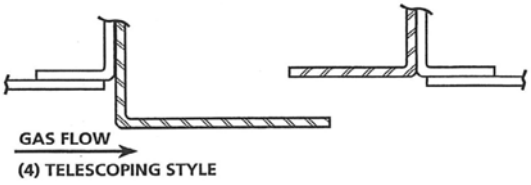
4. The Metal Liners or Baffles are metal shields designed to protect the flexible element and cavity pillow (if present). Metal liners or baffles also reduce fluttering caused by the air turbulence as it passes over the flexible element. They can also be employed as a heat deflector component of an overall thermal protection system. Whenever the metal liner or baffle attachment edge is directly exposed to the particulate flow media, the method of fastening the baffle must be by "SEAL WELDING" to prevent any direct impingement by the flow media against the flexible element.

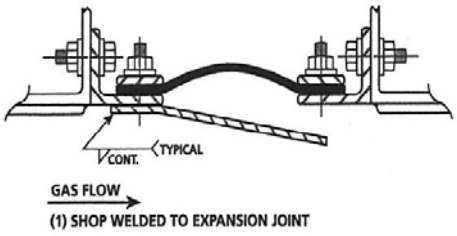
NOTE: Under conditions of "Upward Flow" in vertical ductwork, consult manufacturer for baffle design recommendations.

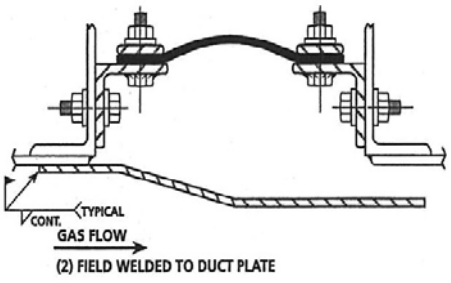


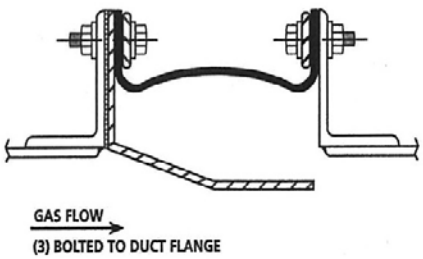


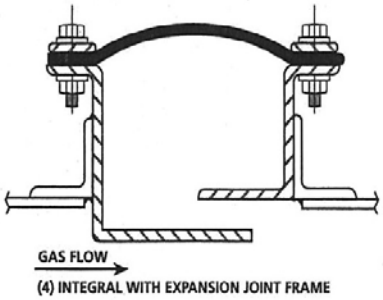








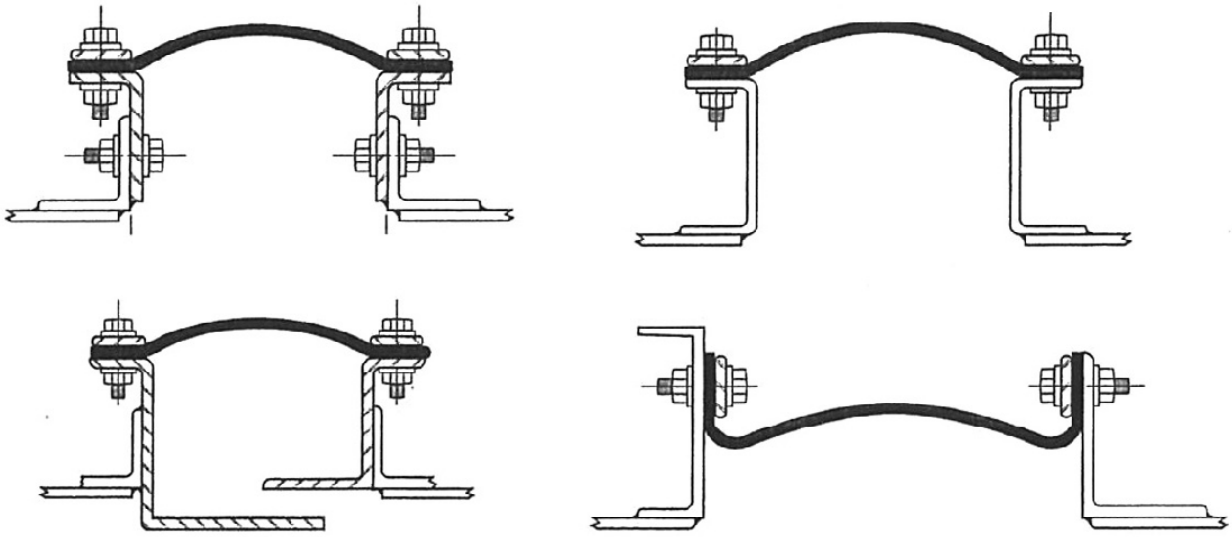




5. The Metal Flanges or Frames are required to connect the flat belt type flexible element to the ductwork.
Metal flanges or frames can be designed in a wide range of geometric profiles which can fit any existing or new ducting system. The flanges or frames establish the stand-off height of the flexible element, which is necessary to achieve the overall design integrity of the expansion joint assembly. The edges of the flanges or frame in contact with the flexible element should have a radius to prevent damage. Consult expansion joint manufacturers for their recommendations.
NOTE: Square and rectangular frames for flat belt designs should have corners with a minimum 3" radius, for optimum performance.

Methods of attachments

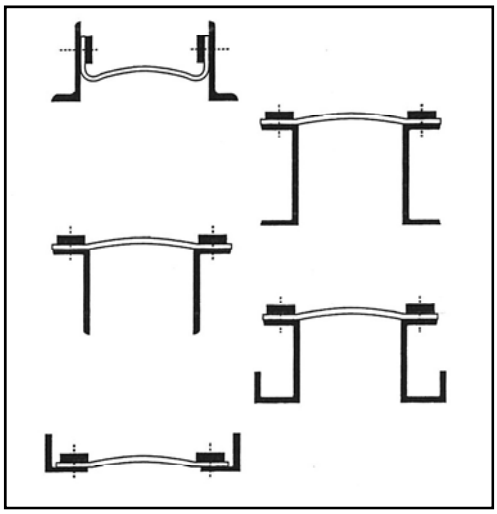
(a) Bolt frame to mating flange (b) Weld frame to mating flange (c) Weld to raw duct end



6. Gasket

Single ply fluoroplastic and fluoroelastoplastic 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.

SOME EXAMPLES OF METAL ATTACHMENT FRAMES



METAL ATTACHMENT FRAMES IN CONJUNCTION WITH BAFFLES (LINERS