

## RUBBER EXPANSION JOINTS

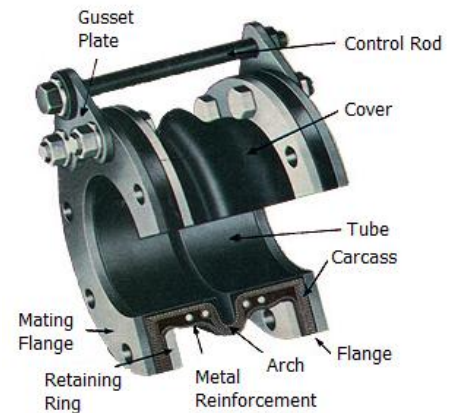
### *Q: What is a rubber expansion joint?*

**A:** A rubber expansion joint is a flexible connector consisting of natural or synthetic elastomers, fabric and when necessary metallic reinforcements. The rubber expansion joint is used to provide stress relief in piping systems due to thermal and mechanical vibration and/or movement.

### *Q: What are the advantages to using a rubber expansion joint?*

**A:** There are many advantages to choosing a rubber expansion joint:

- |                                |                             |
|--------------------------------|-----------------------------|
| 1 Minimal Face-to-face         | 6 Corrosion resistant       |
| 2 Lightweight                  | 7 Erosion resistant         |
| 3 Low movement forces required | 8 No gaskets required       |
| 4 Reduced fatigue factor       | 9 Acoustical impedance      |
| 5 Reduce heat loss             | 10 Greater shock resistance |



### *Q: What are the main components of a rubber expansion joint?*

**A:**

- TUBE:** Protective leak proof lining made of synthetic or natural rubber dependent on service requirements.
- CARCASS:** The body of the expansion joint consists of fabric and when necessary, metal reinforcement.
- COVER:** The exterior surface of the joint formed from natural or synthetic rubber as service dictates.
- ARCH:** The portion of an expansion joint which accommodates the movement of the joint.
- METAL REINFORCEMENT OR VACUUM RINGS:** Wire or steel rings imbedded in the carcass used to strengthen the joint.
- FLANGES:** Full-faced and made an integral part of the joint to insure a tight reliable seal.
- RETAINING RINGS:** Must be used to distribute the bolting load and assure a tight seal. The rings are installed directly against the back of the flanges of the joint and bolted through to the mating piping flange.
- CONTROL ROD:** An assembly of two or more control rods (or tie rods) placed across an expansion joint from flange to flange to minimize possible damage to the joint caused by excessive motion of the pipeline.
- COMPRESSIVE SLEEVE:** Pipe sleeve installed over the control rod to prevent excessive compression in the expansion joint.
- GUSSET PLATES:** Also called Ears, are used to connect the control rod to the expansion joints mating flanges.

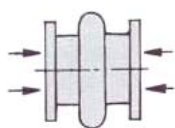


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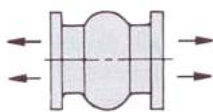
**Q: What is the function of a rubber expansion joint?**

A: A rubber expansion joint will provide the following:

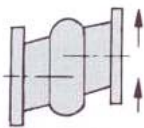
1. Compensate axial movement
2. Compensate for lateral, torsional and angular movements
3. Reduce vibration
4. Dampen sound transmission



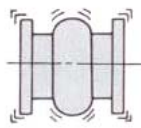
**Axial  
Compression**



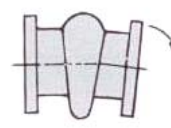
**Axial  
Elongation**



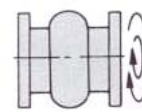
**Lateral  
Movement**



**Absorbing  
Vibration**



**Angular  
Movement**



**Torsional  
Movement**

**Q: What types of movements will a rubber expansion joint handle?**

A: A rubber expansion joint will allow for the following movements:

1. **AXIAL COMPRESSION:** The dimensional reduction or shortening of the face to face parallel length of the joint measured along the longitudinal axis.
2. **AXIAL ELONGATION:** The dimensional increase or lengthening of face to face parallel length of the joint measured along the longitudinal axis.
3. **TRAVERSE OR LATERAL MOVEMENT:** The movement or relating displacement of the two ends of the joint perpendicular to its longitudinal axis.
4. **VIBRATION:** The movement of the joint due to vibrations which are effectively intercepted and insulated against transmission to the remainder of the system.
5. **ANGULAR MOVEMENT:** The displacement of the longitudinal axis of the joint from its initial straight line position ( a combination of axial elongation and axial compression).
6. **TORSIONAL MOVEMENT:** The twisting of one end of the expansion joint with respect to the other end about its longitudinal axis.
7. **CONCURRENT MOVEMENTS:** The combination of two or more of the above listed movements. This value is expressed as the Resultant Movement.

