EXPANSION JOINT

FEATURES

- Designed and manufactured as per site condition and designed pressure rating for long service life (Custom Manufactured).
- The expansion joint can be manufactured with GP cement or Calcium Aluminate cement lining (Istra 40) as per AS1281.
- Packing chambers allow for ample packing and replacing the packer during maintenance increases the life of the expansion joint.
- Expansion joint ends can be manufactured as per site-specific requirements (Plain ends with weld collars or Flanged ends).
- Steel Mains have the manufacturing capability to provide expansion joints for large-diameter pipe sizes ranging from DN800 to DN2500 with customizable expansion allowance and wall thickness to suit site conditions and design requirements.
- Suitable for high pressure up to 2.5 MPa depending on the diameter and wall thickness.
- Suitable for high service temperatures up to 70°C.
- Steel Mains Expansion Joint can accommodate an expansion allowance range from 10mm up to 400mm. Please consult our Regional Sales Representatives for suitable application based on the design requirements.

DESCRIPTION

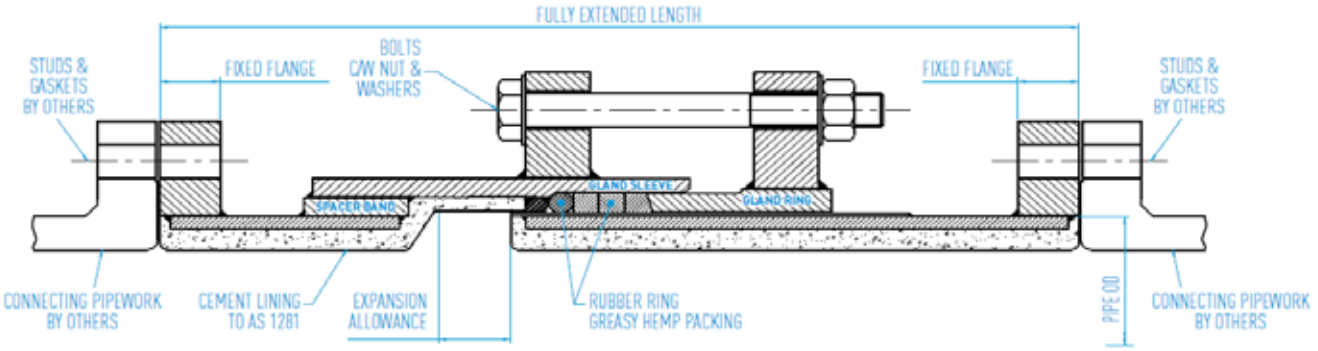
Expansion joints are installed in above-ground long-span steel pipelines as an ideal solution to allow for longitudinal movements (expansion and contraction) with pipe temperature changes without increasing the longitudinal stresses in the pipeline system. Expansion joints are not to be used in buried applications.

Steel Mains manufactures and supplies fabricated steel mechanical slip-type Expansion Joints. These Expansion Joints are available in both flanged ends and plain ends with weld collars for welded joints.

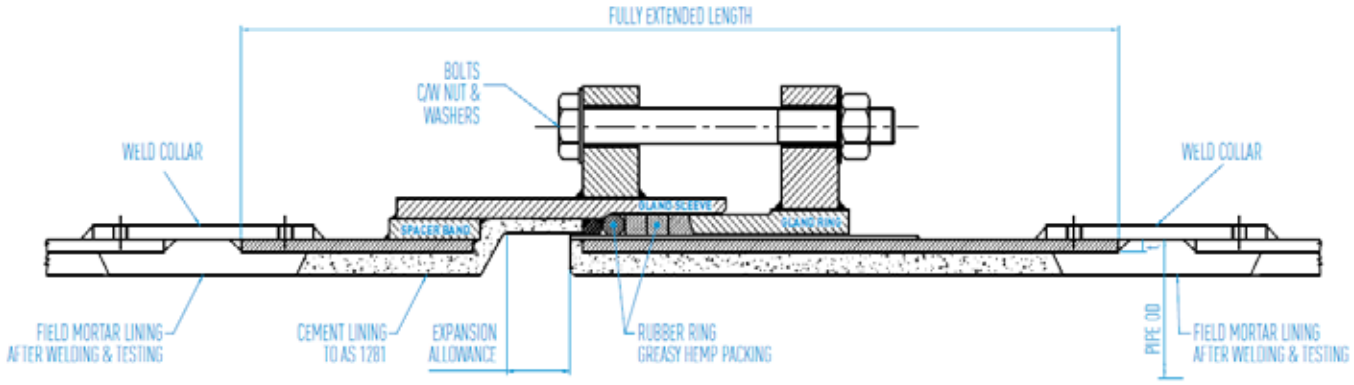
Expansion Joints are manufactured and designed to suit specific site conditions including thermal expansion of pipe in the pipeline and expansion in supporting structures requiring the same movement in the pipeline it is supporting. Steel Mains Expansion Joints do not provide restraint against thrust forces.

When installed as per the installation procedures, Steel Mains Expansion Joints are designed for pressure application up to 2.5 MPa. Please consult our sales representatives for higher working pressure applications.

TYPES OF EXPANSION JOINTS



Flanged Expansion Joint



Welded Expansion Joint

MATERIAL SPECIFICATION & STANDARDS

End type Preparation	Flanged or Plain Ends with Weld collars
Flange Drilling	AS4087, AS4331, AS2129, EN1092, ASME B16.47/ASME B16.5 AWWA C207 or to customer specification
Weld Collar	AS1579, AS3679.1
Steel	Grade 250 Steel (min) to AS1594 & AS3678 316 Stainless Steel grade Sleeve
Gland Bolts & Nuts	Hex HD Bolts Class 4.6 & Hex Nut Class 5 to AS 2528
Coating	High Build Epoxy or other coating if specified on mild steel components
Sealing	EPDM Rubber
Packing	Greasy Hemp 'Palmetto Style 1600'

INSTALLATION PROCEDURE

1. The Joint is supplied shop assembled fully retracted with the gland bolts little more than hand tightened. The Joint must be carefully installed in the pipeline with the correct initial length to the prevailing temperature. Note that care must be taken to ensure that the fixed and moving parts of the joint are truly concentric as it is not the function of the joint to align the pipework. Please note that the joint is not designed to accommodate angular or radial misalignment.

2. The Installation length of the expansion joint is based on the current temperature of the pipeline in comparison to the design temperature range of the expansion joint.

$$L_i = \left(\frac{L + G\,(T_m - T_i)}{T} \right)$$

T_m - Maximum Design Temperature
T_i - Installation Temperature
T - Total Temperature Range
L - Overall Length (Fully retracted at T_m)
G - Total Movement
L_i - Installation Length

3. Fill the pipeline with water and prevent leakage past the gland by tightening the bolts in a manner so that the gland ring is always kept parallel to the gland sleeve. (Star pattern tightening or similar)

4. Apply the line test pressure again to stop the leakage as described in step 3. Note: if the exposed machined outside diameter of the gland ring becomes less than 25mm it may be necessary to add extra ring(s) of greasy hemp to allow for future tightening. The pipeline pressure must be released to do this.

5. After following the above procedure, the joint can be placed into service. Should leakage occur it will be necessary to adjust bolts as described in step 3.

6. Do not overtighten the bolts as this will increase the friction load on the pipe and increase the wear of the packing, thus reducing its life.

INSPECTION AND MAINTENANCE

Regular inspection of the expansion joint is required. This inspection is recommended by tightening the bolts as needed and requires the usage of greasy hemp if the exposed section of the gland ring is less than 25mm. Removal and replacement of the hemp and O-rings are only required if the leakage can not be prevented by tightening the gland bolts.

To access the seals, remove all gland bolts and fully retract the gland ring and remove the greasy hemp and the O-ring. Removal of the O-ring and the greasy hemp will most likely result in damage and therefore replacement components are required to be made available on-site prior to disassembling the expansion joint.

We do not recommend a specific torque setting for the bolts. This is due to the variables of friction in both bolting and the seals which could easily result in higher pressure on the seals and a higher rate of wear or may even result in the joint not sealing correctly. The empirical method of tightening until there are no leaks results in optimum pressure on the seals.

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