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PARAMETRIC STUDY OF GASKETED FLANGE JOINTS OF DIFFERENT SIZES AND CLASSES FOR IMPROVED DESIGN AND PERFORMANCE



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Abstract:

Gasketed bolted flanged pipe joints are widely used in industrial applications and are prone to failure in terms of sealing and strength. In this paper, flange bending stress, flange rotation, bolt bending, stress variation at gasket and centring ring of the gasketed flange joints are analysed during bolt up and internal pressure loading. Three pressure classes 150# (12-600 mm (0.5-24 in.)), 900# (12-600 mm (0.5-24 in.)) and 2500# (12-300 mm (0.5-12 in.)) were employed for comparison of results. For better joint strength and sealing, the bolts were prestressed to 50% of their yield strength during bolt-up and 20% surface yielding is allowed at the hub-flange fillet. In addition, raised face on the flange faces are machined to control flange rotation and bolt bending and achieve required gasket seating stress.

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