Thermoplastic Liner System Assembly Design, with Insulating Liner having Higher Coefficient of Thermal Expansion compared to that of Carbon Steel

Abstract

The present disclosure relates, in some embodiments, to a novel thermoplastic liner system assembly design for corrosion prevention in a tubular piping system in conjunction with a specially designed threaded and coupled connection. The inventive design comprises (i) a specially designed carbon steel threaded and coupled pipe connection with the pin connector having an intermediate and/or external shoulder as a torque stop; and a recessed groove at the centre of the coupling to partially house an elastomeric seal ring, (ii) a chemically inert thermoplastic inner pipe liner with a higher coefficient of thermal expansion than that of carbon steel, with one end being a free end to allow for longitudinal thermal expansion, (iii) a stiff elastomeric end cap acting as a centering guide for the thermoplastic liner free end, (iv) a compressible elastomeric seal ring which would insulate the gap between the two pin connectors, (v) and a layer of non-structural filler material filling the annulus between the thermoplastic liner and the carbon steel pipe.

Fig. 1