Seal With Lip Projections

Cross Reference to Related Applications

[0001]

Field of the Invention

[0002] This invention relates to seals for mechanical couplings and fittings for joining pipe elements.

Background

[0003] Mechanical couplings and fittings (such as elbow and Tee fittings) for joining pipe elements employ flexible, resilient seals to form fluid-tight joints, capable of withstanding service pressures for a particular application. In operation, a seal is positioned between the segments or housing portions which are bolted together to respectively form the coupling or fitting. The seal has circumferential sealing surfaces that engage the outer surfaces of the pipe elements when the pipe elements are inserted into or otherwise engaged with the coupling or fitting. Upon proper tightening of the bolts the seal is compressed between the coupling segments or the housing portions and the pipe elements, the segments or housing portions engage and mechanically restrain the pipe elements, and a fluid-tight joint, capable of withstanding the required design service pressure, is formed.

[0004] However, in a piping network having tens or hundreds of mechanical couplings and fittings it is possible that one or more couplings or fittings might be improperly installed. The most common problem is the bolts not being tightened or

not sufficiently tightened. Such a coupling or fitting might not be fluid tight under service pressure, but, because the seal has sealing surfaces that engage the pipe elements before tightening of the bolts, such improperly installed couplings or fittings might tend to maintain a fluid-tight seal under the relatively lower test pressure used to check the integrity of the piping network and thus might give a false indication of proper installation. Because the improperly installed couplings do not leak under test pressure they might not be found until full service pressure is applied to the network. It is desirable to avoid this situation, and thus it is advantageous to have seals that intentionally leak if the coupling or fitting of which they are a part is improperly installed.

Summary

[0005] According to an aspect of the present invention, there is provided a seal. The seal comprises a ring having a peripheral wall extending circumferentially therearound. A first lobe is attached to the peripheral wall. The first lobe extends circumferentially around the ring. A first sealing surface is positioned on the first lobe. The first sealing surface extends circumferentially around the ring. At least a first projection extends from the first sealing surface. The first projection defines a closeable leak path across the first sealing surface.

[0006] By way of example, the first lobe may comprise a free edge, the first projection being positioned proximate to the free edge. In another example the first lobe comprises a free edge, the first projection being positioned distal to the free edge. Further by way of example, the seal comprises at least a second projection extending from the first sealing surface, the second projection defining a closeable leak path across the first sealing surface.