TITAN PHARMACEUTICAL LOOSE LINED FULLY DRAINABLE TUBESHEET DESIGN

During fabrication it is imperative that the weld area is adequately purged with an inert gas (argon). In order to purge between the Hastelloy tubesheet liner and the tubesheet substrate material, it is necessary to use tell tale holes (See Drawing Enclosed). This heat exchanger quoted has a substrate tubesheet with a Hastelloy liner to the outside of the gasket surface. The Hastelloy tubing is expanded into the double grooved tubesheet and the solid Hastelloy tubing is welded to the Hastelloy loose tubesheet liner.

After being used as purge holes during fabrication, these tell tale ports can be used to evaluate the operation of the unit in service.

The tube to tubesheet liner seal welds are dye penetrant and the expanded joints are hydrotested to ensure a 100% leak free unit.

While in service, the tell tale ports can be used to monitor the integrity of the tube expansions and seal welds independently during operation. The tell tale ports eliminate the possibility of cross contamination just like a double tubesheet design. This design not only provides an early indication of a problem, but also the severity of the problem. If shell side fluid leaks from the tell tale, then it is probable that there is a tube roll leak. The service side fluid is typically not very corrosive therefore the tell tale hole can be plugged and the roll leak fixed during your next scheduled shutdown. If there is tubeside fluid leaking from the tell tale, then it is probable that there is a breach in the integrity of the seal weld. Since the tubeside fluid typically much more corrosive, immediate shutdown and repair is
recommended.

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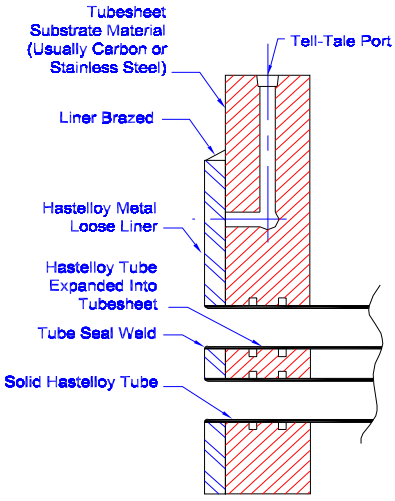

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