Tech Sheet #137
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HEAT EXCHANGER CLADDING

The purpose of this document is to provide an overview of the different types of cladding materials that are common for heat exchangers in power plant applications.

In a heat exchanger, the selection of materials is based on their erosion/corrosion resistance to the chemical composition of the circulating fluid/gas.

In practice, the base material is often steel. In some applications, steel qualities may not provide sufficient resistance and to choose a high quality metal or alloy may be necessary. Alternatively, cladding may provide an economical solution.

The cladded materials are typically used for the following reasons.

1. Some process conditions may require significant thickness for the high quality metal or alloy and the end product will become uneconomical. Cladded material is an alternate solution to meet the specified requirements and reduce the cost without jeopardizing the quality of the equipment.
2. Cladded tube sheets may be used to bridge the difference between the material requirements of the shell side and the tube side of the heat exchanger.
3. Cladding the tube sheet with material compatible with the tubes can eliminate the potential galvanic corrosion between dissimilar metals.

The clad materials typically used on the heat exchangers can be broadly categorized as the following:

a. Stainless Steel
b. Duplex Stainless Steel
c. Copper-Nickel
d. Monel
e. Titanium
f. Al-Bronze
g. Naval Brass
h. AL6XN

In the power plant industry, the process fluid is often the corrosive fluid and most heat exchangers are configured for this fluid to be on the tubeside for maintenance/cleaning purposes.

If cladding is designed for corrosion purposes, the full thickness of the cladding material may be considered as corrosion allowance, unless exempt by the contract.

This Tech Sheet was developed by the members of the Heat Exchange Institute's (HEI) Shell & Tube Heat Exchanger Section. HEI is a trade association comprising the leading manufacturers of heat exchange and vacuum equipment. HEI Tech Sheets are information tools and should not be used as substitutes for instructions from individual manufacturers. Always consult with individual manufacturers for specific instructions regarding their equipment.

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