

Investigation on Corrosion Behavior of Copper Brazed Joints

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Abstract : DHP (Deoxidized High Phosphorus)copper is widely used in various heat transfer units such as, air conditioners refrigerators, evaporators and condensers. Copper sheets and tubes (ISODHP) were brazed with four different brazing alloys. Corrosion resistances of the joints were examined by polarization and salt spray tests. The selected fillers consisted of three silver-based brazing alloys (hard solder); AWS-BCu5 BAg8, DINLAG30, and a copper-based filler AWS BCuP2. All the joints were brazed utilizing four different brazing processes including furnace brazing under argon, vacuum, air atmosphere and torch brazing. All of the fillers were used with and without flux. The microstructure of the brazed sheets was examined using both optical and scanning electron microscope (SEM). Hardness and leak tests were carried out on all the brazed tubes. In all three silver brazing alloys selective and galvanic corrosion were observed in filler metals, but in copper phosphor alloys the copper adjacent to the joints were noticeably corroded by pitting method. Microstructure of damaged area showed selective attack of copper lamellae as well. Interfacial attack was observed along boundaries as well as copper attack within the filler metal itself. It was found that the samples brazed with BAg5 filler metal using vacuum furnace show a higher resistance to corrosion. They also have a good ductility in the brazed zone.

Keywords : copper, brazing, corrosion, filler metal

Conference Title : ICMMSE 2015 : International Conference on Metallurgy, Materials Science and Engineering

Conference Location : Prague, Czechia

Conference Dates : July 09-10, 2015