SPECIFICATION FOR GENERAL REQUIREMENTS OF BRAZING TUNGSTEN CARBIDE TO AISI 4130 MATERIAL

1.0 PURPOSE

1.1 It is the purpose of this specification to list in a concise form the Brazing of tungsten carbide and base materials used in well head, Christmas Tree, Manifold and related equipment used oil field services.

1.2 To specify procedure & maintain to join tungsten carbide and base materials.

2.0 SCOPE

2.1 This specification covers requirements of brazing of tungsten carbide and base materials.

3.0 PROCEDURE

3.1 Wipe of excess flux from parts exterior surfaces. With assembly in the vertical position, heat exterior surfaces with an appropriate electric heating or vacuum furnace. Monitor temperature with temperature indicator marker or measuring device. Do not exceed maximum temperature. Exercise care in achieving uniform heating around the areas to be joined. After reaching required temperature apply brazing filler material to the joint line of the mating components. Do not allow torch flame to contact flux or filler rod directly. As the filler melts manipulate so as to assure joint filling, lift & slightly rotate or oscillate parts to facilitate filler converge and wetting. Finally, press all the parts together & allow cooling, in still air, to room temperature. Do not disturb during cooling process.

3.2 Brazing specification in accordance with ASME Section IX ASME Boiler & Pressure Vessel code.

3.2.1 Base Metal
Tungsten carbide & AISI 4130 material. Pre-clean with solvent degreaser, alkaline wash, rinse with clear water, dry.

3.2.2 Filler Metal
AWS No. 5.8 Class Bag-1.030/.040 diameter wire rod (silver solder) Ag45-Cu15-Zn16-Cd24, Handy Hartman, Easy-Flo45 or equivalent.

3.2.3 Shim Material
Cooper alloy shim material is required with the brazing area exceed 1.5 square inches. Thickness of the shim material shall be 0.005" to 0.030" as applicable.

3.2.4 Brazing Temperature
1145° F (620°C) ± 5° C

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3.2.5 Brazing Process
Electric heating or vacuum furnace

3.2.6 Brazing Flux
AWS No. 3A-working temperature 1050-1600° F (565-871° C). Handy & Hartman, Handy Flux B-1 or equivalent.
Boric Acid-Borates-fluorides-wetting agent form; Liquid or Paste.

3.2.7 Flow Position
Down hand, Face feed.

3.2.8 Joints
Type – Socket Clearance – 0.002 to 0.007" (0.05 – 0.20mm) or 0.008 – 0.012" (0.20 – 0.30mm)
Length of overlap – Per detail drawing.

3.2.9 Post Braze Heat Treatment
None. Slow cool, don't quench.

3.2.10 Post Braze Cleaning
Hot Water, alkaline detergent, rinse clean and blow dry.

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