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Data Sheet

## Hardbanding Wire

# POSTALLOY<sup>®</sup> TOOL JOINT BU-MCG

### A Premium Build-Up wire for Rebuilding of Tool Joint Tong Space

#### Box and Pin Tong Space Rebuilding

The rebuilding of tong spaces on a tool joint box or pin is quite similar to traditional hardbanding applications. Careful attention to preheating procedures and temperatures as well as slow cooling during post-welding procedures is critical. Particular attention should be given to inspection of services for cracks using MPI methods. The procedure below outlines the basic requirements to successfully rebuild tong spaces with Postalloy<sup>®</sup> Tool Joint BU-MCG. Some adjustments will be required to accommodate various diameters of tool joints.



**\*Please note that this procedure will be harmful to the threads of the tool joint and re-cutting of connections will be required.**

#### PROCEDURE:

- 1.0 All previously worn hardbanding should be removed.
- 2.0 The complete tong space should be machined to a consistent diameter.
- 3.0 The complete tong space should be inspected for cracks and defects using MPI methods.
- 4.0 All cracks and defects should be ground out until the tong space is free all defects and cracks.
- 5.0 If any cracks or defects cannot be ground out, then the tool joint should be rejected for this procedure.
- 6.0 The tong space is now ready for the application of Postalloy<sup>®</sup> Tool Joint BU-MCG.
- 7.0 Preheat the entire tool joint to 450°F (232°). Allow to soak at this temperature for 15 minutes prior to welding.
- 8.0 Using pure argon or argon/oxygen mixtures as a shielding gas, commence welding, starting at the threaded end of the tool joint working toward the drill pipe body. See Fig. 1 for complete welding setup.
- 9.0 It is desirable to completely rebuild the tong space area to the desired thickness all at one time. This may require multiple layers. Interpass temperature should not exceed 700°F (371°C). If this temperature is exceeded, discontinue welding until the interpass temperature cools to 450°F (232°C). At that point welding can resume. If for any reason the welding cycle must be interrupted, such as a shift ending, the tool joint should be wrapped in a thermal blanket and precautions taken to ensure the joint does not cool below the preheat temperature of 450°F (232°C). Do not allow the tool joint to cool to room temperature.
- 10.0 After the completion of welding, the tool joint should be wrapped in a thermal blanket and covered with an insulating container to ensure slow cooling to room temperature. Cooling rates should be no more than 50°F/hour.

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11.0 Prior to stress relief in a furnace, the complete build up and adjacent areas of the base material should be MPI inspected for cracks. These areas shall be free of all cracks prior to heat treatment. If cracking should occur in the build up area, repairs can be made by preheating to 450°F (232°C) and applying Postalloy<sup>®</sup> Tool Joint BU-MCG in the affected areas. Grinding to the bottom of cracks may be necessary prior to repair welding. Slow cooling from the welding temperature is mandatory. There shall be no cracks in the base material. If cracks do appear, then the complete build up of Postalloy<sup>®</sup> Tool Joint BU-MCG shall be removed and the cracks repaired, prior to any re-application of Postalloy<sup>®</sup> Tool Joint BU-MCG.

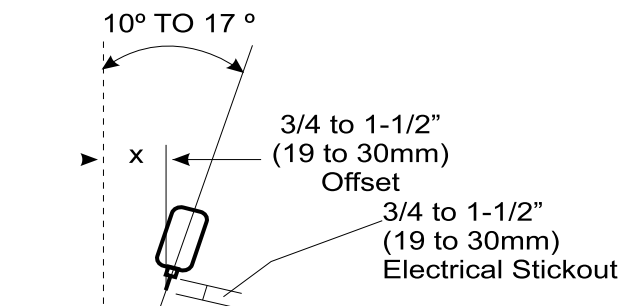
12.0 The finished and MPI inspected tool joint shall be placed in an adequate furnace and brought to a temperature of 900°F (482°C) and soaked for 15 minutes.

13.0 The tool joint shall then be taken out of a furnace and slow cooled to room temperature at a rate of no greater than 50°F/hour.

14.0 The cool tool joint shall then be inspected for cracks using MPI. A tool joint found to contain cracks shall be rejected and reconsidered for Postalloy<sup>®</sup> Tool Joint BU-MCG removal, re-machine, repaired, and welded once again.

15.0 After MPI, no less than five hardness values should be taken over the surface of the Postalloy<sup>®</sup> Tool Joint BU-MCG and no less than five hardness values should be taken on each side of the weld deposit and into the heat affected zone. 80% of the hardness readings taken shall fall between 28 Rc and 35 Rc. If the majority of hardness values falls above 35 Rc, the tool joint shall be heat treated following steps 12 through 15. If the hardness values fall below 28 Rc, the tool joint is too soft to be put in service and shall be considered reject.

14.0 Please direct any questions or comments to the Hardbanding Solutions Headquarters or your local Technical Center.



TJ Dia.	Seconds per Rev.	X
4-1/8"	150	1/2"
8-3/4"	180	1-1/2"
105mm	150	12.7mm
222mm	180	38mm

## Welding Parameters

Diameter.....1/16" (1.6mm)  
 Shielding Gas....98% Argon/2% Oxygen (or other Argon/Oxygen Mix)  
 Gas Flow Rate..32 to 37 CFH (15-17.5 LPM)  
 Polarity.....DC Reverse or Straight Polarity  
 Amperage.....250-325  
 Voltage.....26-33  
 Stickout.....1-1 1/2" (25-38mm)  
 Oscillation Speed.....60-100 per Minute  
 Oscillation Width....3/4-1 1/4" (19-32mm)  
 Preheat.....450°F (232°C)  
 Interpass Temp.....700°F (371°C) Max  
 Hardness on 4137 Steel....30-35 Rc

TIR  
0.030"  
(0.76 mm)



FIG. 1