



## POSTALLOY<sup>®</sup> PS-10



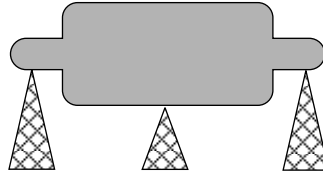
DOWN-HOLE STABILIZERS can exhibit extensive wear depending upon the abrasive nature of the drilling environment. Typically the stabilizer is a 4145 alloy, which requires careful control of preheats, interpass temperatures, and post weld slow cooling procedures to avoid high hardness values in the Heat Affected Zone and protection against hydrogen embrittlement. This procedure applies to new and worn stabilizers, as well as integral and welded blade types.

POSTALLOY<sup>®</sup> PS-10 is a nickel base hardfacing wire designed to resist severe abrasion in combination with excellent corrosion resistance, friction wear resistance and high temperature resistance up to 1100° F (565° C). Weld deposit contains over 60% Fused Tungsten Carbide in a Nickel-Chromium-Silicon-Boron matrix.

The alloying elements in the wire produce a high strength weld matrix that bonds with the tungsten carbide (WC) particles, eliminating premature wear caused by the release of the hard WC particles upon impact. Furthermore, the nickel matrix alloy eliminates the problem of tungsten carbide dissolution created during the welding process. Resistance to abrasion, especially fine particle abrasion is outstanding.

## WELDING PROCEDURE:

- New and worn stabilizer blades should be machined to a dimension that allows 3/32” (2.4mm) deposit thickness, taking into account for metal removal in the final machining of the blade.
- To avoid sagging or distortion during welding, it is recommended that the stabilizer be supported at three separate locations, as shown below.



- Prior to welding the blades shall be cleaned, buffed, and lightly ground to remove all debris, oil, and surface contaminants.
- It is recommended that the stabilizer blades be completely welded within a 12 hour period. Any stoppage of welding should be followed by a complete wrap with a thermal blanket to avoid excessive cooling. Upon a restart of welding the standard preheats shall be applied.
- Preheating: Preheating can be carried out locally on an individual blade and should include the entire blade. A minimum of 400F (204C) preheat shall be applied by an oxyacetylene torch or induction heaters and held for a minimum of 20 minutes to allow for a good soak.
- Welding Parameters, 1/16” (1.6 mm) diameter PS-10 wire:
  - Polarity – DC Reverse (Electrode Positive)
  - Shielding Gas – Pure Argon - @35 cfh (24 m<sup>3</sup>/day)
  - Voltage – 21.5
  - Wire Feed Speed – 160 IPM (400cm/min)
  - Amperage – 170
  - Stickout - 0.5” (13mm)
  - Direction of Travel – Backhand
  - Travel Speed – 8 IPM (20.3 cm/min)
  - Oscillation Width - 0.375” (9.5 mm)
  - Number of Layers – Single
  - Post Heat – Slow Cool
- Post Weld Cooling: While welding, continuous heat from the welding arc is being poured into the stabilizer. It is very important to keep this heat within the stabilizer in the vicinity of the new deposit. This area requires the use of a thermal blanket wrap around the blade. The wrapping should be done on each blade as it is completed. Strong magnets can be used to keep the blanket in place while other blades are being welded. Failure to follow this procedure may lead to cracking or catastrophic failures. The thermal blankets should remain in place for 6 to 8 hours.
- Weld Clean Up: Using pure Argon gas ensures the lowest possible spatter level. Some spatter balls may stick superficially to the stabilizer body, but are easily removed with a wire brush. Any gas other than pure 100% Argon may result in high spatter, cracking, and excessive cleanup.
- Machining to tolerance: The finished deposit should be reasonably smooth and flat, but rarely is it consistently thick to fall within tolerance. Machining or grinding will ensure the that O.D. falls within tolerance.