Technical Bulletin

Orbital Weld Field Preparation/Completion Issues

Requirements:

Tube End Prep

Issues: Must be at a 90 degree, "zero" face, zero chamfer, stringently clean, zero burrs

Result: Failure to meet any one of the above critical initial preparation procedures will result in either a suspect or rejected weld.

Constant Gas Purge

Issues: Slightest concentration loss results in poor and or reject weld quality. Field oxygen displacement through purge gas conditions are ideal if less than 2% and are seldom **"**actually" achieved at the field level.

Result: Failure to achieve will result in suspect or reject weld quality to either some or all welds in the post weld audited procedure, resulting in system re-weld/re-work or post weld cleaning, potentially elevating post weld examination form statistical 5-10% levels to "100% mandatory", affecting project schedule and cost. Larger (1-1/2"-2") diameter tube and or longer continuous system completions, become very difficult to maintain constant gas purge necessary to achieve less than 2% oxygen requirements.

Result: Suspect and or reject weld(s) resulting in diameter specific and or system re-work. Ultimate project cost and schedule are negatively impacted.

Equipment Considerations:

Issue: 1. Must have access to a power supply either 110 or 220/60. 2. Must have a purge gas supply available.

Result: 1. Excess time is spent arranging for this. 2. "Lugging" gas supply around is difficult and has safety issues.

38376 Apollo Parkway, Willoughby, Ohio 44094
Phone: 440-602-5770 Fax: 440-942-1186
WWW.LOKRING.COM

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Machinery Set-Up, Continuous Monitoring and Machinery Adjustment:

Issue: 1. Set Up. Time consuming machinery set up to constantly changing tube stock metallurgies. 2. Continuous monitoring and machinery adjustment – required to maintain calibration to specific tube stocks.

Result: 1. Multiple and costly test fittings in the initial and ongoing machinery calibration, or as adjustments as a result of improper set up and continuous calibration, result in weld rejection, increasing cost and project schedule. 2. "Assumptions" in tube stock "constants" results in either suspect or rejected weld quality.

Extensive Operator Training:

Issue: Ticketed welding background required. Additional "equipment specific" training also necessary.

Result: Large costs incurred by contractor/project owner to maintain welder's ticket and equipment specific training. Weld certification remains resident to welder, NOT the company employed by. Transient nature and dependability of available qualified welders through cert and additional machinery training can and has negatively affected project cost and schedule.

Post Weld Verification Procedures:

Issues: Necessary components of any weldment; and can be in several forms. Primary method is x-ray. Scheduling and NDT methods add significant project costs.

Result: NDT scheduling and costs begin at statistical requirements but can ramp to 20-50-100% if weld quality is deemed suspect or reject.

Other OW Consideration:

Direct Head Cost – Example: X Machine = $$$$

Associated Consumables – Example: Gas = $$

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