WELDING PROCEDURE SPECIFICATION

WPS: 9000CD100-8  REV. NO.: 1  DATE: 11/14/2011
WELDING PROCESS: STUD-  CODE: ASME IX and AWS D1.6
SUPPORTING PQR: 9000CD100-8-25 9000cd100-8-3125

**APPLICABILITY**

WELDING PROCESS:
STUD-

CODE: ASME IX and AWS D1.6

OTHER: Mast. Spec. 11 5311.10 & 12

JOINT: This WPS shall be used in conjunction with the General Welding Standards (GWS) and Welding Fabrication Procedure (WFP) sections and criteria for joint details, repairs, NDE, inspection, etc.

Weld Joint Type: Stud  Class: Capacitor Discharge Stud

See GWS 1-06 and WFP’s for joint details.

Root Opening: N/A  Backing: N/A

Backgrind Root: N/A  Backing Mat.: N/A

Bkgrd Method: N/A  GTA Flux: N/A  Backing Retainer: N/A

FILLER METALS:

Class: SS 3xx-Stud and SS 3xx-Stud

A No: 8  SFA Class: N/A and N/A

Insert: No  Insert Type: N/A

Flux: N/A  Size: N/A

Weld Metal Thickness Ranges:

AWS Root Pass:

AWS Balance: 0 thru 0

ASME Root Pass:

ASME Balance: 0 thru 0

BASE MATERIAL:

P No: 8  Gr No.: N/A  to P No.: 8  Gr No.: N/A

Spec.: SS-3xx-x Stud  Grade: All  to Spec.: A-240 SS- Plate sheet & strip  Grade: All

Qualified Pipe Dia. Range: >=  AWS: ASME:

Qualified Thickness Range: AWS: 0.0625 thru 0.75  ASME: 0.04 thru 0.75

QUALIFIED POSITIONS:

AWS: 1S, 2S, 4S  ASME: 1S, 2S, 4S  Vert. Prog.: N/A

Preheat Min. Temp.: 50  GAS: Shielding: N/A or N/A
Inerpass Max. Temp.: 150 °F  Gas Composition: N/A / N/A / N/A % / / %
Preheat Maintenance: 100 °F  Gas Flow Rate cfm: 0 to 0
PWHT: Time @ °F Temp.: N/A  Backing Gas/Comp: N/A
Temperature Range: N/A °F to N/A °F  N/A %  Backing Gas Flow cfm: 0 to 0
Trailing Gas/Comp: N/A

WELDING CHARACTERISTICS:

Current: DCEN and N/A  Tungsten Type: N/A  Transfer Mode: Cap. Discharge
Ranges:  Amps:  N/A  Tungsten Dia.: N/A  Pulsing Cycle: 0 to 0
Volts: 118  Background Current: 0

Fuel Gas: N/A  Flame: N/A  Braze Temp °F: N/A to N/A

WELDING TECHNIQUE: For fabrication specific requirements such as fitup, cleaning, grinding, PWHT and inspection criteria, refer to Volume 2, Welding Fabrication Procedures.

Technique: N/A  Cleaning Method: Grind/wire brush/file
Single or Multi Pass: N/A
Stringer or Weave Bead (S/W): N/A
Oscillation: N/A
GMAW Gun Angle: N/A
Forehand or Backhand for GMAW: N/A
No Pass > 1/2": N/A
GMAW/FCAW Tube to Work Distance (in): N/A
Maximum K/J Heat Input: N/A
Travel Speed: N/A
Gas Cup Size: N/A

PROCEDURE QUALIFIED FOR:
Charpy "V" Notch: N/A
Nil-Ductile Transition Temperature: N/A
Dynamic Tear: N/A

Comments: This procedure is for Midwest Fasteners CD100 power supply and CD-2p weld gun equipped with a changeable spring for welding 1/4" or 5/16" studs. The power supply "Tap" shall be in the Low position. There are three (3) adjustments for this equipment. For 1/4" use 1. Spring selection, use black. 2. "Tap" selection use LOW. and Voltage is per above. For 5/16" studs the three adjustments are 1. Spring selection, use silver. 2. "Tap" selection use LOW. and Voltage is per above.

<table>
<thead>
<tr>
<th>Weld Layer</th>
<th>Manual Process</th>
<th>Filler Metals</th>
<th>Size</th>
<th>Amp Range</th>
<th>Volt Range</th>
<th>Travel/ipm</th>
<th>Nozzle Angle</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>STUD-</td>
<td>SS 3xx-Stud</td>
<td>1/4</td>
<td></td>
<td>118 to 125</td>
<td></td>
<td></td>
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<tr>
<td>2</td>
<td></td>
<td>SS 3xx-Stud</td>
<td>5/16</td>
<td></td>
<td>115 to 130</td>
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<td></td>
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<tr>
<td>3</td>
<td></td>
<td>SS 3xx-Stud</td>
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<tr>
<td>4</td>
<td></td>
<td>SS 3xx-Stud</td>
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</tbody>
</table>

REM. * Weld layers are representative only - actual number of passes and layer sequence may vary.

ML-1/2 projects or jobs must determine if the supporting documentation for this WPS complies with quality requirements of the project/job.

Use of LANL Welding Procedures and Welder Qualifications for non-LANL work shall be at the sole risk and responsibility of the Subcontractor, and the Subcontractor shall indemnify and save LANL and the Government harmless from any and all claims, demands, actions or causes of action, and for any expense or loss by the reason of Subcontractor's and their employees possession and use of LANL procedures and qualifications.

APPROVAL: Signatures on file at ES-DE

DATE: 11/16/2011 3:06 PM