**JOINT DETAILS:**

- **BASE MATERIAL SPECIFICATION:** SA 516-70N. See attached MTC (Material Test Certificate)
- **PLATE THICKNESS:** 0.375”
- **APPLICABLE CODE/STD:** ASME IX, EDITION 20xx
- **BASE MATERIAL CLASSIFICATION:** P1G1
- **PLATE CHEMISTRY:**
  - C: 0.21
  - Mn: 1.03
  - Si: 0.33
  - S: 0.01
  - P: 0.01
  - Cr: 0.02
  - Ni: 0.14
  - Mo: 0.01
  - Nb: 0
  - Cu: 0.04; Al: 0.045; V: 0.014
- **PLATE TREATMENT:** Ca KILLED, S SHAPE CONTROL, FINE GRAIN, NORMALIZED
- **PLATE MECHANICAL PROPERTIES:**
  - **YIELD STRESS:** 54KSI
  - **UTS:** 76KSI
  - **CVN:** 81 FT-LB AT -50˚F

**WELDING POSITION:** 1G (GROOVE)

**WELDING PARAMETERS:**

<table>
<thead>
<tr>
<th>FLUX-WIRE</th>
<th>CONSUMABLE - FILLER METAL</th>
<th>SPECIFICATION</th>
<th>AWS CLASSIFICATION</th>
<th>CLASSIFICATION (WIRE)</th>
<th>MFG</th>
<th>TRADE NAME</th>
<th>BATCH NO.</th>
<th>WIRE SIZE (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>FLUX-WIRE</td>
<td>FLUX-WIRE</td>
<td>SA 5.17/5.23</td>
<td>F7AB-EH12K</td>
<td>EH12K</td>
<td></td>
<td></td>
<td></td>
<td>Ø 3.2 mm</td>
</tr>
</tbody>
</table>

**FLUX**

- **FUSED:** X
- **ACTIVE:** ACIDIC
- **AGGL.:** INACTIVE
- **BASIC:** X

**PNEUMATIC RECIRCULATION:** Pneumatic with granule sieving

**PASS SEQUENCE:**

- **55°-60°**
- **1-2mm**
- **2-3mm**

**NOTES:**

The joint details are nominal and are flexible to the requirements envisioned. For example, a smaller included angle, root gap, and land; while using an electrode extension >25mm would ensure that the HAZ is smaller, cooler, and utilizes less weld metal. This becomes critical in plates of higher thicknesses. The same logic applies to the number of passes.

General industry procedures call for an SMAW root pass, followed by back gouging and LPI (Liquid penetrant testing) prior to the SAW. However, use of a ceramic backing and the deletion of the SMAW root pass does not require requalification, per ASME IX. Writing a new WPS supported by the original PQR that includes the SAW portion, by revising the WPS; e.g., Joints: “with and without backing” will optimize the welding process.

Plate Chemistry and processing parameters should be sourced from the MTC provided at the time of procurement. This will ensure the flux manufacturer suggests that composition which best replicates the base material. For example, an Al2O3 containing flux may generate deleterious Al2O3 inclusions, not compatible to the Ca-killed base material.

In this case, both flux and agglomerated flux options have been checked to accommodate market availability.

An inactive flux is chosen as this ensures that the ingredients that make up the composition are very stable and do not disintegrate in the welding arc. For example, if SiO2 is present, its decomposition will add O to the weld metal. An inactive and basic flux combination therefore ensures excellent mechanical properties of the weld metal.

The range of welding parameters identified indicates that these will be manipulated in the WPS to ensure a heat input of 2.5KJ/mm, which generally ensures good weld mechanical properties. The note on pneumatic conveying, indicates to the manufacturer that the supplied flux must be capable of handling small amount of iron oxides generated during welding. This serves as a guideline to the flux manufacturer to fine tune its flux composition to accommodate welding operational logistics.