### Welding Procedure Data Sheet (WPDS)

**Ref. Standards:** CSA W47.1/ W59-03

<table>
<thead>
<tr>
<th>WPDS No.:</th>
<th>DEMO-WPDS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ref. WPS:</strong></td>
<td>MCAW-CS 01</td>
</tr>
<tr>
<td><strong>Supporting PQR No.:</strong></td>
<td>Prequalified WPDS</td>
</tr>
</tbody>
</table>

**Company Name:** www.WeldCanada.com  
**Address:** info@WeldCanada.com, 1 (877) WPS-WELD

<table>
<thead>
<tr>
<th>Welding Process:</th>
<th>Process Mode:</th>
<th>Position (s):</th>
</tr>
</thead>
<tbody>
<tr>
<td>MCAW</td>
<td>Semi-Automatic</td>
<td>Flat</td>
</tr>
</tbody>
</table>

**Base Metal Part I (Material Spec., type or grade):**  
Steels in Group 1, 2 and 3 of Table 11.1/ 12.1-CSA W59-03

**Base Metal Part II (Material Spec., type or grade):**  
Steels in Group 1, 2 and 3 of Table 11.1/ 12.1-CSA W59-03

**Qualified Thickness and Diameter (Pipe) Range:**
- Groove (Fillet): mm (in)  
  \[ T \leq 10 \text{ mm (3/8 in)} \]

**Filler Metals:**
- Classification/Specification  
  - E491C-6M-H4  
  - CSA W48

**Joint Details/Sketch:**

- **Joint Design Used:** mm (in)  
  \[ G_{\text{min}} = T \]
  \[ T \leq 10 \text{ mm (3/8 in)} \]

- **B-L1a-FC**

<table>
<thead>
<tr>
<th>Weld Type:</th>
<th>Joint Type:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Complete Joint Penetration Groove Weld</td>
<td>Butt Joint</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Backing Option:</th>
<th>Backing Material:</th>
<th>Transfer Mode (GMAW or MCAW):</th>
</tr>
</thead>
<tbody>
<tr>
<td>Welded with backing</td>
<td>Same as parent material</td>
<td>Spray</td>
</tr>
</tbody>
</table>
**Electrical Characteristics:**

**Current Type/Polarity:** DCEP

**Tungsten Electrode (GTAW):**

Type: N/A  
Size: mm (in) N/A

**Shielding:**

Gas Composition (Flux for SAW): Ar+15% CO2

Gas Flow Rate: lt/min. (CFH) 40 to 50 CFH

Gas Cup Size: 5/8 in.

Electrical Stickout (ESO): mm (in) 3/4 to 1 in.

**Welding Parameters**

<table>
<thead>
<tr>
<th>Thickness</th>
<th>Weld Size</th>
<th>Weld Layer</th>
<th>Pass No.</th>
<th>Process</th>
<th>Filler Metal Classification</th>
<th>Filler Size (mm)</th>
<th>Current Amps</th>
<th>Current Type &amp; Polarity</th>
<th>Wire Feed Speed (in/min)</th>
<th>Volts</th>
<th>Travel Speed (in/min)</th>
<th>Remarks [Heat Input] J/mm (J/in)</th>
</tr>
</thead>
<tbody>
<tr>
<td>6 (1/4)</td>
<td>E=T</td>
<td>1</td>
<td>1</td>
<td>MCAW</td>
<td>E491C-6M-H4</td>
<td>1.4 mm (0.052)</td>
<td>200-250</td>
<td>DCEP</td>
<td>200-250</td>
<td>25-27</td>
<td>10-14</td>
<td>N/A</td>
</tr>
<tr>
<td>8 (5/16)</td>
<td>E=T</td>
<td>1 to 2</td>
<td>1 to 2</td>
<td>MCAW</td>
<td>E491C-6M-H4</td>
<td>1.4 mm (0.052)</td>
<td>200-250</td>
<td>DCEP</td>
<td>200-250</td>
<td>25-27</td>
<td>10-14</td>
<td>N/A</td>
</tr>
<tr>
<td>10 (3/8)</td>
<td>E=T</td>
<td>2</td>
<td>2 to 3</td>
<td>MCAW</td>
<td>E491C-6M-H4</td>
<td>1.4 mm (0.052)</td>
<td>270-300</td>
<td>DCEP</td>
<td>270-320</td>
<td>26-28</td>
<td>12-18</td>
<td>N/A</td>
</tr>
</tbody>
</table>

**Heat Treatment:**

Preheat Temp. Min °C (°F): 10 °C, Table 5.3 of CSA W59-03

Cleaning Procedures: Wire Brush

Interpass Temp. Min/Max °C (°F): 10 °C, Min. Table 5.3 of CSA W59-03

**Additional Notes:**

- The end of contact tube recommended to be recessed in the cup nozzle at least 6 mm (1/4 in).
- Any combination of shielding gas with wire needs to be CWB Certified.

**Welding Supervisor or Welding Engineer:**

Name: Joe Smith

Date: 12,12,2005

**CWB Acceptance:**

Date: 12/14/2005
Heat Treatment Code’s Guideline:

PREHEAT TABLE:
Preheat and interpass temperature shall be sufficient to prevent cold cracking.
The need for and the temperature of preheat are dependent upon a number of factors such as chemical analysis, degree of restraint of the parts being joined, elevated temperature mechanical properties, and material thicknesses.
CSA W59-03, Table 5.3 Minimum Preheat and Interpass Temperature °C (°F):
Preheat and Interpass temperature is provided for each material and thickness and process type on this group.
Preheat requirements shall be based on Welding Procedure Data Sheet (WPDS).

POSTWELD HEAT TREATMENT:
PWHT requirements shall be based on Welding Procedure Data Sheet (WPDS).
CSA W59-03, 5.12 Stress-Relief Heat Treatment: Where required by the contract drawings or specifications, welded assemblies shall be stress-relieved by heat treatment.
See CSA W59-03, 5.12.4, Requirements for stress-relief treatment
See CSA W59-03, 5.12.3, Steels Not Recommended for PWHT

WPDS Qualified Range (CSA Code’s Guideline):
Qualified Position (s): For Prequalified WPDS, only Position (s) allowed for prequalified joint details shown in WPDS based on Section 10 (Figures for CJP and PJP) of CSA W59-03

Qualified Thicknesses: For Prequalified WPDS, only thickness ranges allowed as per prequalified joint details shown in WPDS based on Section 10 (Figures for CJP and PJP) of CSA W59-03

Qualified Diameters: For Prequalified WPDS, pipe diameters [over or less than 24 in. (600 mm OD)] allowed for prequalified joint details shown in WPDS based on Section 10 (Figures for CJP and PJP) of CSA W59-03

Base Metal Group Allowed in Prequalified WPDS: Only Base Metal Group-Filler Metal Combinations for Matching Strength as shown in Table 11.1 or Table 12.1 of CSA W59-03

Filler Metal Allowed in Prequalified WPDS: Only Filler Metal-Base Metal Group Combinations for Matching Strength as shown in Table 11.1 or Table 12.1 of CSA W59-03 (Size and other limit on electrode for prequalification of each process, as per section 10 of CSA W59-03)