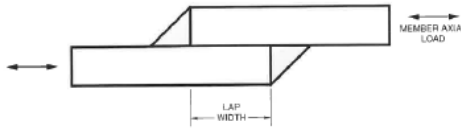
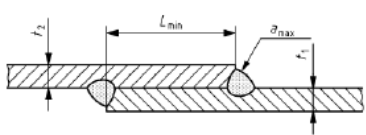


**N. 3 - Confronto tra requisiti AWS D1.2 e EN 15085 per strutture in lega di alluminio saldate mediante processo GMAW.**

Some extracts from the comparison document...

| Issue<br>(see also<br>Figure 4.2 below)   | AWS D1.2<br>acceptance criteria for<br>cyclically loaded structures                       | EN 15085<br>acceptance criteria for                    |  |
|---|---|--|--|
|   |   | CPA  | CPB  |
| Undercut limits                           | No more than 0.25 mm for welds transverse to tensile stress; otherwise no more than 1 mm. | Not permitted  | Continuous undercuts not permitted<br><br>Intermittent undercut (*)<br>$\leq 0.1 \cdot t$ (max 0.5 mm) |
| Globally EN is more conservative than AWS |   |  |  |
| Overlap                                   | Not permitted   | Not permitted  | Not permitted  |
| AWS – EN equivalent for CPA and CPB       |   |  |  |
| Scratch or arc strike maximum depth       | Same as undercut  | Not allowed for CPA and CPB (see EN15085-4 par. 5.2.3) |  |
| EN is more conservative than AWS          |   |  |  |
| Surface porosity                          | Shall not exceed limits given in Note 1 below   | Not permitted  | Not permitted except for isolated gas pore (see table in Note 1 below)                                 |
| EN is more conservative than AWS          |   |  |  |

| AWS D1.2<br>Requirement |  | EN 15085-3<br>Requirement |  |   |                        |                       |                       |   |   |     |     |    |   |     |     |    |    |      |      |
|-------------------------|--|---------------------------|--|---|------------------------|-----------------------|-----------------------|---|---|-----|-----|----|---|-----|-----|----|----|------|------|
| Par.                    |  | Par.                      |  |   |                        |                       |                       |   |   |     |     |    |   |     |     |    |    |      |      |
| 2.4.4                   | <p><b>Lap Joints</b></p> <p><i>Double Fillet Welds.</i> Unless lateral deflection of the parts is prevented, they shall be connected by at least two transverse lines of fillet, plug, or slot welds, or by two or more longitudinal fillet or slot welds.</p> <p><i>Minimum Overlap.</i> The minimum width of laps on lap joints should be five times the thickness of the thinner joint member and not less than 25 mm (see Figure 2).</p> <p>Lap joints joining plates or bars subjected to member axial load shall be fillet welded along the edge of both lapped members except where deflection of the lapped members is sufficiently restrained to prevent opening of the joint under maximum loading (see Figure 2).</p>  <p style="text-align: center;">Figure 2</p> <p><i>Fillet Welds in Holes or Slots.</i> Minimum spacing and dimensions of holes or slots when fillet welding is used shall conform to 2.5. Fillet welds in holes or slots in lap joints may be used to transfer shear or to prevent buckling or separation of lapped parts. These fillet welds may overlap, subject to the requirements specified in the above paragraph 2.4.2. Fillet welds in holes or slots shall not be considered plug or slot welds.</p> <p><i>Maximum Size for Lap Joints.</i> The maximum fillet weld size for a lap joint detailed along edges of material shall be:<br/>                     - the thickness of the base metal, for metal less than 6 mm thick;<br/>                     - 2 mm less than the thickness of the base metal, for metal 6 mm or more in thickness, unless the weld is designated on the drawing to be built out to obtain full throat thickness. The distance between the edge of the base metal and the toe of the weld may be less than 2 mm provided the weld size is verifiable.</p> | 7.3.10                    | <p><b>Fillet weld lap joints</b></p>  <p><math>t_2 \leq t_1</math></p> <p><math>l_{min} = 3 \times t_2</math> (min 50 mm for 5 mm <math>\leq t_2 \leq 20</math> mm)</p> <p><math>a_{max} = \frac{t}{\sqrt{2}} - \frac{t}{10}</math></p> <p>The limitations provided by AWS and EN concerning the minimum overlap distance are a bit different. AWS is more conservative for thickness lower than 8 mm, EN is more conservative for thickness greater than 10 mm.</p> <p>The limitations provided by AWS and EN concerning the maximum fillet weld size are almost equivalent as it is evident from the following table, which compares the maximum fillet weld size for different thicknesses.</p> <table border="1"> <thead> <tr> <th>t</th> <th>Z<sub>max</sub> (AWS)</th> <th>a<sub>max</sub> (EN)</th> <th>Z<sub>max</sub> (EN)</th> </tr> </thead> <tbody> <tr> <td>6</td> <td>6</td> <td>3.6</td> <td>5.2</td> </tr> <tr> <td>10</td> <td>8</td> <td>6.1</td> <td>8.6</td> </tr> <tr> <td>20</td> <td>18</td> <td>12.1</td> <td>17.2</td> </tr> </tbody> </table> <p>a = fillet weld throat      z = fillet weld leg</p> | t | Z <sub>max</sub> (AWS) | a <sub>max</sub> (EN) | Z <sub>max</sub> (EN) | 6 | 6 | 3.6 | 5.2 | 10 | 8 | 6.1 | 8.6 | 20 | 18 | 12.1 | 17.2 |
| t                       | Z <sub>max</sub> (AWS)   | a <sub>max</sub> (EN)     | Z <sub>max</sub> (EN)  |   |                        |                       |                       |   |   |     |     |    |   |     |     |    |    |      |      |
| 6                       | 6  | 3.6                       | 5.2  |   |                        |                       |                       |   |   |     |     |    |   |     |     |    |    |      |      |
| 10                      | 8  | 6.1                       | 8.6  |   |                        |                       |                       |   |   |     |     |    |   |     |     |    |    |      |      |
| 20                      | 18   | 12.1                      | 17.2   |   |                        |                       |                       |   |   |     |     |    |   |     |     |    |    |      |      |
| 2.4.5                   | <p><b>Fillet in Skewed T-Joints</b></p> <p>Fillet welds may be used in T-joints with a dihedral angle between 60° and 135°, inclusive.</p>   |                           | No specific instructions on fillets in skewed T-joints are given by EN 15085-3.  |   |                        |                       |                       |   |   |     |     |    |   |     |     |    |    |      |      |