### Purpose:
Ensure that the joint configurations in the design meets the fabrication requirements.

### Scope:

### Responsibility:
Welding Coordinator

### Reference:
Design department

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Joint</th>
<th>Ref</th>
</tr>
</thead>
</table>
| 1    | **Definition of joint configuration, structure.**  
The code for a joint configuration consists of 3 characters and a running number.  
1. character: Joint type  
2. character: bevel type  
3. character: single or double sided weld  
Running number: A running number of alternatives  
Ex: BV2-11  
Butt weld, v-bevel, double-sided, number 11 |       |     |
| 2    | **Definition of joint configuration, piping.**  
The code for a joint configuration consists of 4 characters and a running number.  
1. character: P for piping  
2. character: Joint type  
3. character: bevel type  
4. character: single or double sided weld  
Running number: A running number of alternatives  
Ex: PBV1-2  
Piping, Butt weld, v-bevel, single sided, number 2 |       |     |
| 3    | **Selection of joint configuration.**  
1. Use double sided welding when possible  
2. Prefer X- or V-joint instead of 1/2V or K-joint  
3. For material thickness above 20 mm use use unsymmetrical joints (2/5, 3/5)  
4 For fillet weld with a > 10mm use full penetration |       |     |
| 4    | **T-Joints.**  
For T-joints prefer either fillet weld or K-joints because:  
1. Simplifies the plate work because adaption of the root opening is not necessary  
2. Give less shrinkage and deformation  
3. Risk for defects are less than compared with joints with root opening |       |     |
| 5    | **Assembly tolerances.**  
Tolerances given here is in relevance to the exact dimension given.  
Root opening for structure:  
Single sided: +3mm, -0 mm  
(Access from one side only)  
Double sided: +4 mm, -2 mm  
(Access from both side)  
Root opening, piping:  
Single sided: +2mm, -1 mm  
Nose:  
Single sided: +0, -2mm  
Double sided: +2mm, -2mm |       |     |
6 **Shrinkage and deformation**
Generally— all dimensions shall be nominal and based on the following:
1. For joint configurations with root opening a nominal shrinkage of 1-3 mm shall be calculated
2. For panel production with stiffeners and fillet weld a transversal shrinkage of 0,5 mm per stiffener shall be calculated if the panel have 8 or more stiffeners.

7 **Preparation of weld surface**
If any requirements for surface treatment of the weld due to fatigue on the design drawings, these requirements must be transferred to the shop drawings as well.

8 **Joint configuration for structural steel**

**BI2-1**
To be used for process 12, SAW for plate thicknesses <= 10mm.
To be used on deck frames in horizontal position.

**BK2-1**
To be used primarily for plate thickness => 20mm.
Unsymmetrical joint.

**BK2-2**
Can be used for plate thickness => 20 mm.
Symmetrical bevel

**BPY2-1**
Partial penetration weld. To be used for profiles and on panels where full penetration is not required.
s—to be identified on the drawing.
<table>
<thead>
<tr>
<th><strong>BPY2-2</strong></th>
<th><strong>BPY2-3</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Partial penetration weld. To be used for profiles and on panels where full penetration is not required. s—to be identified on the drawing.</td>
<td>Partial penetration weld. To be used for profiles and on panels where full penetration is not required. s—to be identified on the drawing. a—to be identified on the drawing.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>BV1-1</strong></th>
<th><strong>BV1-3</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>To be used for one-sided butt welding where no access or reduced access is available from the rear side.</td>
<td>For one-sided butt welds, for all plate thicknesses.</td>
</tr>
</tbody>
</table>

**BV1-4**
This joint configuration can be used when permanent steel backing is used.
Tolerances:
Nose: 0 – 1 mm
Root opening: +/- 2 mm
<table>
<thead>
<tr>
<th>Code</th>
<th>Type of Weld</th>
<th>Description</th>
<th>Joint Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>BV2-1</td>
<td>Double sided butt weld</td>
<td>Plate thicknesses less than 20 mm</td>
<td>Un-symmetrical joint</td>
</tr>
<tr>
<td>BV2-3</td>
<td>Double sided butt weld</td>
<td>Plate thicknesses less than 20 mm</td>
<td>Un-symmetrical joint</td>
</tr>
<tr>
<td>BV2-4</td>
<td>Double sided butt weld</td>
<td>For welding process 131 only and ALUMINUM</td>
<td>Symmetrical joint</td>
</tr>
<tr>
<td>BX2-3</td>
<td>Double sided butt weld</td>
<td>Plate thicknesses larger or equal to 20 mm</td>
<td>Un-symmetrical joint</td>
</tr>
<tr>
<td>BX2-4</td>
<td>Double sided butt weld</td>
<td>Plate thicknesses larger or equal to 20 mm</td>
<td>Symmetrical joint</td>
</tr>
</tbody>
</table>
| BX2-5 | For welding process 12 only  
For plate thicknesses larger or equal to 20 mm in horizontal position.  
Un-symmetrical joint.  
NOTE: The plates must be turned for back side welding.  
Arc-air gouging or grinding before back side welding.  
To be used for extension of profiles, boxes etc. |
<table>
<thead>
<tr>
<th></th>
<th></th>
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</thead>
<tbody>
<tr>
<td><img src="image1" alt="Diagram" /></td>
<td></td>
</tr>
</tbody>
</table>
| BY2-1 | For welding process 12 only  
For plate thicknesses from 12mm to 19 mm.  
NOTE: The plates must be turned for back side welding.  
Grinding of guiding tracks before back side welding.  
To be used for extension of panels, profiles, boxes etc. |
<table>
<thead>
<tr>
<th></th>
<th></th>
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</thead>
<tbody>
<tr>
<td><img src="image2" alt="Diagram" /></td>
<td></td>
</tr>
</tbody>
</table>
| TK2-1 | For corner connections where full penetration is required.  
Double-sided joint. Symmetrical  
Inside to be welded first. Arc-air gauging on the outside before outside welding.  
For material thickness equal to or larger than 20 mm |
| ![Diagram](image3) |
| TK2-2 | For double sided un-symmetrical T-joints.  
For material thickness equal to or larger than 20 mm |
| ![Diagram](image4) |
| TK2-3 | For double sided symmetrical T-joints.  
For material thickness equal to or larger than 20 mm |
<p>| <img src="image5" alt="Diagram" /> |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>TK2-4</strong></td>
<td>For double sided un-symmetrical T-joints. Inside welding with process 136, outside welding with process 121.</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>TPV1-1</strong></td>
<td>Corner joints. To be used for RHS against RHS only. To be regarded as partial penetration fillet weld for verification and control. Rot = 0 mm</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>TPV2-1</strong></td>
<td>Corner joints. To be used for plate against RHS only. To be regarded as partial penetration with fillet weld on the other side. Regarded as partial penetration fillet weld for verification and control.</td>
</tr>
</tbody>
</table>
| TPY1-1 | Partial penetration.  
To be used for box structure to RHS where full penetration is not required. |
|---|---|
| TPY2-1 | Corner joint.  
For welding process 12 when welding longitudinal welds in boxes where full penetration is not required.  
Penetration requirements (s) has to be stated in the drawing. |
| TPY2-2 | Partial penetration.  
For welding of profiles, structures and panels where full penetration is not required.  
Penetration requirements (s) has to be stated in the drawing. |
| TPY2-3 | Partial penetration.  
For welding of profiles, stiffeners and panels where full penetration is not required.  
Penetration requirements (s) has to be stated in the drawing. |
### TPY2-4
Partial penetration.
For welding of profiles, stiffeners and panels where full penetration is not required.
Penetration requirements (s) has to be stated in the drawing.

![Diagram of TPY2-4](image)

### TV1-1
Corner joints.
For welding of longitudinal welds where it is requirements for full penetration.
Cover all material thicknesses.

![Diagram of TV1-1](image)

### TV1-2
T-Joints

![Diagram of TV1-2](image)

### TV1-3
(T-Joint in a given angle)
Structural pipe towards structural pipe or plate.
Minimum stub angle (a1) when single sided welding is 50 degrees.

![Diagram of TV1-3](image)
| TV2-1  | Corner joints  
For plate thickness less than 20mm  
To be used for welding panels to boxes etc |
<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td><img src="image1" alt="Diagram" /></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>TV2-2</th>
<th>T-joints for material thickness less than 20 mm.</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image2" alt="Diagram" /></td>
<td></td>
</tr>
</tbody>
</table>

| TV2-3  | (Angular joint)  
Structural pipe towards structural pipe or plate.  
With stub angle (a1) < 50 degrees, double sided welding shall apply. |
<table>
<thead>
<tr>
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<th></th>
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</thead>
<tbody>
<tr>
<td><img src="image3" alt="Diagram" /></td>
<td></td>
</tr>
</tbody>
</table>

| TV2-4  | (Angular joint)  
Structural pipe towards structural pipe or plate. |
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image4" alt="Diagram" /></td>
<td></td>
</tr>
<tr>
<td></td>
<td>JOINT CONFIGURATION FOR PIPING</td>
</tr>
<tr>
<td>---</td>
<td>--------------------------------</td>
</tr>
</tbody>
</table>
| **PLBI1-1** | For welding process 141.  
To be used for single sided welding, pipe to pipe.  
Diameters: 2” to 8” (60,3mm to 219,1 mm)  
Thickness: 2.0 mm to 6.0 mm |
|   | ![Diagram of PLBI1-1](image1) |
| **PLBU1-1** | To be used for single sided welding, pipe to pipe for thickness above 22 mm.  
Joint type PLBI1-1 and PLBU1-1 can be combined.  
By welding corrosion resistant pipes (316, duplex, 6Mo) root opening shall be 0 mm |
|   | ![Diagram of PLBU1-1](image2) |
| **PBV1-1** | To be used for single sided welding of carbon pipes ONLY |
|   | ![Diagram of PBV1-1](image3) |
| **PBV1-2** | To be used for single sided welding of corrosion resistant pipes, 316, duplex, 6Mo |
|   | ![Diagram of PBV1-2](image4) |
| **PBV1-3** | To be used with welding process 141.  
To be used for single sided welding pipe to flanges etc. |
|   | ![Diagram of PBV1-3](image5) |
PTV1-1
For single sided welding of o'let to pipe

PTV1-2
(Angle joint)
To be used for welding branch pipe to main pipe ONLY. Note if the fluid moves from branch pipe to main pipe the edges must be cut.

10 Special connections
Examples of joints between plates/profiles
F = Fillet weld
B = Butt weld
T = T-joint
PL = Plate
FLG= Flange

1. FLG / PL
   KANALSTÅL

2. BOKS
11 Selection of joint configuration and positioning of the joint

Profile with equal size (1-6)
Profiles with unequal size (7-9)
Deck/bulkhead (10-11)
Main focus shall be on access for back welding and arc-air gouging and grinding

Fig 1: For h< 300mm

Fig 2: For h >300 mm and t< 20mm Arc-air gouging from outside.

Fig 3: For h >300 mm and t< 20mm Arc-air gouging from outside.
Fig 4: Single sided welding for $h < 300$ mm

Fig 5: For double sided welding $h > 300$ mm and $t < 20$ mm
Arc-air gouging from outside.

Fig 6: For double sided welding $h > 300$ mm and $t < 20$ mm
Arc-air gouging from outside.

Fig 7: For single sided welding for $h < 300$ mm

Fig 8: For double sided welding $h > 300$ mm and $t < 20$ mm
Arc-air gouging from outside.
**Fig 9:** For double sided welding $h > 300$ mm and $t < 20$ mm
Arc-air gouging from outside.

**Fig 10:** Single sided welding with $h < 300$ mm

**Fig 11:** For double sided welding with $h > 300$ mm. Arc-air gouging from outside