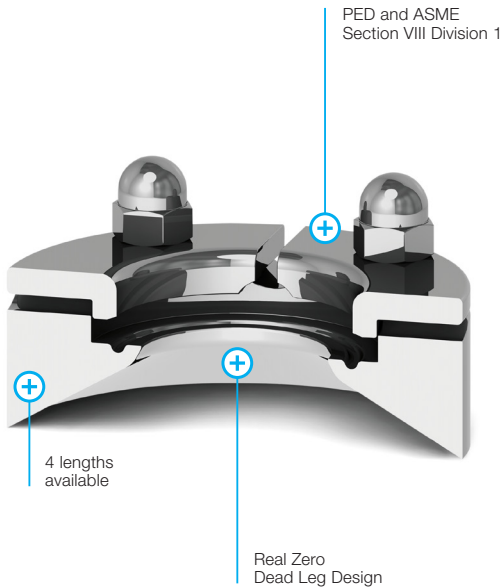




CADCON

ZERO DEAD LEG CONNECTION

**WELDING
GUIDELINES
FOR CADCON**



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1. General

The following guideline is a recommendation on how to avoid deformation when welding **CADCON**.

Before starting to weld, please check that all necessary documents for final approval of the vessel are available, if not contact Rattiinox Documentation Service: info@rattiinox.com

CADCON are highly sensitive to deformation when welded. Please follow these instructions to prevent deformation that will compromise sealing effectiveness.

- > Important: these instructions must be read carefully and fully understood before the **CADCON** is welded. All prohibitions must be followed. Any negligence following these instructions can generate damage to the equipment.
- > The adopted welding procedure must comply with the designated pressure vessel code and applicable rules.

In addition to the welding procedure described below, pay attention to the following points:

- Welders must hold a valid welding license for the method and relative thickness involved and must be familiar with this type of welding operation.
- The dimensions of the filler material, the electrical welding current and heat condition are very important and must be selected carefully.
- During welding, it is most important that the applied heat is well balanced and is evenly distributed along the weld seam.

The following instructions must be considered as an aid to the welding work.

2. Positioning of the CADCON

2.1 Orientation

Check that there is enough space to connect pipe, valve, etc. into the **CADCON** and to mount/dismount the locking rings.

2.2) Free distance between welds

The minimum distance between two welds (fig.1 – “D”) should satisfy the applied rules for construction.

2.3) Location

CADCON can be placed anywhere on the bottom of the vessel, but if the project foresees this position outside the large radius R2 (or the free distance between welds is not respected – point 2.2) calculations must be done to determine the need for reinforcement in that area (Fig.1).

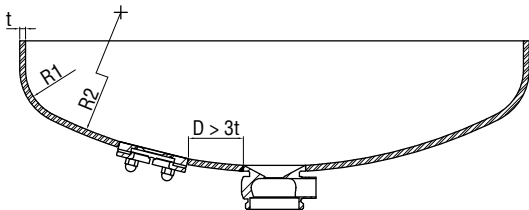


Fig. 1

2.4) Alignment

When **CADCON** is to be welded to the center of dished bottom end, check that it is welded flush with the inner surface to optimize drainage.

2.5) Making the hole for the CADCON

The hole must have the same diameter as the **CADCON** without air gaps (hole diameter tolerance $+0.5\text{mm} / +1.0\text{mm}$ - Fig.2).

The outside edge of the hole must be ground with a 45° external chamfer to create a weld groove.

A straight edge of approx. 2mm should be left on the inner edge (Fig.2).

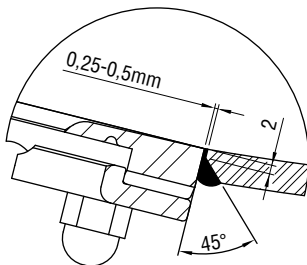


Fig. 2

3. Welding (Example for 1” CADCON)

> These instructions are to avoid deformation of the **CADCON**.

3.1 Before Welding

- Check that the stamped reference heat number on the **CADCON** is the same as on the certification documents.
- Use TIG welding method if this conforms to the vessel certification rules.
- Use filler material appropriate for the materials of the **CADCON** and dished bottom end.
- Welders must have valid licenses to weld according to the method and relative thickness involved.



Welding parameter:

don't exceed welding current of 85-90 Amper.

3.2 Positioning and tack welding the CADCON

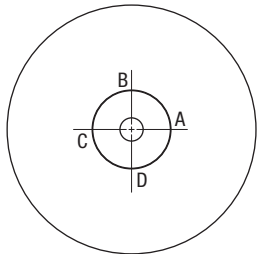
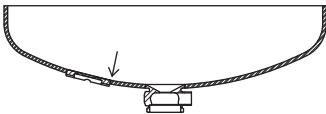
Set position of **CADCON** into the pre-machined hole so that the inner surface is flush with the dished end inner surface.

- **Step 1 - From the inside**

Tack-weld at A and C, without filling material.

Check alignment with inner surface. If necessary, correct.

Then, tack-weld at position B and D

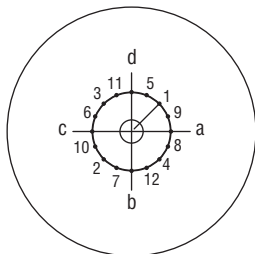
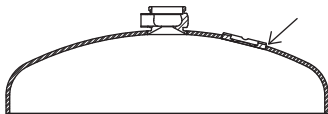


- **Step 2 - from the outside**

Turn upside down the dished bottom end on a plain working table and fill it with Argon gas (keep a certain gas flow during the welding). Tack-weld crosswise, without filling materials.

Start with a then c then b then d.

Next follow the numbers from 1 to 12.



3.3 Final Welding (from the inside)

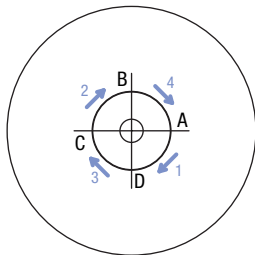
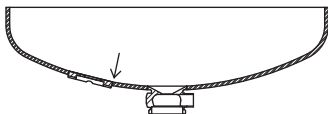
Turn the dished end to weld from the inside. With the aid of filler material, apply one continuous weld layer A to D.

Then, apply the next layer from C to B, D to C and B to A.

Between one weld and the next, let cool until maximum “hand-hot” (i.e. you can leave your unprotected hand on the weld without burning yourself).



**Don't overheat during weld,
there is a potential risk of deformation!**



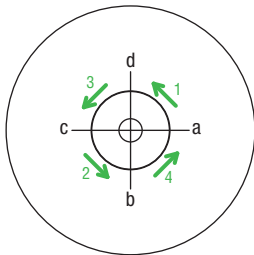
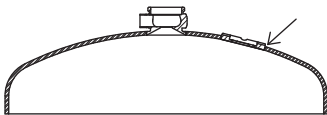
3.4 Final Welding (from the outside)

Turn the dished end to weld from the outside with filler material. Start to weld from a to d, then apply the next layer from c to b, d to c and b to a.

Between one weld and the other let cool for the necessary time (i.e. maximum hand-hot as previously).

With the aid of filler material, apply one or more continuous weld layer (as shown above).

The procedure must be followed until the weld groove is filled as required by the building requirement foreseen from the code of the pressure vessel.



Attention

The division of the final welding into segments depends on the size of the **CADCON**. The main concept is not to overheat the connection.

Consider the following data in order to avoid overheating:

UP TO 1": Divide the welding into quarters

FROM 1.1/2" TO 2": Divide the welding into eighths

2" UP: Divide the welding into sixteenths

Do not weld 2 consecutive segments but alternate one side and the other of the welding flange.

4. Cooling

When the welding is finished leave the dished bottom end section and **CADCON** to self-cool.

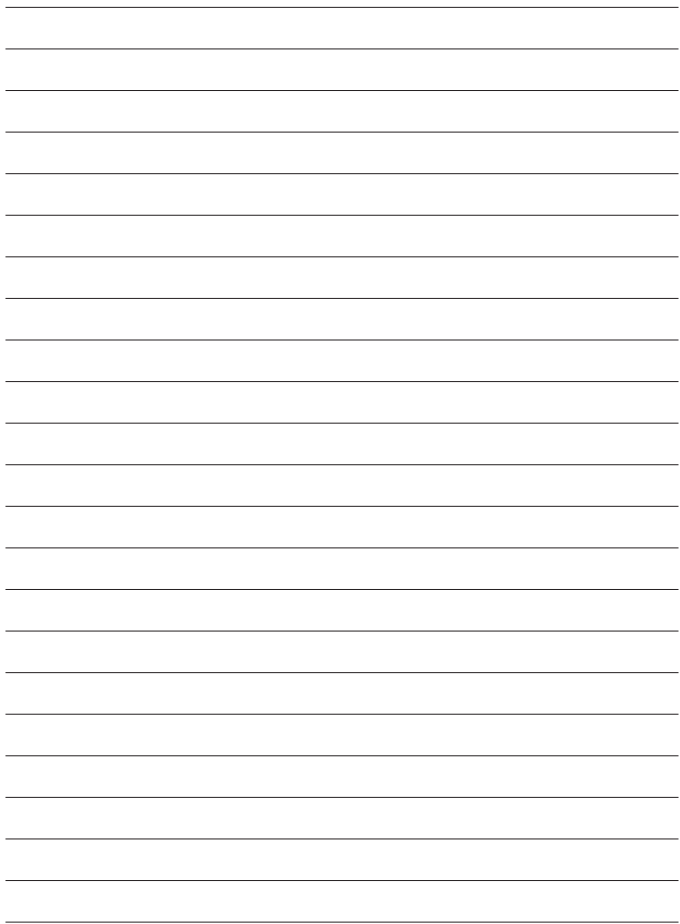
5. Grinding / Polishing

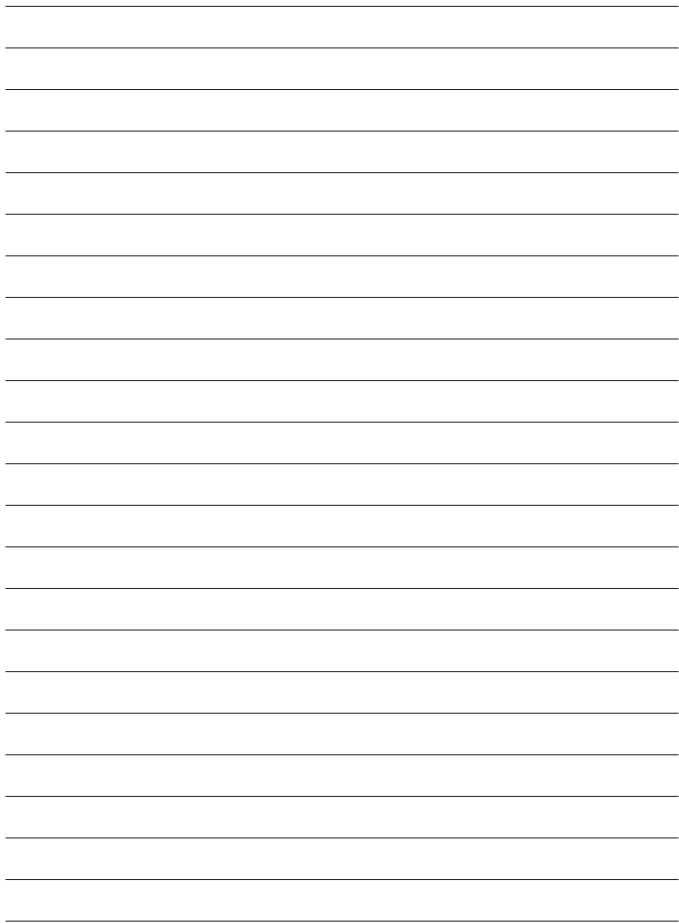
After cooling, the welds can be ground, polished and finished as required by the construction specification.

6. Final control

When the dished bottom end has cooled to room temperature, and all welding and polishing activities are finished, a check should be made that the **CADCON** is not deformed.

This check can be done by accurate measurement with the aid of a gauge.





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