



Welding instructions

RDT-PPO-001 rev A (changes: R- and X-models added)
Updated 27.11.2024 / NO

1 Scope

This document is a pWPS document and acts as a general welding instruction until an official WPS documentation is published. This document is intended to describe the welding process for welding a casing shoe to a casing pipe. The welding instructions are applicable for all RDT CAS products.

2 Materials

As a guiding rule, the filler rod material is selected based on the casing material. The table below shows guidelines for ESAB filler rods. The recommended filler rod thickness is 2.5 mm. For the casing materials that are not found from the table, the same filler rods are to be used as the table implies, i.e., either for casing materials with yield strength below 450 MPa or casing materials with yield strength between 450 and 550 MPa.

Casing strength	Casing material	Filler rod	Filler wire
Yield strength max 450 MPa	S235	ESAB OK 48.00	ESAB OK Tubrod 15.14
	S275		
	S355		
	S420		
Yield strength 450 – 550 MPa	S450	ESAB OK 48.08	ESAB OK Tubrod 15.14
	S470	ESAB OK 55.00	
	S520		
	S550		

3 Welding instructions

3.1 Casing shoe welded over the casing pipe

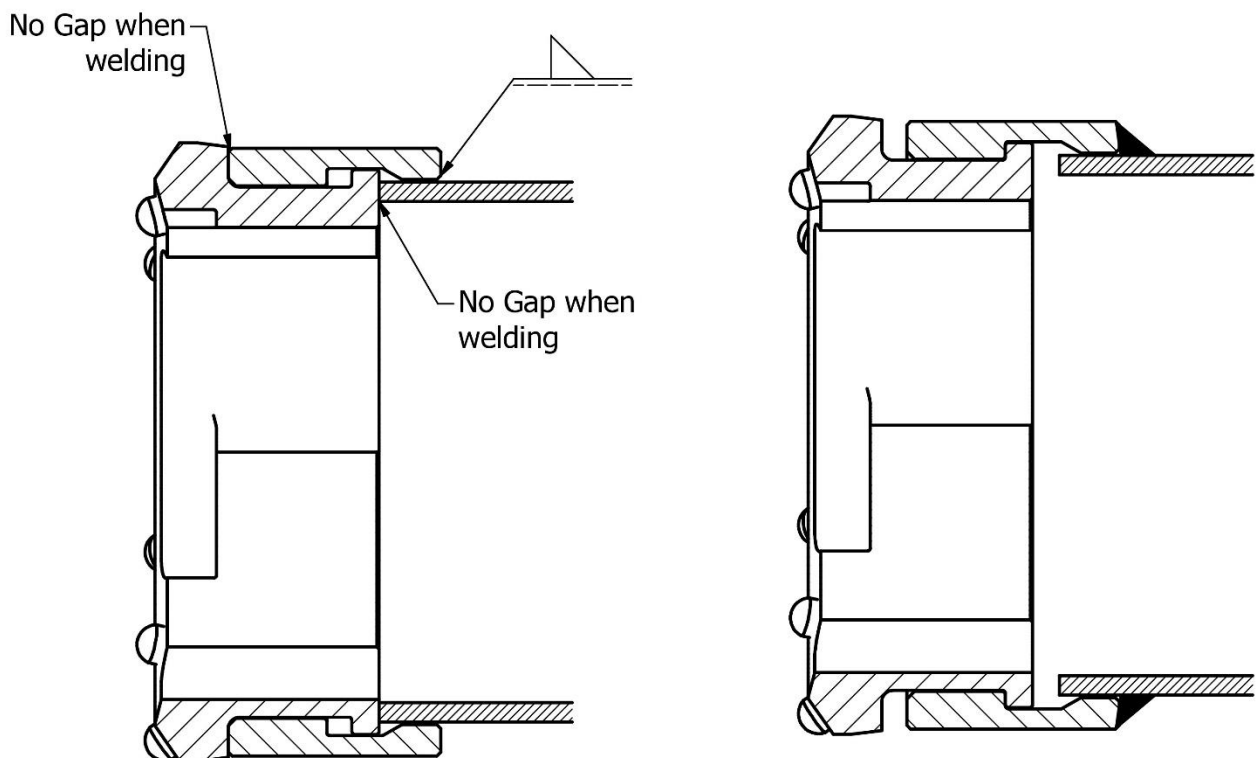
Applicable RDT Ring bit sets: A-models and B-models.

Allowed welding method: Shielded metal arc welding, ISO 4063 method number 111, AWS reference SMAW, also known as manual metal arc (MMA) welding or stick welding.

Description: Consumable electrode covered in flux.

Schematic illustration of the Ring bit set, Casing pipe setup and the welding location is shown in the picture below. For producing a quality weld joint, welding in fixed welding position and multi-pass fillet weld is required. Minimum temperature of 15 °C is required for all materials to start the welding process. The seams must be cleaned between the passes and seam ends must be grinded to maximize fatigue strength.

1. Before welding, correct welding parameters must be carefully selected for the materials that will be used to produce the weld joint.
2. All surfaces need to be carefully cleaned just before welding. Surfaces and filler materials need to be dry.
3. For the welding, the front end of the Casing shoe must be pressed against the Ring bit so that there is no gap between the two. Also, the Casing pipe will be placed inside the Casing shoe so that end of the Casing sits against the Ring bit and so that all gaps are eliminated. This ensures that the welding location is correct, and the set up operates with the intended performance.
4. Finally, the Casing shoe is welded on the Casing pipe with a full fillet weld around the perimeter of the casing.



3.2 Casing shoe welded end-to-end with the casing pipe

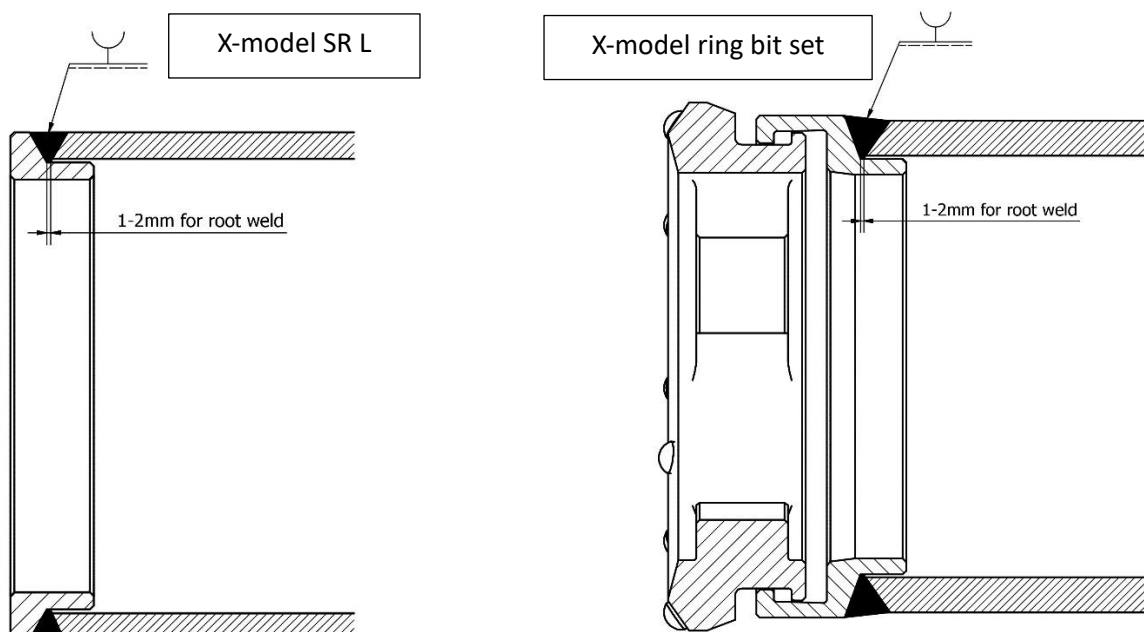
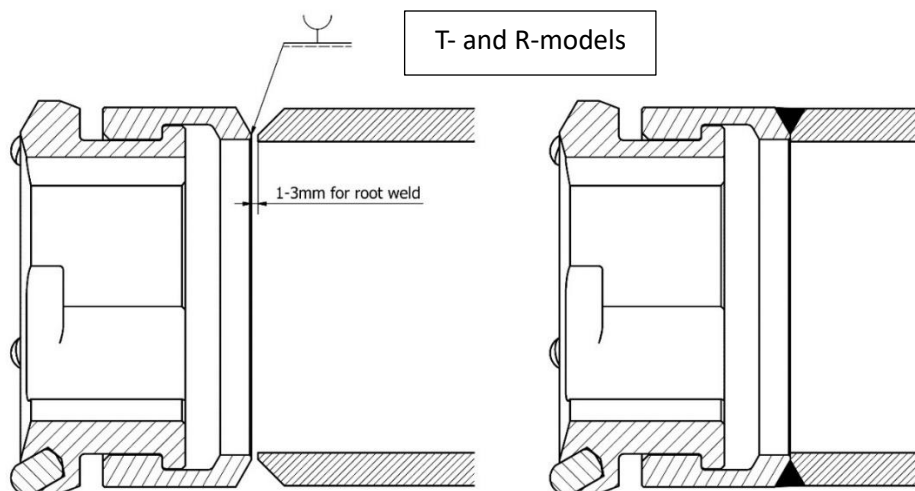
Applicable RDT Ring bit sets: T-models, R-models and X-models

Allowed welding method: Shielded metal arc welding, ISO 4063 method number 111, AWS reference SMAW, also known as manual metal arc (MMA) welding or stick welding.

Description: Consumable electrode covered in flux.

Schematic illustration of the Ring bit set, Casing pipe setup and the welding location is shown in the picture below. For producing a quality weld joint, welding by rotating the pipe and multi-pass butt weld without backing is required. Minimum temperature of 15 °C is required for all materials to start the welding process. The seams must be cleaned between the passes and seam ends must be grinded to maximize fatigue strength.

1. Before welding, correct welding parameters must be carefully selected for the materials that will be used to produce the weld joint.
2. All surfaces need to be carefully cleaned just before welding. Surfaces and filler materials need to be dry.
3. For the welding, the Casing shoe is tack welded on to the Casing pipe and a gap of 1-3 mm is left between the two.
4. The Casing shoe is welded on the Casing pipe with a butt weld around the perimeter of the casing. The whole gap between the two parts is filled.
5. Finally, for T- and R-models, the weld bead is grinded to the same level with the casing.



3.3 Casing shoe welded inside the casing pipe

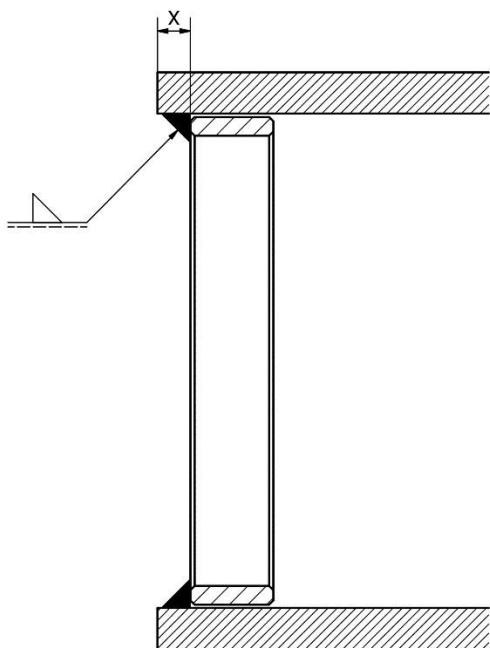
Applicable RDT Ring bit sets: X-model separate ring bit version

Allowed welding method: Shielded metal arc welding, ISO 4063 method number 111, AWS reference SMAW, also known as manual metal arc (MMA) welding or stick welding.

Description: Consumable electrode covered in flux.

Schematic illustration of the separate Ring bit, separate Casing Shoe and Casing pipe setup with the welding location is shown in the pictures below. For producing a quality weld joint, welding by rotating the pipe and multi-pass butt weld is required. Minimum temperature of 15 °C is required for all materials to start the welding process. The seams must be cleaned between the passes and seam ends must be grinded to maximize fatigue strength.

1. Before welding, correct welding parameters must be carefully selected for the materials that will be used to produce the weld joint.
2. All surfaces need to be carefully cleaned just before welding. Surfaces and filler materials need to be dry.
3. For the welding, place the (separate) Casing shoe inside the Casing pipe to a given depth from the end of the pipe, as shown below in the picture and the dimensions below it for different ring sizes.
4. Finally, the Casing shoe is welded on the Casing pipe with a full fillet weld around the perimeter of the casing.



X =

(casing size : dimension)

114,3/139,7: 6mm

168,3/219,1: 8mm

273/323,9:12mm

406/508/610:16mm

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