

PANDROL



UK Good practice when welding with PLA

REFERENCE



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Partners in excellence

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1. Trouble Shooting

1.1 Luting

When luting the bottom briquette ends; do not use too much paste.

Figure 1: Correct method



Figure 2: Incorrect method



1.2 Working with moulds

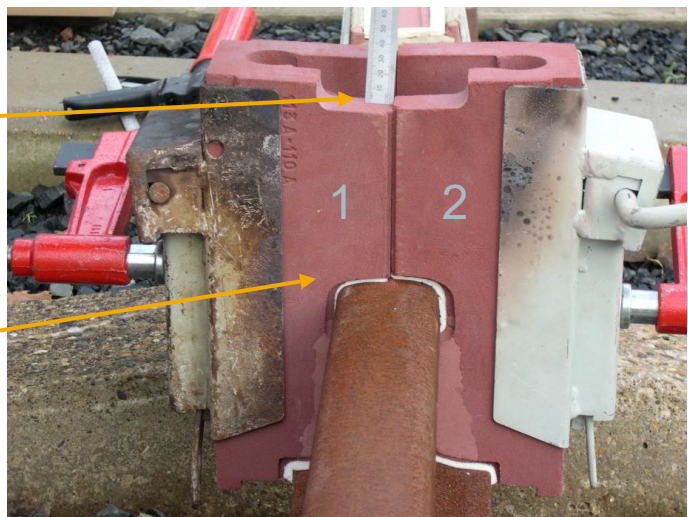
1.2.1 Tightening

Incorrect tightening of 1st mould (i.e. too much pressure applied) will prevent the 2nd mould aligning correctly.

Figure 3: Excessive compression of felt on mould 1.

Mould not aligned correctly

Too much pressure applied

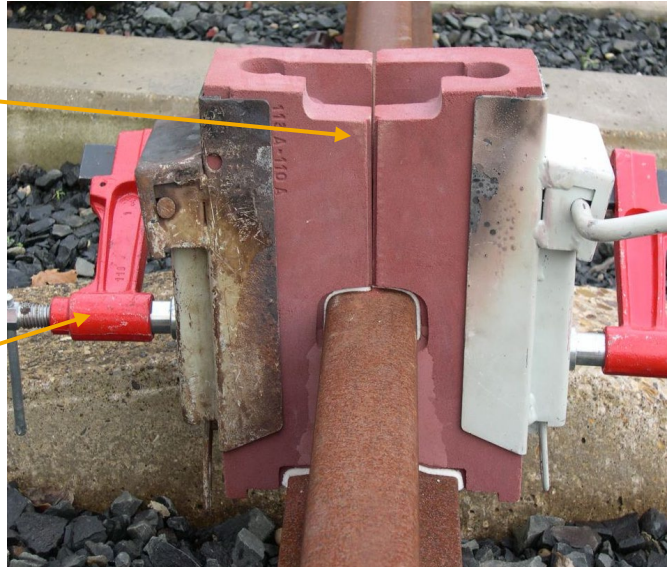


1.2.2 Mould clamp alignment

Figure 4: Incorrect mould clamp alignment

Incorrect gap at top of mould

Mould clamp too low



1.2.3 Luting

NOTE

When using luting paste don't rush, take care and take your time

Figure 5: Correct luting procedure



Figure 6: Incorrect luting procedure



1.3 Preparing the rail

See below the correct (figure 7) and incorrect (figure 8) preparation of rail prior to welding.

Figure 7: Rail ends cleaned - Correct



Figure 8: Rail ends not cleaned - Incorrect



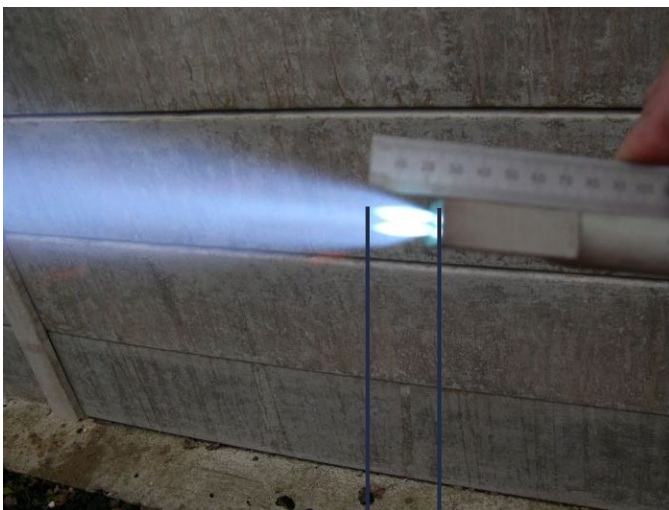
NOTE

Always clean rail ends to remove contaminants. Failure to clean rail ends can cause inclusion type defects.

1.4 Preheating

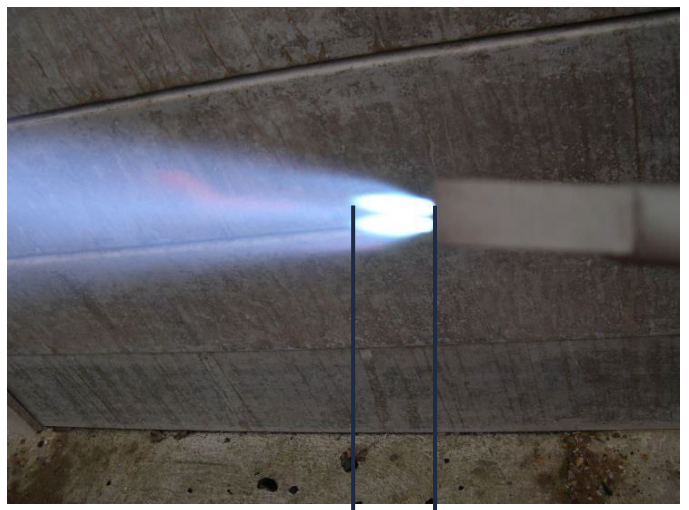
1.4.1 Preheating flame condition

Figure 9: Correct flame condition for preheating



25 mm

Figure 10: Incorrect flame condition for preheating



35 mm

1.4.2 Preheating Parameters

Table 1: Preheating Parameters

	Oxy-propane	Oxy-acetylene
Preheating burner	RT22	RT8
Fuel gas pressure	0.6 bar	0.6 bar
Oxygen pressure	1.2 bar	0.6 bar
Cone length	25mm	8mm
Burner height	50mm	60mm
Preheat time	4 minutes	6 minutes

NOTE

If the correct cone length cannot be achieved, a tolerance +/- 10% can be applied to the fuel gas pressure to facilitate flame adjustment.

NOTE

Incorrect flame cone length may indicate problems with pressure check gauges. If the correct cone length cannot be maintained the gas equipment should be repaired or replaced.

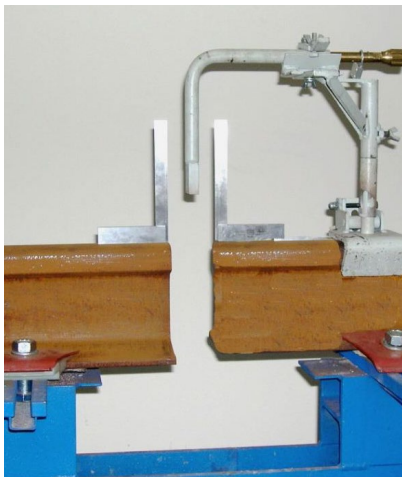
1.4.3 Setting the preheater

Make sure pre-heater is positioned square and central to the welding gap.

The pre-heater stem shall be set to guarantee the correct burner height and set in accordance with the process parameters

The preheater shall be positioned on the most worn rail.

Figure 11: Setting the preheater



1.4.4 Flame condition

Figure 12: Correct flame condition

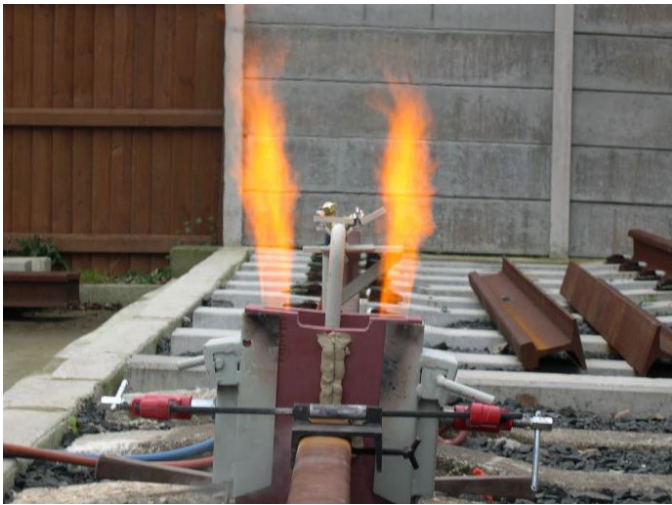
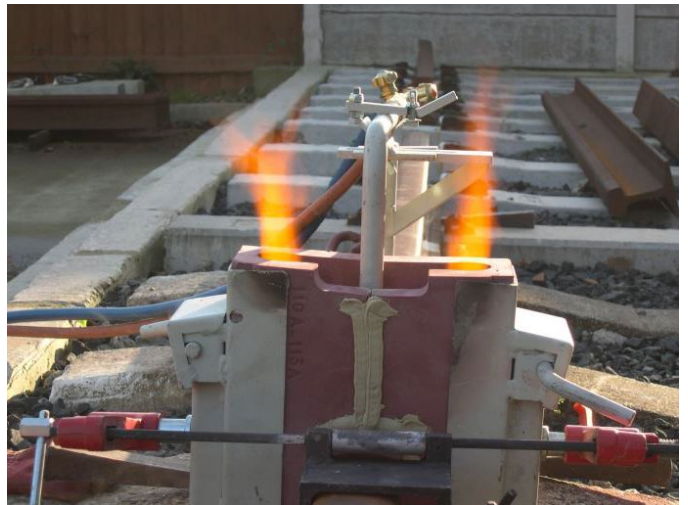


Figure 13: Incorrect flame condition



Low flames are caused by too much oxygen or not enough propane.

1.5 After the weld has been cast

1.5.1 Procedure for removing the crucible

Figure 14: Correct procedure

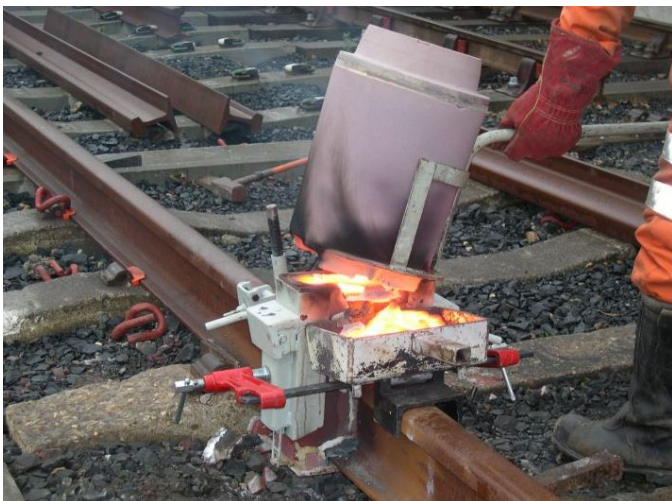


Figure 15: Incorrect procedure



WARNING

Always use crucible fork to remove the crucible as shown in figure 14.

1.5.2 Procedure for removing the slag bowl

Figure 16: Correct procedure

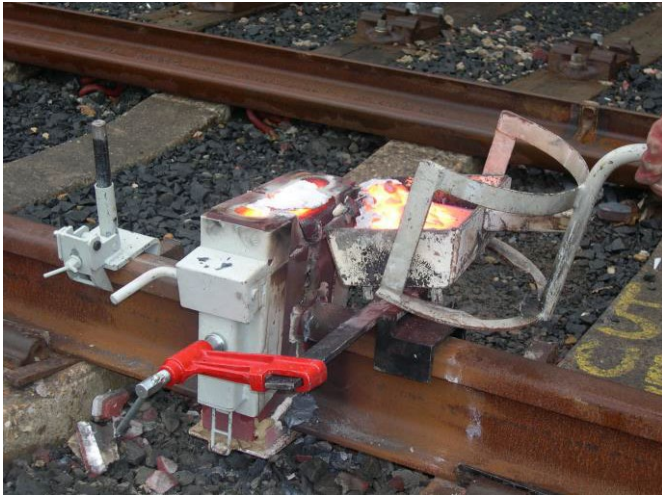


Figure 17: Incorrect procedure



WARNING

Always use crucible fork to remove the slag bowl as shown in figure 16.

WARNING

It is a fire risk to leave hot work/consumables on combustible/flammable material.

Figure 18: Correct procedure



1.6 Measuring the tap time

The correct procedure for measuring tap/reaction time is as follows:

- Remove the crucible lid.
- Light the ignitor.
- Insert the ignitor into the centre of the portion approx. 20mm – 30mm depth.
- Start the stopwatch immediately
- Replace the crucible lid.
- Stop the stopwatch immediately when you see the start of the pour.
- Record the reaction/tap time on to the weld record sheet or using the Pandrol Connect app.

Figure 19: Weld with too short reaction time



1.7 Shearing Procedure

1.7.1 Correct procedure

The correct procedure for shearing the weld is as follows:

- Prior to shearing, mould sand and loose paste must be cleaned from the rail head each side of the weld to prevent impregnation into the hot weld metal. This can be done by wire brushing.
- The weld shear blades must be adjusted to leave a minimum of 2mm of weld metal above the running surface for profile grinding.
- After a minimum of 5 minutes has elapsed from completion of the pour, the excess weld material can be sheared.

1.7.2 Incorrect procedure

Incorrect procedure when shearing the weld:

- Figure 20 illustrates the appearance of paste scarring
- This is due to incorrect procedure being applied prior to carrying out the shearing operation.
- Usually paste scarring happens when the loose paste has not been removed from the head of the rail prior to shearing.

Figure 20: Paste scarring



NOTE

Paste scarring is not detrimental to the integrity of the weld providing it does not exceed a maximum depth of 0.5 mm for line categories 1 and 2; however, it is undesirable cosmetically. For categories 3, 4, 5 & 6 the maximum depth is 1.00mm.

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