



Process variants



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Aluminothermic welding technology

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Welding with long preheating

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Welding with long preheating

Procedure LP



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Welding with long preheating

Welding with long preheating is the aluminothermic welding procedure that is used most frequently throughout the world. The preheating period that was originally more than 20 minutes long has now been reduced to 4 to 6 minutes via various stages of development in the past few decades. The combination of small portions and a long preheating period takes account of the economic and technical demands in the field of modern track construction. This procedure is successfully applied both in high speed networks and also in the rail cargo sector.

Railtech has developed the tried and tested **LP** procedure from the original procedures SoWoS and SmW-F. In addition to the well-known process dependability and reliability this offers the metallurgical benefits of long preheating for the production of gap-free tracks.

Metallurgical properties

- Very high elongation values
- Similar in heat affected zone (HAZ) as the SkV / SP procedures
- Even melting of the rail ends
- Low residual stresses due to the homogenous breaking up of heat centres
- Can be used for all steel grades, only the portion must be selected accordingly.

Procedure LP

with paste sealing



- One size of mould shoe for all moulds
- No turning of the head is necessary before shearing
- Rectangular exterior form
- Small moulds > less packaging
- Low mould weight > reduction in costs

with sand sealing



Direct comparison on the procedures variants

	LP	SP	SkV
Preheating time [min]	4 - 6	1,5 - 2	
Propane gas [kg]	0,36	0,18	
Oxygen [kg]	0,81	0,47	
Weight of the single mould [kg]	2,5	3,5	
Weight of the one-shot crucible	~ 14	~ 19	
Number of moulds per pallet	144	96	

Paste or sand?

Fundamentally it is the case that the same quality of the aluminothermic welds can be achieved if they are applied correctly. In a standard case the sealant is not in contact with the liquid steel and would thus not influence the weld deposit. However, the use of paste offers much greater process reliability due to the fact that sealing sand can always fall into the mould in practice.

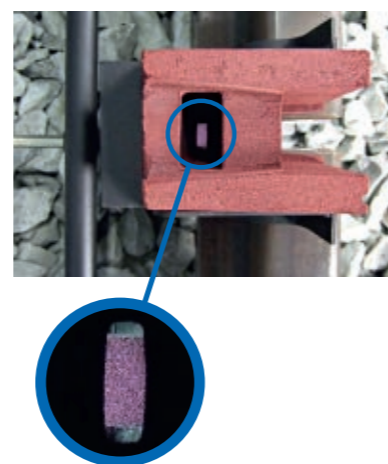
The following welding faults are avoided with paste:

- gas bubbles due to moist sand,
- sand inclusions,
- bubbles from enclosed sand,
- pores on the welding beads,
- discharges due to sand that is too dry.

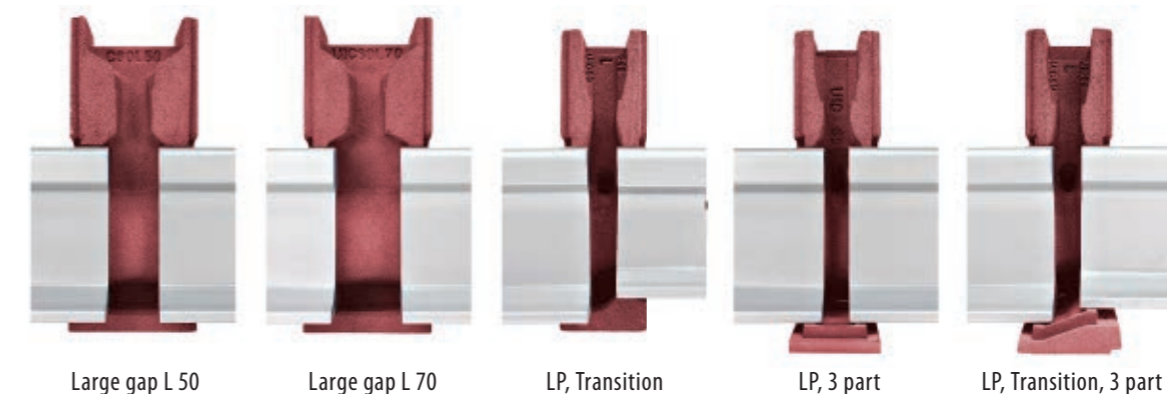


Characteristics

- The preheating time amounts to 4 to 6 minutes depending on the rail profile.
- The centric alignment of the moulds is made easier due to the rectangular geometry of the feeder with a sufficient width, on the other hand the correct fitting of the moulds can be controlled at all times.
- The high quality moulding sand makes it easy to work the contours and guarantees high levels of stability for robust use in track due to the use of special binders and additives.
- Appropriate moulds are available in our product range for virtually every rail profiles and their combinations.



A variety of applications



Large gap L 50

Large gap L 70

LP, Transition

LP, 3 part

LP, Transition, 3 part