

# ISO 23300-2:2025-10 (E)

## Railway infrastructure - Rail welding - Part 2: Aluminothermic welding

---

<b>Contents</b>		<b>Page</b>
Foreword .....		v
Introduction .....		vi
1	Scope .....	1
2	Normative references .....	1
3	Terms and definitions .....	1
4	Information to be confirmed with the railway authority .....	2
5	Approval process .....	3
5.1	General .....	3
5.2	Process identification .....	3
5.3	General requirements .....	3
5.4	Documents to be submitted with the request for approval .....	3
5.4.1	General .....	3
5.4.2	Process manual .....	3
5.4.3	Drawing with the required measurements .....	4
5.4.4	Chemical analysis ranges and tolerances .....	5
5.5	Initial approval testing .....	5
5.5.1	General .....	5
5.5.2	Grouping rail profile .....	5
5.5.3	Grouping rail grade .....	5
5.5.4	Testing scheme .....	5
5.6	Extension of initial approval testing .....	6
5.7	Re-approval following process changes .....	6
5.7.1	Changes requiring approval .....	6
5.7.2	Test requirements for re-approval following process changes .....	7
5.8	Preparation and allocation of test welds .....	10
6	Laboratory tests .....	10
6.1	Visual surface examination .....	10
6.1.1	As-cast weld surface .....	10
6.1.2	Ground weld surface .....	10
6.1.3	Visible HAZ .....	11
6.2	Hardness test .....	11
6.2.1	Running surface hardness test .....	11
6.2.2	Heat softened zone width .....	11
6.3	Slow-bending test .....	12
6.4	Past-the-post fatigue test .....	12
6.5	Internal examination .....	12
6.5.1	Weld soundness by ultrasonic testing .....	12
6.5.2	Weld soundness by sectioning .....	13
6.5.3	Weld soundness by fracture faces assessment .....	14
6.5.4	Fusion zone -- Shape and dimension .....	15
6.6	Structure .....	15
6.7	Chemical analysis .....	15
7	Requirements for welder and contractor .....	16
7.1	Welder .....	16

7.1.1	General .....	16
7.1.2	Recognition of welders .....	16
7.2	Contractor .....	17
7.2.1	General .....	17
7.2.2	Traceability .....	17
7.2.3	Audits .....	17
8	Acceptance of aluminothermic welds in track .....	18
8.1	General .....	18
8.2	Weld inspector .....	18
8.3	Weld inspection .....	18
8.4	Geometric requirements .....	18
8.4.1	General .....	18
8.4.2	Alignment and matching of the weld collars .....	18
8.4.3	Welded rail straightness .....	21
8.5	Weld integrity .....	22
8.5.1	As-cast weld surface .....	22
8.5.2	Ground weld surface .....	22
8.6	Non-destructive testing (NDT) .....	22
8.7	Documentation .....	22
	Annex A (informative) Example of approval stages .....	23
	Annex B (informative) Suggested sequence of laboratory test .....	24
	Annex C (normative) Procedure for measurement of surface hardness .....	25
	Annex D (normative) Ultrasonic testing procedure on aluminothermic welds to be sectioned .....	26
	Annex E (normative) Procedure for measurement of the heat softened zone width .....	28
	Annex F (informative) Example of a diploma and a permit to weld .....	31
	Annex G (informative) Example of qualification of aluminothermic trainers and welders .....	33
	Annex H (informative) Example of approval of aluminothermic welding contractors .....	37
	Bibliography .....	39