

ISO 14555:2025-07 (E)

Welding - Arc stud welding of metallic materials

Contents

Page

Foreword.....	v
Introduction.....	vi
1 Scope.....	1
2 Normative references.....	1
3 Terms and definitions.....	2
4 Symbols and abbreviated terms.....	3
4.1 Symbols.....	3
4.2 Abbreviated terms.....	4
5 Technical review.....	4
6 Welding personnel.....	5
6.1 Stud-welding operators.....	5
6.2 Welding coordination.....	5
7 Equipment.....	6
7.1 Production equipment.....	6
7.2 Description of the equipment.....	6
7.3 Maintenance.....	6
8 Production planning.....	7
9 Welding procedure specification (WPS).....	7
9.1 General.....	7
9.2 Information related to the manufacturer.....	7
9.2.1 Identification of the manufacturer.....	7
9.2.2 Identification of the WPS.....	7
9.2.3 Reference to the welding procedure qualification record (WPQR) or other relevant documents.....	7
9.3 Information related to the parent material.....	7
9.3.1 Parent material type.....	7
9.3.2 Dimensions.....	7
9.4 Welding process.....	8
9.5 Joint.....	8
9.5.1 Joint design.....	8
9.5.2 Welding position.....	8
9.5.3 Preparation of parent material surface.....	8
9.5.4 Jigs and fixtures.....	8
9.5.5 Support.....	8
9.6 Studs.....	8
9.6.1 Designation.....	8
9.6.2 Handling.....	8
9.7 Auxiliary materials.....	8
9.7.1 Ceramic ferrules (if any).....	8
9.7.2 Protective gas (if any).....	8
9.8 Power source.....	9
9.9 Movable fixtures.....	9
9.9.1 Welding gun/lift mechanism.....	9
9.9.2 Shielding gas system (if used).....	9
9.9.3 Stud feeding system (if any).....	9
9.10 Welding variables.....	9
9.11 Thermal conditions.....	9

9.12	Post-weld heat-treatment.....	10
9.13	Non-thermal treatment after welding.....	10
10	Welding procedure qualification	10
10.1	Principles.....	10
10.2	Qualification by welding procedure tests.....	10
10.2.1	Application.....	10
10.2.2	Proof of conformity of parent materials and stud materials.....	10
10.2.3	Shape and dimensions of test pieces.....	10
10.2.4	Welding.....	11
10.2.5	Scope of examination and testing.....	11
10.2.6	Acceptance criteria.....	11
10.2.7	Re-testing.....	13
10.2.8	Range of qualification.....	13
10.2.9	Qualification by pre-production tests for stud welding on site (for through-deck stud welding).....	14
10.3	Qualification based on previous experience.....	15
10.4	Welding procedure qualification record (WPQR).....	15
11	Examination and testing	15
11.1	General.....	15
11.2	Visual examination.....	15
11.3	Bend testing.....	16
11.4	Tensile testing.....	19
11.5	Macro examination.....	21
11.6	Radiographic examination.....	21
11.7	Ring test.....	21
12	Acceptance criteria	22
12.1	General.....	22
12.2	Acceptance criteria for visual examination.....	22
12.3	Acceptance criteria for bend testing.....	22
12.4	Acceptance criteria for tensile testing.....	22
12.5	Acceptance criteria for macro examination.....	23
12.6	Acceptance criteria for radiographic examination.....	23
12.7	Acceptance criteria for ring tests.....	23
12.8	Acceptance criteria for additional tests.....	23
13	Workmanship.....	23
14	Process control.....	24
14.1	General.....	24
14.2	Production test.....	24
14.2.1	General.....	24
14.2.2	Production test for arc stud welding and use of weld pool protection.....	24
14.2.3	Production test for arc stud welding without weld pool protection.....	24
14.3	Simplified production test.....	25
14.4	Re-testing for production test or simplified production test.....	25
14.5	Production surveillance.....	25
14.5.1	Visual examination.....	25
14.5.2	Checking the welding parameters.....	25
14.5.3	Other examinations and tests.....	25
14.5.4	Production surveillance for arc stud welding with ceramic ferrule with qualification according to 10.2.9	25
14.6	Production surveillance record.....	26
14.7	Non-conformance and corrective actions.....	26
14.8	Calibration of the measuring and testing equipment.....	26
	Annex A (normative) Quality requirements for stud welding.....	27
	Annex B (informative) Working range.....	28
	Annex C (informative) Manufacturer's welding procedure specification (WPS).....	29
	Annex D (informative) Test results — Production test.....	34
	Annex E (informative) Example of production surveillance record.....	37
	Bibliography.....	38