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