

Section 3

Welder's Qualification Tests

Preliminary remarks:

The following rules for the testing of welders conform to or make use of the standards EN 287 resp. ISO 9606, Parts 1 (Steel) and 2 (Aluminium). For other non-ferrous metals, DIN 8561 shall continue to apply until the corresponding parts of EN 287 and ISO 9606 come into force.

Where no details of the tests are specified in the following Rules, the tests shall be performed in accordance with these standards. References in the text also refer to these standards unless otherwise specified.

Some deviations from the standards have been made with regard to the testing of steel welders (EN 287-1 resp. ISO 9606-1), especially in relation to the ranges of approval for base materials and weld types which have been somewhat narrowed down compared with the standards. As far as the testing of non-ferrous metal welders is concerned, it is chiefly the weld forms which differ from those of the standard.

A. General

1. Required testing (welding processes)

1.1 Welder's qualification tests are required for all welders who are to perform welding work using manually guided welding appliances (as for manual metal arc welding or semi-mechanized gas-shielded metal arc and/or welding using flux-cored electrodes) and where the quality of the welded joints depends mainly on the manual skill of the welder.

1.2 For welders who are required to perform welding work on steam boiler installations, the "Technische Regeln für Dampfkessel" (Technical Rules for Steam Boilers) TRD 201, Annex 2, Guidelines for testing and supervising boiler welders, shall also be complied with. The inclusions and exclusions specified in these Regulations shall apply hereto.

1.3 The qualification of operators of fully mechanized and automatic welding equipment and of welding robots, shall be demonstrated in accordance with EN 1418/ISO 14732 on welded test pieces e.g. as part of the welding procedure or fabrication tests or by

means of random tests and operational tests (cf. the standards).

2. Training, manual skill, knowledge

2.1 Welder's qualification tests may only be taken by welders who have received appropriate previous training (both practical and theoretical) and who have had sufficient opportunity to practise the craft.

2.2 Besides the necessary manual skill, the welder shall also possess the professional knowledge enabling him to perform the welding work competently and safely. Cf. the relevant information in the standards.

Note:

In accordance with the foreword to DIN EN 287 relating to German practice, the job knowledge tests described in Annex D of the standard (for information purposes) are required for welders taking the test (and employed) in the Federal Republic of Germany. Welders who work in the Federal Republic of Germany and who have not taken a job knowledge test must demonstrate that they at least have knowledge of the area of health and safety at work and accident prevention in accordance with the legislation applicable at the time. Such proof is the responsibility of the welding shop.

3. Lists of welders, symbols

3.1 Welding shops are required to maintain lists or files which furnish information about the number, names (code number) and test scope of the welders and the dates of their initial and repeat tests (cf. [Annex C](#) "Assessment Form"). These lists shall be submitted to the Society for examination on demand together with the relevant original documentation or, where appropriate, together with the description of the welding shop (cf. [Section 2, A.3.](#)).

3.2 Each welder shall be assigned an unmistakable symbol, which shall be recorded in the testing documentation (certificates, lists, etc.). The Society may in addition - depending on the application - require the components and welds to be marked with the symbol of the welder who performed the work; cf. also [Section 1, F.5.](#)

B. Testing Bodies, Certificates

1. Initial tests in the welding shop

The initial testing of welders in the welding shop is to be conducted by the welding supervisory staff in the presence of the Society's representative. Following submission of the assessment forms completed by the welding shop and initialled by the Surveyor (cf. [Annex C](#)), these tests will be confirmed by the Society's head office in the form of test certificates.

2. Repeat tests in the welding shop

2.1 Repeat tests taken by welders who have been certified by the Society or by those certified by other recognized testing bodies and recognized by the Society may be conducted independently by the **welding engineer** recognized by the Society in conjunction with the approval granted to the welding shop. Tests conducted by other welding supervisors shall be carried out in the presence of the Society's representative.

2.2 The extension of the validity of a test certified by the Society by a further two years may, however, only be authorised by the Society. For this purpose, a full set of test documentation (welding procedure specification, assessment form and test certificate) must be submitted to the Surveyor. Cf. [E.4](#).

3. Tests conducted by other testing bodies

Welder's qualification tests conducted by other testing bodies (e.g. welding training and testing establishments or welding training establishments, cf the foreword to DIN EN 287) which are **independent of the welding shop** and which are recognized by the Society will be recognized by the Society subject to the test categories specified below. Such recognition is subject to the submission to the Society of a full set of test documentation, as described in 2.2 above.

4. Tests conducted as part of the welding procedure tests

The testing of welders may be included in the welding procedure tests (cf. [Section 4, B.5.3](#)) and their names will then be included in the welding procedure approval. A welder's qualification test certificate conforming to the standards may, however, only be issued provided that all the provisions of the standards, e.g. scope of test and jobknowledge testing, have been met and that this is recorded in an assessment form which has been completed accordingly (cf. [Annex C](#)).

C. Scope of Testing and Range of Approval

1. Base materials

1.1 In the case of base materials - and in contrast to the provisions of the standards EN 287-1 resp. ISO 9606-1 - higher-strength (hull structural) steels with a minimum yield strength R_{eH} of up to 355 [N/mm²] (up to 360 [N/mm²] in the case of pipe-grade steels) shall only be considered, following testing, as being included in the material category W 01 if the test (using the appropriate welding consumables) was also performed on a higher-strength steel.

1.2 Unless otherwise stipulated by the Society in a particular case, the test categories conforming to the standards shall also apply to the base materials. The Society may, however, require a more precise subdivision of the categories in accordance with the note to [Chapter 3, Section 1, F.2](#).

2. Joint types

2.1 In the case of joint types - and in contrast to the provisions of the standards - the test performed on butt welds does **not** also include fillet welds. Where welders are required to lay down butt welds as well as fillet welds, both weld forms must be included in the test.

2.2 Unless otherwise stipulated by the Society in a particular case, the test categories conforming to the standards shall also apply to the weld forms.

3. Other inclusions and exclusions

Unless otherwise specified by the Society in a particular case, the inclusions and exclusions stipulated in the standards shall otherwise apply.

4. Deviations, special features, particular applications

4.1 If deviations from the standards or these rules for testing are to be included in the welder's qualification test, this shall be agreed with the Society beforehand. The kind of the deviation or special feature is to be indicated on the assessment form under "Remarks" and will be noted in the test certificate.

4.2 Welder's qualification tests for particular applications (particular materials, shapes of weld, welding processes) which are not covered by the tests and work assignments described above and in the standards (e.g. for clad plates or offshore pipe junctions) shall be carried out according to a test schedule to be agreed with the Society on a case-by-case basis.

D. Performance of Welder's Qualification Tests

1. Welding of test pieces, Welding Procedure Specification (WPS)

For welding test pieces, a "Manufacturer's" Welding Procedure Specification (WPS) shall be produced by the welding shop - a separate one for each welding task - in accordance with the [Annex C](#) of the standards EN 287 resp. ISO 9606. The welding conditions for testing shall match those during fabrication.

2. Test pieces, specimen types and tests

The test pieces, the specimen types and the performance of the tests shall conform to the standards.

3. Evaluation of test pieces and specimens, recording of results

3.1 Depending upon the kind and scope of the tests, test pieces and specimens shall be evaluated, conforming to the specifications of the standards, according to the following criteria:

- Thickness, reinforcement and appearance of weld (external results)
- Radiograph (internal results)
- Appearance of fracture (internal results)
- Mechanical properties, where applicable
- Metallographic specimen, if required.

3.2 A welder shall be regarded as having passed the test provided that the imperfections fall within the limits of assessment category B conforming to EN 25817 resp. ISO 5817. Exceptions to this rule include the following imperfections: weld reinforcement too large (butt and fillet welds), excessive fillet weld thickness and excessive root reinforcement, to which assessment category C applies.

3.3 A test shall only be passed as successful if **all** the requirements stated in the standards relating to the test piece in question and the specimens taken from it can be evaluated as having been met. Repeat test pieces and specimens are subject to the specifications of the standards EN 287 resp. ISO 9606.

3.4 The assessment form provided at [Annex C](#) is to be used to record the details and results of the tests (p = passed, np = not passed). Additional sheets shall be used as necessary.

E. Period of Validity, Repeat Tests

1. Standard period of validity

A welder's qualification test remains valid for two years with effect from the test date, provided that during this period welding work is constantly performed in the range of approval of the test and the work of the welder is monitored by the welding supervisors at all times. This is to be confirmed by the welding supervisors on the welder's qualification test certificate at intervals of no more than six months. The provisions given in the standards in this regard shall also apply.

2. Reduced period of validity

2.1 The Society may reduce the validity of the test (e.g. to one year) if the supervision of the welder's work mainly takes the form of visual inspections.

2.2 A repeat test relating to an individual welding process is required where a welder who has been tested in more than one welding process has not used the process in question for longer than six months.

2.3 A repeat test is in any case necessary where a welder has not performed any welding work as defined in para 1. for longer than six months.

2.4 The Society may demand a repeat test at any time should reasonable doubts arise as to a welder's skill.

3. Continuous supervision

3.1 A repeat test may be dispensed with where the quality of the work performed by the welder in the work assignment range corresponding to his test category is systematically and verifiably monitored during fabrication by the welding shop's welding engineer recognized by the Society and this is confirmed, as described above in paragraph 1 above, at intervals of no more than six months.

3.2 For this purpose the following measures shall be implemented at times of which the welder has no prior knowledge and which shall occur at intervals of not more than three months:

- Destructive tests on test welds or sections of weld produced by the welder (wherever possible, in the most difficult positions), and/or
- Non-destructive tests for defects on production welds provided that these tests can be documented (e.g. by means of radiographs).

3.3 The results of these tests are to be noted in the lists of welding personnel (cf. [A.3.1](#)) and are to be submitted to the Society for examination and confirmation at intervals of not more than one year. Please refer to the standards.

4. Extensions to the period of validity, repeat tests

4.1 The validity of a welder's qualification test certified by the Society may be extended by a further two years at a time only if specified by the Society on the test certificate provided that the preconditions relating to this as stated above resp. in the standards have been met and provided that this was confirmed by the employer (welding supervisor) on the test certificate for the six month period as applicable.

4.2 An extension may only be certified for the range of approval in which the initial test took place.

4.3 If the conditions under which an extension is granted, as specified above, are not met a repeat test is to be carried out conforming in scope to the initial test. If a repeat test is carried out with a restricted scope of testing compared with the initial test, the subsequent range of approval is determined by scope of testing of the repeat test.

F. Other Welder's Tests

1. Other rules and standards

1.1 The Society may consent to the performance of welder's qualification tests in accordance with other comparable recognized rules, standards or codes. The

work assignments of welders tested in accordance with these tests will be specified in analogous manner to the above Rules, depending on the scope of testing. The period of validity is as specified in E.

1.2 Welder's tests conforming to other rules, standards or codes which have been conducted by an **independent** testing body in analogous manner to B.3. may be recognized by the Society subject to the foregoing provisions. The relevant welding procedure specifications, test reports, test certificates and, upon request, the relevant rules, standards or codes shall be submitted to the Society for this purpose.

2. Exceptions

In justified exceptional circumstances (e.g. repairs), the Surveyor may, subject to a specified time limit and to limitation to a particular structure, authorise the employment of well-trained and experienced welders without the documentary qualifications stipulated above, provided that he has reason to believe that the welders concerned are competent to perform the work envisaged and that the quality of the welds produced by them can be verified by suitable, e.g. non-destructive tests.