



Supplementary Criteria for Accreditation
Welder Qualification Testing to AS/NZS 2980



The NZ mark of competence
Tohu Matatau Aotearoa

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Supplementary Criteria for Accreditation

Inspection Body Accreditation Programme

Welder Qualification Testing to AS/NZS 2980

AS IB C1.4

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1 Introduction

1.1 International Accreditation New Zealand's (IANZ) Supplementary Criteria provide supplementary information to the General Criteria for Accreditation for specific types or groups of tests or calibrations. They provide detail or add extra information to the generally stated requirements of IANZ General Criteria for Accreditation and IANZ Specific Criteria for the particular field.

1.2 This supplementary criteria details the specific requirements covering the accreditation of laboratories or inspection bodies (organisations) undertaking the assessment of the welding process, mechanical tests, and the interpretation of radiographs in accordance with AS/NZS 2980.

1.3 This is a supplementary document to IANZ Specific Criteria 4 (AS LAB C4) that includes requirements for mechanical testing laboratories and inspection bodies generally. This document must be read in conjunction with the current issues of following standard and IANZ publications:

- (a) ISO/IEC 17025 *General Requirements for the Competence of Testing and Calibration Laboratories*
- (b) ISO/IEC 17020 *Conformity assessment – Requirements for the operation of various types of bodies performing inspection*
- (c) *Specific Criteria for Accreditation: Mechanical Testing (AS LAB C4)*
- (d) *Procedures and Conditions for Accreditation (AS 1)*

1.4 AS/NZS 2980 requires evaluation of the ability of a welder through a welding procedure including the inspection of test pieces and welding process used, and testing of the finished welds using visual, non-destructive testing and destructive test methods. The results of these activities determine the acceptability of welder applicants for qualification.

1.5 The addition of this class of test to the Scope of Accreditation may be granted only when the organisation has:

- (a) Implemented a documented quality management system in accordance with ISO/IEC 17025 or ISO/IEC 17020 (appropriate to Welder Qualification Testing).
- (b) Demonstrated to an assessment team that the organisation has at least one staff member or *appointed person* with the appropriate skills and qualifications to meet the requirements listed under Clause 5. Qualifications of Examiners below. Examiners assessed as meeting these requirements will be awarded Approved Signatory status.
- (c) Demonstrated to an assessment team that it has the necessary facilities and equipment.

2 Requirements of AS/NZS 2980

2.1 To be able to issue Welder Qualification Certificates an organisation will need to be accredited and appointed as an "Examining Body" as defined in section 1.4.2 of AS/NZS 2980 and employ or appoint at least one examiner involved in the approval process. The Examining Body role will be assessed against requirements of AS/NZS ISO/IEC 17020 as clarified in the Requirements for Inspection Body Accreditation in NZ (RIBANZ), published procedures and conditions for accreditation and applicable technical criteria.

There are up to three examiner roles involved in the welder approval process. These are:

- Supervising Examiner who will supervise the preparation for and production of weld samples, ensure appropriate marking of test pieces and specify the test methods to be performed as outlined in section 3 of AS/NZS 2980.
- Destructive Testing Examiner(s) who will assess visual, mechanical and/or metallographic tests required for the welding process under consideration as defined in sections 4.3.1 – 4.3.4 of AS/NZS 2980.
- Non-destructive Testing Examiner who will assess radiographic tests required for the welding process under consideration as defined in section 4.3.5 of AS/NZS 2980.

Qualifications requirements for these roles are as listed in section 1.6 of AS/NZS 2980. Examining bodies shall appoint appropriately qualified staff to perform the required examiners' roles.

2.2 The competency of examiners carrying out visual, non-destructive and destructive tests will be evaluated against the requirements of ISO/IEC 17025 or ISO/IEC 17020, published procedures and conditions for accreditation and applicable technical criteria. IANZ subdivides different types of testing into a structure referred to as classes of test. The class of test structure is defined in Specific Criteria 4 and the following class has been assigned to Welder Qualification Testing:

4.75 Welder Qualification Tests

Approved Signatories meeting section 5 below will be awarded this class of test. An organisation meeting all the requirements for accreditation, appropriate to Welder Qualification Testing, will have this class of test included in their Scope of Accreditation.

3 Accommodation and Equipment

3.1 An organisation seeking accreditation for interpretation of radiographs, in accordance with AS/NZS 2980, must demonstrate that it has access to radiographic viewing facilities that comply with the requirements of Clause 2.10 of AS 2177:2006.

3.2 The light output of radiograph viewers shall be adequate and checked for sufficient light output. Formal calibration is not required but operators shall have a positive means for ensuring suitability at the time of use. The formal measurement of light output using an appropriate light measuring procedure may be one means for ensuring suitability. Records of such checks must be maintained for review during IANZ assessments.

3.3 Equipment such as a densitometer or a density strip must be held for the assessment of the density of radiographs. The radiograph viewing room must be equipped with charts or graphs enabling radiographic sensitivity to be calculated when wire type image quality indicators are used. See AS 2177, Clause 3.5.

Note: The use of film density strips is not recommended unless operators are experienced and competent in their use. Working film density strips used for this purpose shall be maintained in good condition and be in service in accordance with dates shown on the manufacturer's certificate.

3.4 The organisation must have access to a press and formers complying with the requirements of clause 5(b) of AS 2205.3.1-2003 for the purpose of conducting bend tests. The formers must be subjected to dimensional checks at least annually and records of such checks must be maintained. Where formers are not under the direct control of the organisation (e.g. not owned by them), a record is to be generated at the time of use to show that the former was fit for purpose. Nick-break tests may be carried out using the same apparatus or others as specified in AS 2205.4.1-2003.

3.5 Copies of the following documents must be available to the staff conducting tests in accordance with AS/NZS 2980

- (a) AS/NZS 2980:2007 *Qualification of welders for fusion welding of steels*
- (b) AS 2205.2.1, .4.1, .4.2, .and/or 5.1 as appropriate for the testing being carried out.
- (c) AS 2177:2006 *Non-destructive testing – Radiography of welded butt joints in metal*
- (d) AS 2207 *Non-destructive testing – Ultrasonic testing of fusion welded joints in carbon steel*
- (e) AS 2314 *Radiography of metals – Image quality indicators (IQI) and recommendations for their use.*

3.6 Copies of the following documents must be available in the accredited organisation and approved signatories need to be familiar with them:

- (a) IANZ *Procedures and Conditions of Accreditation (AS 1)*
- (b) IANZ *Procedures and Conditions of Inspection Body Accreditation AS3*
- (c) ISO/IEC 17025 *General requirements for the competence of testing and calibration laboratories*
- (d) ISO/IEC 17020 *Conformity assessment - Requirements for the operation of various types of bodies performing inspection*
- (e) IANZ *Specific Criteria for Accreditation – Mechanical Testing (AS LAB C4_*
- (f) IANZ *Supplementary Criteria for Accreditation – Welder Qualification Testing to AS/NZS 2980 (this document)*

4 Test Records

4.1 Test records relating to welder qualification tests must include the information detailed in Appendix C of AS/NZS 2980 and shall be issued to the welder in a certificate, provided the required testing has been completed with acceptable results.

5 Qualifications of Examiners

5.1 Examiners undertaking tests in accordance with AS/NZS 2980 would normally be expected to have a background in engineering, welding, metallurgy or non-destructive testing. They must also have had extensive experience in the assessment of nick break tests and bend tests and the interpretation of radiographs of fusion welded butt joints in steel. Prerequisite formal personal qualifications are required. Personal qualifications, *listed in AS/NZS 1554. Section 7 Clause 7.2 and 7.4* such as a CBIP Certified Welding Inspector and/or holder of CBIP Radcert, will assist staff to understand the background technical aspects involved, and are therefore recommended.

5.2 Examiners undertaking the interpretation of radiographs must be familiar with:

- (a) The general requirements of section 4.3.5 of AS/NZS 2980.
- (b) The definition of radiographic sensitivity and methods of determining sensitivity
- (c) The definition of radiographic film density and methods of determining film density
- (d) The general requirements of AS 2177:2006 with regard to:
 - (i) Surface condition of the weld to be radiographed AS 2177:2006 Clause 3.2
 - (ii) Weld image location AS 2177:2006 Clause 3.10
 - (iii) Density of radiographs AS 2177:2006 Clause 3.5
 - (iv) Use of image quality indicators AS 2177:2006 Clause 2.7 and Clause 3.3
 - (v) Radiograph viewing AS 2177:2006 Clause 3.13.

5.3 Examiners undertaking the assessment of mechanical tests must be familiar with sections 4.3.1 – 4.3.4 of AS/NZS 2980 and the applicable relevant test methods

5.4 Examiners carrying out the assessment of mechanical tests or interpreting radiographs need to possess good eyesight. An adequate level of visual acuity is defined in clause 1.7 of AS 2177:2006. All approved signatories will be screened for adequate eyesight during IANZ assessments. Any staff member not meeting the required standard will be asked to provide a certificate from an appropriately qualified and recognised practitioner.

It is considered good practice for accredited laboratories or inspection bodies to have in place a system for detecting deterioration in visual acuity, and an annual eyesight check is considered appropriate for this.

5.5 Examiners seeking signatory approval status must meet the requirements set out in Appendix 2 of *IANZ Specific Criteria for Accreditation Mechanical Testing (AS LAB C4)*

5.6 Examiners carrying out mechanical assessments and interpretation of radiographs in accordance with AS/NZS 2980 must be IANZ Approved Signatories and must have personally carried out the work for which they are signing (taking responsibility).

6 Welder Qualification Tests for Stainless Steel Tube for the NZ Dairy Industry

6.1 To clarify the test methods and acceptance criteria for this Appendix F Welder Qualification:

Test required are:

- Visual Examination to AS 3978 and
- Bend Test to AS 2205.3.1 and
- Macro Examination to AS 2205.5.1 and
- Dye Penetrant Test to AS 2062

Acceptance criteria are as listed in Table F3 of AS/NZS 2890.