

Welding course

Content title	AS/NZS ISO 9606.1 Job Knowledge Manual Metal Arc Welding
Overview	<p data-bbox="549 409 1485 584">Welder Job Knowledge Validation to AS/NZS ISO 9606.1 - web-based training modules from the welding professionals</p> <ol data-bbox="596 629 1485 790" style="list-style-type: none"> 1. Quality welding tips to enable a successful welder qualification test. 2. Gain the Job Knowledge requirements of the AS/NZS ISO 9606.1 certificate. 3. Get registered on the HERA Certified Welders on-line platform (The platform is currently under development). <p data-bbox="549 819 1485 880">HERA's Expert Practical Welder Training is a modular web-based training system offering:</p> <ol data-bbox="596 909 1485 1126" style="list-style-type: none"> 4. One-hour webinars covering the theory and practice required to pass the weld tests for the AS/NZS ISO 9606.1 certificate. 5. On-line training module for use after the webinar in preparation for the: <ol data-bbox="692 1003 1485 1093" style="list-style-type: none"> a. Practical weld test b. On-line quiz that earns the HERA certificate for the AS/NZS ISO 9606.1 Job Knowledge. 6. Registration on the HERA Certified Welders online platform. <p data-bbox="549 1171 986 1211">Basis of this E-Training</p> <p data-bbox="549 1261 1485 1529">Welding operations in the areas of steel structures, transport and maintenance shall comply with AS/NZS 1554 series. The standard specifies a range of quality requirements including qualification testing of welders. It requires welders to be qualified to AS/NZS ISO 9606-1 or AS/NZS 2980. The first option is the one preferred by the industry is not industry-specific and can therefore be utilised across a range of applications and industries, including the manufacture and repair of pressure equipment. AS/NZS ISO 9606-1 allows welders to work across the industries and countries. It is anticipated that AS/NZS ISO 9606-1 will eventually replace AS/NZS 2980.</p> <p data-bbox="549 1563 1485 1776">AS/NZS ISO 9606-1 requires that the test weld be made by the welder following a suitably qualified weld procedure (WPS), or draft procedure (pWPS), provided that the latter is successfully qualified in conjunction with the weld test. The procedure shall be prepared in accordance with the application standards (AS/NZS 1554.1, AS/NZS 3992, ISO 15609-1, ASME IX etc.) It shall contain all requirements needed by the welder to reproduce the weld as specified within the appropriate application standard.</p> <p data-bbox="549 1783 1485 1865">In order to successfully pass the (re)qualification test the welder needs to have adequate manual manipulation skills and job knowledge required to setup the job in accordance with the welding procedure (WPS).</p>

Job knowledge requirements within AS/NZS ISO 9606-1 are optional, and whilst syllabus items are as defined within its Annex B, it is noted that these items remain consistent with related standards such as AS 1796 theory syllabus, competency requirements. Welders who have successfully completed the existing AS/NZS ISO 9606-1 theory training, can usually be deemed to comply by the examiner.

The welder is a key part of the welding quality management system (QMS) to AS/NZS ISO 3834. He/she should be familiar with the key aspects of the system such as quality documentation, procedures and ITPs as well as individual inspection stages. The welder shall be able to inspect his own work before Fabricator's and third-party inspection. It includes visual checks to establish compliance of the weld with that required in the WPS and fabrication documentation. Introduction to welding QMS and welding inspection training for welders is included in this course as two separate modules.

It is recommended that the fabricators working under AS/NZS 5131 Construction Category CC3 and CC4 should employ welders with the Job Knowledge Test endorsement.

Automated and mechanised welding systems, where the required welding conditions are maintained by mechanical or electronic means but may be manually varied during the process are increasingly used in welding fabrication and manufacturing. The operators for these systems shall be qualified in accordance with ISO 14732. A functional knowledge test is compulsory according to ISO 14732 welding personnel – qualification testing of welding operators and weld setters for mechanized and automatic welding of metallic materials. This compulsory requirement can be fulfilled through HERA's training.

Benefits

There are multiple advantages of completing the Job Knowledge Training:

- Fabricators - Avoid costly and time consuming 9606.1/2980 weld test failures
- Move forward from the “weld and hope” approach to qualification; welders and supervisors get to understand the test and what is required to pass it
- Welders gain the Job Knowledge (9606.1 Annex B) endorsement on Welding certificates
- WPS included, can be qualified to AS/NZS 1554.1 by the ISO 9606.1 test piece if required
- The welder will be better integrated in the Quality Management Framework of ISO 3834 and AS/NZS 5131
- Welder qualification guide using optimized welding procedures by experienced welding trainer
- Webinar format allows for questions and answers

The Job Knowledge E-Training course is delivered as a series of online training modules.

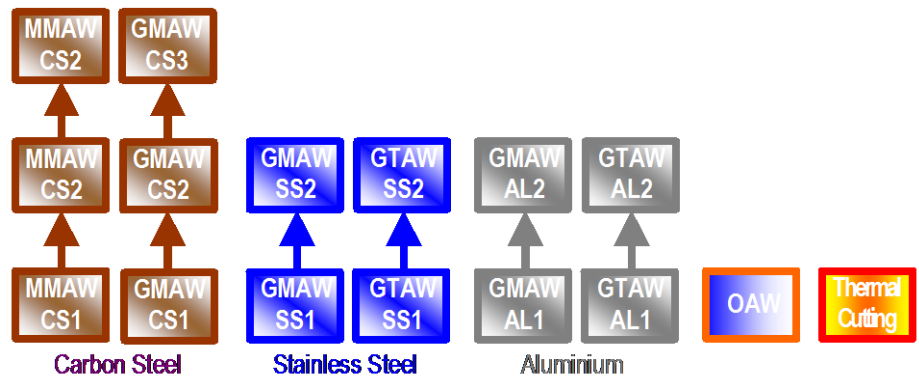
Training Content

The Modular E-Training Scheme for the Joining of Materials is a training resource for the welding of metals, fully aligned with the Job Knowledge requirements of AS/NZS ISO 9606.1 and **HERA's Qualifications Framework**. There are 20 modules available, each available in the form of "a "Student Workbook", Online training (e-lecture) and the test.

The Student Workbook provides theory notes corresponding to each topic/e-lecture, detailed practical welding exercises and multi-choice questions for self-assessment.

The modules cover modern technology and emphasise safety, economical work practice and quality assurance as applied to welding fabrication. Industry welding standards e.g. AS/NZS 1554 series, ISO 3834, AS/NZS ISO 5817, AS/NZS 5131 and AS/NZS 1665 are introduced to ensure the relevance of the training.

The diagram below shows the modules available.



MMAW = Manual metal arc welding or "stick" welding
GMAW = Gas metal arc welding or "Mig"
GTAW = Gas tungsten arc welding or "Tig"
OAW = Oxyacetylene welding
Thermal cutting = oxyfuel gas cutting, plasma arc cutting

WELDING STEEL (AS/NZS ISO 9606.1 and AS/NZS 1554.1)

MMAW CS1 Manual Metal Arc Welding 1

Introduces MMAW ("stick" welding) and trains to a basic level in the Flat position for light to medium (up to 10mm thick) general-purpose mild steel fabrication. Suitable preparation for welder qualification tests (e.g. 6mm butt weld): AS/NZS ISO 9606.1 and AS/NZS 1554.1.

MMAW CS2 Manual Metal Arc Welding 2

Progresses from MMAW 1 to the standard required for structural steelwork as required by industries such as construction and heavy transport. Trains to the

	<p>level of welder qualification tests: AS/NZS ISO 9606.1 flat and horizontal-vertical positions, and AS/NZS 1554.1.</p> <p>MMAW CS3 Manual Metal Arc Welding 3 Progresses from MMAW 2 to the standard of a competent tradesperson able to weld plate in all positions. Trains to the level of welder qualification tests: AS/NZS ISO 9606.1 all positions and AS/NZS 1554.1.</p> <p>GMAW CS1 Gas Metal Arc Welding 1 GMAW for structural steelwork such as building frames, heavy transport, marine, plant and equipment. Welder qualification test for butt welds (flat position) and fillet welds (horizontal-vertical position). GMAW safety, equipment set-up, and weld faults. GMAW process attributes and knowledge. Properties and attributes of structural steel materials. Welding procedures and techniques for the 9606.1 tests.</p> <p>GMAW/FCAW CS2 Gas Metal Arc Welding 2 GMAW process advantages and equipment setup. FCAW safety, equipment set-up, and weld faults. FCAW and GMAW process advantages and comparisons. FCAW and GMAW welding consumable classifications-what they mean? Structural steel sections available in NZ. Quality assurance and control.</p> <p>GMAW/FCAW CS3 Gas Metal Arc Welding 3 FCAW and GMAW Site safety-additional hazards encountered. Controlling heat input in the GMAW and FCAW process. Using FCAW for positional welding. Understanding the preheat requirement. Controlling distortion. Understanding weld symbols</p> <p>WELDING STAINLESS STEEL</p> <p>GTAW SS1 Gas Tungsten Arc Welding 1 Introduces GTAW ("TIG" welding) and trains to the level required for Sheetmetal and light stainless-steel fabrication. Suitable welder qualification tests (3mm butt weld): AS/NZS ISO 9606.1 and AS/NZS 1554.6.</p> <p>GTAW SS2 Gas Tungsten Arc Welding 2 Progresses from GTAW 1 to the standard required in the fabrication of food processing equipment and tube as used in the dairy industry. Suitable welder qualification tests: AS/NZS ISO 9606.1, AS/NZS 2980: 2018 Appendix C and AS/NZS 1554.6.</p> <p>GMAW SS1 Gas Metal Arc Welding 1 Welding Steel GMAW 1 is the prerequisite to this module that covers the specific requirements of stainless-steel fabrication with GMAW solid wire, GMAW-Pulsed and FCAW. Suitable welder qualification tests (e.g. 10mm butt weld): AS/NZS ISO 9606.1 and AS/NZS 1554.6.</p> <p>GMAW SS2 Gas Metal Arc Welding 2 Progresses from Welding Stainless Steel GMAW 1 to cover the welding of sheet and positional welding with GMAW solid wire, GMAW-Pulsed and FCAW. Suitable welder qualification tests: AS/NZS ISO 9606.1 flat and horizontal-vertical position and AS/NZS 1554.6.</p>
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	<p>WELDING ALUMINIUM</p> <p>GTAW AL1 Gas Tungsten Arc Welding 1 GTAW (“TIG” welding) aluminium for industries such as marine and transport fabrication in the flat position. Suitable welder qualification tests (e.g. 6mm butt weld): AS/NZS 1665.</p> <p>GTAW AL2 Gas Tungsten Arc Welding 2 Progresses from GTAW 1 to the welding of aluminium structures (e.g. boats, truck trailers) in all positions. Suitable welder qualification tests: AS/NZS 1665.</p> <p>GMAW AL1 Gas Metal Arc Welding 1 GMAW (MIG) welding of aluminium in the Flat position for fabrication such as marine and transport. Suitable welder qualification tests (e.g. 6mm butt weld): AS/NZS 1665.</p> <p>GMAW AL2 Gas Metal Arc Welding 2 Progresses from Welding Aluminium GMAW 1 to cover positional welding with GMAW and GMAW -Pulsed. Suitable welder qualification tests: AS/NZS 1665.</p> <p>OTHER PROCESSES</p> <p>OAW Oxyacetylene Welding OAW (“gas” welding) covering the fusion welding of mild steel, braze (bronze) welding, and introduces cast iron fusion and bronze welding; suitable welder qualification tests AS/NZS ISO 9606.1.</p> <p>CUTTING METALS Manual Thermal Cutting Covers oxyfuel gas cutting, plasma arc cutting and air carbon arc gouging. Applicable to a wide range of industries including automotive, all metal fabrication and plant maintenance/repair.</p> <p>MECHANIZED AND AUTOMATIC WELDING ISO 14732 welding personnel – qualification testing of welding operators and weld setters for mechanized and automatic welding of metallic materials. This compulsory requirement can be fulfilled through HERA’s training.</p> <p>STUD WELDING AS/NZS 1554.2 Shear studs are commonly welded to steel elements when steel-concrete composite action is required in accordance with AS/NZS 1554.2 All stud welding shall be undertaken by qualified stud-welding operators. This module covers operator’s training to satisfy the requirements of AS/NZS 1554.2.</p> <p>QUALITY CONTROL FOR WELDERS Introduces welding quality management system to AS/NZS ISO 3834 including Quality Plans Inspection and Testing Plans and procedures.</p> <p>VISUAL ASSESSMENT OF WELDS CARBON STEEL Introduces the concept of inspection before, after and during welding including visual checks for welders to ensure compliance of the welds with the requirements of the WPS and specifications with reference to AS/NZS 1554.1 .</p>
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	<p>VISUAL ASSESSMENT OF WELDS STAINLESS STEEL</p> <p>Introduces the concept of inspection before, after and during welding including visual checks for welders to ensure compliance of the welds with the requirements of the WPS and specifications with reference to AS/NZS 1554.6.</p> <p>Certification</p> <p>Attendees seeking certification need to complete the E-Training and pass the online quiz/test. Upon successful completion of the training, an e-certificate <i>HERA Job Knowledge Certificate AS/NZS ISO 9606.1</i> will be issued for each of the welding processes. The validity of the certificate is 3 years. In order to extend the certificate a repeat quiz/test can be undertaken in the following 3-year periods.</p>
<p>Presenters</p>	<p>Trainer(s)</p> <div data-bbox="544 1010 746 1211" data-label="Image"> </div> <p>The E-Training is presented by Robert Ryan HERA Welding Engineer is an international welding inspector (IIW IWI-S) and AS 2214 Welding Supervisor with expertise in the field of welding processes, procedures, training of welders as well as quality management systems to AS/NZS 5131 and SFC</p>
<p>Who is the intended audience?</p>	<p>Practicing welders seeking prolongation of the certificate or extension of the certification, trainees and apprentices, technical personnel and engineers interested in gaining essential knowledge in practical welding.</p>
<p>In-house training for fabricators</p>	<p>In-house training for fabricators is available upon request. Please contact Robert Ryan at HERA for details: robert.ryan@hera.org.nz</p>
<p>Upcoming training</p>	<p>Include links to HERA Calendar: https://www.hera.org.nz/event/as-nzs-iso-9606-1-job-knowledge-gas-metal-arc-welding/ https://www.hera.org.nz/event/e-course-as-nzs-iso-9606-1-job-knowledge-manual-metal-arc-welding/</p>
<p>Further info:</p>	<p>For further info please contact Robert Ryan at HERA: robert.ryan@hera.org.nz</p>

