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Navsea technical publication s9074-aq-gib-010/248

S9074A-QIG-010/248, NAVSEA TECHNICAL PUBLICATION: REQUIREMENTS FOR WELDING AND BRAZING PROCEDURE AND PERFORMANCE QUALIFICATION (01-AUG-1995). This document contains the requirements for the qualification of welding and brazing procedures, welders, welding operators, brazers and brazing operators that must be met prior to any production fabrication. It includes manual, semiautomatic, automatic and machine welding and brazing of ferrous, nonferrous, and dissimilar metals. The qualification tests required by this document are devised to demonstrate the adequacy of the welding or brazing procedures and to demonstrate the ability of welders, brazers, welding operators and brazing operators to produce sound welds or brazes. **S9074A-QIG-010/248(d)** For the socket weld test, the smallest pipe size to be welded in production shall be used, except that 1/2 NPS schedule 10 shall qualify all sizes and thicknesses of 0.058 inch and greater. Thickest shall be designated as number 35.5.3.5.2 Qualification of the following welds shall require completion of amock-up weld per 5.3.5.1 or the weld test indicated below in accordance with section 5(a)(b)(c) For socket welds with wall thickness 3/16 inch or greater - pipebutt weld test. For fillet type seal welds in pipe with thickness 3/16 inch or greater - pipe butt or socket weld test. For other fillet type seal welds (i.e., not in pipe) and edge sealwelds - butt weld test on plate or pipe per table IX or socketweld test. 5.3.6 Internal tube-to-header welding of boiler components. Welders shall be qualified on a test assembly consisting of four joints which are welded in the sequence of 4.4.9. Joint design shall simulate the production joint except as specified by 4.4.9.1(b).

NAVSEA OP 3565/NAVAIR 16-1-529 VOLUME 1
SIXTH REVISION

TECHNICAL MANUAL

**ELECTROMAGNETIC RADIATION HAZARDS (U)(HAZARDS
TO PERSONNEL, FUEL AND OTHER
FLAMMABLE MATERIAL) (U)**



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S-1 material may be used. The requirements of this paragraph apply only to manual welding. Qualification shall otherwise be in accordance with 4.4.9. The requirements of this paragraph do not negate any additional requirements as may be imposed by specific component fabrication or repair documents. 5.3.6.1 **Welding** shall be performed under the space restrictions depicted by figure 25. The entire space restriction assembly shall be held at 400 degrees Fahrenheit (°F) minimum for the entire test. The welder shall perform all grinding and any repair weld preparation in the heated assembly. After completion of all welding and grinding of all joints, the test assembly shall be removed and cooled as required for root and final weld NDT inspection. 5.3.6.2 The root pass and finished welds of the test assembly shall be nondestructively tested in accordance with 4.4.9.1(e), (f) and (i).

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MMSSEA Technical Publication

FILLER MATERIALS FOR CRITICAL APPLICATIONS:
REQUIREMENTS FOR FLUX-CORED WELDING
ELECTRODES, BARE WELDING ELECTRODES AND
FLUXES, AND COVERED WELDING ELECTRODES FOR
LOW-ALLOY STEEL APPLICATIONS



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Undercut 1/32 inch maximum is permissible along the plate weld toes. 5.3.6.3 After successful nondestructive testing, all four welds shall be repaired/sectioned and examined in accordance with 4.4.9.1(g) and 5.3.6.4. Qualification position shall be in accordance with table IX.5.3.6.5. Failure of either the root pass or final weld by any inspection or test on any joint shall constitute failure of the qualification test. Repair of test assembly as a result of a root pass defect shall preclude further repair (see 5.2.8(b)). 5.4 Test and evaluation of qualification test assemblies. This section provides for evaluation of test assemblies required for qualification. The test required for each assembly are as specified in table XI. For suggested removal of destructive test specimens (when used), see figures 12 through 17.5.4.1 Nondestructive inspection. 5.4.1.1 Visual examination. Visual examination shall be performed for weld surface geometry and weld surface soundness. For titanium and titanium alloys, refer to 4.5.1.1 except that the rejection of the qualification tests for multiple occurrences of straw color is not applicable. However, if the straw color occurs more than once, the cause shall be determined and corrected. 5.4.1.2 Nondestructive test performance. Nondestructive testing shall be performed in accordance with MIL-STD-2035. Acceptance shall be permitted by 5.4.1.3, test assembly welds shall be 100 percent inspected. 5.4.1.3 Acceptance standards. Acceptance standards for magnetic-particle, liquid penetrant, and visual examination shall be based on the requirements of MIL-STD-2035, class I. For acceptable visual appearance of titanium and titanium alloys, refer to 4.5.1.1. Acceptance standards for radiography shall be based on the requirements of class I of MIL-STD-2035. Acceptance standards for ultrasonic testing shall be class I of MIL-STD-2035.



Basics of NAVSEA Technical Authority

- Definition of Technical Authority
- Technical Warrants
- Key Responsibilities of Technical Warrant Holders
- Technical Decision-Making
- Coordination with Programmatic Authorities



27 October 2003

Jim Lawrence

For plate assemblies, 1/16 inch of weld at each end of the test assembly need not be evaluated.5.4.2 Destructive tests. Required specimen preparation, dimensions, and mechanical testing shall be in accordance with AWS B4.5.4.2.1 Guided-bend tests. Acceptance standards shall be specified in 4.5.2.3.1.5.4.2.2 Break test. The tack and fillet welder qualification test assemblies shall be flattened in accordance with figure 16 such that the root of the weld is in tension. The load shall be steadily increased until the specimen fractures. The fractured surfaces shall be examined without magnification. Evidence of cracks, incomplete root fusion in excess of 10 percent of the weld length, wormholes or porosity in excess of three pores over 1/16 inch diameter in any 1 inch of fillet weld, or an accumulation of more than 10 pores in 8 inches of the test plate shall be cause for rejection.5.4.2.3 Macro-cut specimens. Specimens shall be extracted transversely to the weld, prepared, and etched to show weld cross-section and examined at minimum of 5X magnification. Acceptance standards shall be as specified in 4.5.2.6.5.5 Data accumulation and records. This section provides requirements for performance qualification data accumulation and maintenance of records. A sample is provided for guidance (see figure 18).5.5.1 Records. The welder qualification test record shall include at least the following information: (a) (b) (c) (d) (e) (f) (g) Welder or welding operator identification (name, clock number, social security number), Date of test, Qualification test number, hour, position, base material type and filler metal type and size, Results of qualification test, Record of omission of space between welds, and the signature of the person performing the test.5.5.2 Maintenance of records. The qualification test record shall be maintained in accordance with 5.5.3. Detailed records shall be maintained for the purpose of qualification test results.5.5.3 Detailed records. Detailed records shall be maintained for the purpose of qualification test results.5.5.4 Maintenance of personnel qualification (see 5.2.1.1) need only be retained for the current and preceding calendar quarter.5.6 Changes requiring requalification of welder or welding operator. Requalification of welder or welding operator is required for the change specified in 5.6.1 through 5.6.7.5.6.1 Base material. A change from one base material thickness to thickness outside the limits specified in table X and figures 12 and 13.5.6.2 Filler material. (a) A change from a filler material listed under one A-number into another A-number except as permitted by table VIII. Filler materials conforming to AWS, ASTM, ASME, and so forth, classifications, and for which there is a qualified procedure (see 5.2.5), may be grouped within the appropriate A-number of table II, and the extent of welder's Original