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STANDARDS ASSOCIATION OF AUSTRALIA

Australian Standard

METHODS OF DESTRUCTIVE TESTING OF WELDS IN METAL

PART 6: HARDNESS TESTS

AS 2205.6.1
METHOD 6.1: WELD JOINT HARDNESS TEST

1 SCOPE. This Standard sets out the method for the hardness test of a welded joint. The test is intended to measure the hardness of the weld metal, heat-affected zone (HAZ), and parent metal on prescribed traverses located in the regions of expected maximum and minimum hardness.

2 REFERENCED DOCUMENTS. The documents below are referred to in this Standard.

AS
1817 Method for Vickers hardness test
Part 1: Testing of metals (AS 1817.1)
Part 2: Calibration of the testing machine (AS 1817.2)
2205 Methods of destructive testing of welds in metal
Part 1: General requirements for test (AS 2205.1)
Part 5: Metallographic tests
Method 5.1: Macro test—Cross-section examination (AS 2205.5.1)

3 PREPARATION OF TEST SPECIMEN. The test specimen shall be prepared in accordance with AS 2205.1 and the following:

(a) The test specimen shall be cut from the weld zone as specified by the relevant application Standard. The regions in which hardness tests are to be made shall be at least 25 mm from the line of any flame cut.
NOTE: The dimension indicated in Figure 1 is usually adequate.

(b) The surface finish of the test specimen shall be as described in Appendix A, AS 2205.5.1 except that polishing shall be continued at least to the stage where P1200 abrasive quality finish has been achieved.

(c) Light etching should be carried out to define the weld zone and to allow hardness indentations to be correctly positioned. Suitable etchants are given in Appendix A, AS 2205.5.1.

4 PROCEDURE. The procedure shall be as follows:

(a) The hardness shall be measured by means of the Vickers hardness test. The equipment used and the method of test shall comply with AS 1817.1 and AS 1817.2, except that the spacing of the indentations shall comply with Item (d). The test surface of the test specimen shall be normal to the axis of the indentor.
NOTE: No significant difference has been found in the hardness figures obtained when using this spacing, compared with the spacing given in AS 1817.1.

(b) The test should be conducted using a nominal force of 49 N (HV 5).
Where the maximum hardness exceeds 350 HV, the traverse should be repeated using a nominal force of 98 N (HV 10). In such a case, all further traverses on the test specimen shall be conducted at the same level of force.

(c) The minimum number and location of hardness test traverses shall be as shown in Figure 2 for the weld types and thickness shown. For other weld configurations, the following principles underlying the traverse positions in Figure 2 shall be used:
(i) The traverses shall be located so that they intersect regions of minimum and maximum hardness approximately.
(ii) Hardness traverses shall be made through all weld toes and the weld root.
(iii) The traverses near the surface shall be parallel to and 2 mm below the plate surface.

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