SAE Aerospace
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AEROSPACE STANDARD

AS7110/4	REV. D

Issued 1995-03
Revised 2003-12
Cancelled 2007-03

Superseding AS7110/4C

Nadcap
Requirements for Resistance Welding (Spot, Seam, Projection)

RATIONALE

AS7003 at Revision C removed the requirement for AS standards. The Nadcap Weld Task Group have revised their checklists and per AS7003 have not re-written associated standards. The AS standards, therefore, require cancellation.

CANCELLATION NOTICE

This document has been declared "CANCELLED" as of March 2007. By this action, this document will remain listed in the Numerical Section of the Aerospace Standards Index.

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Nadcap
Requirements for Resistance Welding (Spot, Seam, Projection)

1. SCOPE:

This Aerospace Standard (AS) is to be used to supplement AS7110. In addition to the requirements contained in AS7110, the requirements contained herein shall apply to suppliers seeking Nadcap accreditation for resistance welding (spot, seam, and projection).

2. REFERENCES:

2.1 SAE Publications:

Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096-0001.

AS7110 Nadcap - Requirements for Welding/Brazing

3. REFERENCE REQUIREMENTS:

3.1 Applicable customer specifications shall be available at the facility.

4. MATERIALS/MATERIAL CONTROL:

4.1 Surface resistance shall be checked for aluminum and magnesium alloys prior to welding, as required by the customer.

4.1.1 One or more surface resistance indicators shall be available for checking the effectiveness of the cleaning.

4.2 Mating parts shall be designed and processed so that prior to welding parts are in contact, or can be made to be in contact, with manual pressure.

4.3 When required the contractor shall identify the maximum time limits between cleaning and welding.

4.4 The ability of the facilities cleaning process shall be adequately demonstrated.

4.5 Surfaces of the part details and representative test specimens shall be properly cleaned and free from contaminants such as oxides, scale, oil, dirt, ink, or other surface conditions that are detrimental to the welding process.

5. EQUIPMENT AND EQUIPMENT CONTROL:

5.1 The equipment shall be capable of controlling the welding force, the time of current flow, current and when required, electrode cooling.

5.1.1 When required, equipment shall be calibrated to a define accuracy and frequency.

5.2 Electrode materials and shapes shall be controlled and the same as on the certified weld schedule.

5.3 The supplier shall have shear testing machines, as required.

5.3.1 The shear testing machines shall be accurate and calibrated within ± 2% of the indicated reading or as specified by applicable customer specifications.

5.3.2 Portable spot weld shear test machines shall be checked for accuracy at intervals not to exceed 2 months.

5.4 Tooling and fixtures shall be so designed so that magnetic material is not present in the throat of the machine, insofar as possible.

5.4.1 Jigs and fixtures shall be so designed so that welding current can not shunt through them.

6. PERIODIC MAINTENANCE:

6.1 Written procedures shall require preventive maintenance of equipment and tooling at a specified frequency.

6.2 Records shall indicate that maintenance is performed on equipment and tooling in accordance with the procedures and appropriate standards.

7. QUALIFICATION OF WELDING MACHINES:

7.1 The equipment shall be qualified in accordance with applicable customer specifications.

7.2 Welding conditions or settings shall be documented on Machine Qualification Test Reports or equivalent.

7.3 Evidence of Machine Qualification Test Reports, or equivalent, and supporting data, shall be available to machine operators, inspectors, and customer representatives.

7.4 Machines shall be qualified for the material type and thickness for which they are intended to be used in production.

7.5 Welding machines shall be requalified if rebuilt or if significant operational changes are made.

8. CERTIFICATION OF WELD PROCEDURE/SCHEDULE:

8.1 Provision shall be made to prevent the use of fusion tack welds unless specifically permitted by contract documents.

8.1.1 If parts are fusion tack welded, the tack process shall be performed using qualified procedures if required.

8.1.2 If required by the customer, resistance tack welding shall be performed with the same parameters as the production weld.

8.1.3 If required by the customer, the resistance tack weld shall be totally consumed and within the confines of the finished weld.

8.2 Welding procedures/schedules shall be certified to customer requirements.

8.3 Tests shall be conducted and documented for the purpose of welding schedule/procedure certification.

8.4 Certification Test Reports shall be available to customer representatives.

8.5 There shall be a Certification Test Report traceable to each machine and each combination of relevant material conditions, surface conditions, electrode configurations, and thickness combinations.

8.6 Each Certification Test Report shall contain all customer requirements. These data may include shear strength data on each weld, the average shear strength, the number of specimens with shear values outside set limits, and the nugget diameters for each metallographic specimen as required.