AERONAUTICAL MATERIAL SPECIFICATION

Society of Automotive Engineers, Inc.
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RINGS, FLASH WELDED
Non-Austenitic Corrosion Resistant Steels

1. ACKNOWLEDGMENT: A vendor shall mention this specification number and its revision letter in all quotations and when acknowledging purchase orders.

2. APPLICATION: Primarily for parts such as flanges and rings, requiring corrosion and moderate heat resistance, fabricated by flash welding roll-formed ø strip or shapes of non-austenitic corrosion resistant steels, usually AMS 5613 or AMS 5627.

3. MATERIAL: Material from which rings are made shall be as specified on the drawing.

4. FABRICATION:

4.1 Forming: Rings as applicable for the particular part shall be formed from suitably rolled or forged shapes.

4.2 Preparation for Welding:

4.2.1 Formed rings shall be clean and free from foreign materials in the area of electrode contact and at the surfaces to be welded.

4.2.2 Formed rings may be pre-heated, before welding, as agreed upon by purchaser and vendor.

4.3 Welding: The ends of the formed rings shall be flash butt-welded together. Welding shall be performed on a machine provided with accurate control of feed of joint during flashing, rate and distance of travel of sections to be welded, secondary voltage and current magnitude, and timing and current cut-off. The flash shall be maintained during the flashing interval of the welding operation. The machine shall be capable of repeating the sequence of operations independently of the skill of the operator. A record of all machine settings and sequence of operations for welding each different ring shall be kept by the vendor and be made available to the Engineering Department of the purchaser upon written request.

4.4 Annealing: The welded rings shall be annealed by heating to 1400-1500 F, holding at heat for 1 hr and cooling in air.

4.5 Proof Testing of Welds (Sizing): Unless otherwise specified, each ring, after cooling to room temperature and removal of flash following annealing, shall be tested to determine quality of weld. Preliminay sizing may be done before ø cooling, but final sizing shall be done at room temperature. The stress applied for final sizing shall be sufficient to provide an increase in circumference of not less than 1% after the load is released. Testing shall be performed in such a way as to provide uniform stress distribution throughout the ring.

4.6 Restoration to Shape: If it is necessary to restore shape of rings following sizing, such operation shall be done on suitable presses and not be localized blows as from a hammer. Rings may be reheated to 800-900 F for such operation.

5. TECHNICAL REQUIREMENTS:

5.1 Tensile Properties: If finished welded rings are cut for examination, tensile test specimens shall conform to the following requirements:

Tensile Strength, psi	
Through Welded Area	95% min of parent metal
Elongation, % in 2 in. or 4D	
Parent Metal	20 min
Through Welded Area	20 min

5.2 Hardness: Rings shall have hardness not higher than Brinell 241 or equivalent, unless otherwise specified on the drawing or purchase order.

5.3 Grain Size: Parent metal of fabricated rings shall have uniform grain size throughout and shall be free from localized large-grained areas.

6. QUALITY:

6.1 Parts shall be uniform in quality and condition, clean, sound, and free from foreign materials and from internal and external defects detrimental to fabrication or performance.

6.2 Parts shall be subject to X-ray inspection.

6.3 Parts shall be subject to magnetic particle inspection.

7. REPORTS: Unless otherwise specified, the vendor of finished or semi-finished parts shall furnish with each shipment three copies of a report showing the purchase order number, material specification number, contractor or other direct supplier of material, part number, and quantity. When material for making parts is produced or purchased by the parts vendor, that vendor shall inspect each lot of material to determine conformance to the requirements of the applicable material specification, and shall include in the report a statement that the material conforms, or shall include copies of laboratory reports showing the results of tests to determine conformance.

8. APPROVAL:

8.1 To assure adequate performance characteristics, sample parts shall be approved, unless such approval be waived.