AERONAUTICAL MATERIAL SPECIFICATION

Society of Automotive Engineers, Inc.
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AMS 7496 B

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RINGS, FLASH WELDED
Carbon and Low Alloy 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 fabricated by flash welding carbon and low alloy steels, usually AMS 5062, AMS 6280, AMS 6302, AMS 6303, AMS 6370, or AMS 6412.

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 parts shall be formed from suitably rolled, extruded, 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 surface to be welded.

4.3 Welding: The ends of the formed rings shall be flash butt-welded together; unless otherwise permitted by purchaser, there shall be only one weld per ring. 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 amount of manual flashing, for purposes of preheating, shall be limited to 10% of total flashing distance. 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 purchaser upon written request.

4.4 Heat Treatment: Unless otherwise specified, the welded rings shall be normalized by heating to the appropriate temperature, holding at heat for not less than 1 hr, cooling as desired, and tempered as necessary to produce the specified hardness. Materials such as AMS 6302, AMS 6303, and AMS 6412 may be cycle annealed to produce the specified hardness. For material less than 0.188 in. thick, normalizing time at heat may be reduced to 15-30 minutes.

4.5 Proof Testing of Welds (Sizing): Unless otherwise specified, each ring, after cooling to room temperature following heat treatment, shall be tested to determine quality of weld. Flash shall be removed from rings either before or after heat treatment but before sizing. Preliminary sizing may be done before 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 by localized blows as from a hammer. Rings may be reheated for such operation.

4.7 Any descaling requirement shall be as agreed upon by purchaser and vendor.

5. TECHNICAL REQUIREMENTS:

5.1 Tensile Properties: Test specimens cut from welded rings processed to this specification shall conform to the following requirements:

Tensile Strength	
Through Welded Area	90% min of parent metal in same ring
Elongation, % in 2 in. or 4D	
Through Welded Area	60% min of parent metal in same ring but not less than 15%

5.2 Hardness: Unless otherwise specified, rings shall have hardness not higher than Brinell 241 or equivalent.

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. Any controlled grain size requirement shall be as agreed upon by purchaser and vendor.

6.2 Parts shall be subject to X-ray inspection.

6.3 Parts shall be subject to magnetic particle inspection.

6.4 Parts shall be subject to ultrasonic inspection.

7. REPORTS:

7.1 Unless otherwise specified, the vendor of welded rings shall furnish with each shipment three copies of a report of the results of tests for tensile properties and hardness of each lot in the shipment. This report shall include the purchase order number, this specification number, material specification number, contractor or other direct supplier of material, size or part number, heat number, and quantity from each lot. When material for making rings is produced or purchased by the ring 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.