AERONAUTICAL
MATERIAL SPECIFICATIONS

SOCIETY OF AUTOMOTIVE ENGINEERS, Inc. 485 Lexington Ave., New York 17, N.Y.

AMS 7496C

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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, and 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.

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4.5 Proof Testing of Welds (Sizing): Unless otherwise specified, each ring shall have flash and excess metal at the weld removed to within + 1/32 in. of parent metal surfaces, and shall then be sized. Flash may be removed from rings either ø before or after heat treatment as in 4.4. 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 a permanent expansion of not less than 1% across a 2 in. gage length centered on the weld. Sizing shall be performed in such a way as to provide uniform stress distribution throughout the ring.

4.5.1 For rings made of material less than 0.188 in. thick, flash removal may reduce thickness below that of parent metal provided that the finished weld blends smoothly into adjacent metal and provided that thickness is not reduced below ø the minimum specified on the drawing for the parent metal; when so specified by purchaser, proof testing of such rings will be waived if welding precedes a final forming operation which involves an expansion of the weld equivalent to or exceeding that required by 4.5.

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 imperfections 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 non-destructive testing as agreed upon by purchaser ø and vendor.