SAE Aerospace
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# AEROSPACE MATERIAL SPECIFICATION

SAE AMS 7241B

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Superseding AMS 7241A

## Washers, Spring Lock, Corrosion Resistant Steel 18Cr - 9Ni

S30200

NONCURRENT NOTICE

This specification has been declared “NONCURRENT” by the Aerospace Materials Division, SAE, as of January 1992. It is recommended, therefore, that this specification not be specified for new designs.

“NONCURRENT” refers to those materials which have previously been widely used and which may be required on some existing designs in the future. The Aerospace Materials Division, however, does not recommend these as standard materials for future use in new designs. Each of these “NONCURRENT” specifications is available from SAE.





**TO PLACE A DOCUMENT ORDER:** **Tel: 877-606-7323 (inside USA and Canada)**
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1. SCOPE:

1.1 Type:

This specification covers plain helical lock washers fabricated from corrosion-resistant steel.

1.2 Application:

Primarily for use with corrosion-resistant steel threaded fasteners; not recommended for use at temperatures higher than 700°F (370°C).

2. APPLICABLE DOCUMENTS:

The following publications form a part of this specification to the extent specified herein. The latest issue of Aerospace Material Specifications shall apply. The applicable issue of other documents shall be as specified in AMS 2350.

2.1 SAE Publications:

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

2.1.1 Aerospace Material Specifications:

AMS 2248 - Chemical Check Analysis Limits, Wrought Corrosion and Heat Resistant Steels and Alloys, Maraging and Other Highly-Alloyed Steels, and Iron Alloys
AMS 2350 - Standards and Test Methods
AMS 2371 - Quality Assurance Sampling of Corrosion and Heat Resistant Steels and Alloys, Wrought Products Except Forgings and Forging Stock

2.2 ASTM Publications:

Available from American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103.

ASTM E18 - Rockwell Hardness and Rockwell Superficial Hardness of Metallic Materials
ASTM E353 - Chemical Analysis of Stainless, Heat-Resisting, Maraging, and Other Similar Chromium-Nickel-Iron Alloys

2.3 U.S. Government Publications:

Available from Commanding Officer, Naval Publications and Forms Center, 5801 Tabor Avenue, Philadelphia, PA 19120.

2.3.1 Military Standards:

MIL-STD-414 - Sampling Procedures and Tables for Inspection by Variables for Percent Defective
MIL-STD-794 - Parts and Equipment, Procedures for Packaging and Packing of

3. TECHNICAL REQUIREMENTS:

3.1 Composition:

Shall conform to the following percentages by weight, determined by wet chemical methods in accordance with ASTM E353 or by spectrochemical or other analytical methods approved by purchaser:

| | min | max |
|---|---|---|
| Carbon | -- | 0.15 |
| Manganese | -- | 2.00 |
| Silicon | -- | 1.00 |
| Phosphorus | -- | 0.040 |
| Sulfur | -- | 0.030 |
| Chromium | 17.00 | 19.00 |
| Nickel | 8.00 | 10.00 |
| Molybdenum | -- | 0.75 |
| Copper | -- | 0.75 |



3.1.1 Check Analysis: Composition variations shall meet the requirements of AMS 2248.

3.2 Condition:

Cold worked.

3.3 Fabrication:

3.3.1 Helix: Washers shall be coiled so that the free height is approximately twice the thickness of the washer section. Gap and relationship of the severed ends shall be such as to prevent the washers tangling.

3.4 Properties:

Washers shall conform to the following requirements:

3.4.1 Hardness: Shall be 35 - 43 HRC, or equivalent, determined in accordance with ASTM E18.

3.4.2 Temper: After the first compression to flat, the free height of a washer shall be not less than 0.66 times the original free height. Subsequent compressions to flat shall not further reduce this free height by more than 0.005 in. (0.12 mm) but the free height after ten compressions to flat shall be not less than 0.66 times the original free height.

3.4.3 Toughness: A portion of washer shall be firmly gripped in vise jaws having sharp edges. Ends of washer shall be free and an axis passing through the slot shall be parallel to top of vise. An equal portion of washer shall be gripped in wrench jaws. Edges of wrench jaws shall be sharp and in a plane parallel to top of vise. Free portion of washer, between the grip of vise and wrench, shall be approximately 25% of washer diameter. Movement of wrench in the direction that increases the free height of the washer shall twist the lock washer through 90 deg without evidence of fracture. When a washer fractures because of twist, the structure at the point of fracture shall show a fine grain; the washers shall deliver, at the instant of fracture, a tough, springy, reactive shear.

3.5 Quality:

The flat faces and the inner and outer periphery of the washers shall be smooth and free from knurling, serrations, die marks, and deep scratches; however, slight feed marks are permissible. The ends at the gap shall not have cutting edges at the contact surfaces. Washers shall have rounded edges and shall be free from imperfections detrimental to usage of the washers.

4. QUALITY ASSURANCE PROVISIONS:

4.1 Responsibility for Inspection:

The vendor of washers shall supply all samples for vendor's tests and shall be responsible for performing all required tests. Results of such tests shall be reported to the purchaser as required by 4.4. Purchaser reserves the right to sample and to perform any confirmatory testing deemed necessary to ensure that the washers conform to the requirements of this specification.

4.2 Classification of Tests:

Tests to determine conformance to all technical requirements of this specification are classified as acceptance tests and shall be performed on each heat or lot as applicable.

4.3 Sampling:

Shall be in accordance with the following; a lot shall be all washers of the same part number, fabricated from the same heat of steel, and presented for vendor's inspection at one time:

4.3.1 Composition: . One sample from each heat.

4.3.2 Other Requirements: . In accordance with MIL-STD-414 to an AQL of 3.5%.

4.4 Reports:

The vendor of washers shall furnish with each shipment a report showing the results of test for chemical composition of each heat and stating that the washers conform to the technical requirements of this specification. This report shall include the purchase order number, AMS 7241B, lot number, contractor or other direct supplier of material, part number, nominal size, and quantity.