



METRIC AEROSPACE STANDARD

MA4036™**REV. A**

Issued 1988-06
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Revised 2021-11

Superseding MA4036

(R) Rings, Retaining - Tapered Width, Uniform Thickness
Corrosion Resistant, Procurement Specification For, Metric

FSC 5365

RATIONALE

Delete MIL-STD-105, revise sampling requirements and acceptance testing based on zero defectives, revise packaging requirements to MIL-STD-2073-1, extensive revision to Section 4, update references, extensive editorial updates.

1. SCOPE

1.1 Scope

This specification covers the procurement requirements for corrosion resistant steel retaining rings of the tapered width type with rectangular and beveled cross-sections.

1.2 Classification

Retaining rings shall be of the types and classes shown in Table 1.

Table 1 - Classification

Type	Class	Description
I – Flat, rectangular section	1	Internal, Type 3BM1 per ASME B27.7
	2	External, Type 3AM1 per ASME B27.7
	3	External, Type 3EM1 per ASME B27.8M
II – Flat, beveled section	1	Internal, Series 10-102 per Waldes Truarco (Rotor Clip Co, Inc.)

1.3 Application

Intended for use on aerospace propulsion systems for retaining parts on shafts and in housing bores where extended temperature use is not greater than 315 °C.

1.4 Dimensions and Tolerances

Dimensions and tolerances in this specification are in millimeters unless otherwise specified.

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2. REFERENCES

2.1 Applicable Documents

The following publications form a part of this document to the extent specified herein. The latest issue of SAE publications shall apply. The applicable issue of other publications shall be the issue in effect on the date of the purchase order. In the event of conflict between the text of this document and references cited herein, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

2.1.1 SAE Publications

Available from SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (inside USA and Canada) or +1 724-776-4970 (outside USA), www.sae.org.

AMS5520	Steel, Corrosion and Heat-Resistant, Sheet, Strip, Foil, and Plate 15Cr - 7.1Ni - 2.5Mo - 1.1Al Solution Heat Treated, Precipitation Hardenable
MA4020	Ring, Retaining - External, Tapered, Type I, Class 2, AMS5520, Metric
MA4021	Ring, Retaining - Internal, Tapered, Type I, Class 1, AMS5520, Metric
MA4029	Ring, Retaining - Internal, Beveled, Tapered, Type II, Class 1, AMS5520, Metric
MA4030	Ring, Retaining - External, Reinforced E-Ring, Type I, Class 3 AMS5520, Metric

2.1.2 ASTM Publications

Available from ASTM International, 100 Bar Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959, Tel: 610-832-9585, www.astm.org.

ASTM E18	Rockwell Hardness and Rockwell Superficial Hardness of Metallic Materials
ASTM E1417/1417M	Standard Practice for Liquid Penetrant Testing

2.1.3 ASME Publications

Available from ASME, P. O. Box 2900, 22 Law Drive, Fairfield, NJ 07007-2900, Tel. 800-843-2763 (US/Canada), 001-800-843-2763 (Mexico), 973-882-1170 (outside North America), www.asme.org.

ASME B27.7	General Purpose Tapered and Reduced Cross Section Retaining Rings
ASME B27.8M	General Purpose Metric Tapered and Reduced Cross Section Retaining Rings
ASME B46.1	Surface Texture (Surface Roughness, Waviness and Lay)

2.1.4 U.S. Government Publications

Copies of these documents are available online at <https://quicksearch.dla.mil>.

MIL-STD-2073-1	Standard Practice for Military Packaging
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2.2 Definitions

DEFECTIVE: A unit of product which contains one or more defects.

PRODUCTION INSPECTION LOT: Shall be all finished parts of the same part number, made from a single heat of alloy, heat treated at the same time to the same specified condition, produced as one continuous run, and submitted for vendor's inspection at the same time.

2.3 Unit Symbols

%	percent (1% = 1/100)
°C	degree Celsius
mm	millimeter
MPa	megapascals
HRC	hardness, Rockwell, C scale

3. TECHNICAL REQUIREMENTS

3.1 Material

AMS5520 corrosion resistant steel, sheet, or strip.

3.2 Design

Finished (completely manufactured) parts shall conform to the following requirements:

3.2.1 Design and Dimensions

Unless otherwise specified on the part drawing, retaining rings furnished under this specification shall conform to the design, shape, dimensions and other requirements, specified on the applicable MA standard drawings as in 2.1.1. Dimensions shall conform after all processing.

3.2.2 Surface Texture

Surface texture of finished parts shall conform to the requirements as specified on the part drawing, determined in accordance with ASME B46.1.

3.2.3 Gap Width, Minimum

Type I, Class 1 rings, when seated in a groove as specified in Table 3, shall have a gap between lugs (dimension K as shown in Figure 1) not less than the minimum values for dimension K as specified in Table 3.

3.2.4 Gap Width, Minimum

Type II, Class 1 rings, when seated in a groove as specified in Table 4, shall have a gap between lugs (dimension K as shown in Figure 2) not less than the minimum values for dimension K as specified in Table 4.

3.2.5 Gaging Diameter, Maximum

Type I, Class 2 rings, when seated in a groove as specified in Table 5, shall have an outside diameter (dimension ØK as shown in Figure 3) not greater than the maximum values for ØK as specified in Table 5.

3.2.6 Gaging Diameter, Maximum

Type I, Class 3 rings, when seated in a groove as specified in Table 6, shall have an outside diameter (dimension $\varnothing K$ as shown in Figure 4) not greater than the maximum values for $\varnothing K$ as specified in Table 6.

3.2.7 Dish

The dish (see Figure 5) of Type I and Type II rings shall not exceed the dimensions specified in Table 2 for the applicable ring thickness.

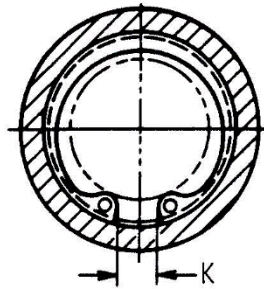


Figure 1 - Gap width minimum
Type I, Class 1 ring
Seated in groove

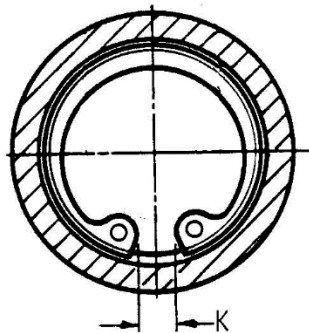


Figure 2 - Gap width minimum
Type II, Class 1 ring
Seated in groove

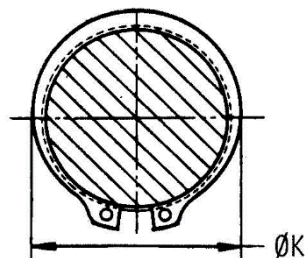


Figure 3 - Gaging dia maximum
Type I, Class 2 ring
Seated in groove

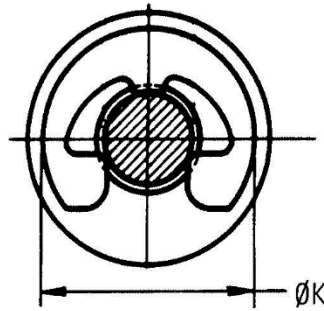


**Figure 4 - Gaging dia maximum
Type I, Class 3 ring
Seated in groove**

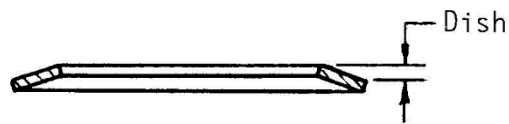


Figure 5 - Dish, Type I and II rings

Table 2 - Ring dish limitations

Types I & II	
Ring Thickness Range mm	Permissible Dish Max mm
0.20-0.53	0.05
0.54-1.03	0.08
1.04-2.71	0.13
2.72-3.87	0.25
3.88-4.92	0.40