



AEROSPACE STANDARD

AS5782™**REV. B**

Issued 2007-07
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Revised 2020-10

Superseding AS5782A

(R) Retainers (Backup Rings), Hydraulic and Pneumatic,
Polytetrafluoroethylene Resin, Solid, Un-Cut,
for Use in AS4716 Glands

RATIONALE

This document has been revised to:

- Add the requirement that no resizing of parts during the manufacturing process is permitted.
- Clarify the use in AS4716 glands.
- Add the dimensional stability requirement of material tubes to 4.1.
- Include some editorial corrections and improvements.

1. SCOPE

This SAE Aerospace Standard (AS) specifies solid, uncut polytetrafluoroethylene (PTFE) retainers (backup rings) for use in glands in accordance with AS4716. They are usually used in hydraulic and pneumatic system components as anti-extrusion devices in conjunction with O-rings and other seals for static and dynamic applications.

1.1 Field of Application

Backup rings to the dimensions in AS5782 are for use in glands to AS4716 only. They shall not be used in glands to MIL-G-5514 or AS5857.

NOTE: Parts standard AS27595 (solid, un-cut backup rings) for use in glands to MIL-G-5514 and parts standard AS5861 (solid un-cut backup rings) for use in AS5857 glands have been published.

This specification includes material tests but does not include hydraulic or pneumatic performance tests.

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Documents

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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.

AMS3678	Polytetrafluoroethylene (PTFE) Moldings and Extrusions Unfilled, Pigmented, and Filled Components
AMS3678/1	Type 1 - Virgin Polytetrafluoroethylene (PTFE) Moldings and Extrusions
AMS3678/2	Type 2 - 15% Graphite Filled Virgin Polytetrafluoroethylene (PTFE) Moldings or Extrusions
AMS3678/3	Type 3 - 15% Glass, 5% Molybdenum Disulfide Filled Virgin Polytetrafluoroethylene (PTFE) Moldings or Extrusions
AMS3678/5	Type 5 - Virgin Polytetrafluoroethylene (PTFE) Moldings or Extrusions with Pigment
AMS3678/6	Type 6 - 60% Bronze Filled Virgin Polytetrafluoroethylene (PTFE) Moldings or Extrusions
AMS3678/7	Type 7 - Virgin Polytetrafluoroethylene (PTFE) Moldings or Extrusions with 25% Carbon and Graphite
AMS3678/8	Type 8 - Virgin Polytetrafluoroethylene (PTFE) Moldings or Extrusions with 10% Carbon Fiber
AMS3678/9	Type 9 - Virgin Polytetrafluoroethylene (PTFE) Moldings with Pigment for AS4716 and AS5857 Backup Rings
AMS3678/10	Type 10 - Virgin Polytetrafluoroethylene (PTFE) Moldings or Extrusions with 15% Carbon Fiber
AS4716	Gland Design, O-Ring and Other Seals
AS5857	Gland Design, O-Ring and Other Elastomeric Seals, Static Applications
AS5861	Retainers, (Back-Up Rings), Hydraulic and Pneumatic, Polytetrafluoroethylene Resin, Solid, Static Gland

2.1.2 U.S. Government Publications

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

MIL-G-5514	Gland Design; Packing, Hydraulic, General Requirements For (inactive for new design)
MIL-STD-2073-1	Standard Practice for Military Packaging
MS27595	Retainer, Packing Backup, Continuous Ring, Polytetrafluoroethylene (inactive for new design)

2.1.3 ASME Publications

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

ASME Y14.5-2009 Dimensioning and Tolerancing

3. TECHNICAL REQUIREMENTS

3.1 Design

Backup rings specified herein have been designed for a temperature range of -65 to 275 °F (-54 to 135 °C) and a nominal operating pressure of 3000 psi (20684 kPa) for code 09 material (AMS3678/9). Alternate materials to AMS3678 are offered for more arduous operating conditions.

Because of the construction of groove dimensions, backup rings specific to piston applications are designated “P” - piston (male). Backup rings specific to rod applications are designated “R” - rod (female).

3.2 Materials and Applications

3.2.1 Primary Material

Code 09, Virgin PTFE with pigment: For operating pressures up to 3000 psi (20684 kPa) parts shall be made from material code 09 of this standard shall conform to AMS3678/9, Pigmented Virgin PTFE, Molded.

- Parts made from material code 09 of this standard for “R” (rod) applications shall be blue per AMS3678/9.
- Parts made from material code 09 of this standard for “P” (piston) applications shall be yellow per AMS3678/9.

NOTE: Green pigmented material to AMS3678/9 is for use for “R” (rod) backup rings to AS5860 and AS5861. Brown pigmented material to AMS3678/9 is for use for “P” (piston) backup rings to AS5860 and AS5861.

Details of material specification, material code, color, composition, application, and pressures for code 09 material applicable to this document are listed in Table 1. Other data is for alternate materials or for reference only.

3.2.2 Alternate Materials

Alternate materials to AMS3678 offer improved physical properties for more arduous operating conditions.

The alternate materials listed in Table 1 (except AMS3678/1 and AMS3678/4) can also be ordered by using the part identification numbers of this standard (see 3.3.1).

NOTE: When alternate materials are selected, it is recommended that adequate performance for the application be verified by operational testing.

Table 1 - Materials and applications

Material Specification	Material Code ⁽⁶⁾	Color	Composition	Application	Max Pressure ⁽⁵⁾	
					psi	kPa
AMS3678/1	N/A	White	Virgin PTFE ⁽¹⁾	Not to be used	N/A	
AMS3678/2	02	Black	15% graphite	Static & dynamic	3000	20684
AMS3678/3	03	Gray	15% glass, 5% MoS ₂	Static	4000	27579
AMS3678/4	N/A	White	25% glass ⁽²⁾	Not to be used	N/A	
AMS3678/5	05	Per supplier	Virgin, pigmented ⁽³⁾	Static & dynamic	2000	13790
AMS3678/6	06	Brown	60% bronze ⁽⁴⁾	Static	5000	34474
AMS3678/7	07	Black	25% carbon/graphite	Static	5000	34474
AMS3678/8	08	Black	10% carbon fiber	Static & dynamic	4000	27579
AMS3678/9	09	See 3.2.3	Virgin, pigmented	Static & dynamic	3000	20684
AMS3678/10	10	Black	15% carbon fiber	Static & dynamic	5000	34474

NOTES:

- (1) Material to AMS3678/1 Grade A and Grade B is not to be used because both have lower physical properties and, therefore, lower performance than AMS3678/9.
- (2) Glass fibers can be abrasive, particularly in dynamic applications and against soft surfaces such as aluminum and some grades of titanium and stainless steels.
- (3) Usually used for manufacturer's proprietary pigment colors.
- (4) Not usually recommended for hydraulic systems as bronze particles can clog filters.
- (5) Maximum pressures indicated are for guidance purposes only and for pressures above 3000 psi (20684 kPa) testing is recommended.
- (6) Material "designation codes" are derived from the appropriate slash sheets of AMS3678.

3.2.3 Color Identification for Materials Other Than Code 09

Color pigmentation for material to AMS3678/5 is usually proprietary per manufacturer but shall not be blue, yellow, brown, or green in order to avoid confusion with material per AMS3678/9.

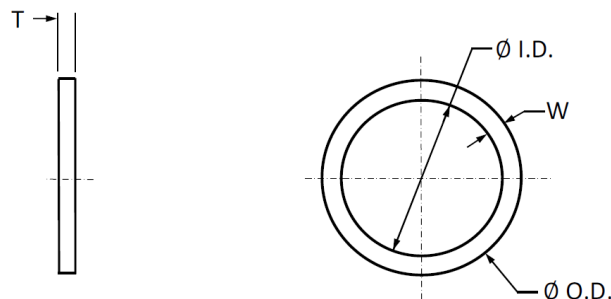
There is no color pigmentation applied to materials to AMS3678/1, AMS3678/2, AMS3678/3, AMS3678/4, AMS3678/6, AMS3678/7, AMS3678/8, and AMS3678/10.

3.3 Dimensional Requirements

See Figure 1.

See Tables 2A and 2B for dimensions.

Dimensions and tolerancing per ASME Y-14.5-2009

**Figure 1 - Backup ring controlled features**

3.3.1 Part Number

The part number consists of the standard number, the piston ("P") or rod ("R") code, the material code followed by the appropriate three digit dash number taken from Tables 2A and 2B as shown in Figure 2.

Example Part Number:

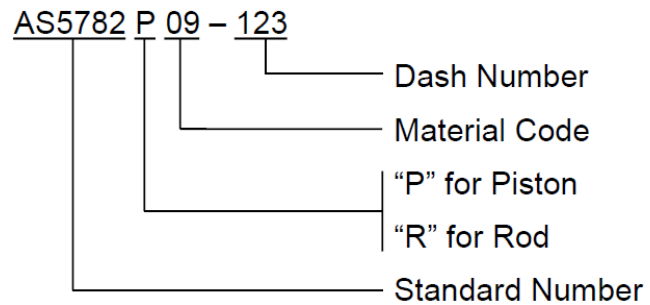


Figure 2 - Example part number

NOTES:

1. In Figure 2, "P" for piston, code 09 material, and dash 123 size are all used for example purposes only.
2. Spaces between characters in the above example part number are for illustration clarity only and are not used in the part number.

See Figures 1 and 2.

Table 2A - AS5782 backup ring dimensions, in inches

Male (Piston) Applications				Female (Rod) Applications			
Part No.	OD ±0.001	T ±0.002	W ±0.001	Part No.	ID ±0.001	T ±0.002	W ±0.001
AS5782P(XX)-004	0.190	0.052	0.056	AS5782R(XX)-004	0.076	0.052	0.056
AS5782P(XX)-005	0.221	0.052	0.052	AS5782R(XX)-005	0.108	0.052	0.053
AS5782P(XX)-006	0.235	0.052	0.052	AS5782R(XX)-006	0.123	0.052	0.054
AS5782P(XX)-007	0.266	0.052	0.053	AS5782R(XX)-007	0.154	0.052	0.054
AS5782P(XX)-008	0.297	0.052	0.053	AS5782R(XX)-008	0.185	0.052	0.053
AS5782P(XX)-009	0.329	0.052	0.054	AS5782R(XX)-009	0.217	0.052	0.054
AS5782P(XX)-010	0.360	0.054	0.054	AS5782R(XX)-010	0.248	0.054	0.054
AS5782P(XX)-011	0.422	0.054	0.054	AS5782R(XX)-011	0.310	0.054	0.054
AS5782P(XX)-012	0.485	0.054	0.054	AS5782R(XX)-012	0.373	0.054	0.054
AS5782P(XX)-013	0.550	0.054	0.053	AS5782R(XX)-013	0.435	0.054	0.054
AS5782P(XX)-014	0.613	0.054	0.054	AS5782R(XX)-014	0.498	0.054	0.054
AS5782P(XX)-015	0.675	0.054	0.054	AS5782R(XX)-015	0.560	0.054	0.054
AS5782P(XX)-016	0.738	0.054	0.054	AS5782R(XX)-016	0.623	0.054	0.054
AS5782P(XX)-017	0.800	0.054	0.054	AS5782R(XX)-017	0.685	0.054	0.054
AS5782P(XX)-018	0.863	0.054	0.054	AS5782R(XX)-018	0.748	0.054	0.054
AS5782P(XX)-019	0.925	0.054	0.054	AS5782R(XX)-019	0.810	0.054	0.054
AS5782P(XX)-020	0.991	0.054	0.054	AS5782R(XX)-020	0.873	0.054	0.054
AS5782P(XX)-021	1.053	0.054	0.054	AS5782R(XX)-021	0.935	0.054	0.054
	OD ±0.002				ID ±0.002		
AS5782P(XX)-022	1.116	0.054	0.054	AS5782R(XX)-022	0.998	0.054	0.054
AS5782P(XX)-023	1.178	0.054	0.054	AS5782R(XX)-023	1.060	0.054	0.054
AS5782P(XX)-024	1.241	0.054	0.054	AS5782R(XX)-024	1.123	0.054	0.054
AS5782P(XX)-025	1.303	0.054	0.054	AS5782R(XX)-025	1.185	0.054	0.054
AS5782P(XX)-026	1.366	0.054	0.054	AS5782R(XX)-026	1.248	0.054	0.054
AS5782P(XX)-027	1.428	0.054	0.054	AS5782R(XX)-027	1.310	0.054	0.054
AS5782P(XX)-028	1.491	0.054	0.054	AS5782R(XX)-028	1.373	0.054	0.054