



AEROSPACE STANDARD

AS5861™**REV. B**Issued 2005-12
Revised 2020-11

Superseding AS5861A

(R) Retainers, (Backup Rings), Hydraulic and Pneumatic,
Polytetrafluoroethylene Resin, Solid, Un-Cut, for Use in Static Glands to AS5857

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 AS5857 glands
- Add the stabilized temperature at which measurements shall be taken
- Add the dimensional stability requirement of material tubes to 4.1
- Include some editorial corrections and improvements
- Update the references

1. SCOPE

This SAE Aerospace Standard (AS) specifies solid polytetrafluoroethylene (PTFE) retainers (backup rings) for use in static glands in accordance with AS5857. They are usually for use in hydraulic and pneumatic systems as anti-extrusion devices in conjunction with O-rings and other seals.

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

1.1 Field of Application

Backup rings to the dimensions in AS5861 are for use in glands to AS5857 only. They shall not be used in glands to MIL-G-5514 or AS4716, please see the note below.

NOTE: Parts standard MS27595 (solid un-cut backup rings) for use in glands to MIL-G-5514 and parts standard AS5782 (solid un-cut backup rings) for use in AS4716 glands have been published.

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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
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
AS5782	Retainers (Backup Rings), Hydraulic and Pneumatic, Polytetrafluoroethylene Resin, Solid, Un-Cut, For Use in AS4716 Glands
AS5857	Gland Design, O-ring and Other Elastomeric Seals, Static Applications
AS5860	Retainers, (Backup Rings), Hydraulic and Pneumatic, Polytetrafluoroethylene Resin, Single Turn, Static Gland

2.1.2 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
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2.1.3 U.S. Government Publications

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

MIL-G-5514	Gland Designs; Packings, Hydraulic, General Requirements for (Inactive for new design)
MIL-STD-2073-1	Standard Practice for Military Packaging
MS 27595	Retainer, Packing Backup, Continuous Ring, Polytetrafluoroethylene (Inactive for new design)

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 (20680 kPa) for Code 09 material and 5000 psi (34470 kPa) for Code 10 material. Material codes are based on AMS3678 material types.

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 (20680 kPa) parts shall be made from material Code 09 of this standard and shall conform to AMS3678/9.

- Parts made from material Code 09 of this standard for “P” (Piston) applications shall be brown per AMS3678/9.
- Parts made from material Code 09 of this standard for “R” (Rod) applications shall be green per AMS3678/9.

NOTE:

- Yellow pigmented material to AMS3678/9 is for use for “P” (Piston) backup rings to AS5781 and AS5782.
- Blue pigmented material to AMS3678/9 is for use for “R” (Rod) backup rings to AS5781 and AS5782.

3.2.2 Alternate Material

Code 10, PTFE with 15% Carbon Fiber: For operating pressures up to 5000 psi (34470 kPa) parts shall be made from material Code 10 of this standard and shall conform to AMS3678/10.

Parts made from material code 10 of this standard shall be dark gray to black with no identifying color pigment.

3.3 Dimensional Requirements

See Figure 1.

See Tables 1A and 1B for dimensions.

Dimensions and Tolerancing per ASME Y-14.5-2009

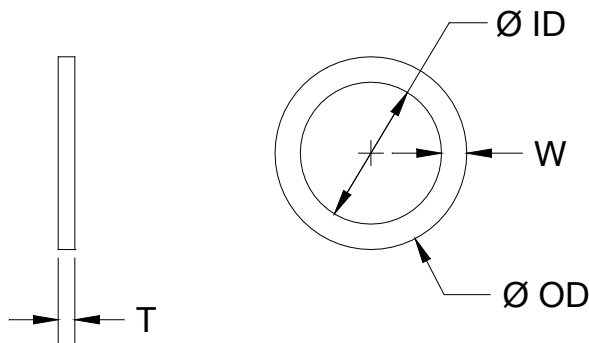


Figure 1 - Backup ring controlled features

3.4 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 1A and 1B as shown in Figure 2 below.

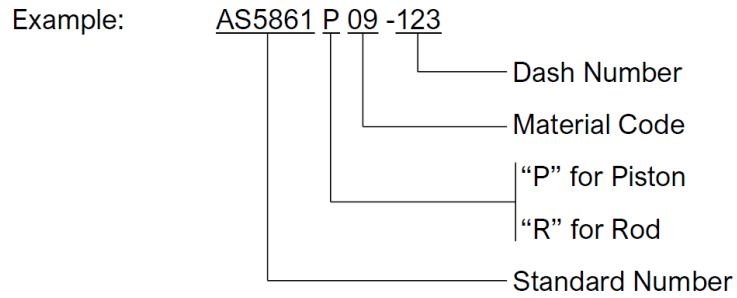


Figure 2 - Example part number

NOTES:

1. In the above example Part Number, "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 1A - AS5861 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
AS5861P(XX)-004	0.185	0.054	0.052	AS5861R(XX)-004	0.076	0.054	0.053
AS5861P(XX)-005	0.217	0.054	0.052	AS5861R(XX)-005	0.108	0.054	0.053
AS5861P(XX)-006	0.230	0.054	0.052	AS5861R(XX)-006	0.123	0.054	0.053
AS5861P(XX)-007	0.261	0.054	0.052	AS5861R(XX)-007	0.154	0.054	0.053
AS5861P(XX)-008	0.293	0.054	0.052	AS5861R(XX)-008	0.185	0.054	0.053
AS5861P(XX)-009	0.326	0.054	0.052	AS5861R(XX)-009	0.217	0.054	0.053
AS5861P(XX)-010	0.357	0.054	0.052	AS5861R(XX)-010	0.248	0.054	0.053
AS5861P(XX)-011	0.420	0.054	0.052	AS5861R(XX)-011	0.310	0.054	0.053
AS5861P(XX)-012	0.485	0.054	0.052	AS5861R(XX)-012	0.373	0.054	0.053
AS5861P(XX)-013	0.550	0.054	0.052	AS5861R(XX)-013	0.435	0.054	0.053
AS5861P(XX)-014	0.613	0.054	0.052	AS5861R(XX)-014	0.498	0.054	0.053
AS5861P(XX)-015	0.675	0.054	0.052	AS5861R(XX)-015	0.560	0.054	0.053
AS5861P(XX)-016	0.738	0.054	0.052	AS5861R(XX)-016	0.623	0.054	0.053
AS5861P(XX)-017	0.800	0.054	0.052	AS5861R(XX)-017	0.685	0.054	0.053
AS5861P(XX)-018	0.863	0.054	0.052	AS5861R(XX)-018	0.748	0.054	0.053
AS5861P(XX)-019	0.925	0.054	0.052	AS5861R(XX)-019	0.810	0.054	0.053
AS5861P(XX)-020	0.991	0.054	0.052	AS5861R(XX)-020	0.873	0.054	0.053
AS5861P(XX)-021	1.053	0.054	0.052	AS5861R(XX)-021	0.935	0.054	0.053
	OD ±0.002				ID ±0.002		
AS5861P(XX)-022	1.116	0.054	0.052	AS5861R(XX)-022	0.998	0.054	0.053
AS5861P(XX)-023	1.178	0.054	0.052	AS5861R(XX)-023	1.060	0.054	0.053
AS5861P(XX)-024	1.241	0.054	0.052	AS5861R(XX)-024	1.123	0.054	0.053
AS5861P(XX)-025	1.303	0.054	0.052	AS5861R(XX)-025	1.185	0.054	0.053
AS5861P(XX)-026	1.366	0.054	0.052	AS5861R(XX)-026	1.248	0.054	0.053
AS5861P(XX)-027	1.428	0.054	0.052	AS5861R(XX)-027	1.310	0.054	0.053
AS5861P(XX)-028	1.491	0.054	0.052	AS5861R(XX)-028	1.373	0.054	0.053

Table 1A - AS5861 backup ring dimensions (in inches) (continued)

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
AS5861P(XX)-104	0.286	0.058	0.081	AS5861R(XX)-104	0.123	0.058	0.081
AS5861P(XX)-105	0.317	0.058	0.081	AS5861R(XX)-105	0.154	0.058	0.081
AS5861P(XX)-106	0.349	0.058	0.081	AS5861R(XX)-106	0.185	0.058	0.081
AS5861P(XX)-107	0.382	0.058	0.081	AS5861R(XX)-107	0.217	0.058	0.081
AS5861P(XX)-108	0.414	0.058	0.081	AS5861R(XX)-108	0.248	0.058	0.081
AS5861P(XX)-109	0.477	0.058	0.081	AS5861R(XX)-109	0.310	0.058	0.081
AS5861P(XX)-110	0.541	0.058	0.081	AS5861R(XX)-110	0.373	0.058	0.081
AS5861P(XX)-111	0.604	0.058	0.081	AS5861R(XX)-111	0.435	0.058	0.081
AS5861P(XX)-112	0.668	0.058	0.081	AS5861R(XX)-112	0.498	0.058	0.081
AS5861P(XX)-113	0.734	0.058	0.081	AS5861R(XX)-113	0.560	0.058	0.081
AS5861P(XX)-114	0.800	0.058	0.081	AS5861R(XX)-114	0.623	0.058	0.081
AS5861P(XX)-115	0.863	0.058	0.081	AS5861R(XX)-115	0.685	0.058	0.081
AS5861P(XX)-116	0.925	0.058	0.081	AS5861R(XX)-116	0.748	0.058	0.081
AS5861P(XX)-117	0.991	0.058	0.081	AS5861R(XX)-117	0.810	0.058	0.081
AS5861P(XX)-118	1.053	0.058	0.081	AS5861R(XX)-118	0.873	0.058	0.081
AS5861P(XX)-119	1.116	0.058	0.081	AS5861R(XX)-119	0.935	0.058	0.081
OD ±0.002				ID ±0.002			
AS5861P(XX)-120	1.178	0.058	0.081	AS5861R(XX)-120	0.998	0.058	0.081
AS5861P(XX)-121	1.241	0.058	0.081	AS5861R(XX)-121	1.060	0.058	0.081
AS5861P(XX)-122	1.303	0.058	0.081	AS5861R(XX)-122	1.123	0.058	0.081
AS5861P(XX)-123	1.366	0.058	0.081	AS5861R(XX)-123	1.185	0.058	0.081
AS5861P(XX)-124	1.428	0.058	0.081	AS5861R(XX)-124	1.248	0.058	0.081
AS5861P(XX)-125	1.491	0.058	0.081	AS5861R(XX)-125	1.310	0.058	0.081
AS5861P(XX)-126	1.553	0.058	0.081	AS5861R(XX)-126	1.373	0.058	0.081
AS5861P(XX)-127	1.616	0.058	0.081	AS5861R(XX)-127	1.435	0.058	0.081
AS5861P(XX)-128	1.678	0.058	0.081	AS5861R(XX)-128	1.498	0.058	0.081
AS5861P(XX)-129	1.741	0.058	0.081	AS5861R(XX)-129	1.560	0.058	0.081
AS5861P(XX)-130	1.805	0.058	0.081	AS5861R(XX)-130	1.623	0.058	0.081
AS5861P(XX)-131	1.867	0.058	0.081	AS5861R(XX)-131	1.685	0.058	0.081
AS5861P(XX)-132	1.930	0.058	0.081	AS5861R(XX)-132	1.748	0.058	0.081
AS5861P(XX)-133	1.992	0.058	0.081	AS5861R(XX)-133	1.810	0.058	0.081
AS5861P(XX)-134	2.055	0.058	0.081	AS5861R(XX)-134	1.873	0.058	0.081