

Hydraulic and Pneumatic Retainers
(Back-Up Rings), Polytetrafluoroethylene (PTFE) Resin

RATIONALE

This document has been revised to provide some minor technical updates and to include dimensions and tables in metric units

1. SCOPE

This specification and part standard covers polytetrafluoroethylene (PTFE) resin material and the dimensional requirements for retainers (back-up rings) previously covered by MIL-R-8791 and MIL-R-8791/1. The retainers are intended for use in hydraulic and pneumatic system components as anti-extrusion devices in conjunction with packings and O-rings.

1.1 Use

Retainers to the dimensions in this specification are for use in glands to MIL-G-5514 (formerly MIL-P-5514C, D and E Revisions) (Cancelled). They may also be used in glands to AS4716, however, please refer to the Caution and Important Note below.

Caution: Parts standard AS5781 for back-up rings for use in glands to AS4716 has been published. For new design, backup rings to AS8791 should not be used in AS4716 glands.

Important Note: The dimensional requirements of this specification are the same as former Military Specification MIL-R-8791/1*. As such, no attempt has been made to ensure the lap of the scarf-cut ends is adequately designed to be functionally satisfactory at low temperatures or to cater for cylinder expansion (breathing) due to pressure effects. Users should ensure satisfactory performance by testing at the appropriate low temperature for each application.

* With the exception of dash sizes 004, 005, 006 where the angle of the scarf-cut has been changed for reasons of manufacturability.

1.1.1 MIL-R-8791 (cancelled) and AS8791 (original issue) were used for the material specification for back-up rings to MIL-R-8791/1 (cancelled) and the following military standards that are inactive for new design: MS27595, MS28773, MS28774, MS28782, MS28783. This specification (AS8791) should be used as the material call-out for the standards listed above.

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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 724-776-4970 (outside USA), Website Address www.sae.org.

AMS3678	Polytetrafluoroethylene (PTFE) Moldings and Extrusions Unfilled, Pigmented, and Filled Compounds
AS4716	Gland Design, O-ring and Other Elastomeric Seals
AS5781	Retainers (Backup Rings), Hydraulic and Pneumatic, Polytetrafluoroethylene Resin, Single Turn, Scarf-Cut, For Use in AS4716 Glands

2.1.2 U.S. Government Publications

Available from the Document Automation and Production Service (DAPS), Building 4/D, 700 Robbins Avenue, Philadelphia, PA 19111-5094, Tel: 215-697-6257, Website Address <http://assist.daps.dla.mil/quicksearch/>.

MIL-G-5514	Gland Design, Packings, Hydraulic, General Requirements for (Inactive for New Design)
MIL-R-8791	Retainer, Packing, Hydraulic and Pneumatic, Polytetrafluoroethylene Resin (Single Turn) (Cancelled)
MIL-R-8791/1	Retainer, Packing, Hydraulic and Pneumatic, Polytetrafluoroethylene, Single Turn (Cancelled)
MS27595	Retainer, Packing Backup, Continuous Ring, Tetrafluoroethylene (Inactive for New Design)
MS28773	Retainer, Packing Backup, Tetrafluoroethylene, Straight Thread Tube Fitting Boss (Inactive for New Design)
MS28774	Retainer, Packing Backup, Single Turn, Tetrafluoroethylene (Inactive for New Design)
MS28782	Retainer, Packing Backup, Teflon (Inactive for New Design)
MS28783	Ring, Gasket, Backup, Teflon (Inactive for New Design)

3. TECHNICAL REQUIREMENTS

3.1 Material

Material for parts to this specification shall be virgin polytetrafluoroethylene (PTFE) conforming to AMS3678 Type 1, Grade B, Virgin Polytetrafluoroethylene (PTFE) Moldings and Extrusions.

3.2 Safety - Hazardous Materials

While the materials, methods, applications, and processes described or referenced in this specification may involve the use of hazardous materials, this specification does not address the hazards which may be involved in such use. It is the sole responsibility of the user to ensure familiarity with the safe and proper use of any hazardous materials and to take necessary precautionary measures to ensure the health and safety of all personnel involved.

3.3 Dimensional Requirements

The shape and dimensions of PTFE retainers shall conform to Figure 1 and Tables 1A and 1B.

3.3.1 Surfaces and Edges

Surfaces shall be smooth and free from irregularities. Edges shall be clean and sharp.

3.3.2 Scarf-cut

When measuring diameter $M \pm 0.001$ inches (0.03 mm) over a mandrel (see Tables 1A and 1B) the scarf-cut shall not exceed dimension 'G' and shall exhibit no overlap. These measurements are to be made at stabilized temperature of $73^{\circ}\text{F} \pm 2^{\circ}\text{F}$ ($23^{\circ}\text{C} \pm 1^{\circ}\text{C}$).

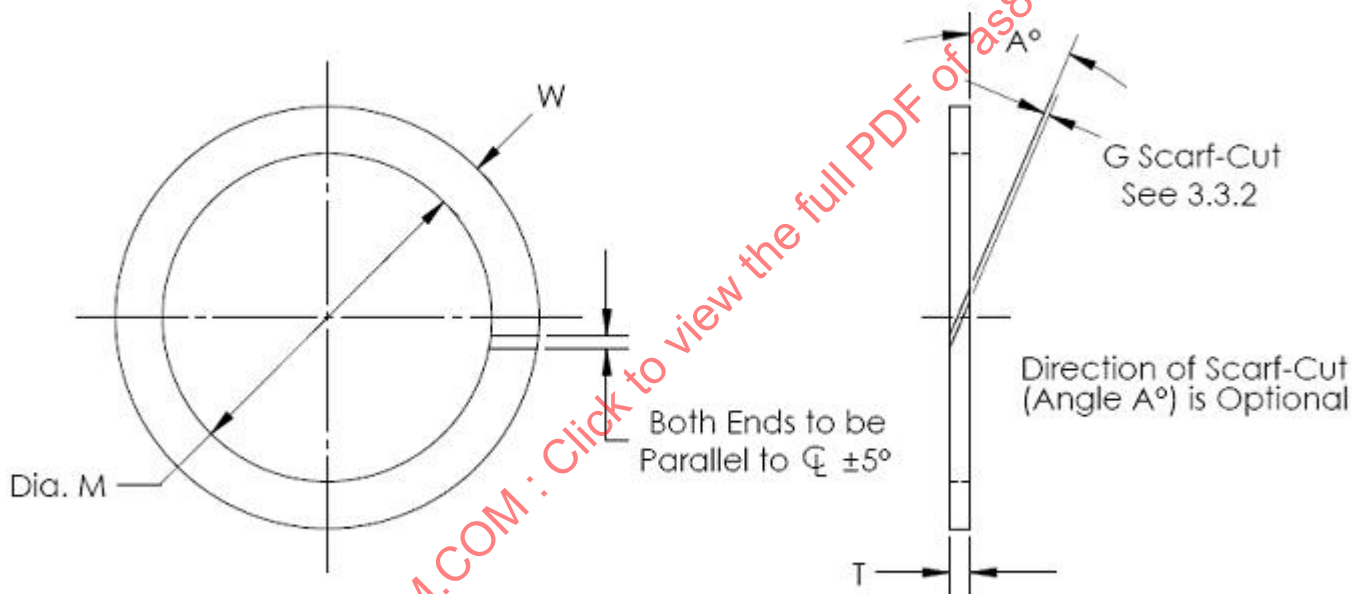


FIGURE 1 - RETAINER, PACKING, HYDRAULIC AND PNEUMATIC, POLYTETRAFLUOROETHYLENE, SINGLE TURN

TABLE 1A - DASH NUMBERS AND DIMENSIONS IN INCHES

Part No.	M Dia. Gage $\pm .001$	T $\pm .002$	W $\pm .001$	G Max See 3.3.2	A Degrees Range
M8791/1-004	.076	.050	.053	.005	45-42
M8791/1-005	.108	.050	.053	.005	36-33
M8791/1-006	.123	.050	.053	.005	33-30
M8791/1-007	.154	.050	.053	.005	27-24
M8791/1-008	.185	.050	.053	.005	22-19
M8791/1-009	.217	.050	.053	.005	22-19
M8791/1-010	.248	.050	.053	.005	22-19
M8791/1-011	.310	.050	.053	.005	22-19
M8791/1-012	.373	.050	.053	.005	22-19
M8791/1-013	.438	.050	.053	.005	22-19
M8791/1-014	.501	.050	.053	.005	22-19
M8791/1-015	.563	.050	.053	.005	22-19
M8791/1-016	.626	.050	.053	.005	22-19
M8791/1-017	.688	.050	.053	.005	22-19
M8791/1-018	.751	.050	.053	.005	22-19
M8791/1-019	.813	.050	.053	.005	22-19
M8791/1-020	.881	.050	.053	.005	22-19
M8791/1-021	.943	.050	.053	.005	22-19
M8791/1-022	1.006	.050	.053	.005	22-19
M8791/1-023	1.068	.050	.053	.005	22-19
M8791/1-024	1.131	.050	.053	.005	22-19
M8791/1-025	1.193	.050	.053	.005	22-19
M8791/1-026	1.256	.050	.053	.005	22-19
M8791/1-027	1.318	.050	.053	.005	22-19
M8791/1-028	1.381	.050	.053	.005	22-19
M8791/1-110	.373	.054	.086	.006	22-19
M8791/1-111	.435	.054	.086	.006	22-19
M8791/1-112	.498	.054	.086	.006	22-19
M8791/1-113	.560	.054	.086	.006	22-19
M8791/1-114	.623	.054	.086	.006	22-19
M8791/1-115	.685	.054	.086	.006	22-19
M8791/1-116	.748	.054	.086	.006	22-19
M8791/1-117	.815	.054	.086	.006	22-19
M8791/1-118	.878	.054	.086	.006	22-19
M8791/1-119	.940	.054	.086	.006	22-19
M8791/1-120	1.003	.054	.086	.006	22-19
M8791/1-121	1.065	.054	.086	.006	22-19
M8791/1-122	1.128	.054	.086	.006	22-19
M8791/1-123	1.190	.054	.086	.006	22-19
M8791/1-124	1.253	.054	.086	.006	22-19
M8791/1-125	1.315	.054	.086	.006	22-19

TABLE 1A - DASH NUMBERS AND DIMENSIONS IN INCHES (CONTINUED)

Part No.	M Dia. Gage $\pm .001$	T $\pm .002$	W $\pm .001$	G Max See 3.3.2	A Degrees Range
M8791/1-126	1.380	.054	.086	.006	22-19
M8791/1-127	1.442	.054	.086	.006	22-19
M8791/1-128	1.505	.054	.086	.006	22-19
M8791/1-129	1.564	.054	.086	.006	22-19
M8791/1-130	1.627	.054	.086	.006	22-19
M8791/1-131	1.689	.054	.086	.006	22-19
M8791/1-132	1.752	.054	.086	.006	22-19
M8791/1-133	1.814	.054	.086	.006	22-19
M8791/1-134	1.877	.054	.086	.006	22-19
M8791/1-135	1.940	.054	.086	.006	22-19
M8791/1-136	2.002	.054	.086	.006	22-19
M8791/1-137	2.065	.054	.086	.006	22-19
M8791/1-138	2.127	.054	.086	.006	22-19
M8791/1-139 ¹	2.190	.054	.086	.006	22-19
M8791/1-210	.748	.062	.119	.006	22-19
M8791/1-211	.810	.062	.119	.006	22-19
M8791/1-212	.873	.062	.119	.006	22-19
M8791/1-213	.935	.062	.119	.006	22-19
M8791/1-214	.998	.062	.119	.006	22-19
M8791/1-215	1.060	.062	.119	.006	22-19
M8791/1-216	1.123	.062	.119	.006	22-19
M8791/1-217	1.185	.062	.119	.006	22-19
M8791/1-218	1.248	.062	.119	.006	22-19
M8791/1-219	1.310	.062	.119	.006	22-19
M8791/1-220	1.373	.062	.119	.006	22-19
M8791/1-221	1.435	.062	.119	.006	22-19
M8791/1-222	1.498	.062	.119	.006	22-19
M8791/1-223	1.625	.062	.119	.006	22-19
M8791/1-224	1.750	.062	.119	.006	22-19
M8791/1-225	1.875	.062	.119	.006	22-19
M8791/1-226	2.000	.062	.119	.006	22-19
M8791/1-227	2.125	.062	.119	.006	22-19
M8791/1-228	2.250	.062	.119	.006	22-19
M8791/1-229	2.375	.062	.119	.006	22-19
M8791/1-230 ¹	2.500	.062	.119	.006	22-19
M8791/1-325	1.498	.088	.183	.007	22-19
M8791/1-326	1.623	.088	.183	.007	22-19
M8791/1-327	1.748	.088	.183	.007	22-19
M8791/1-328	1.873	.088	.183	.007	22-19
M8791/1-329	1.998	.088	.183	.007	22-19
M8791/1-330	2.123	.088	.183	.007	22-19
M8791/1-331	2.248	.088	.183	.007	22-19

TABLE 1A - DASH NUMBERS AND DIMENSIONS IN INCHES (CONTINUED)

Part No.	M Dia. Gage ± .001	T +/- .002	W +/- .001	G Max See 3.3.2	A Degrees Range
M8791/1-332	2.373	.088	.183	.007	22-19
M8791/1-333	2.498	.088	.183	.007	22-19
M8791/1-334	2.623	.088	.183	.007	22-19
M8791/1-335	2.748	.088	.183	.007	22-19
M8791/1-336	2.873	.088	.183	.007	22-19
M8791/1-337	2.997	.088	.183	.007	22-19
M8791/1-338	3.122	.088	.183	.007	22-19
M8791/1-339	3.247	.088	.183	.007	22-19
M8791/1-340	3.372	.088	.183	.007	22-19
M8791/1-341	3.497	.088	.183	.007	22-19
M8791/1-342	3.622	.088	.183	.007	22-19
M8791/1-343	3.747	.088	.183	.007	22-19
M8791/1-344	3.872	.088	.183	.007	22-19
M8791/1-345	3.997	.088	.183	.007	22-19
M8791/1-346	4.122	.088	.183	.007	22-19
M8791/1-347	4.247	.088	.183	.007	22-19
M8791/1-348	4.372	.088	.183	.007	22-19
M8791/1-349	4.497	.088	.183	.007	22-19
M8791/1-425	4.497	.120	.236	.008	22-19
M8791/1-426	4.622	.120	.236	.008	22-19
M8791/1-427	4.747	.120	.236	.008	22-19
M8791/1-428	4.872	.120	.236	.008	22-19
M8791/1-429	4.997	.120	.236	.008	22-19
M8791/1-430	5.122	.120	.236	.008	22-19
M8791/1-431	5.247	.120	.236	.008	22-19
M8791/1-432	5.372	.120	.236	.008	22-19
M8791/1-433	5.497	.120	.236	.008	22-19
M8791/1-434	5.622	.120	.236	.008	22-19
M8791/1-435	5.747	.120	.236	.008	22-19
M8791/1-436	5.872	.120	.236	.008	22-19
M8791/1-437	5.997	.120	.236	.008	22-19

*1 For Larger packing retainers (back-up rings) in this series, uncut packing retainers MS27595 are recommended.

TABLE 1B - DASH NUMBERS AND DIMENSIONS IN MILLIMETERS

Part No.	M Dia. Gage ± 0.03	T ± 0.05	W ± 0.03	G Max See 3.3.2	A Degrees Range
M8791/1-004	1.930	1.270	1.346	0.127	45-42
M8791/1-005	2.743	1.270	1.350	0.130	36-33
M8791/1-006	3.124	1.270	1.350	0.130	33-30
M8791/1-007	3.912	1.270	1.350	0.130	27-24
M8791/1-008	4.699	1.270	1.350	0.130	22-19
M8791/1-009	5.512	1.270	1.350	0.130	22-19
M8791/1-010	6.299	1.270	1.350	0.130	22-19
M8791/1-011	7.874	1.270	1.350	0.130	22-19
M8791/1-012	9.474	1.270	1.350	0.130	22-19
M8791/1-013	11.125	1.270	1.350	0.130	22-19
M8791/1-014	12.725	1.270	1.350	0.130	22-19
M8791/1-015	14.300	1.270	1.350	0.130	22-19
M8791/1-016	15.900	1.270	1.350	0.130	22-19
M8791/1-017	17.475	1.270	1.350	0.130	22-19
M8791/1-018	19.075	1.270	1.350	0.130	22-19
M8791/1-019	20.650	1.270	1.350	0.130	22-19
M8791/1-020	22.377	1.270	1.350	0.130	22-19
M8791/1-021	23.952	1.270	1.350	0.130	22-19
M8791/1-022	25.552	1.270	1.350	0.130	22-19
M8791/1-023	27.127	1.270	1.350	0.130	22-19
M8791/1-024	28.727	1.270	1.350	0.130	22-19
M8791/1-025	30.302	1.270	1.350	0.130	22-19
M8791/1-026	31.902	1.270	1.350	0.130	22-19
M8791/1-027	33.477	1.270	1.350	0.130	22-19
M8791/1-028	35.077	1.270	1.350	0.130	22-19
M8791/1-110	9.474	1.372	2.184	0.152	22-19
M8791/1-111	11.049	1.372	2.184	0.152	22-19
M8791/1-112	12.649	1.372	2.184	0.152	22-19
M8791/1-113	14.224	1.372	2.184	0.152	22-19
M8791/1-114	15.824	1.372	2.184	0.152	22-19
M8791/1-115	17.399	1.372	2.184	0.152	22-19
M8791/1-116	18.999	1.372	2.184	0.152	22-19
M8791/1-117	20.701	1.372	2.184	0.152	22-19
M8791/1-118	22.301	1.372	2.184	0.152	22-19
M8791/1-119	23.876	1.372	2.184	0.152	22-19
M8791/1-120	25.476	1.372	2.184	0.152	22-19
M8791/1-121	27.051	1.372	2.184	0.152	22-19
M8791/1-122	28.651	1.372	2.184	0.152	22-19
M8791/1-123	30.226	1.372	2.184	0.152	22-19
M8791/1-124	31.826	1.372	2.184	0.152	22-19
M8791/1-125	33.401	1.372	2.184	0.152	22-19

TABLE 1B - DASH NUMBERS AND DIMENSIONS IN MILLIMETERS (CONTINUED)

Part No.	M Dia. Gage ± 0.03	T ± 0.05	W ± 0.03	G Max See 3.3.2	A Degrees Range
M8791/1-126	35.052	1.372	2.184	0.152	22-19
M8791/1-127	36.627	1.372	2.184	0.152	22-19
M8791/1-128	38.227	1.372	2.184	0.152	22-19
M8791/1-129	39.726	1.372	2.184	0.152	22-19
M8791/1-130	41.326	1.372	2.184	0.152	22-19
M8791/1-131	42.901	1.372	2.184	0.152	22-19
M8791/1-132	44.501	1.372	2.184	0.152	22-19
M8791/1-133	46.076	1.372	2.184	0.152	22-19
M8791/1-134	47.676	1.372	2.184	0.152	22-19
M8791/1-135	49.276	1.372	2.184	0.152	22-19
M8791/1-136	50.851	1.372	2.184	0.152	22-19
M8791/1-137	52.451	1.372	2.184	0.152	22-19
M8791/1-138	54.026	1.372	2.184	0.152	22-19
M8791/1-139 ¹	55.626	1.372	2.184	0.152	22-19
M8791/1-210	18.999	1.575	3.023	0.152	22-19
M8791/1-211	20.574	1.575	3.023	0.152	22-19
M8791/1-212	22.174	1.575	3.023	0.152	22-19
M8791/1-213	23.749	1.575	3.023	0.152	22-19
M8791/1-214	25.349	1.575	3.023	0.152	22-19
M8791/1-215	26.924	1.575	3.023	0.152	22-19
M8791/1-216	28.524	1.575	3.023	0.152	22-19
M8791/1-217	30.099	1.575	3.023	0.152	22-19
M8791/1-218	31.699	1.575	3.023	0.152	22-19
M8791/1-219	33.274	1.575	3.023	0.152	22-19
M8791/1-220	34.874	1.575	3.023	0.152	22-19
M8791/1-221	36.449	1.575	3.023	0.152	22-19
M8791/1-222	38.049	1.575	3.023	0.152	22-19
M8791/1-223	41.275	1.575	3.023	0.152	22-19
M8791/1-224	44.450	1.575	3.023	0.152	22-19
M8791/1-225	47.625	1.575	3.023	0.152	22-19
M8791/1-226	50.800	1.575	3.023	0.178	22-19
M8791/1-227	53.975	1.575	3.023	0.178	22-19
M8791/1-228	57.150	1.575	3.023	0.178	22-19
M8791/1-229	60.325	1.575	3.023	0.178	22-19
M8791/1-230 ¹	63.500	1.575	3.023	0.178	22-19
M8791/1-325	38.049	2.235	3.023	0.178	22-19
M8791/1-326	41.224	2.235	3.023	0.178	22-19
M8791/1-327	44.399	2.235	3.023	0.178	22-19
M8791/1-328	47.574	2.235	3.023	0.178	22-19
M8791/1-329	50.749	2.235	3.023	0.178	22-19
M8791/1-330	53.924	2.235	3.023	0.178	22-19
M8791/1-331	57.099	2.235	3.023	0.178	22-19

TABLE 1B - DASH NUMBERS AND DIMENSIONS IN MILLIMETERS (CONTINUED)

Part No.	M Dia. Gage ± 0.03	T ± 0.05	W ± 0.03	G Max See 3.3.2	A Degrees Range
M8791/1-332	60.274	2.235	3.023	0.178	22-19
M8791/1-333	63.449	2.235	3.023	0.178	22-19
M8791/1-334	66.624	2.235	3.023	0.178	22-19
M8791/1-335	69.799	2.235	3.023	0.178	22-19
M8791/1-336	72.974	2.235	3.023	0.178	22-19
M8791/1-337	76.124	2.235	3.023	0.178	22-19
M8791/1-338	79.299	2.235	3.023	0.178	22-19
M8791/1-339	82.474	2.235	3.023	0.178	22-19
M8791/1-340	85.649	2.235	3.023	0.178	22-19
M8791/1-341	88.824	2.235	3.023	0.178	22-19
M8791/1-342	91.999	2.235	3.023	0.178	22-19
M8791/1-343	95.174	2.235	3.023	0.178	22-19
M8791/1-344	98.349	2.235	3.023	0.178	22-19
M8791/1-345	101.524	2.235	3.023	0.178	22-19
M8791/1-346	104.699	2.235	3.023	0.178	22-19
M8791/1-347	107.874	2.235	3.023	0.178	22-19
M8791/1-348	111.049	2.235	3.023	0.178	22-19
M8791/1-349	114.224	2.235	3.023	0.178	22-19
M8791/1-425	114.224	3.048	5.994	0.203	22-19
M8791/1-426	117.399	3.048	5.994	0.203	22-19
M8791/1-427	120.574	3.048	5.994	0.203	22-19
M8791/1-428	123.749	3.048	5.994	0.203	22-19
M8791/1-429	126.924	3.048	5.994	0.203	22-19
M8791/1-430	130.099	3.048	5.994	0.203	22-19
M8791/1-431	133.274	3.048	5.994	0.203	22-19
M8791/1-432	136.449	3.048	5.994	0.203	22-19
M8791/1-433	139.624	3.048	5.994	0.203	22-19
M8791/1-434	142.799	3.048	5.994	0.203	22-19
M8791/1-435	145.974	3.048	5.994	0.203	22-19
M8791/1-436	149.149	3.048	5.994	0.203	22-19
M8791/1-437 ¹	152.324	3.048	5.994	0.203	22-19

*1 For Larger packing retainers (back-up rings) in this series, uncut packing retainers MS27595 are recommended.