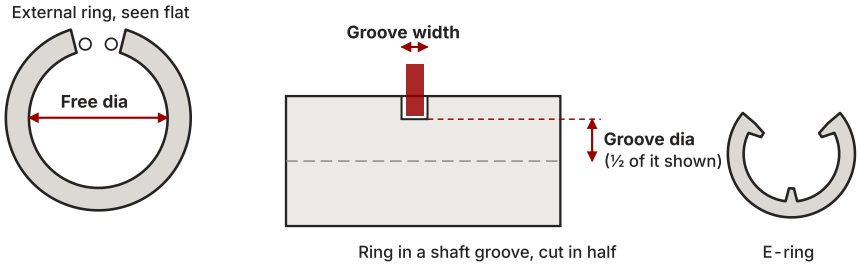
Retaining Ring Sizes

jandesupply.com/reference-retaining-ring-sizes.php

J & E Supply & FASTENER CO.

Inch retaining rings by shaft or bore size: the ring's free diameter and thickness, and the groove diameter and width to cut for it.

A **retaining ring** (circlip, snap ring) snaps into a groove and makes a shoulder that holds a bearing, gear or pin in place on a shaft or in a bore. An **external** retaining ring is spread open with pliers, slipped over the shaft and let close into a groove cut around it. An **internal** retaining ring is squeezed closed with pliers, put into the bore and let open into a groove cut inside it. An **E-ring** is an external ring that pushes onto the shaft groove from the side. Each is sized by the shaft or bore it fits. A **crescent ring** (C-ring) has no lugs: it pushes onto the shaft groove from the side, like an E-ring. A **reinforced E-ring** is an E-ring with a heavier section, pushed on from the side the same way.



The labels match the table columns. Not to scale.

External retaining rings — basic, for shafts (MS16624 sizes)

SIZE	SHAFT	FREE DIA	THICKNESS	GROOVE DIA	GROOVE WIDTH
1/8"	.125	.112	.010	.117	.012
5/32"	.156	.142	.010	.146	.012
3/16"	.188	.168	.015	.175	.018
.197	.197	.179	.015	.185	.018
7/32"	.219	.196	.015	.205	.018
.236	.236	.215	.015	.222	.018
1/4"	.250	.225	.025	.230	—
.276	.276	.250	.025	.255	—
9/32"	.281	.256	.025	.261	—
5/16"	.312	.281	.025	.290	—
11/32"	.344	.309	.025	.321	—
.354	.354	.320	.025	.330	—
3/8"	.375	.338	.025	.352	—
.394	.394	.354	.025	.369	—
13/32"	.406	.366	.025	.382	—
7/16"	.438	.395	.025	.412	—
15/32"	.469	.428	.025	.443	—
1/2"	.500	.461	.035	.468	—
.551	.551	.509	.035	.519	—
9/16"	.562	.521	.035	.530	—
19/32"	.594	.550	.035	.559	—
5/8"	.625	.579	.035	.588	—
.669	.669	.621	.035	.629	—
.672	.672	.621	.035	.631	—
11/16"	.688	.635	.042	.646	—
3/4"	.750	.693	.042	.704	—
25/32"	.781	.722	.042	.733	—
13/16"	.812	.751	.042	.762	—
7/8"	.875	.810	.042	.821	—
15/16"	.938	.867	.042	.882	—
.984	.984	.910	.042	.926	—
1"	1.000	.925	.042	.940	—
1.023	1.023	.946	.042	.961	—
1-1/16"	1.062	.982	.050	.998	.056
1-1/8"	1.125	1.041	.050	1.059	.056

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SIZE	SHAFT	FREE DIA	THICKNESS	GROOVE DIA	GROOVE WIDTH
1-3/16"	1.188	1.098	.050	1.118	.056
1-1/4"	1.250	1.156	.050	1.176	.056
1-5/16"	1.312	1.214	.050	1.232	.056
1-3/8"	1.375	1.272	.050	1.291	.056
1-7/16"	1.438	1.333	.050	1.350	.056
1-1/2"	1.500	1.387	.050	1.406	.056
1-9/16"	1.562	1.446	.062	1.468	.068
1-5/8"	1.625	1.503	.062	1.529	.068
1-11/16"	1.687 / 1.688	1.560	.062	1.589	.068
1-3/4"	1.750	1.618	.062	1.650	.068
1.772	1.772	1.637	.062	1.669	.068
1-13/16"	1.812	1.675	.062	1.708	.068
1-7/8"	1.875	1.735	.062	1.769	.068
1-31/32"	1.969	1.819	.062	1.857	.068
2"	2.000	1.850	.062	1.886	.068
2-1/16"	2.062	1.906	.078	1.946	.086
2-1/8"	2.125	1.964	.078	2.003	.086
2-5/32"	2.156	1.993	.078	2.032	.086
2-1/4"	2.250	2.081	.078	2.120	.086
2-5/16"	2.312	2.139	.078	2.178	.086
2-3/8"	2.375	2.197	.078	2.239	.086
2-7/16"	2.438	2.255	.078	2.299	.086
2-1/2"	2.500	2.313	.078	2.360	.086
2.559	2.559	2.377	.078	2.419	.086
2-5/8"	2.625	2.428	.078	2.481	.086
2-11/16"	2.688	2.485	.078	2.541	.086
2-3/4"	2.750	2.543	.093	2.602	.103
2-7/8"	2.875	2.659	.093	2.721	.103
2-15/16"	2.938	2.717	.093	2.779	.103
3"	3.000	2.775	.093	2.838	.103
3-1/16"	3.062	2.832	.093	2.898	.103
3-1/8"	3.125	2.892	.093	2.957	.103
3-5/32"	3.156	2.920	.093	2.986	.103
3-1/4"	3.250	3.006	.093	3.076	.103
3.346	3.346	3.092	.093	3.166	.103
3-7/16"	3.438	3.179	.093	3.257	.103
3-1/2"	3.500	3.237	.109	3.316	.120
3.543	3.543	3.277	.109	3.357	.120
3-5/8"	3.625	3.352	.109	3.435	.120
3-11/16"	3.688	3.410	.109	3.493	.120
3-3/4"	3.750	3.468	.109	3.552	.120
3-7/8"	3.875	3.584	.109	3.673	.120
3-15/16"	3.938	3.642	.109	3.734	.120
4"	4.000	3.700	.109	3.792	.120
4-1/4"	4.250	3.989	.109	4.065	.120
4-3/8"	4.375	4.106	.109	4.190	.120
4-1/2"	4.500	4.223	.109	4.310	.120
4-3/4"	4.750	4.458	.109	4.550	.120
5"	5.000	4.692	.109	4.790	.120
5-1/4"	5.250	4.927	.125	5.030	.139
5-1/2"	5.500	5.162	.125	5.265	.139
5-3/4"	5.750	5.396	.125	5.505	.139
6"	6.000	5.631	.125	5.745	.139
6-1/4"	6.250	5.866	.156	5.985	.174
6-1/2"	6.500	6.100	.156	6.225	.174
6-3/4"	6.750	6.335	.156	6.465	.174
7"	7.000	6.570	.156	6.705	.174
7-1/2"	7.500	7.009	.187	7.180	.209

Inches. Basic sizes from MS16624 and the Waldes Truarc 5100 and IRR 3100 tables; printed where two or more agree. A dash: our sources differ (the smaller sizes' groove widths), or only one lists it — give us a call.

Internal retaining rings — basic, for housings and bores

SIZE	HOUSING	FREE DIA	THICKNESS	GROOVE DIA	GROOVE WIDTH
1/4″	.250	.280	.015	.268	—
5/16″	.312	.346	.015	.330	—
3/8″	.375	.415	.025	.397	.029
7/16″	.438	.482	.025	.461	.029
1/2″	.500	.548	.035	—	.039
9/16″	.562	.620	.035	.596	.039
5/8″	.625	.694	.035	.665	.039
11/16″	.688	.763	.035	.732	.039
3/4″	.750	.831	.035	.796	.039
13/16″	.812	.901	.042	.862	.046
7/8″	.875	.971	.042	.931	.046
15/16″	.938	1.041	.042	1.000	.046
1″	1.000	1.111	.042	1.066	.046
1-1/16″	1.062	1.180	.050	1.130	.056
1-1/8″	1.125	1.249	.050	1.197	.056
1.181	1.181	1.319	.050	1.255	.056
1-1/4″	1.250	1.388	.050	1.330	.056
1-5/16″	1.312	1.456	.050	—	.056
1-3/8″	1.375	1.526	.050	1.461	.056
1-7/16″	1.438	1.596	.050	1.528	.056
1-1/2″	1.500	1.660	.050	1.594	.056
1-9/16″	1.562	1.734	.062	1.658	.068
1-5/8″	1.625	1.804	.062	1.725	.068
1-11/16″	1.688	1.874	.062	1.792	.068
1-3/4″	1.750	1.942	.062	1.858	.068
1-13/16″	1.812	2.012	.062	1.922	.068
1-7/8″	1.875	—	.062	1.989	.068
1-15/16″	1.938	2.141	.062	2.056	.068
2″	2.000	2.210	.062	2.122	.068
2-1/16″	2.062	2.280	.078	2.186	.086
2-1/8″	2.125	2.350	.078	2.251	.086
2-3/16″	2.188	2.415	.078	2.318	.086
2-1/4″	2.250	2.490	.078	2.382	.086
2-5/16″	2.312	2.560	.078	2.450	.086
2-3/8″	2.375	2.630	.078	2.517	.086
2.440	2.440	2.702	.078	2.584	.086
2-1/2″	2.500	2.775	.078	2.648	.086
2-9/16″	2.562	2.844	.093	2.714	.103
2-5/8″	2.625	2.910	.093	2.781	.103
2-11/16″	2.688	2.980	.093	2.848	.103
2-3/4″	2.750	3.050	.093	2.914	.103
2-13/16″	2.812	3.121	.093	2.980	.103
2-7/8″	2.875	3.191	.093	3.051	.103
3″	3.000	3.325	.093	3.182	.103

Inches. Basic sizes from the Waldes Truarc N5000 and IRR 3000 tables, printed where both agree; more housing sizes, over 3″ too, are in the table after the E-rings. A dash: our sources differ — give us a call.

E-rings — external, reduced section (MS16633 sizes)

SIZE	SHAFT	FREE DIA	THICKNESS	GROOVE DIA	GROOVE WIDTH
.040	.040	.025	.010	.026	.012
1/16″	.062	.051	.010	.052	—
3/32″	.094	.073	.015	.074	—

SIZE	SHAFT	FREE DIA	THICKNESS	GROOVE DIA	GROOVE WIDTH
7/64″	.110	.076	.015	.079	—
1/8″	.125	.094	.015	.095	—
5/32″	.156	.114	.025	.116	—
11/64″	.172	.125	.025	.127	—
3/16″	.188	.145	.025	.147	—
7/32″	.218 / .219	.185	.025	.188	—
1/4″	.250	.207	.025	.210	—
5/16″	.312	.243	.025	.250	—
3/8″	.375	.300	.035	.303	—
7/16″	.437 / .438	.337	.035	.343	—
1/2″	.500	.392	.042	.396	—
5/8″	.625	.480	.042	.485	—
.744	.744	.616	.050	.625	.056
3/4″	.750	.574	.050	.580	.056
7/8″	.875	—	.050	.675	.056
.984	.984 / .985	.822	.050	.835	.056
1-3/16″	1.188	1.066	.062	1.079	.068
1-3/8″	1.375	1.213	.062	1.230	.068

Inches. Basic sizes from MS16633 and the IRR 1000 table, printed where both agree. Free dia is the E-ring's inside opening, relaxed. A dash: our sources differ — give us a call.

Internal retaining rings — more housing sizes (IRR 3000 / Arcon N1300 sizes)

SIZE	HOUSING	FREE DIA	THICKNESS	GROOVE DIA	GROOVE WIDTH
29/64″	.453	.498	.025	.477	.029
.512	.512	.560	.035	.542	.039
.777	.777	.859	.042	.825	.046
.866	.866	.961	.042	.920	.046
.901	.901	1.000	.042	.959	.046
1.023	1.023	1.136	.042	1.091	.046
1-3/16″	1.188	1.319	.050	1.262	.056
1.259	1.259	1.388	.050	1.339	.056
1.378	1.378	1.526	.050	1.464	.056
1.456	1.456	1.616	.050	1.548	.056
1.575	1.575	1.734	.062	1.671	.068
1.653	1.653	1.835	.062	1.755	.068
1.850	1.850	2.054	.062	1.962	.068
2.047	2.047	2.280	.078	2.171	.086
2.165	2.165	2.415	.078	2.295	.086
2-17/32″	2.531	2.775	.078	2.681	.086
2.677	2.677	2.980	.093	2.837	.103
2.835	2.835	3.121	.093	3.006	.103
2.953	2.953	3.325	.093	3.135	.103
3-1/16″	3.062	3.418	.109	3.248	.120
3-1/8″	3.125	3.488	.109	3.315	.120
3.149	3.149 / 3.150	3.523	.109	3.341	.120
3-5/32″	3.156	3.523	.109	3.348	.120
3-1/4″	3.250	3.623	.109	3.446	.120
3.346	3.346	3.734	.109	3.546	.120
3-15/32″	3.469	3.857	.109	3.675	.120
3-1/2″	3.500	3.890	.109	3.710	.120
3.543	3.543	3.936	.109	3.755	.120
3-9/16″	3.562	3.936	.109	3.776	.120
3-5/8″	3.625	4.024	.109	3.841	.120
3.740	3.740	4.157	.109	3.964	.120
3-3/4″	3.750	4.157	.109	3.974	.120
3-7/8″	3.875	4.291	.109	4.107	.120
3-15/16″	3.938	4.358	.109	4.174	.120
4″	4.000	4.424	.109	4.240	.120

SIZE	HOUSING	FREE DIA	THICKNESS	GROOVE DIA	GROOVE WIDTH
4-1/8"	4.125	4.558	.109	4.365	.120
4-1/4"	4.250	4.691	.109	4.490	.120
4.331	4.331	4.756	.109	4.571	.120
4-1/2"	4.500	4.940	.109	4.740	.120
4-5/8"	4.625	5.076	.109	4.865	.120
4.724	4.724	5.213	.109	4.969	.120
4-3/4"	4.750	5.213	.109	4.995	.120
5"	5.000	5.485	.109	5.260	.120
5-1/4"	5.250	5.770	.125	5.520	.139
5-3/8"	5.375	5.910	.125	5.650	.139
5-1/2"	5.500	6.066	.125	5.770	.139
5-3/4"	5.750	6.336	.125	6.020	.139
6"	6.000	6.620	.125	6.270	.139
6-1/4"	6.250	6.895	.156	6.530	.174
6-1/2"	6.500	7.170	.156	6.790	.174
6-5/8"	6.625	7.308	.156	6.925	.174
6-3/4"	6.750	7.445	.156	7.055	.174
7"	7.000	7.720	.156	7.315	.174
7-1/4"	7.250	7.995	.187	7.575	.209
7-1/2"	7.500	8.270	.187	7.840	.209
7-3/4"	7.750	8.545	.187	8.100	.209
8"	8.000	8.820	.187	8.360	.209
8-1/4"	8.250	9.095	.187	8.620	.209

Inches. Housing sizes the basic chart above doesn't list, from the IRR 3000 and Arcon N1300 tables, printed where both agree. Sizes only one of them lists are left off — give us a call.

Crescent rings (C-rings) — for shafts (IRR 2000 / Arcon 1800 sizes)

SIZE	SHAFT	FREE DIA	THICKNESS	GROOVE DIA	GROOVE WIDTH
1/8"	.125	.102	.015	.106	—
5/32"	.156	.131	.015	.135	—
3/16"	.188	.161	.015	.165	—
7/32"	.219	.187	.025	.193	.029
.236	.236	.203	.025	.208	.029
1/4"	.250	.211	.025	.220	.029
9/32"	.281	.242	.025	.247	.029
5/16"	.312	.270	.025	.276	.029
3/8"	.375	.328	.025	.335	.029
13/32"	.406	.359	.025	.364	.029
7/16"	.437 / .438	.386	.025	.393	.029
1/2"	.500	.441	.035	.450	.039
9/16"	.562	.497	.035	.507	.039
5/8"	.625	.553	.035	.563	.039
11/16"	.687 / .688	—	.042	.619	.046
3/4"	.750	.665	.042	.676	.046
13/16"	.812	.721	.042	.732	.046
7/8"	.875	.777	.042	.789	.046
15/16"	.937 / .938	.830	.042	.843	.046
1"	1.000	.887	.042	.900	.046
1-1/8"	1.125	.997	.050	1.013	.056
1-3/8"	1.375	1.220	.050	1.237	.056
1-1/2"	1.500	1.331	.050	1.350	.056
1-3/4"	1.750	1.555	.062	1.576	.068
2"	2.000	1.777	.062	1.800	.068

Inches. From the IRR 2000 and Arcon 1800 tables (MS16632 type), printed where both agree. Free dia is the ring's inside opening, relaxed. A dash: our sources differ (the smallest sizes' groove widths), or only one lists it — give us a call.

Reinforced E-rings — for shafts (IRR 1200 / Arcon 1540 sizes)

SIZE	SHAFT	FREE DIA	THICKNESS	GROOVE DIA	GROOVE WIDTH
3/32″	.094	.072	.015	.074	.018
1/8″	.125	.093	.015	.095	.018
5/32″	.156	.113	.025	.116	.029
3/16″	.188	.143	.025	.147	.029
7/32″	.219	.182	.025	.188	.029
1/4″	.250	.204	.025	.210	.029
5/16″	.312	.242	—	.250	—
3/8″	.375	.292	.035	.303	.039
7/16″	.438	.332	.035	.343	.039
1/2″	.500	.385	.042	.396	.046
9/16″	.562	.430	.042	.437	.046

Inches. From the IRR 1200 and Arcon 1540 tables (MS3215 type), printed where both agree. Free dia is the ring's inside opening, relaxed. A dash: our sources differ — give us a call.

Good to know

Order by the shaft or bore size, check by the groove. The ring is made to the groove: an external ring's free diameter is smaller than its groove so it grips it, and an internal ring's is larger so it pushes out into it. Cut the groove to the listed diameter and width, square at the bottom.

Thickness is for plain (unplated) rings — the standard and the maker's tables say so for external rings and E-rings; plated and stainless rings can run a little thicker. Thrust load ratings aren't on our chart: the makers rate them with different safety factors. For a critical load, use the ring maker's rating for the exact part.

Quick answers

What size retaining ring fits a 1/2 inch shaft?

A 1/2″ external (shaft) ring: free diameter **.461″**, thickness **.035″**, in a groove cut to **.468″** diameter.

What groove does a 1 inch internal retaining ring need?

A 1″ internal (housing) ring goes in a groove **1.066″** in diameter and **.046″** wide; the ring is .042″ thick, 1.111″ across before it goes in.

What are the dimensions of a 1/4 E-ring?

An E-ring for a 1/4″ shaft: groove diameter **.210″**, ring thickness **.025″**, free (inside) diameter .207″.

What is the difference between an internal and an external retaining ring?

An **external** ring is spread open and snaps into a groove on a shaft; an **internal** ring is squeezed closed and snaps into a groove inside a bore or housing. Both are sized by the shaft or bore they fit.

What is the free diameter of a retaining ring?

The ring's size relaxed, before it is installed. On this chart an external ring's free diameter is smaller than its groove, so it grips it; an internal ring's is larger than its groove, so it pushes out into it.

Reference values drawn from the governing standards. For critical applications, confirm against the standard and the manufacturer's published data. Technical information disclaimer →