NEWMAN

SANITARY GASKET COMPANY

Products of integrity...from people of integrity.

FDA & USP "O"-RINGS

ISO 9001:2000 CERTIFICATION

PLATINUM CURED SILICONE

NEWMAN SANITARY GASKET COMPANY FDA CERTIFICATION

NEWMAN SANITARY GASKET COMPANY USP CLASS VI CERTIFICATION

Kalrez® perfluoroelastomer parts

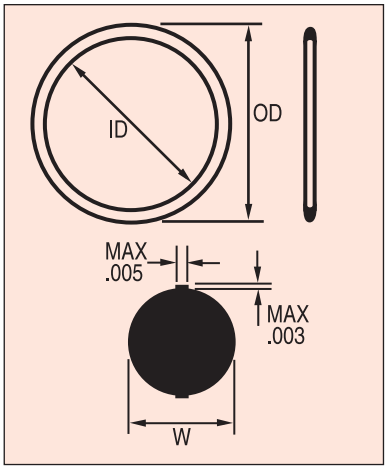
DuPont Dow elastomers

AUTHORIZED DISTRIBUTOR

www.newmangasket.com

How to size your "O"-Rings

If you don't know the size or number of the "O"-Ring, you will need to determine the I.D. and width (see illustration below); or you may enclose a sample of the size you need with your quote request or order.



If your FDA rubber requirements are demanding, you can be assured that Newman will meet your exact standards precisely. For specific applications, data and design assistance, give us a call.

Newman Elastomer Characteristics

Newman Sanitary Gasket Company has the largest stock of FDA "O"-Rings in North America ready to serve your requirements whether your needs are small or large. You will find our quality "O"-Rings have the mechanical properties you are seeking, plus the most demanding quality criteria.

Buna-N compound No. 1107 material will handle most food, dairy, pharmaceutical and sanitary services. It is the backbone of the food and edibles industries, has excellent resistance to compression set, tear and abrasion. It has good acid and mild alkali resistance and is good for vegetable oil service. Rated at -40° to 225°F.

EPDM (ethylene propylene rubber) compound No. 2107 is excellent for hot water and steam service up to 325°F. It is very abrasion-resistant and has excellent resistance to ozone, sunlight or weather and deionized water. EPDM also has good tensile strength and good resistance to mild acids, alkalis and alcohols. Rated -65°F to 350°F (short term to 400°F).

CMPD No. 2197 material will handle soft drink applications and is very well suited for products containing aspartame, Nutra–Sweet®.

Viton® (bisphenol cured fluorocarbon elastomer) compound No. 3207 material has excellent mechanical, chemical, heat and steam resistance. It is particularly well-suited for hot fatty and oil products. Viton® is especially good for hard vacuum service because of its high molecular weight and low gas permeability. It has been used to -65°F in some static seals — flexibility, 0°F to 400°F under continuous duty and will take 600°F for short periods of time. Rated at -20°F to 400°F (short terms to 600°F).

Silicone Platinum cured compound No. 4137 (red) and No. 4749 (clear) material is known for its standard of purity and non-leaching characteristics. Its ability to withstand many chemicals and combination of chemicals is the reason it is so popular with the pharmaceutical industry. Silicone has excellent low temperature flexibility — to 100°F in dry heat; 450°F is the top for continuous duty with 600°F possible for short periods. Rated at -80° to 400°F.

Kalrez® perfluoroelastomer compounds No. 6230 (black) and 6221 (white) last longer and seal more effectively than other elastomers due to their exceptional chemical resistance and thermal stability. Kalrez® o-rings can withstand attack by more than 1,800 chemicals, including many acids and amines that cause other elastomers to fail due to excessive swelling. Even after long-term exposure to temperatures up to 600°F, Kalrez® retains its elasticity and recovery properties better than other high temperature elastomers

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Newman "O"-Ring sizes are the same as those established in AS568A, which includes more available sizes than several of the military specifications. These sizes and tolerances were published by SAE and have been approved by the Air Standards Committee (membership by U.S.A., Australia, Canada, New Zealand, and the United Kingdom) July 1974 and are illustrated in the table below and on the following pages.

AS568A
Standard Dimensional Tolerance Table (RMA A2)Molded Solid Rubber Products

Size (inches)	Fixed	Closure
Above Incl.		
0 - .40	±.006	±.008
.40 - .63	.008	.010
.63 - 1.00	.010	.013
1.00 - 1.60	.013	.016
1.60 - 2.50	.016	.020
2.50 - 4.00	.020	.025
4.00 - 6.30	.025	.032
6.30 & over:		

To find fixed dimensional tolerances, multiply by 0.4%.

NEWMAN "O"-RINGS MEET

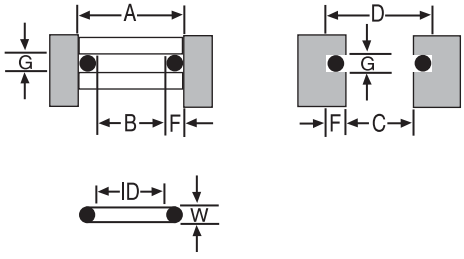
Teflon® is a registered trademark of DuPont Fluorocarbon Resins Viton® is a registered trademark of DuPont Dow Elastomers Kalrez® is a registered trademark of DuPont Dow Elastomers

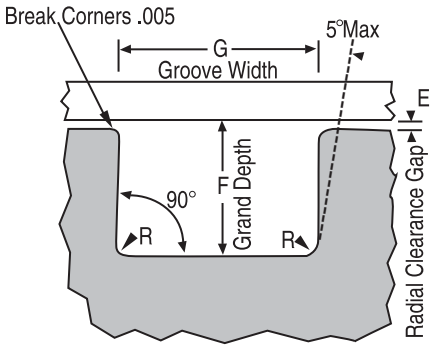
Groove Finish

Straight-sided grooves are best to prevent extrusion or nibbling, but 5° sloping sides are easier to machine and are suitable for pressures up to 1500 psi. Finish sides to 32 RMS with no burrs, nicks, or scratches. Locate in a shaft or rod, if possible, for easier machining and installation.

The rubbing surfaces should be 8 to 16 RMS without longitudinal or circumferential scratches. Best surfaces are honed, burnished, or hard chromeplate. Soft or stringy metals such as aluminum, brass, bronze, monel, or free machining stainless steel should not be used for moving seals. A 63RMS finish may be used for static glands.

Finishes below 5 RMS wipe too clean for good moving seal life. Steel or cast iron cylinder bores are preferred. They should be thick enough not to expand or breathe with pressure, otherwise the radial clearance gap may expand and contract with pressure fluctuations causing nibbling of the ring. Pistons should be softer than cylinder materials to avoid scratching.





(E) Maximum Radial Clearance Gap to Prevent Extrusion

Maximum Pressure PSI	"O"-Ring Hardness (Shore A)				
	50	60	70	80	90
100	.008"	.009"	.010"	.013"	.016"
250	.005"	.008"	.009"	.012"	.014"
500	.003"	.005"	.008"	.010"	.012"
1,000	.001"	.003"	.005"	.008"	.010"
1,500	.000"	.001"	.003"	.005"	.008"
2,000		.000"	.002"	.004"	.005"
3,000			.000"	.002"	.003"
4,000				.000"	.001"
5,000					.000"

Clearances apply to dynamic "O"-Rings with no backup washers for .139 in. (3.53mm) "O"-Ring cross-sections and up. Smaller cross-sections do not give effective moving seal life, are less resistant to extrusion, and may be critical in sealing high frequency dynamic motion.

Static Tolerances

SIZE No.	A +000 −000	B +000 −	C +000 −	D + −000
001-012	+.001	−.001	−.001	+.001
013-050	+.002	−.002	−.002	+.002
102-178	+.003	−.003	−.003	+.003
201-284	+.004	−.004	−.003	+.003
309-395	+.005	−.005	−.003	+.003
425-475	+.006	−.006	−.003	+.003

Dynamic Tolerances

SIZE No.	A +000 −000	B +000 −	C +000 −	D + −000
001-012	+.001	−.001	−.001	+.001
012-116	+.003	−.003	−.003	+.003
201-222	+.004	−.004	−.004	+.004
309-349	+.005	−.005	−.005	+.005
425-460	+.006	−.006	−.006	+.006

(G) Groove Dimensions $^{+.005}_{-.000}$ Commercial Applications

"O"-Ring Cross-Section	ROLLING SEALS			NON-ROLLING SEALS *		
W	No Backup Washer	One Backup Washer	Two Backup Washer	No Backup Washer	One Backup Washer	Two Backup Washer
.070	.093	.149	.207	.083	.138	.205
.103	.140	.183	.245	.120	.171	.238
.139	.185	.225	.304	.160	.208	.275
.210	.285	.334	.474	.235	.311	.410
.275	.375	.440	.579	.310	.408	.538

** These groove widths are for compounds that free swell less than 15%. Suitable extra allowances should be made for higher swell.*

	BUNA-N (1107)	EPDM (2107)	VITON® (3207)	SILICONE (4137)	SILICONE (4749)
Specific Gravity	1.38	1.20	1.94	1.20	1.22
Tensile Strength, psi	2010	1705	1910	1256	1130
Elongation, %	405	450	310	307	610
300% Modulus, psi	1430	1260	1610	1245	450
Hardness, Shore A, pts.	70	71	74	75	80
Compression Set, % (Method B, 22 hrs. @ 100°C)	21.6	27.5	26.7	24.5	6.5

These materials meet the criteria of the FDA, Title 21, Paragraph 177.2600, as a direct contact material with food and pharmaceutical products.

Your Part Number	Newman Size Number	Nominal Size	INCH STANDARD Inside Diameter In.	±	INCH STANDARD Cross Section W In.	±	METRIC STANDARD Inside Diameter MM.	±	METRIC STANDARD Cross Section W mm.	±
	001	1/32 x 3/32 x 1/32	.029	.004	.040	.003	0.74	0.10	1.02	0.08
	902 1/2	1/16 x 1/8 x 1/32	.070	.004	.040	.003	1.78	0.10	1.02	0.08
	002	3/64 x 9/64 x 1/32	.042	.004	.050	.003	1.07	0.10	1.27	0.08
	003	1/16 x 3/16 x 1/16	.056	.004	.060	.003	1.42	0.10	1.52	0.08
	004	5/64 x 13/64 x 1/16	.070	.005	.070	.003	1.78	0.13	1.78	0.08
	005	3/32 x 7/32 x 1/16	.101	.005			2.57	0.13		
	006	1/8 x 1/4 x 1/16	.114	.005			2.90	0.13		
	007	5/32 x 9/32 x 1/16	.145	.005			3.68	0.13		
	008	3/16 x 5/16 x 1/16	.176	.005			4.47	0.13		
	009	7/32 x 11/32 x 1/16	.208	.005			5.28	0.13		
	010	1/4 x 3/8 x 1/16	.239	.005			6.07	0.13		
	011	5/16 x 7/16 x 1/16	.301	.005			7.65	0.13		
	012	3/8 x 1/2 x 1/16	.364	.005			9.25	0.13		
	013	7/16 x 9/16 x 1/16	.426	.005			10.82	0.13		
	014	1/2 x 5/8 x 1/16	.489	.005			12.42	0.13		
	015	9/16 x 11/16 x 1/16	.551	.007			14.00	0.18		
	016	5/8 x 3/4 x 1/16	.614	.009			15.60	0.23		
	017	11/16 x 13/16 x 1/16	.676	.009			17.17	0.23		
	018	3/4 x 7/8 x 1/16	.739	.009			18.77	0.23		
	019	13/16 x 15/16 x 1/16	.801	.009			20.35	0.23		
	020	7/8 x 1 x 1/16	.864	.009			21.95	0.23		
	021	15/16 x 1 1/16 x 1/16	.926	.009			23.52	0.23		
	022	1 x 1 1/8 x 1/16	.989	.010			25.12	0.25		
	023	1 1/16 x 1 3/16 x 1/16	1.051	.010			26.70	0.25		
	024	1 1/8 x 1 1/4 x 1/16	1.114	.010			28.30	0.25		
	025	1 3/16 x 1 5/16 x 1/16	1.176	.011			29.87	0.28		
	026	1 1/4 x 1 3/8 x 1/16	1.239	.011			31.47	0.28		
	027	1 5/16 x 1 7/16 x 1/16	1.301	.011			33.05	0.28		
	028	1 3/8 x 1 1/2 x 1/16	1.364	.013			34.65	0.33		
	029	1 1/2 x 1 5/8 x 1/16	1.489	.013			37.82	0.33		
	030	1 5/8 x 1 3/4 x 1/16	1.614	.013			41.00	0.33		
	031	1 3/4 x 1 7/8 x 1/16	1.739	.015			44.17	0.38		
	032	1 7/8 x 2 x 1/16	1.864	.015			47.35	0.38		
	033	2 x 2 1/8 x 1/16	1.989	.018			50.52	0.46		
	034	2 1/8 x 2 1/4 x 1/16	2.114	.018			53.70	0.46		
	035	2 1/4 x 2 3/8 x 1/16	2.239	.018			56.87	0.46		
	036	2 3/8 x 2 1/2 x 1/16	2.364	.018			60.05	0.46		
	037	2 1/2 x 2 5/8 x 1/16	2.489	.018			63.22	0.46		
	038	2 5/8 x 2 3/4 x 1/16	2.614	.020			66.40	0.51		
	039	2 3/4 x 2 7/8 x 1/16	2.739	.020			69.57	0.51		
	040	2 7/8 x 3 x 1/16	2.864	.020			72.75	0.51		
	041	3 x 3 1/8 x 1/16	2.989	.024			75.92	0.61		
	042	3 1/4 X 3 3/8 x 1/16	3.239	.024			82.27	0.61		
	043	3 1/2 x 3 5/8 x 1/16	3.489	.024			88.62	0.61		
	044	3 3/4 x 3 7/8 x 1/16	3.739	.027			94.97	0.69		
	045	4 x 4 1/8 x 1/16	3.989	.027			101.32	0.69		
	046	4 1/4 x 4 3/8 x 1/16	4.239	.027			107.67	0.76		
	047	4 1/2 x 4 5/8 x 1/16	4.489	.030			114.02	0.76		
	048	4 3/4 x 4 7/8 x 1/16	4.739	.030			120.37	0.76		
	049	5 x 5 1/8 x 1/16	4.989	.037			126.72	0.94		
	050	5 1/4 x 5 3/8 x 1/16	5.239	.037	.070	.003	133.07	0.94	1.78	0.08

Your Part Number	Newman Size Number	Nominal Size	INCH STANDARD Inside Diameter In.	±	Cross Section W In.	±	METRIC STANDARD Inside Diameter MM.	±	Cross Section W mm.	±
	102	1/16 x 1/4 x 3/32	.049	.005	.103	.003	1.24	0.10	2.62	0.08
	103	3/32 x 9/32 x 3/32	.081	.005			2.06	0.13		
	104	1/8 x 5/16 x 3/32	.112	.005			2.84	0.13		
	105	5/32 x 11/32 x 3/32	.143	.005			3.63	0.13		
	106	3/16 x 3/8 x 3/32	.174	.005			4.42	0.13		
	107	7/32 x 13/32 x 3/32	.206	.005			5.23	0.13		
	108	1/4 x 7/16 x 3/32	.237	.005			6.02	0.13		
	109	5/16 x 1/2 x 3/32	.299	.005			7.59	0.13		
	110	3/8 x 9/16 x 3/32	.362	.005			9.19	0.13		
	111	7/16 x 5/8 x 3/32	.424	.005			10.77	0.13		
	112	1/2 x 11/16 x 3/32	.487	.005			12.37	0.13		
	113	9/16 x 3/4 x 3/32	.549	.007			13.94	0.18		
	114	5/8 x 13/16 x 3/32	.612	.009			15.54	0.23		
	115	11/16 x 7/8 x 3/32	.674	.009			17.12	0.23		
	116	3/4 x 15/16 x 3/32	.737	.009			18.72	0.23		
	117	13/16 x 1 x 3/32	.799	.010			20.29	0.25		
	118	7/8 x 1 1/16 x 3/32	.862	.010			21.89	0.25		
	119	15/16 x 1 1/8 x 3/32	.924	.010			23.47	0.25		
	120	1 x 1 3/16 x 3/32	.987	.010			25.07	0.25		
	121	1 1/16 x 1 1/4 x 3/32	1.049	.010			26.64	0.25		
	122	1 1/8 x 1 5/16 x 3/32	1.112	.010			28.24	0.25		
	123	1 3/16 x 1 3/8 x 3/32	1.174	.012			29.82	0.30		
	124	1 1/4 x 1 7/16 x 3/32	1.237	.012			31.42	0.30		
	125	1 5/16 x 1 1/2 x 3/32	1.299	.012			32.99	0.30		
	126	1 3/8 x 1 9/16 x 3/32	1.362	.012			34.59	0.30		
	127	1 7/16 x 1 5/8 x 3/32	1.424	.012			36.17	0.30		
	128	1 1/2 x 1 11/16 x 3/32	1.487	.012			37.77	0.30		
	129	1 9/16 x 1 3/4 x 3/32	1.549	.015			39.34	0.38		
	130	1 5/8 x 1 13/16 x 3/32	1.612	.015			40.94	0.38		
	131	1 11/16 x 1 7/8 x 3/32	1.674	.015			42.52	0.38		
	132	1 3/4 x 1 15/16 x 3/32	1.737	.015			44.12	0.38		
	133	1 13/16 x 2 x 3/32	1.799	.015			45.69	0.38		
	134	1 7/8 x 2 1/16 x 3/32	1.862	.015			47.29	0.38		
	135	1 15/16 x 2 1/8 x 3/32	1.925	.017			48.90	0.43		
	136	2 x 2 3/16 x 3/32	1.987	.017			50.47	0.43		
	137	2 1/16 x 2 1/4 x 3/32	2.050	.017			52.07	0.43		
	138	2 1/8 x 2 5/16 x 3/32	2.112	.017			53.64	0.43		
	139	2 3/16 x 2 3/8 x 3/32	2.175	.017			55.25	0.43		
	140	2 1/4 x 2 7/16 x 3/32	2.237	.017			56.82	0.43		
	141	2 5/16 x 2 1/2 x 3/32	2.300	.020			58.42	0.51		
	142	2 3/8 x 2 9/16 x 3/32	2.362	.020			59.99	0.5		
	143	2 7/16 x 2 5/8 x 3/32	2.425	.020			61.60	0.51		
	144	2 1/2 x 2 11/16 x 3/32	2.487	.020			63.17	0.51		
	145	2 9/16 x 2 3/4 x 3/32	2.550	.020			64.77	0.51		
	146	2 5/8 x 2 13/16 x 3/32	2.612	.020			66.34	0.51		
	147	2 11/16 x 2 7/8 x 3/32	2.675	.022			67.95	0.56		
	148	2 3/4 x 2 15/16 x 3/32	2.737	.022			69.52	0.56		
	149	2 13/16 x 3 x 3/32	2.800	.022			71.12	0.56		
	150	2 7/8 x 3 1/16 x 3/32	2.862	.022			72.69	0.56		
	151	3 x 3 3/16 x 3/32	2.987	.024			75.87	0.61		
	152	3 1/4 x 3 7/16 x 3/32	3.237	.024	.103	.003	82.22	0.61	2.62	0.08

Your Part Number	Newman Size Number	Nominal Size	INCH STANDARD Inside Diameter In.	±	Cross Section W In.	±	METRIC STANDARD Inside Diameter MM.	±	Cross Section W mm.	±
	153	3 1/2 x 3 11/16 x 3/32	3.487	.024	.103	.003	88.57	0.61	2.62	0.08
	154	3 3/4 x 3 15/16 x 3/32	3.737	.028			94.92	0.71		
	155	4 x 4 3/16 x 3/32	3.987	.028			101.27	0.71		
	156	4 1/4 x 4 7/16 x 3/32	4.237	.030			107.62	0.76		
	157	4 1/2 x 4 11/16 x 3/32	4.487	.030			113.97	0.76		
	158	4 3/4 x 4 15/16 x 3/32	4.737	.030			120.32	0.76		
	159	5 x 5 3/16 x 3/32	4.987	.035			126.67	0.89		
	160	5 1/4 x 5 7/16 x 3/32	5.237	.035			133.02	0.89		
	161	5 1/2 x 5 11/16 x 3/32	5.487	.035			139.37	0.89		
	162	5 3/4 x 5 15/16 x 3/32	5.737	.035			145.72	0.89		
	163	6 x 6 3/16 x 3/32	5.987	.035			152.07	0.89		
	164	6 1/4 x 6 7/16 x 3/32	6.237	.040			158.42	1.02		
	165	6 1/2 x 6 11/16 x 3/32	6.487	.040			164.77	1.02		
	166	6 3/4 x 6 15/16 x 3/32	6.737	.040			171.12	1.02		
	167	7 x 7 3/16 x 3/32	6.987	.040			177.47	1.02		
	168	7 1/4 x 7 7/16 x 3/32	7.237	.045			183.82	1.14		
	169	7 1/2 x 7 11/16 x 3/32	7.487	.045			190.17	1.14		
	170	7 3/4 x 7 15/16 x 3/32	7.737	.045			196.54	1.14		
	171	8 x 8 3/16 x 3/32	7.987	.045			202.87	1.14		
	172	8 1/4 x 8 7/16 x 3/32	8.237	.050			209.22	1.27		
	173	8 1/2 x 8 11/16 x 3/32	8.487	.050			215.57	1.27		
	174	8 3/4 x 8 15/16 x 3/32	8.737	.050			221.92	1.27		
	175	9 x 9 3/16 x 3/32	8.987	.050			228.27	1.27		
	176	9 1/4 x 9 7/16 x 3/32	9.237	.055			234.62	1.40		
	177	9 1/2 x 9 11/16 x 3/32	9.487	.055			240.97	1.40		
	178	9 3/4 x 9 15/16 x 3/32	9.737	.055	.103	.003	247.32	1.40	2.62	0.08
	201	3/16 x 7/16 x 1/8	.171	.007	.139	.004	4.34	0.18	3.53	0.10
	202	1/4 x 1/2 x 1/8	.234	.007			5.94	0.18		
	203	5/16 x 9/16 x 1/8	.296	.007			7.52	0.18		
	204	3/8 x 5/8 x 1/8	.359	.007			9.12	0.18		
	205	7/16 x 11/16 x 1/8	.421	.007			10.69	0.18		
	206	1/2 x 3/4 x 1/8	.484	.007			12.29	0.18		
	207	9/16 x 13/16 x 1/8	.546	.007			13.87	0.18		
	208	5/8 x 7/8 x 1/8	.609	.009			15.47	0.23		
	209	11/16 x 15/16 x 1/8	.671	.009			17.04	0.23		
	210	3/4 x 1 x 1/8	.734	.010			18.66	0.25		
	211	13/16 x 1 1/16 x 1/8	.796	.010			20.22	0.25		
	212	7/8 x 1 1/8 x 1/8	.859	.010			21.82	0.25		
	213	15/16 x 1 3/16 x 1/8	.921	.010			23.40	0.25		
	214	1 x 1 1/4 x 1/8	.984	.010			25.00	0.25		
	215	1 1/16 x 1 5/16 x 1/8	1.046	.010			26.58	0.25		
	216	1 1/8 x 1 3/8 x 1/8	1.109	.012			28.17	0.30		
	217	1 3/16 x 1 7/16 x 1/8	1.171	.012			29.75	0.30		
	218	1 1/4 x 1 1/2 x 1/8	1.234	.012			31.35	0.30		
	219	1 5/16 x 1 9/16 x 1/8	1.296	.012			32.92	0.30		
	220	1 3/8 x 1 5/8 x 1/8	1.359	.012			34.52	0.30		
	221	1 7/16 x 1 11/16 x 1/8	1.421	.012			36.09	0.30		
	222	1 1/2 x 1 3/4 x 1/8	1.484	.015			37.70	0.38		
	223	1 5/8 x 1 7/8 x 1/8	1.609	.015	.139	.004	40.87	0.38	3.53	0.10

Your Part Number	Newman Size Number	Nominal Size	INCH STANDARD Inside Diameter In.	±	Cross Section W In.	±	METRIC STANDARD Inside Diameter MM.	±	Cross Section W mm.	±
	224	1 3/4 x 2 x 1/8	1.734	.015	.139	.004	44.04	0.38	3.53	0.10
	225	1 7/8 x 2 1/8 x 1/8	1.859	.018			47.22	0.46		
	226	2 x 2 1/4 x 1/8	1.984	.018			50.39	0.46		
	227	2 1/8 x 2 3/8 x 1/8	2.109	.018			53.57	0.46		
	228	2 1/4 x 2 1/2 x 1/8	2.234	.020			56.74	0.51		
	229	2 3/8 x 2 5/8 x 1/8	2.359	.020			59.92	0.51		
	230	2 1/2 x 2 3/4 x 1/8	2.484	.020			63.09	0.51		
	231	2 5/8 x 2 7/8 x 1/8	2.609	.020			66.27	0.51		
	232	2 3/4 x 3 x 1/8	2.734	.024			69.44	0.61		
	233	2 7/8 x 3 1/8 x 1/8	2.859	.024			72.62	0.61		
	234	3 x 3 1/4 x 1/8	2.984	.024			75.79	0.61		
	235	3 1/8 x 3 3/8 x 1/8	3.109	.024			78.97	0.61		
	236	3 1/4 x 3 1/2 x 1/8	3.234	.024			82.14	0.61		
	237	3 3/8 x 3 5/8 x 1/8	3.359	.024			85.32	0.61		
	238	3 1/2 x 3 3/4 x 1/8	3.484	.024			88.49	0.61		
	239	3 5/8 x 3 7/8 x 1/8	3.609	.028			91.67	0.71		
	240	3 3/4 x 4 x 1/8	3.734	.028			94.84	0.71		
	241	3 7/8 x 4 1/8 x 1/8	3.859	.028			98.02	0.71		
	242	4 x 4 1/4 x 1/8	3.984	.028			101.19	0.71		
	243	4 1/8 x 4 3/8 x 1/8	4.109	.028			104.37	0.71		
	244	4 1/4 x 4 1/2 x 1/8	4.234	.030			107.54	0.76		
	245	4 3/8 x 4 5/8 x 1/8	4.359	.030			110.72	0.76		
	246	4 1/2 x 4 3/4 x 1/8	4.484	.030			113.89	0.76		
	247	4 5/8 x 4 7/8 x 1/8	4.609	.030			117.07	0.76		
	248	4 3/4 x 5 x 1/8	4.734	.030			120.24	0.76		
	249	4 7/8 x 5 1/8 x 1/8	4.859	.035			123.42	0.89		
	250	5 x 5 1/4 x 1/8	4.984	.035			126.59	0.89		
	251	5 1/8 x 5 3/8 x 1/8	5.109	.035			129.77	0.89		
	252	5 1/4 x 5 1/2 x 1/8	5.234	.035			132.94	0.89		
	253	5 3/8 x 5 5/8 x 1/8	5.359	.035			136.12	0.89		
	254	5 1/2 x 5 3/4 x 1/8	5.484	.035			139.29	0.89		
	255	5 5/8 x 5 7/8 x 1/8	5.609	.035			142.47	0.89		
	256	5 3/4 x 6 x 1/8	5.734	.035			145.64	0.89		
	257	5 7/8 x 6 1/8 x 1/8	5.859	.035			148.82	0.89		
	258	6 x 6 1/4 x 1/8	5.984	.035			151.99	0.89		
	259	6 1/4 x 6 1/2 x 1/8	6.234	.040			158.34	1.02		
	260	6 1/2 x 6 3/4 x 1/8	6.484	.040			164.69	1.02		
	261	6 3/4 x 7 x 1/8	6.734	.040			171.04	1.02		
	262	7 x 7 1/4 x 1/8	6.984	.040			177.39	1.02		
	263	7 1/4 x 7 1/2 x 1/8	7.234	.045			183.74	1.14		
	264	7 1/2 x 7 3/4 x 1/8	7.484	.045			190.09	1.14		
	265	7 3/4 x 8 x 1/8	7.734	.045			196.44	1.14		
	266	8 x 8 1/4 x 1/8	7.984	.045			202.79	1.14		
	267	8 1/4 x 8 1/2 x 1/8	8.234	.050			209.14	1.27		
	268	8 1/2 x 8 3/4 x 1/8	8.484	.050			215.49	1.27		
	269	8 3/4 x 9 x 1/8	8.734	.050			221.84	1.27		
	270	9 x 9 1/4 x 1/8	8.984	.050			228.19	1.27		
	271	9 1/4 x 9 1/2 x 1/8	9.234	.055			234.54	1.40		
	272	9 1/2 x 9 3/4 x 1/8	9.484	.055			240.89	1.40		
	273	9 3/4 x 10 x 1/8	9.734	.055			247.24	1.40		
	274	10 x 10 1/4 x 1/8	9.984	.055	.139	.004	253.59	1.40	3.53	0.10

Your Part Number	Newman Size Number	Nominal Size	INCH STANDARD Inside Diameter In.	±	Cross Section W In.	±	METRIC STANDARD Inside Diameter MM.	±	Cross Section W mm.	±
	275	10 1/2 x 10 3/4 x 1/8	10.484	.055	.139	.004	266.29	1.40	3.53	0.10
	276	11 x 11 1/4 x 1/8	10.984	.065			278.99	1.65		
	277	11 1/2 x 11 3/4 x 1/8	11.484	.065			291.69	1.65		
	278	12 x 12 1/4 x 1/8	11.984	.065			304.39	1.65		
	279	13 x 13 1/4 x 1/8	12.984	.065			329.79	1.65		
	280	14 x 14 1/4 x 1/8	13.984	.065			355.19	1.65		
	281	15 x 15 1/4 x 1/8	14.984	.065			380.59	1.65		
	282	16 x 16 1/4 x 1/8	15.955	.075			405.26	1.90		
	283	17 x 17 1/4 x 1/8	16.955	.080			430.66	2.16		
	284	18 x 18 1/4 x 1/8	17.955	.085	.139	.004	456.06	2.42	3.53	0.10
	309	7/16 x 13/16 x 3/16	.412	.005	.210	.005	10.46	0.13	5.33	0.13
	310	1/2 x 7/8 x 3/16	.475	.005			12.07	0.13		
	311	9/16 x 15/16 x 3/16	.537	.007			13.64	0.18		
	312	5/8 x 1 x 3/16	.600	.009			15.25	0.23		
	313	11/16 x 1 1/16 x 3/16	.662	.009			16.81	0.23		
	314	3/4 x 1 1/8 x 3/16	.725	.010			18.42	0.25		
	315	13/16 x 1 3/16 x 3/16	.787	.010			19.99	0.25		
	316	7/8 x 1 1/4 x 3/16	.850	.010			21.59	0.25		
	317	15/16 x 1 5/16 x 3/16	.912	.010			23.16	0.25		
	318	1 x 1 3/8 x 3/16	.975	.010			24.77	0.25		
	319	1 1/16 x 1 7/16 x 3/16	1.037	.010			26.34	0.25		
	320	1 1/8 x 1 1/2 x 3/16	1.100	.012			27.94	0.30		
	321	1 3/16 x 1 9/16 x 3/16	1.162	.012			29.51	0.30		
	322	1 1/4 x 1 5/8 x 3/16	1.225	.012			31.12	0.30		
	323	1 5/16 x 1 11/16 x 3/16	1.287	.012			32.69	0.30		
	324	1 3/8 x 1 3/4 x 3/16	1.350	.012			34.29	0.30		
	325	1 1/12 x 1 7/8 x 3/16	1.475	.015			37.47	0.38		
	326	1 5/8 x 2 x 3/16	1.600	.015			40.64	0.38		
	327	1 3/4 x 2 1/8 x 3/16	1.725	.015			43.82	0.38		
	328	1 7/8 x 2 1/4 x 3/16	1.850	.015			46.99	0.38		
	329	2 x 2 3/8 x 3/16	1.975	.018			50.17	0.46		
	330	2 1/8 x 2 1/2 x 3/16	2.100	.018			53.34	0.46		
	331	2 1/4 x 2 5/8 x 3/16	2.225	.018			56.52	0.46		
	332	2 3/8 x 2 3/4 x 3/16	2.350	.018			59.69	0.46		
	333	2 1/2 x 2 7/8 x 3/16	2.475	.020			62.87	0.51		
	334	2 5/8 x 3 x 3/16	2.600	.020			66.04	0.51		
	335	2 3/4 x 3 1/8 x 3/16	2.725	.020			69.22	0.51		
	336	2 7/8 x 3 1/4 x 3/16	2.850	.020			72.39	0.51		
	337	3 x 3 3/8 x 3/16	2.975	.024			75.57	0.61		
	338	3 1/8 x 3 1/2 x 3/16	3.100	.024			78.74	0.61		
	339	3 1/4 x 3 5/8 x 3/16	3.225	.024			81.92	0.61		
	340	3 3/8 x 3 3/4 x 3/16	3.350	.024			85.09	0.61		
	341	3 1/2 x 3 7/8 x 3/16	3.475	.024			88.27	0.61		
	342	3 5/8 x 4 x 3/16	3.600	.028			91.44	0.71		
	343	3 3/4 x 4 1/8 x 3/16	3.725	.028			94.62	0.71		
	344	3 7/8 x 4 1/4 x 3/16	3.850	.028			97.79	0.71		
	345	4 x 4 3/8 x 3/16	3.975	.028			100.97	0.71		
	346	4 1/8 x 4 1/2 x 3/16	4.100	.028	.210	.005	104.14	0.71	5.33	0.13

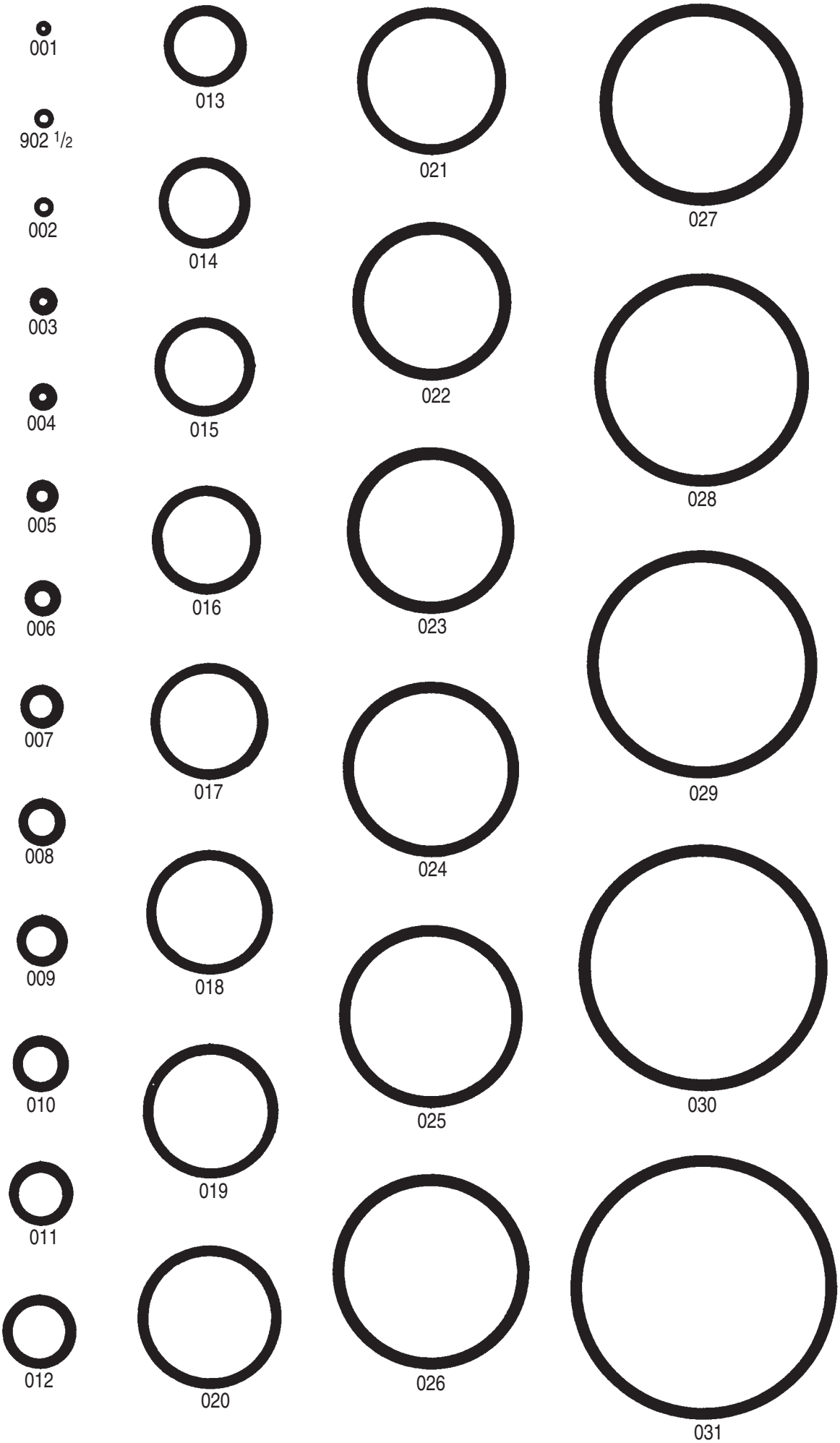
Your Part Number	Newman Size Number	Nominal Size	INCH STANDARD Inside Diameter In.	±	Cross Section W In.	±	METRIC STANDARD Inside Diameter MM.	±	Cross Section W mm.	±
	347	4 1/4 x 4 5/8 x 3/16	4.225	.030	.210	.005	107.32	0.76	5.33	0.13
	348	4 3/8 x 4 3/4 x 3/16	4.350	.030			110.49	0.76		
	349	4 1/2 x 4 7/8 x 3/16	4.475	.030			113.67	0.76		
	350	4 5/8 x 5 x 3/16	4.600	.030			116.84	0.76		
	351	4 3/4 x 5 1/8 x 3/16	4.725	.030			120.02	0.76		
	352	4 7/8 x 5 1/4 x 3/16	4.850	.030			123.19	0.76		
	353	5 x 5 3/8 x 3/16	4.975	.037			126.37	0.94		
	354	5 1/8 x 5 1/2 x 3/16	5.100	.037			129.54	0.94		
	355	5 1/4 x 5 5/8 x 3/16	5.225	.037			132.72	0.94		
	356	5 3/8 x 5 3/4 x 3/16	5.350	.037			135.89	0.94		
	357	5 1/2 x 5 7/8 x 3/16	5.475	.037			139.07	0.94		
	358	5 5/8 x 6 x 3/16	5.600	.037			142.24	0.94		
	359	5 3/4 x 6 1/8 x 3/16	5.725	.037			145.42	0.94		
	360	5 7/8 x 6 1/4 x 3/16	5.850	.037			148.49	0.94		
	361	6 x 6 3/8 x 3/16	5.975	.037			151.77	0.94		
	362	6 1/4 x 6 5/8 x 3/16	6.225	.040			158.12	1.02		
	363	6 1/2 x 6 7/8 x 3/16	6.475	.040			164.47	1.02		
	364	6 3/4 x 7 1/8 x 3/16	6.725	.040			170.82	1.02		
	365	7 x 7 3/8 x 3/16	6.975	.040			177.17	1.02		
	366	7 1/4 x 7 5/8 x 3/16	7.225	.045			183.52	1.14		
	367	7 1/2 x 7 7/8 x 3/16	7.475	.045			189.87	1.14		
	368	7 3/4 x 8 1/8 x 3/16	7.725	.045			196.22	1.14		
	369	8 x 8 3/8 x 3/16	7.975	.045			202.57	1.14		
	370	8 1/4 x 8 5/8 x 3/16	8.225	.050			208.92	1.30		
	371	8 1/2 x 8 7/8 x 3/16	8.475	.050			215.27	1.30		
	372	8 3/4 x 9 1/8 x 3/16	8.725	.050			221.65	1.30		
	373	9 x 9 3/8 x 3/16	8.975	.050			227.97	1.30		
	374	9 1/4 x 9 5/8 x 3/16	9.225	.055			234.32	1.40		
	375	9 1/2 x 9 7/8 x 3/16	9.475	.055			240.67	1.40		
	376	9 3/4 x 10 1/8 x 3/16	9.725	.055			247.02	1.40		
	377	10 x 10 3/8 x 3/16	9.975	.055			253.37	1.40		
	378	10 1/2 x 10 7/8 x 3/16	10.475	.060			266.07	1.52		
	379	11 x 11 3/8 x 3/16	10.975	.060			278.77	1.52		
	380	11 1/2 x 11 7/8 x 3/16	11.475	.065			291.47	1.65		
	381	12 x 12 3/8 x 3/16	11.975	.065			304.17	1.65		
	382	13 x 13 3/8 x 3/16	12.975	.065			329.57	1.65		
	383	14 x 14 3/8 x 3/16	13.975	.070			354.97	1.78		
	384	15 x 15 3/8 x 3/16	14.975	.070			380.37	1.78		
	385	16 x 16 3/8 x 3/16	15.955	.075			405.26	1.90		
	386	17 x 17 3/8 x 3/16	16.955	.080			430.66	2.03		
	387	18 x 18 3/8 x 3/16	17.955	.085			456.06	2.16		
	388	19 x 19 3/8 x 3/16	18.952	.090			481.38	2.29		
	389	20 x 20 3/8 x 3/16	19.952	.090			506.78	2.41		
	390	21 x 21 3/8 x 3/16	20.952	.090			532.18	2.41		
	391	22 x 22 3/8 x 3/16	21.952	.100			557.58	2.55		
	392	23 x 23 3/8 x 3/16	22.940	.105			582.68	2.75		
	393	24 x 24 3/8 x 3/16	23.940	.110			608.08	2.80		
	394	25 x 25 3/8 x 3/16	24.940	.115			633.48	2.90		
	395	26 x 26 3/8 x 3/16	25.940	.120	.210	.005	658.88	3.05	5.33	0.13

Your Part Number	Newman Size Number	Nominal Size	INCH STANDARD Inside Diameter In.	±	Cross Section W In.	±	METRIC STANDARD Inside Diameter MM.	±	Cross Section W mm.	±
	425	4 1/2 x 5 x 1/4	4.475	.033	.275	.006	113.67	0.84	6.99	0.15
	426	4 5/8 x 5 1/8 x 1/4	4.600	.033			116.84	0.84		
	427	4 3/4 x 5 1/4 x 1/4	4.725	.033			120.02	0.84		
	428	4 7/8 x 5 3/8 x 1/4	4.850	.033			123.19	0.84		
	429	5 x 5 1/2 x 1/4	4.975	.037			126.37	0.94		
	430	5 1/8 x 5 5/8 x 1/4	5.100	.037			129.54	0.94		
	431	5 1/4 x 5 3/4 x 1/4	5.225	.037			132.72	0.94		
	432	5 3/8 x 5 7/8 x 1/4	5.350	.037			135.89	0.94		
	433	5 1/2 x 6 x 1/4	5.475	.037			139.07	0.94		
	434	5 5/8 x 6 1/8 x 1/4	5.600	.037			142.24	0.94		
	435	5 3/4 x 6 1/4 x 1/4	5.725	.037			145.42	0.94		
	436	5 7/8 x 6 3/8 x 1/4	5.850	.037			148.59	0.94		
	437	6 x 6 1/2 x 1/4	5.975	.037			151.77	0.94		
	438	6 1/4 x 6 3/4 x 1/4	6.225	.040			158.12	1.02		
	439	6 1/2 x 7 x 1/4	6.475	.040			164.47	1.02		
	440	6 3/4 x 7 1/4 x 1/4	6.725	.040			170.82	1.02		
	441	7 x 7 1/2 x 1/4	6.975	.040			177.17	1.02		
	442	7 1/4 x 7 3/4 x 1/4	7.225	.045			183.52	1.14		
	443	7 1/2 x 8 x 1/4	7.475	.045			189.87	1.14		
	444	7 3/4 x 8 1/4 x 1/4	7.725	.045			196.22	1.14		
	445	8 x 8 1/2 x 1/4	7.975	.045			202.57	1.14		
	446	8 1/2 x 9 x 1/4	8.475	.055			215.27	1.40		
	447	9 x 9 1/2 x 1/4	8.975	.055			227.97	1.40		
	448	9 1/2 x 10 x 1/4	9.475	.055			240.67	1.40		
	449	10 x 10 1/2 x 1/4	9.975	.055			253.37	1.40		
	450	10 1/2 x 11 x 1/4	10.475	.060			266.07	1.52		
	451	11 x 11 1/2 x 1/4	10.975	.060			278.77	1.52		
	452	11 1/2 x 12 x 1/4	11.475	.060			291.47	1.52		
	453	12 x 12 1/2 x 1/4	11.975	.060			304.17	1.52		
	454	12 1/2 x 13 x 1/4	12.475	.060			316.87	1.52		
	455	13 x 13 1/2 x 1/4	12.975	.060			329.57	1.52		
	456	13 1/2 x 14 x 1/4	13.475	.070			342.27	1.78		
	457	14 x 14 1/2 x 1/4	13.975	.070			354.97	1.78		
	458	14 1/2 x 15 x 1/4	14.475	.070			367.67	1.78		
	459	15 x 15 1/2 x 1/4	14.975	.070			380.37	1.78		
	460	15 1/2 x 16 x 1/4	15.475	.070			393.07	1.78		
	461	16 x 16 1/2 x 1/4	15.955	.075			405.26	1.90		
	462	16 1/2 x 17 x 1/4	16.455	.075			417.96	1.90		
	463	17 x 17 1/2 x 1/4	16.955	.080			430.66	2.05		
	464	17 1/2 x 18 x 1/4	17.455	.085			443.36	2.15		
	465	18 x 18 1/2 x 1/4	17.955	.085			456.06	2.15		
	466	18 1/2 x 19 x 1/4	18.455	.085			468.76	2.15		
	467	19 x 19 1/2 x 1/4	18.955	.090			481.46	2.29		
	468	19 1/2 x 20 x 1/4	19.455	.090			494.16	2.29		
	469	20 x 20 1/2 x 1/4	19.955	.090			506.86	2.41		
	470	21 x 21 1/2 x 1/4	20.955	.090			532.26	2.41		
	471	22 x 22 1/2 x 1/4	21.955	.100			557.66	2.55		
	472	23 x 23 1/2 x 1/4	22.940	.105			582.68	2.65		
	473	24 x 24 1/2 x 1/4	23.940	.110			608.08	2.80		
	474	25 x 25 1/2 x 1/4	24.940	.115			633.48	2.90		
	475	26 x 26 1/2 x 1/4	25.940	.120	.275	.006	658.88	3.05	6.99	0.15

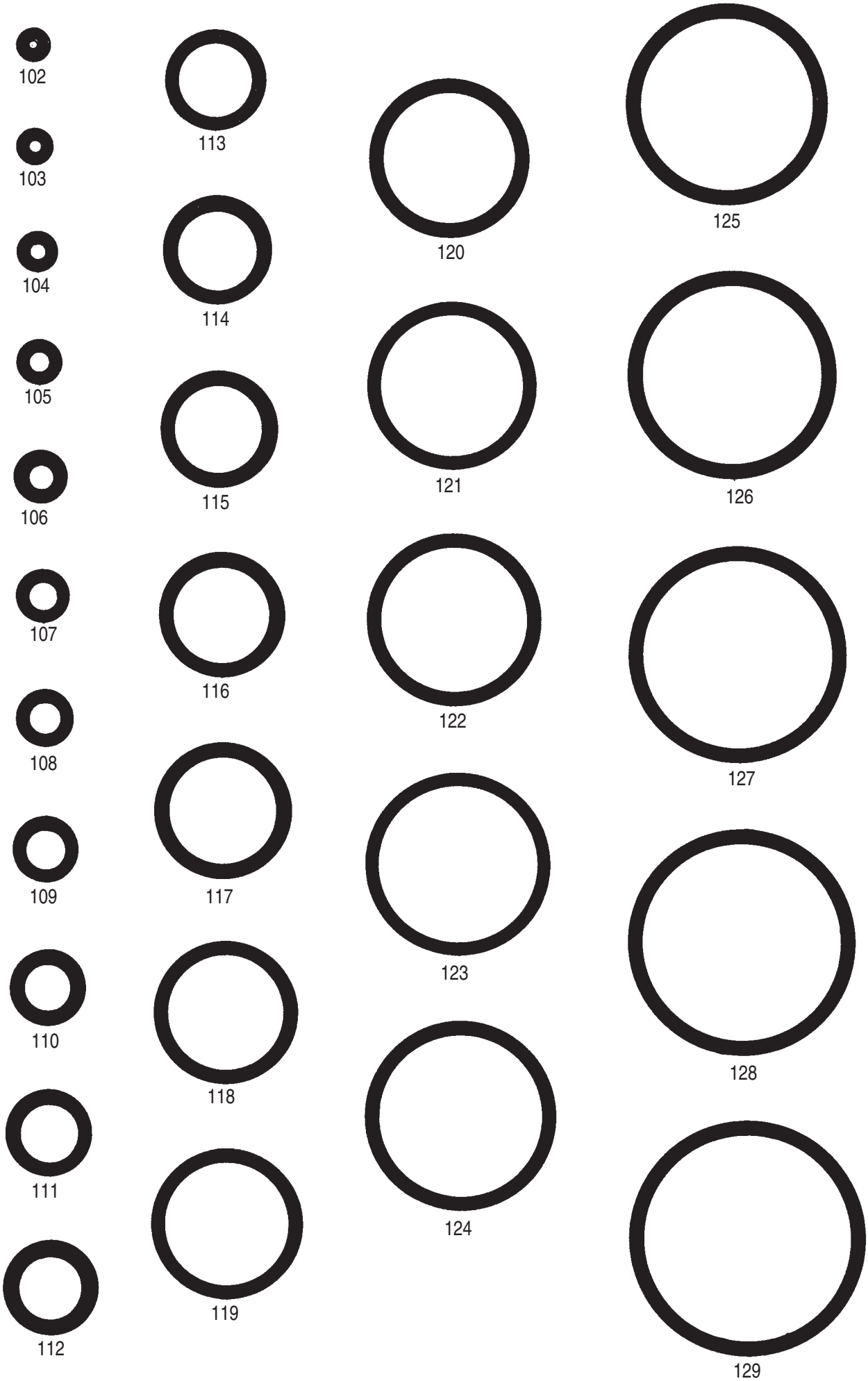
ADDITIONAL CROSS REFERENCE SPACE

Your Number	Newman Number	Your Number	Newman Number	Your Number	Newman Number

000 SERIES – .070 cross section



100 SERIES – .103 cross section



200 SERIES – .139 cross section

300 SERIES – .210 cross section

Some parts shown are proprietary parts and are not available for resale.

When it comes to custom molded parts, you'll find that personal attention to your specific needs is our first priority. What's more, we have significantly expanded our custom molding capabilities with the addition of experienced professionals at the tooling and design phases of the process.

Tooling design in a thought stimulating environment is also supplemented by our extensive computer aided design capabilities. Your custom parts production start with the design phase. Our custom molded products are developed using concurrent engineering techniques to assure a time-line from concept to production that has the consensus of both your team and our development staff. This complex task is the result of total coordination of vendors schedules with the allocation of resources to minimize the time required for tooling to be built and samples manufactured.

In short, you can count on us to work with you to design and manufacture products that optimize cost and functionality of your custom needs.

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