Selection Guide for Standard Size Quad-Ring® Brand Seals and Quad® Brand O-Ring Seals

Our standard Quad-Ring® Brand and O-Ring Seals are available from stock, in compound 366Y, a 70 Shore A nitrile and 514AD, a 70 Shore A fluorocarbon material.

For applications requiring other materials, Minnesota Rubber and Plastics can recommend one of our existing compounds or customize a special material to meet your needs. These parts are all manufactured in standard tools.

Understanding Our Part Numbers

Tolerances

Our standard Quad-Ring® Brand and O-Ring seal tooling is designed to the shrinkage characteristics of our popular 366Y, a 70 durometer nitrile formulation. Because every rubber formulation has its own shrinkage characteristics, slight deviations in dimensions will occur when standard seal tooling is used with materials other than our 366Y. The majority of the cases we encounter involve rubber compounds with a higher shrinkage factor, resulting in seals with undersized cross-sections and undersized inside diameters. This increase in shrinkage is most pronounced when using silicone, fluorosilicone and flourocarbon elastomer materials. Because of the decrease in cross-sectional size, groove dimensions may need to decrease to maintain a good seal. Parts produced in materials other than 366Y may not conform to the dimensional specifications as stated in AS-568A or the following table.

Note: The Rod and Bore columns listed in the following table do NOT indicate a rod/bore combination for a specific seal number. To use the table, first determine the proper seal size by locating the rod or the bore size on which you are sealing. The seal groove diameter can then be calculated as indicated, starting on page 6-10.

RING SIZE	ROD (in)	BORE (in)	NOMINAL ID (in)	NOMINAL C/S (in)	INSIDE DIAMETER (in)	INSIDE DIAMETER (mm)	CROSS-SECTION (in)	CROSS-SECTION (mm)
001	.031	.093	1/32	1/32	.029 ±.004	0.74 ±0.10	.040 ±.003	1.02 ±0.08
002	.046	.125	3/64	3/64	.042 ±.004	1.07 ±0.10	.050 ±.003	1.27 ±0.08
003	.062	.156	1/16	1/16	.056 ±.004	1.42 ±0.10	.060 ±.003	1.52 ±0.08
003 1/2	.078	.141	1/16	1/32	.070 ±.004	1.78 ±0.10	.040 ±.003	1.02 ±0.08
004	.078	.203	5/64	1/16	.070 ±.005	1.78 ±0.13	.070 ±.003	1.78 ±0.08
005	.109	.234	3/32	1/16	.101 ±.005	2.57 ±0.13	.070 ±.003	1.78 ±0.08
006	.125	.250	1/8	1/16	.114 ±.005	2.90 ±0.13	.070 ±.003	1.78 ±0.08
007	.156	.281	5/32	1/16	.145 ±.005	3.68 ±0.13	.070 ±.003	1.78 ±0.08
008	.187	.312	3/16	1/16	.176 ±.005	4.47 ±0.13	.070 ±.003	1.78 ±0.08
009	.218	.343	7/32	1/16	.208 ±.005	5.28 ±0.13	.070 ±.003	1.78 ±0.08
010	.250	.375	1/4	1/16	.239 ±.005	6.07 ±0.13	.070 ±.003	1.78 ±0.08
011	.312	.437	5/16	1/16	.301 ±.005	7.65 ±0.13	.070 ±.003	1.78 ±0.08
012	.375	.500	3/8	1/16	.364 ±.005	9.25 ±0.13	.070 ±.003	1.78 ±0.08
013	.437	.562	7/16	1/16	.426 ±.005	10.82 ±0.13	.070 ±.003	1.78 ±0.08
014	.500	.625	1/2	1/16	.489 ±.005	12.42 ±0.13	.070 ±.003	1.78 ±0.08
015	.562	.687	9/16	1/16	.551 ±.007	14.00 ±0.18	.070 ±.003	1.78 ±0.08
016	.625	.750	5/8	1/16	.614 ±.009	15.60 ±0.23	.070 ±.003	1.78 ±0.08
017	.687	.812	11/16	1/16	.676 ±.009	17.17 ±0.23	.070 ±.003	1.78 ±0.08

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RING SIZE	ROD (in)	BORE (in)	NOMINAL ID (in)	NOMINAL C/S (in)	INSIDE DIAMETER (in)	INSIDE DIAMETER (mm)	CROSS-SECTION (in)	CROSS-SECTION (mm)
018	.750	.875	3/4	1/16	.739 ±.009	18.77 ±0.23	.070 ±.003	1.78 ±0.08
019	.812	.937	13/16	1/16	.801 ±.009	20.35 ±0.23	.070 ±.003	1.78 ±0.08
020	.875	1.000	7/8	1/16	.864 ±.009	21.95 ±0.23	.070 ±.003	1.78 ±0.08
021	.937	1.062	15/16	1/16	.926 ±.009	23.52 ±0.23	.070 ±.003	1.78 ±0.08
022	1.000	1.125	1	1/16	.989 ±.010	25.12 ±0.25	.070 ±.003	1.78 ±0.08
023	1.062	1.187	1 1/16	1/16	1.051 ±.010	26.70 ±0.25	.070 ±.003	1.78 ±0.08
024	1.125	1.250	1 1/8	1/16	1.114 ±.010	28.30 ±0.25	.070 ±.003	1.78 ±0.08
025	1.187	1.312	1 3/16	1/16	1.176 ±.011	29.87 ±0.28	.070 ±.003	1.78 ±0.08
026	1.250	1.375	1 1/4	1/16	1.239 ±.011	31.47 ±0.28	.070 ±.003	1.78 ±0.08
027	1.312	1.437	1 5/16	1/16	1.301 ±.011	33.05 ±0.28	.070 ±.003	1.78 ±0.08
028	1.375	1.500	1 3/8	1/16	1.364 ±.013	34.65 ±0.33	.070 ±.003	1.78 ±0.08
029	1.500	1.625	1 1/2	1/16	1.489 ±.013	37.82 ±0.33	.070 ±.003	1.78 ±0.08
030	1.625	1.750	1 5/8	1/16	1.614 ±.013	41.00 ±0.33	.070 ±.003	1.78 ±0.08
031	1.750	1.875	1 3/4	1/16	1.739 ±.015	44.17 ±0.38	.070 ±.003	1.78 ±0.08
032	1.875	2.000	1 7/8	1/16	1.864 ±.015	47.35 ±0.38	.070 ±.003	1.78 ±0.08
033	2.000	2.125	2	1/16	1.989 ±.018	50.52 ±0.46	.070 ±.003	1.78 ±0.08
034	2.125	2.250	2 1/8	1/16	2.114 ±.018	53.70 ±0.46	.070 ±.003	1.78 ±0.08
035	2.250	2.375	2 1/4	1/16	2.239 ±.018	56.87 ±0.46	.070 ±.003	1.78 ±0.08
036	2.375	2.500	2 3/8	1/16	2.364 ±.018	60.05 ±0.46	.070 ±.003	1.78 ±0.08
037	2.500	2.625	2 1/2	1/16	2.489 ±.018	63.22 ±0.46	.070 ±.003	1.78 ±0.08
038	2.625	2.750	2 5/8	1/16	2.614 ±.020	66.40 ±0.51	.070 ±.003	1.78 ±0.08
039	2.750	2.875	2 3/4	1/16	2.739 ±.020	69.57 ±0.51	.070 ±.003	1.78 ±0.08
040	2.875	3.000	2 7/8	1/16	2.864 ±.020	72.75 ±0.51	.070 ±.003	1.78 ±0.08
041	3.000	3.125	3	1/16	2.989 ±.024	75.92 ±0.61	.070 ±.003	1.78 ±0.08
042	3.250	3.375	3 1/4	1/16	3.239 ±.024	82.27 ±0.61	.070 ±.003	1.78 ±0.08
043	3.500	3.625	3 1/2	1/16	3.489 ±.024	88.62 ±0.61	.070 ±.003	1.78 ±0.08
044	3.750	3.875	3 3/4	1/16	3.739 ±.027	94.97 ±0.69	.070 ±.003	1.78 ±0.08
045	4.000	4.125	4	1/16	3.989 ±.027	101.32 ±0.69	.070 ±.003	1.78 ±0.08
046	4.250	4.375	4 1/4	1/16	4.239 ±.030	107.67 ±0.76	.070 ±.003	1.78 ±0.08
047	4.500	4.625	4 1/2	1/16	4.489 ±.030	114.02 ±0.76	.070 ±.003	1.78 ±0.08
048	4.750	4.875	4 3/4	1/16	4.739 ±.030	120.37 ±0.76	.070 ±.003	1.78 ±0.08
049	5.000	5.125	5	1/16	4.989 ±.037	126.72 ±0.94	.070 ±.003	1.78 ±0.08
050	5.250	5.375	5 1/4	1/16	5.239 ±.037	133.07 ±0.94	.070 ±.003	1.78 ±0.08
051 THROUGH 101 SIZES NOT ASSIGNED								
102	.062	.250	1/16	3/32	.049 ±.005	1.24 ±0.13	.103 ±.003	2.62 ±0.08
103	.094	.281	3/32	3/32	.081 ±.005	2.06 ±0.13	.103 ±.003	2.62 ±0.08
104	.125	.312	1/8	3/32	.112 ±.005	2.84 ±0.13	.103 ±.003	2.62 ±0.08
105	.156	.343	5/32	3/32	.143 ±.005	3.63 ±0.13	.103 ±.003	2.62 ±0.08
106	.187	.375	3/16	3/32	.174 ±.005	4.42 ±0.13	.103 ±.003	2.62 ±0.08
107	.219	.406	7/32	3/32	.206 ±.005	5.23 ±0.13	.103 ±.003	2.62 ±0.08

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RING SIZE	ROD (in)	BORE (in)	NOMINAL ID (in)	NOMINAL C/S (in)	INSIDE DIAMETER (in)	INSIDE DIAMETER (mm)	CROSS-SECTION (in)	CROSS-SECTION (mm)
108	.250	.437	1/4	3/32	.237 ±.005	6.02 ±0.13	.103 ±.003	2.62 ±0.08
109	.312	.500	5/16	3/32	.299 ±.005	7.59 ±0.13	.103 ±.003	2.62 ±0.08
110	.375	.562	3/8	3/32	.362 ±.005	9.19 ±0.13	.103 ±.003	2.62 ±0.08
111	.437	.625	7/16	3/32	.424 ±.005	10.77 ±0.13	.103 ±.003	2.62 ±0.08
112	.500	.687	1/2	3/32	.487 ±.005	12.37 ±0.13	.103 ±.003	2.62 ±0.08
113	.562	.750	9/16	3/32	.549 ±.007	13.94 ±0.18	.103 ±.003	2.62 ±0.08
114	.625	.812	5/8	3/32	.612 ±.009	15.54 ±0.23	.103 ±.003	2.62 ±0.08
115	.687	.875	11/16	3/32	.674 ±.009	17.12 ±0.23	.103 ±.003	2.62 ±0.08
116	.750	.937	3/4	3/32	.737 ±.009	18.72 ±0.23	.103 ±.003	2.62 ±0.08
117	.812	1.000	13/16	3/32	.799 ±.010	20.29 ±0.25	.103 ±.003	2.62 ±0.08
118	.875	1.062	7/8	3/32	.862 ±.010	21.89 ±0.25	.103 ±.003	2.62 ±0.08
119	.937	1.125	15/16	3/32	.924 ±.010	23.47 ±0.25	.103 ±.003	2.62 ±0.08
120	1.000	1.187	1	3/32	.987 ±.010	25.07 ±0.25	.103 ±.003	2.62 ±0.08
121	1.062	1.250	1 1/16	3/32	1.049 ±.010	26.64 ±0.25	.103 ±.003	2.62 ±0.08
122	1.125	1.312	1 1/8	3/32	1.112 ±.010	28.24 ±0.25	.103 ±.003	2.62 ±0.08
123	1.187	1.375	1 3/16	3/32	1.174 ±.012	29.82 ±0.30	.103 ±.003	2.62 ±0.08
124	1.250	1.437	1 1/4	3/32	1.237 ±.012	31.42 ±0.30	.103 ±.003	2.62 ±0.08
125	1.312	1.500	1 5/16	3/32	1.299 ±.012	32.99 ±0.30	.103 ±.003	2.62 ±0.08
126	1.375	1.562	1 3/8	3/32	1.362 ±.012	34.59 ±0.30	.103 ±.003	2.62 ±0.08
127	1.437	1.625	1 7/16	3/32	1.424 ±.012	36.17 ±0.30	.103 ±.003	2.62 ±0.08
128	1.500	1.687	1 1/2	3/32	1.487 ±.012	37.77 ±0.30	.103 ±.003	2.62 ±0.08
129	1.562	1.750	1 9/16	3/32	1.549 ±.015	39.34 ±0.38	.103 ±.003	2.62 ±0.08
130	1.625	1.812	1 5/8	3/32	1.612 ±.015	40.94 ±0.38	.103 ±.003	2.62 ±0.08
131	1.687	1.875	1 11/16	3/32	1.674 ±.015	42.52 ±0.38	.103 ±.003	2.62 ±0.08
132	1.750	1.937	1 3/4	3/32	1.737 ±.015	44.12 ±0.38	.103 ±.003	2.62 ±0.08
133	1.812	2.000	1 13/16	3/32	1.799 ±.015	45.69 ±0.38	.103 ±.003	2.62 ±0.08
134	1.875	2.062	1 7/8	3/32	1.862 ±.015	47.29 ±0.38	.103 ±.003	2.62 ±0.08
135	1.938	2.125	1 15/16	3/32	1.925 ±.017	48.90 ±0.43	.103 ±.003	2.62 ±0.08
136	2.000	2.187	2	3/32	1.987 ±.017	50.47 ±0.43	.103 ±.003	2.62 ±0.08
137	2.063	2.250	2 1/16	3/32	2.050 ±.017	52.07 ±0.43	.103 ±.003	2.62 ±0.08
138	2.125	2.312	2 1/8	3/32	2.112 ±.017	53.64 ±0.43	.103 ±.003	2.62 ±0.08
139	2.188	2.375	2 3/16	3/32	2.175 ±.017	55.25 ±0.43	.103 ±.003	2.62 ±0.08
140	2.250	2.437	2 1/4	3/32	2.237 ±.017	56.82 ±0.43	.103 ±.003	2.62 ±0.08
141	2.313	2.500	2 5/16	3/32	2.300 ±.020	58.42 ±0.51	.103 ±.003	2.62 ±0.08
142	2.375	2.562	2 3/8	3/32	2.362 ±.020	59.99 ±0.51	.103 ±.003	2.62 ±0.08
143	2.438	2.625	2 7/16	3/32	2.425 ±.020	61.60 ±0.51	.103 ±.003	2.62 ±0.08
144	2.500	2.687	2 1/2	3/32	2.487 ±.020	63.17 ±0.51	.103 ±.003	2.62 ±0.08
145	2.563	2.750	2 9/16	3/32	2.550 ±.020	64.77 ±0.51	.103 ±.003	2.62 ±0.08
146	2.625	2.812	2 5/8	3/32	2.612 ±.020	66.34 ±0.51	.103 ±.003	2.62 ±0.08
147	2.688	2.875	2 11/16	3/32	2.675 ±.022	67.95 ±0.56	.103 ±.003	2.62 ±0.08

RING SIZE	ROD (in)	BORE (in)	NOMINAL ID (in)	NOMINAL C/S (in)	INSIDE DIAMETER (in)	INSIDE DIAMETER (mm)	CROSS-SECTION (in)	CROSS-SECTION (mm)
148	2.750	2.937	2 3/4	3/32	2.737 ±.022	69.52 ±0.56	.103 ±.003	2.62 ±0.08
149	2.813	3.000	2 13/16	3/32	2.800 ±.022	71.12 ±0.56	.103 ±.003	2.62 ±0.08
150	2.875	3.062	2 7/8	3/32	2.862 ±.022	72.69 ±0.56	.103 ±.003	2.62 ±0.08
151	3.000	3.187	3	3/32	2.987 ±.024	75.87 ±0.61	.103 ±.003	2.62 ±0.08
152	3.250	3.437	3 1/4	3/32	3.237 ±.024	82.22 ±0.61	.103 ±.003	2.62 ±0.08
153	3.500	3.687	3 1/2	3/32	3.487 ±.024	88.57 ±0.61	.103 ±.003	2.62 ±0.08
154	3.750	3.937	3 3/4	3/32	3.737 ±.028	94.92 ±0.71	.103 ±.003	2.62 ±0.08
155	4.000	4.187	4	3/32	3.987 ±.028	101.27 ±0.71	.103 ±.003	2.62 ±0.08
156	4.250	4.437	4 1/4	3/32	4.237 ±.030	107.62 ±0.76	.103 ±.003	2.62 ±0.08
157	4.500	4.687	4 1/2	3/32	4.487 ±.030	113.97 ±0.76	.103 ±.003	2.62 ±0.08
158	4.750	4.937	4 3/4	3/32	4.737 ±.030	120.32 ±0.76	.103 ±.003	2.62 ±0.08
159	5.000	5.187	5	3/32	4.987 ±.035	126.67 ±0.89	.103 ±.003	2.62 ±0.08
160	5.250	5.437	5 1/4	3/32	5.237 ±.035	133.02 ±0.89	.103 ±.003	2.62 ±0.08
161	5.500	5.687	5 1/2	3/32	5.487 ±.035	139.37 ±0.89	.103 ±.003	2.62 ±0.08
162	5.750	5.937	5 3/4	3/32	5.737 ±.035	145.72 ±0.89	.103 ±.003	2.62 ±0.08
163	6.000	6.187	6	3/32	5.987 ±.035	152.07 ±0.89	.103 ±.003	2.62 ±0.08
164	6.250	6.437	6 1/4	3/32	6.237 ±.040	158.42 ±1.02	.103 ±.003	2.62 ±0.08
165	6.500	6.687	6 1/2	3/32	6.487 ±.040	164.77 ±1.02	.103 ±.003	2.62 ±0.08
166	6.750	6.937	6 3/4	3/32	6.737 ±.040	171.12 ±1.02	.103 ±.003	2.62 ±0.08
167	7.000	7.187	7	3/32	6.987 ±.040	177.47 ±1.02	.103 ±.003	2.62 ±0.08
168	7.250	7.437	7 1/4	3/32	7.237 ±.045	183.82 ±1.14	.103 ±.003	2.62 ±0.08
169	7.500	7.687	7 1/2	3/32	7.487 ±.045	190.17 ±1.14	.103 ±.003	2.62 ±0.08
170	7.750	7.937	7 3/4	3/32	7.737 ±.045	196.52 ±1.14	.103 ±.003	2.62 ±0.08
171	8.000	8.187	8	3/32	7.987 ±.045	202.87 ±1.14	.103 ±.003	2.62 ±0.08
172	8.250	8.437	8 1/4	3/32	8.237 ±.050	209.22 ±1.27	.103 ±.003	2.62 ±0.08
173	8.500	8.687	8 1/2	3/32	8.487 ±.050	215.57 ±1.27	.103 ±.003	2.62 ±0.08
174	8.750	8.937	8 3/4	3/32	8.737 ±.050	221.92 ±1.27	.103 ±.003	2.62 ±0.08
175	9.000	9.187	9	3/32	8.987 ±.050	228.27 ±1.27	.103 ±.003	2.62 ±0.08
176	9.250	9.437	9 1/4	3/32	9.237 ±.055	234.62 ±1.40	.103 ±.003	2.62 ±0.08
177	9.500	9.687	9 1/2	3/32	9.487 ±.055	240.97 ±1.40	.103 ±.003	2.62 ±0.08
178	9.750	9.937	9 3/4	3/32	9.737 ±.055	247.32 ±1.40	.103 ±.003	2.62 ±0.08
179 THROUGH 201 SIZES NOT ASSIGNED								
201	.187	.437	3/16	1/8	.171 ±.005	4.34 ±0.13	.139 ±.004	3.53 ±0.10
202	.250	.500	1/4	1/8	.234 ±.005	5.94 ±0.13	.139 ±.004	3.53 ±0.10
203	.312	.562	5/16	1/8	.296 ±.005	7.52 ±0.13	.139 ±.004	3.53 ±0.10
204	.375	.625	3/8	1/8	.359 ±.005	9.12 ±0.13	.139 ±.004	3.53 ±0.10
205	.437	.687	7/16	1/8	.421 ±.005	10.69 ±0.13	.139 ±.004	3.53 ±0.10
206	.500	.750	1/2	1/8	.484 ±.005	12.29 ±0.13	.139 ±.004	3.53 ±0.10
207	.562	.812	9/16	1/8	.546 ±.007	13.87 ±0.18	.139 ±.004	3.53 ±0.10
208	.625	.875	5/8	1/8	.609 ±.009	15.47 ±0.23	.139 ±.004	3.53 ±0.10

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RING SIZE	ROD (in)	BORE (in)	NOMINAL ID (in)	NOMINAL C/S (in)	INSIDE DIAMETER (in)	INSIDE DIAMETER (mm)	CROSS-SECTION (in)	CROSS-SECTION (mm)
209	.687	.937	11/16	1/8	.671 ±.009	17.04 ±0.23	.139 ±.004	3.53 ±0.10
210	.750	1.000	3/4	1/8	.734 ±.010	18.64 ±0.25	.139 ±.004	3.53 ±0.10
211	.812	1.062	13/16	1/8	.796 ±.010	20.22 ±0.25	.139 ±.004	3.53 ±0.10
212	.875	1.125	7/8	1/8	.859 ±.010	21.82 ±0.25	.139 ±.004	3.53 ±0.10
213	.937	1.187	15/16	1/8	.921 ±.010	23.39 ±0.25	.139 ±.004	3.53 ±0.10
214	1.000	1.250	1	1/8	.984 ±.010	24.99 ±0.25	.139 ±.004	3.53 ±0.10
215	1.062	1.312	1 1/16	1/8	1.046 ±.010	26.57 ±0.25	.139 ±.004	3.53 ±0.10
216	1.125	1.375	1 1/8	1/8	1.109 ±.012	28.17 ±0.30	.139 ±.004	3.53 ±0.10
217	1.187	1.437	1 3/16	1/8	1.171 ±.012	29.74 ±0.30	.139 ±.004	3.53 ±0.10
218	1.250	1.500	1 1/4	1/8	1.234 ±.012	31.34 ±0.30	.139 ±.004	3.53 ±0.10
219	1.312	1.562	1 5/16	1/8	1.296 ±.012	32.92 ±0.30	.139 ±.004	3.53 ±0.10
220	1.375	1.625	1 3/8	1/8	1.359 ±.012	34.52 ±0.30	.139 ±.004	3.53 ±0.10
221	1.437	1.687	1 7/16	1/8	1.421 ±.012	36.09 ±0.30	.139 ±.004	3.53 ±0.10
222	1.500	1.750	1 1/2	1/8	1.484 ±.015	37.69 ±0.38	.139 ±.004	3.53 ±0.10
223	1.625	1.875	1 5/8	1/8	1.609 ±.015	40.87 ±0.38	.139 ±.004	3.53 ±0.10
224	1.750	2.000	1 3/4	1/8	1.734 ±.015	44.04 ±0.38	.139 ±.004	3.53 ±0.10
225	1.875	2.125	1 7/8	1/8	1.859 ±.018	47.22 ±0.46	.139 ±.004	3.53 ±0.10
226	2.000	2.250	2	1/8	1.984 ±.018	50.39 ±0.46	.139 ±.004	3.53 ±0.10
227	2.125	2.375	2 1/8	1/8	2.109 ±.018	53.57 ±0.46	.139 ±.004	3.53 ±0.10
228	2.250	2.500	2 1/4	1/8	2.234 ±.020	56.74 ±0.51	.139 ±.004	3.53 ±0.10
229	2.375	2.625	2 3/8	1/8	2.359 ±.020	59.92 ±0.51	.139 ±.004	3.53 ±0.10
230	2.500	2.750	2 1/2	1/8	2.484 ±.020	63.09 ±0.51	.139 ±.004	3.53 ±0.10
231	2.625	2.875	2 5/8	1/8	2.609 ±.020	66.27 ±0.51	.139 ±.004	3.53 ±0.10
232	2.750	3.000	2 3/4	1/8	2.734 ±.024	69.44 ±0.61	.139 ±.004	3.53 ±0.10
233	2.875	3.125	2 7/8	1/8	2.859 ±.024	72.62 ±0.61	.139 ±.004	3.53 ±0.10
234	3.000	3.250	3	1/8	2.984 ±.024	75.79 ±0.61	.139 ±.004	3.53 ±0.10
235	3.125	3.375	3 1/8	1/8	3.109 ±.024	78.97 ±0.61	.139 ±.004	3.53 ±0.10
236	3.250	3.500	3 1/4	1/8	3.234 ±.024	82.14 ±0.61	.139 ±.004	3.53 ±0.10
237	3.375	3.625	3 3/8	1/8	3.359 ±.024	85.32 ±0.61	.139 ±.004	3.53 ±0.10
238	3.500	3.750	3 1/2	1/8	3.484 ±.024	88.49 ±0.61	.139 ±.004	3.53 ±0.10
239	3.625	3.875	3 5/8	1/8	3.609 ±.028	91.67 ±0.71	.139 ±.004	3.53 ±0.10
240	3.750	4.000	3 3/4	1/8	3.734 ±.028	94.84 ±0.71	.139 ±.004	3.53 ±0.10
241	3.875	4.125	3 7/8	1/8	3.859 ±.028	98.02 ±0.71	.139 ±.004	3.53 ±0.10
242	4.000	4.250	4	1/8	3.984 ±.028	101.19 ±0.71	.139 ±.004	3.53 ±0.10
243	4.125	4.375	4 1/8	1/8	4.109 ±.028	104.37 ±0.71	.139 ±.004	3.53 ±0.10
244	4.250	4.500	4 1/4	1/8	4.234 ±.030	107.54 ±0.76	.139 ±.004	3.53 ±0.10
245	4.375	4.625	4 3/8	1/8	4.359 ±.030	110.72 ±0.76	.139 ±.004	3.53 ±0.10
246	4.500	4.750	4 1/2	1/8	4.484 ±.030	113.89 ±0.76	.139 ±.004	3.53 ±0.10
247	4.625	4.875	4 5/8	1/8	4.609 ±.030	117.07 ±0.76	.139 ±.004	3.53 ±0.10
248	4.750	5.000	4 3/4	1/8	4.734 ±.030	120.24 ±0.76	.139 ±.004	3.53 ±0.10

RING SIZE	ROD (in)	BORE (in)	NOMINAL ID (in)	NOMINAL C/S (in)	INSIDE DIAMETER (in)	INSIDE DIAMETER (mm)	CROSS-SECTION (in)	CROSS-SECTION (mm)
249	4.875	5.125	4 7/8	1/8	4.859 ±.035	123.42 ±0.89	.139 ±.004	3.53 ±0.10
250	5.000	5.250	5	1/8	4.984 ±.035	126.59 ±0.89	.139 ±.004	3.53 ±0.10
251	5.125	5.375	5 1/8	1/8	5.109 ±.035	129.77 ±0.89	.139 ±.004	3.53 ±0.10
252	5.250	5.500	5 1/4	1/8	5.234 ±.035	132.94 ±0.89	.139 ±.004	3.53 ±0.10
253	5.375	5.625	5 3/8	1/8	5.359 ±.035	136.12 ±0.89	.139 ±.004	3.53 ±0.10
254	5.500	5.750	5 1/2	1/8	5.484 ±.035	139.29 ±0.89	.139 ±.004	3.53 ±0.10
255	5.625	5.875	5 5/8	1/8	5.609 ±.035	142.47 ±0.89	.139 ±.004	3.53 ±0.10
256	5.750	6.000	5 3/4	1/8	5.734 ±.035	145.64 ±0.89	.139 ±.004	3.53 ±0.10
257	5.875	6.125	5 7/8	1/8	5.859 ±.035	148.82 ±0.89	.139 ±.004	3.53 ±0.10
258	6.000	6.250	6	1/8	5.984 ±.035	151.99 ±0.89	.139 ±.004	3.53 ±0.10
259	6.250	6.500	6 1/4	1/8	6.234 ±.040	158.34 ±1.02	.139 ±.004	3.53 ±0.10
260	6.500	6.750	6 1/2	1/8	6.484 ±.040	164.69 ±1.02	.139 ±.004	3.53 ±0.10
261	6.750	7.000	6 3/4	1/8	6.734 ±.040	171.04 ±1.02	.139 ±.004	3.53 ±0.10
262	7.000	7.250	7	1/8	6.984 ±.040	177.39 ±1.02	.139 ±.004	3.53 ±0.10
263	7.250	7.500	7 1/4	1/8	7.234 ±.045	183.74 ±1.14	.139 ±.004	3.53 ±0.10
264	7.500	7.750	7 1/2	1/8	7.484 ±.045	190.09 ±1.14	.139 ±.004	3.53 ±0.10
265	7.750	8.000	7 3/4	1/8	7.734 ±.045	196.44 ±1.14	.139 ±.004	3.53 ±0.10
266	8.000	8.250	8	1/8	7.984 ±.045	202.79 ±1.14	.139 ±.004	3.53 ±0.10
267	8.250	8.500	8 1/4	1/8	8.234 ±.050	209.14 ±1.27	.139 ±.004	3.53 ±0.10
268	8.500	8.750	8 1/2	1/8	8.484 ±.050	215.49 ±1.27	.139 ±.004	3.53 ±0.10
269	8.750	9.000	8 3/4	1/8	8.734 ±.050	221.84 ±1.27	.139 ±.004	3.53 ±0.10
270	9.000	9.250	9	1/8	8.984 ±.050	228.19 ±1.27	.139 ±.004	3.53 ±0.10
271	9.250	9.500	9 1/4	1/8	9.234 ±.055	234.54 ±1.40	.139 ±.004	3.53 ±0.10
272	9.500	9.750	9 1/2	1/8	9.484 ±.055	240.89 ±1.40	.139 ±.004	3.53 ±0.10
273	9.750	10.000	9 3/4	1/8	9.734 ±.055	247.24 ±1.40	.139 ±.004	3.53 ±0.10
274	10.000	10.250	10	1/8	9.984 ±.055	253.59 ±1.40	.139 ±.004	3.53 ±0.10
275	10.500	10.750	10 1/2	1/8	10.484 ±.055	266.29 ±1.40	.139 ±.004	3.53 ±0.10
276	11.000	11.250	11	1/8	10.984 ±.065	278.99 ±1.65	.139 ±.004	3.53 ±0.10
277	11.500	11.750	11 1/2	1/8	11.484 ±.065	291.69 ±1.65	.139 ±.004	3.53 ±0.10
278	12.000	12.250	12	1/8	11.984 ±.065	304.39 ±1.65	.139 ±.004	3.53 ±0.10
279	13.000	13.250	13	1/8	12.984 ±.065	329.79 ±1.65	.139 ±.004	3.53 ±0.10
280	14.000	14.250	14	1/8	13.984 ±.065	355.19 ±1.65	.139 ±.004	3.53 ±0.10
281	15.000	15.250	15	1/8	14.984 ±.065	380.59 ±1.65	.139 ±.004	3.53 ±0.10
282	16.000	16.250	16	1/8	15.955 ±.075	405.26 ±1.91	.139 ±.004	3.53 ±0.10
283	17.000	17.250	17	1/8	16.955 ±.080	430.66 ±2.03	.139 ±.004	3.53 ±0.10
284	18.000	18.250	18	1/8	17.955 ±.085	456.06 ±2.16	.139 ±.004	3.53 ±0.10
285 THROUGH 308 SIZES NOT ASSIGNED								
309	.437	.812	7/16	3/16	.412 ±.005	10.46 ±0.13	.210 ±.005	5.33 ±0.13
310	.500	.875	1/2	3/16	.475 ±.005	12.07 ±0.13	.210 ±.005	5.33 ±0.13
311	.562	.937	9/16	3/16	.537 ±.007	13.64 ±0.18	.210 ±.005	5.33 ±0.13

Selection Guide for Standard Size Quad-Ring® Brand Seals and Quad® Brand O-Ring Seals - continued

RING SIZE	ROD (in)	BORE (in)	NOMINAL ID (in)	NOMINAL C/S (in)	INSIDE DIAMETER (in)	INSIDE DIAMETER (mm)	CROSS-SECTION (in)	CROSS-SECTION (mm)
312	.625	1.000	5/8	3/16	.600 ±.009	15.24 ±0.23	.210 ±.005	5.33 ±0.13
313	.687	1.062	11/16	3/16	.662 ±.009	16.81 ±0.23	.210 ±.005	5.33 ±0.13
314	.750	1.125	3/4	3/16	.725 ±.010	18.42 ±0.25	.210 ±.005	5.33 ±0.13
315	.812	1.187	13/16	3/16	.787 ±.010	19.99 ±0.25	.210 ±.005	5.33 ±0.13
316	.875	1.250	7/8	3/16	.850 ±.010	21.59 ±0.25	.210 ±.005	5.33 ±0.13
317	.937	1.312	15/16	3/16	.912 ±.010	23.16 ±0.25	.210 ±.005	5.33 ±0.13
318	1.000	1.375	1	3/16	.975 ±.010	24.77 ±0.25	.210 ±.005	5.33 ±0.13
319	1.062	1.437	1 1/16	3/16	1.037 ±.010	26.34 ±0.25	.210 ±.005	5.33 ±0.13
320	1.125	1.500	1 1/8	3/16	1.100 ±.012	27.94 ±0.30	.210 ±.005	5.33 ±0.13
321	1.187	1.562	1 3/16	3/16	1.162 ±.012	29.51 ±0.30	.210 ±.005	5.33 ±0.13
322	1.250	1.625	1 1/4	3/16	1.225 ±.012	31.12 ±0.30	.210 ±.005	5.33 ±0.13
323	1.312	1.687	1 5/16	3/16	1.287 ±.012	32.69 ±0.30	.210 ±.005	5.33 ±0.13
324	1.375	1.750	1 3/8	3/16	1.350 ±.012	34.29 ±0.30	.210 ±.005	5.33 ±0.13
325	1.500	1.875	1 1/2	3/16	1.475 ±.015	37.47 ±0.38	.210 ±.005	5.33 ±0.13
326	1.625	2.000	1 5/8	3/16	1.600 ±.015	40.64 ±0.38	.210 ±.005	5.33 ±0.13
327	1.750	2.125	1 3/4	3/16	1.725 ±.015	43.82 ±0.38	.210 ±.005	5.33 ±0.13
328	1.875	2.250	1 7/8	3/16	1.850 ±.015	46.99 ±0.38	.210 ±.005	5.33 ±0.13
329	2.000	2.375	2	3/16	1.975 ±.018	50.17 ±0.46	.210 ±.005	5.33 ±0.13
330	2.125	2.500	2 1/8	3/16	2.100 ±.018	53.34 ±0.46	.210 ±.005	5.33 ±0.13
331	2.250	2.625	2 1/4	3/16	2.225 ±.018	56.52 ±0.46	.210 ±.005	5.33 ±0.13
332	2.375	2.750	2 3/8	3/16	2.350 ±.018	59.69 ±0.46	.210 ±.005	5.33 ±0.13
333	2.500	2.875	2 1/2	3/16	2.475 ±.020	62.87 ±0.51	.210 ±.005	5.33 ±0.13
334	2.625	3.000	2 5/8	3/16	2.600 ±.020	66.04 ±0.51	.210 ±.005	5.33 ±0.13
335	2.750	3.125	2 3/4	3/16	2.725 ±.020	69.22 ±0.51	.210 ±.005	5.33 ±0.13
336	2.875	3.250	2 7/8	3/16	2.850 ±.020	72.39 ±0.51	.210 ±.005	5.33 ±0.13
337	3.000	3.375	3	3/16	2.975 ±.024	75.57 ±0.61	.210 ±.005	5.33 ±0.13
338	3.125	3.500	3 1/8	3/16	3.100 ±.024	78.74 ±0.61	.210 ±.005	5.33 ±0.13
339	3.250	3.625	3 1/4	3/16	3.225 ±.024	81.92 ±0.61	.210 ±.005	5.33 ±0.13
340	3.375	3.750	3 3/8	3/16	3.350 ±.024	85.09 ±0.61	.210 ±.005	5.33 ±0.13
341	3.500	3.875	3 1/2	3/16	3.475 ±.024	88.27 ±0.61	.210 ±.005	5.33 ±0.13
342	3.625	4.000	3 5/8	3/16	3.600 ±.028	91.44 ±0.71	.210 ±.005	5.33 ±0.13
343	3.750	4.125	3 3/4	3/16	3.725 ±.028	94.62 ±0.71	.210 ±.005	5.33 ±0.13
344	3.875	4.250	3 7/8	3/16	3.850 ±.028	97.79 ±0.71	.210 ±.005	5.33 ±0.13
345	4.000	4.375	4	3/16	3.975 ±.028	100.97 ±0.71	.210 ±.005	5.33 ±0.13
346	4.125	4.500	4 1/8	3/16	4.100 ±.028	104.14 ±0.71	.210 ±.005	5.33 ±0.13
347	4.250	4.625	4 1/4	3/16	4.225 ±.030	107.32 ±0.76	.210 ±.005	5.33 ±0.13
348	4.375	4.750	4 3/8	3/16	4.350 ±.030	110.49 ±0.76	.210 ±.005	5.33 ±0.13
349	4.500	4.875	4 1/2	3/16	4.475 ±.030	113.67 ±0.76	.210 ±.005	5.33 ±0.13
350	4.625	5.000	4 5/8	3/16	4.600 ±.030	116.84 ±0.76	.210 ±.005	5.33 ±0.13
351	4.750	5.125	4 3/4	3/16	4.725 ±.030	120.02 ±0.76	.210 ±.005	5.33 ±0.13

RING SIZE	ROD (in)	BORE (in)	NOMINAL ID (in)	NOMINAL C/S (in)	INSIDE DIAMETER (in)	INSIDE DIAMETER (mm)	CROSS-SECTION (in)	CROSS-SECTION (mm)
352	4.875	5.250	4 7/8	3/16	4.850 ±.030	123.19 ±0.76	.210 ±.005	5.33 ±0.13
353	5.000	5.375	5	3/16	4.975 ±.037	126.37 ±0.94	.210 ±.005	5.33 ±0.13
354	5.125	5.500	5 1/8	3/16	5.100 ±.037	129.54 ±0.94	.210 ±.005	5.33 ±0.13
355	5.250	5.625	5 1/4	3/16	5.225 ±.037	132.72 ±0.94	.210 ±.005	5.33 ±0.13
356	5.375	5.750	5 3/8	3/16	5.350 ±.037	135.89 ±0.94	.210 ±.005	5.33 ±0.13
357	5.500	5.875	5 1/2	3/16	5.475 ±.037	139.07 ±0.94	.210 ±.005	5.33 ±0.13
358	5.625	6.000	5 5/8	3/16	5.600 ±.037	142.24 ±0.94	.210 ±.005	5.33 ±0.13
359	5.750	6.125	5 3/4	3/16	5.725 ±.037	145.42 ±0.94	.210 ±.005	5.33 ±0.13
360	5.875	6.250	5 7/8	3/16	5.850 ±.037	148.59 ±0.94	.210 ±.005	5.33 ±0.13
361	6.000	6.375	6	3/16	5.975 ±.037	151.77 ±0.94	.210 ±.005	5.33 ±0.13
362	6.250	6.625	6 1/4	3/16	6.225 ±.040	158.12 ±1.02	.210 ±.005	5.33 ±0.13
363	6.500	6.875	6 1/2	3/16	6.475 ±.040	164.47 ±1.02	.210 ±.005	5.33 ±0.13
364	6.750	7.125	6 3/4	3/16	6.725 ±.040	170.82 ±1.02	.210 ±.005	5.33 ±0.13
365	7.000	7.375	7	3/16	6.975 ±.040	177.17 ±1.02	.210 ±.005	5.33 ±0.13
366	7.250	7.625	7 1/4	3/16	7.225 ±.045	183.52 ±1.14	.210 ±.005	5.33 ±0.13
367	7.500	7.875	7 1/2	3/16	7.475 ±.045	189.87 ±1.14	.210 ±.005	5.33 ±0.13
368	7.750	8.125	7 3/4	3/16	7.725 ±.045	196.22 ±1.14	.210 ±.005	5.33 ±0.13
369	8.000	8.375	8	3/16	7.975 ±.045	202.57 ±1.14	.210 ±.005	5.33 ±0.13
370	8.250	8.625	8 1/4	3/16	8.225 ±.050	208.92 ±1.27	.210 ±.005	5.33 ±0.13
371	8.500	8.875	8 1/2	3/16	8.475 ±.050	215.27 ±1.27	.210 ±.005	5.33 ±0.13
372	8.750	9.125	8 3/4	3/16	8.725 ±.050	221.62 ±1.27	.210 ±.005	5.33 ±0.13
373	9.000	9.375	9	3/16	8.975 ±.050	227.97 ±1.27	.210 ±.005	5.33 ±0.13
374	9.250	9.625	9 1/4	3/16	9.225 ±.055	234.32 ±1.40	.210 ±.005	5.33 ±0.13
375	9.500	9.875	9 1/2	3/16	9.475 ±.055	240.67 ±1.40	.210 ±.005	5.33 ±0.13
376	9.750	10.125	9 3/4	3/16	9.725 ±.055	247.02 ±1.40	.210 ±.005	5.33 ±0.13
377	10.000	10.375	10	3/16	9.975 ±.055	253.37 ±1.40	.210 ±.005	5.33 ±0.13
378	10.500	10.875	10 1/2	3/16	10.475 ±.060	266.07 ±1.52	.210 ±.005	5.33 ±0.13
379	11.000	11.375	11	3/16	10.975 ±.060	278.77 ±1.52	.210 ±.005	5.33 ±0.13
380	11.500	11.875	11 1/2	3/16	11.475 ±.065	291.47 ±1.65	.210 ±.005	5.33 ±0.13
381	12.000	12.375	12	3/16	11.975 ±.065	304.17 ±1.65	.210 ±.005	5.33 ±0.13
382	13.000	13.375	13	3/16	12.975 ±.065	329.57 ±1.65	.210 ±.005	5.33 ±0.13
383	14.000	14.375	14	3/16	13.975 ±.070	354.97 ±1.78	.210 ±.005	5.33 ±0.13
384	15.000	15.375	15	3/16	14.975 ±.070	380.37 ±1.78	.210 ±.005	5.33 ±0.13
385	16.000	16.375	16	3/16	15.955 ±.075	405.26 ±1.91	.210 ±.005	5.33 ±0.13
386	17.000	17.375	17	3/16	16.955 ±.080	430.66 ±2.03	.210 ±.005	5.33 ±0.13
387	18.000	18.375	18	3/16	17.955 ±.085	456.06 ±2.16	.210 ±.005	5.33 ±0.13
388	19.000	19.375	19	3/16	18.955 ±.090	481.46 ±2.29	.210 ±.005	5.33 ±0.13
389	20.000	20.375	20	3/16	19.955 ±.095	506.86 ±2.41	.210 ±.005	5.33 ±0.13
390	21.000	21.375	21	3/16	20.955 ±.095	532.26 ±2.41	.210 ±.005	5.33 ±0.13
391	22.000	22.375	22	3/16	21.955 ±.100	557.66 ±2.54	.210 ±.005	5.33 ±0.13

Selection Guide for Standard Size Quad-Ring® Brand Seals and Quad® Brand O-Ring Seals - continued

RING SIZE	ROD (in)	BORE (in)	NOMINAL ID (in)	NOMINAL C/S (in)	INSIDE DIAMETER (in)	INSIDE DIAMETER (mm)	CROSS-SECTION (in)	CROSS-SECTION (mm)
392	23.000	23.375	23	3/16	22.940 ±.105	582.68 ±2.67	.210 ±.005	5.33 ±0.13
393	24.000	24.375	24	3/16	23.940 ±.110	608.08 ±2.79	.210 ±.005	5.33 ±0.13
394	25.000	25.375	25	3/16	24.940 ±.115	633.48 ±2.92	.210 ±.005	5.33 ±0.13
395	26.000	26.375	26	3/16	25.940 ±.120	658.88 ±3.05	.210 ±.005	5.33 ±0.13
396 THROUGH 424 SIZES NOT ASSIGNED								
425	4.500	5.000	4 1/2	1/4	4.475 ±.033	113.67 ±0.84	.275 ±.006	6.99 ±0.15
426	4.625	5.125	4 5/8	1/4	4.600 ±.033	116.84 ±0.84	.275 ±.006	6.99 ±0.15
427	4.750	5.250	4 3/4	1/4	4.725 ±.033	120.02 ±0.84	.275 ±.006	6.99 ±0.15
428	4.875	5.375	4 7/8	1/4	4.850 ±.033	123.19 ±0.84	.275 ±.006	6.99 ±0.15
429	5.000	5.500	5	1/4	4.975 ±.037	126.37 ±0.94	.275 ±.006	6.99 ±0.15
430	5.125	5.625	5 1/8	1/4	5.100 ±.037	129.54 ±0.94	.275 ±.006	6.99 ±0.15
431	5.250	5.750	5 1/4	1/4	5.225 ±.037	132.72 ±0.94	.275 ±.006	6.99 ±0.15
432	5.375	5.875	5 3/8	1/4	5.350 ±.037	135.89 ±0.94	.275 ±.006	6.99 ±0.15
433	5.500	6.000	5 1/2	1/4	5.475 ±.037	139.07 ±0.94	.275 ±.006	6.99 ±0.15
434	5.625	6.125	5 5/8	1/4	5.600 ±.037	142.24 ±0.94	.275 ±.006	6.99 ±0.15
435	5.750	6.250	5 3/4	1/4	5.725 ±.037	145.42 ±0.94	.275 ±.006	6.99 ±0.15
436	5.875	6.375	5 7/8	1/4	5.850 ±.037	148.59 ±0.94	.275 ±.006	6.99 ±0.15
437	6.000	6.500	6	1/4	5.975 ±.037	151.77 ±0.94	.275 ±.006	6.99 ±0.15
438	6.250	6.750	6 1/4	1/4	6.225 ±.040	158.12 ±1.02	.275 ±.006	6.99 ±0.15
439	6.500	7.000	6 1/2	1/4	6.475 ±.040	164.47 ±1.02	.275 ±.006	6.99 ±0.15
440	6.750	7.250	6 3/4	1/4	6.725 ±.040	170.82 ±1.02	.275 ±.006	6.99 ±0.15
441	7.000	7.500	7	1/4	6.975 ±.040	177.17 ±1.02	.275 ±.006	6.99 ±0.15
442	7.250	7.750	7 1/4	1/4	7.225 ±.045	183.52 ±1.14	.275 ±.006	6.99 ±0.15
443	7.500	8.000	7 1/2	1/4	7.475 ±.045	189.87 ±1.14	.275 ±.006	6.99 ±0.15
444	7.750	8.250	7 3/4	1/4	7.725 ±.045	196.22 ±1.14	.275 ±.006	6.99 ±0.15
445	8.000	8.500	8	1/4	7.975 ±.045	202.57 ±1.14	.275 ±.006	6.99 ±0.15
446	8.500	9.000	8 1/2	1/4	8.475 ±.055	215.27 ±1.40	.275 ±.006	6.99 ±0.15
447	9.000	9.500	9	1/4	8.975 ±.055	227.97 ±1.40	.275 ±.006	6.99 ±0.15
448	9.500	10.000	9 1/2	1/4	9.475 ±.055	240.67 ±1.40	.275 ±.006	6.99 ±0.15
449	10.000	10.500	10	1/4	9.975 ±.055	253.37 ±1.40	.275 ±.006	6.99 ±0.15
450	10.500	11.000	10 1/2	1/4	10.475 ±.060	266.07 ±1.52	.275 ±.006	6.99 ±0.15
451	11.000	11.500	11	1/4	10.975 ±.060	278.77 ±1.52	.275 ±.006	6.99 ±0.15
452	11.500	12.000	11 1/2	1/4	11.475 ±.060	291.47 ±1.52	.275 ±.006	6.99 ±0.15
453	12.000	12.500	12	1/4	11.975 ±.060	304.17 ±1.52	.275 ±.006	6.99 ±0.15
454	12.500	13.000	12 1/2	1/4	12.475 ±.060	316.87 ±1.52	.275 ±.006	6.99 ±0.15
455	13.000	13.500	13	1/4	12.975 ±.060	329.57 ±1.52	.275 ±.006	6.99 ±0.15
456	13.500	14.000	13 1/2	1/4	13.475 ±.070	342.27 ±1.78	.275 ±.006	6.99 ±0.15
457	14.000	14.500	14	1/4	13.975 ±.070	354.97 ±1.78	.275 ±.006	6.99 ±0.15
458	14.500	15.000	14 1/2	1/4	14.475 ±.070	367.67 ±1.78	.275 ±.006	6.99 ±0.15
459	15.000	15.500	15	1/4	14.975 ±.070	380.37 ±1.78	.275 ±.006	6.99 ±0.15

RING SIZE	ROD (in)	BORE (in)	NOMINAL ID (in)	NOMINAL C/S (in)	INSIDE DIAMETER (in)	INSIDE DIAMETER (mm)	CROSS-SECTION (in)	CROSS-SECTION (mm)
460	15.500	16.000	15 1/2	1/4	15.475 ±.070	393.07 ±1.78	.275 ±.006	6.99 ±0.15
461	16.000	16.500	16	1/4	15.955 ±.075	405.26 ±1.91	.275 ±.006	6.99 ±0.15
462	16.500	17.000	16 1/2	1/4	16.455 ±.075	417.96 ±1.91	.275 ±.006	6.99 ±0.15
463	17.000	17.500	17	1/4	16.955 ±.080	430.66 ±2.03	.275 ±.006	6.99 ±0.15
464	17.500	18.000	17 1/2	1/4	17.455 ±.085	443.36 ±2.16	.275 ±.006	6.99 ±0.15
465	18.000	18.500	18	1/4	17.955 ±.085	456.06 ±2.16	.275 ±.006	6.99 ±0.15
466	18.500	19.000	18 1/2	1/4	18.455 ±.085	468.76 ±2.16	.275 ±.006	6.99 ±0.15
467	19.000	19.500	19	1/4	18.955 ±.090	481.46 ±2.29	.275 ±.006	6.99 ±0.15
468	19.500	20.000	19 1/2	1/4	19.455 ±.090	494.16 ±2.29	.275 ±.006	6.99 ±0.15
469	20.000	20.500	20	1/4	19.955 ±.095	506.86 ±2.41	.275 ±.006	6.99 ±0.15
470	21.000	21.500	21	1/4	20.955 ±.095	532.26 ±2.41	.275 ±.006	6.99 ±0.15
471	22.000	22.500	22	1/4	21.955 ±.100	557.66 ±2.54	.275 ±.006	6.99 ±0.15
472	23.000	23.500	23	1/4	22.940 ±.105	582.68 ±2.67	.275 ±.006	6.99 ±0.15
473	24.000	24.500	24	1/4	23.940 ±.110	608.08 ±2.79	.275 ±.006	6.99 ±0.15
474	25.00	25.500	25	1/4	24.940 ±.115	633.48 ±2.92	.275 ±.006	6.99 ±0.15
475	26.000	26.500	26	1/4	25.940 ±.120	658.88 ±3.05	.275 ±.006	6.99 ±0.15