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ISO 9001:2015 Certified

1/16"	Nominal Cross Section ACTUAL: .070 ± .003 in. 1.78 ± .08 mm					
SIZE	NOMINAL (in.)		ACTUAL I.D.			
	I.D.	O.D.	in.	±	mm	±
-001	1/32	3/32	0.029	.004	0.74	.10
-002	3/64	9/64	0.042	.004	1.07	.10
-003	1/16	3/16	0.056	.004	1.42	.10
-004	5/64	13/64	0.070	.005	1.78	.13
-005	3/32	7/32	0.101	.005	2.57	.13
-006	1/8	1/4	0.114	.005	2.90	.13
-007	5/32	9/32	0.145	.005	3.68	.13
-008	3/16	5/16	0.176	.005	4.47	.13
-009	7/32	11/32	0.208	.005	5.28	.13
-010	1/4	3/8	0.239	.005	6.07	.13
-011	5/16	7/16	0.301	.005	7.65	.13
-012	3/8	1/2	0.364	.005	9.25	.13
-013	7/16	9/16	0.426	.005	10.82	.13
-014	1/2	5/8	0.489	.005	12.42	.13
-015	9/16	11/16	0.551	.007	14.00	.18
-016	5/8	3/4	0.614	.009	15.60	.23
-017	11/16	13/16	0.676	.009	17.17	.23
-018	3/4	7/8	0.739	.009	18.77	.23
-019	13/16	15/16	0.801	.009	20.35	.23
-020	7/8	1	0.864	.009	21.95	.23
-021	15/16	1-1/16	0.926	.009	23.52	.23
-022	1	1-1/8	0.989	.010	25.12	.25
-023	1-1/16	1-3/16	1.051	.010	26.70	.25
-024	1-1/8	1-1/4	1.114	.010	28.30	.25
-025	1-3/16	1-5/16	1.176	.011	29.87	.28
-026	1-1/4	1-3/8	1.239	.011	31.47	.28
-027	1-5/16	1-7/16	1.301	.011	33.05	.28
-028	1-3/8	1-1/2	1.364	.013	34.65	.33
-029	1-1/2	1-5/8	1.489	.013	37.82	.33
-030	1-5/8	1-3/4	1.614	.013	41.00	.33
-031	1-3/4	1-7/8	1.739	.015	44.17	.38
-032	1-7/8	2	1.864	.015	47.35	.38
-033	2	2-1/8	1.989	.018	50.52	.46
-034	2-1/8	2-1/4	2.114	.018	53.70	.46
-035	2-1/4	2-3/8	2.239	.018	56.87	.46
-036	2-3/8	2-1/2	2.364	.018	60.05	.46
-037	2-1/2	2-5/8	2.489	.018	63.22	.46
-038	2-5/8	2-3/4	2.614	.020	66.40	.51
-039	2-3/4	2-7/8	2.739	.020	69.57	.51
-040	2-7/8	3	2.864	.020	72.75	.51
-041	3	3-1/8	2.989	.024	75.92	.61
-042	3-1/4	3-3/8	3.239	.024	82.27	.61
-043	3-1/2	3-5/8	3.489	.024	88.62	.61
-044	3-3/4	3-7/8	3.739	.027	94.97	.69
-045	4	4-1/8	3.989	.027	101.32	.69
-046	4-1/4	4-3/8	4.239	.030	107.67	.76
-047	4-1/2	4-5/8	4.489	.030	114.02	.76
-048	4-3/4	4-7/8	4.739	.030	120.37	.76
-049	5	5-1/8	4.989	.037	126.72	.94
-050	5-1/4	5-3/8	5.239	.037	133.07	.94

3/32"	Nominal Cross Section ACTUAL: .103 ± .003 in. 2.62 ± .08 mm					
SIZE	NOMINAL (in.)		ACTUAL I.D.			
	I.D.	O.D.	in.	±	mm	±
-102	1/16	1/4	.049	.005	1.24	.13
-103	3/32	9/32	.081	.005	2.06	.13
-104	1/8	5/16	.112	.005	2.84	.13
-105	5/32	11/32	.143	.005	3.63	.13
-106	3/16	3/8	.174	.005	4.42	.13
-107	7/32	13/32	.206	.005	5.23	.13
-108	1/4	7/16	.237	.005	6.02	.13
-109	5/16	1/2	.299	.005	7.59	.13
-110	3/8	9/16	.362	.005	9.19	.13
-111	7/16	5/8	.424	.005	10.77	.13
-112	1/2	11/16	.487	.005	12.37	.13
-113	9/16	3/4	.549	.005	13.94	.18
-114	5/8	13/16	.612	.009	15.54	.23
-115	11/16	7/8	.674	.009	17.12	.23
-116	3/4	15/16	.737	.009	18.72	.23
-117	13/16	1	.799	.010	20.30	.25
-118	7/8	1-1/16	.862	.010	21.89	.25
-119	15/16	1-1/8	.924	.010	23.47	.25
-120	1	1-3/16	.987	.010	25.07	.25
-121	1-1/16	1-1/4	1.049	.010	26.64	.25
-122	1-1/8	1-5/16	1.112	.010	28.24	.25
-123	1-3/16	1-3/8	1.174	.012	29.82	.30
-124	1-1/4	1-7/16	1.237	.012	31.42	.30
-125	1-5/16	1-1/2	1.299	.012	32.99	.30
-126	1-3/8	1-9/16	1.362	.012	34.59	.30
-127	1-7/16	1-5/8	1.424	.012	36.17	.30
-128	1-1/2	1-11/16	1.487	.012	37.77	.30
-129	1-9/16	1-3/4	1.549	.015	39.34	.38
-130	1-5/8	1-3/16	1.612	.015	40.94	.38
-131	1-11/16	1-7/8	1.674	.015	42.52	.38
-132	1-3/4	1-15/16	1.737	.015	44.12	.38
-133	1-13/16	2	1.799	.015	45.69	.38
-134	1-7/8	2-1/16	1.862	.015	47.29	.38
-135	1-15/16	2-1/8	1.925	.017	48.90	.43
-136	2	2-3/16	1.987	.017	50.47	.43
-137	2-1/16	2-1/4	2.050	.017	52.07	.43
-138	2-1/8	2-5/16	2.112	.017	53.64	.43
-139	2-3/16	2-3/8	2.175	.017	55.25	.43
-140	2-1/4	2-7/16	2.237	.017	56.82	.43
-141	2-5/16	2-1/2	2.300	.020	58.42	.51
-142	2-3/8	2-9/16	2.362	.020	59.99	.51
-143	2-7/16	2-5/8	2.425	.020	61.60	.51
-144	2-1/2	2-11/16	2.487	.020	63.17	.51
-145	2-9/16	2-3/4	2.550	.020	64.77	.51
-146	2-5/8	2-13/16	2.612	.020	66.34	.51
-147	2-11/16	2-7/8	2.675	.022	67.95	.56
-148	2-3/4	2-15/16	2.737	.022	69.52	.56
-149	2-13/16	3	2.800	.022	71.12	.56
-150	2-7/8	3-1/16	2.862	.022	72.69	.56
-151	3	3-3/16	2.987	.024	75.87	.61
-152	3-1/4	3-7/16	3.237	.024	82.22	.61
-153	3-1/2	3-11/16	3.487	.024	88.57	.61
-154	3-3/4	3-15/16	3.737	.028	94.92	.71
-155	4	4-3/16	3.987	.028	101.27	.71
-156	4-1/4	4-7/16	4.237	.030	107.62	.76
-157	4-1/2	4-11/16	4.487	.030	113.97	.76
-158	4-3/4	4-15/16	4.737	.030	120.32	.76
-159	5	5-3/16	4.987	.035	126.67	.89
-160	5-1/4	5-7/16	5.237	.035	133.02	.89

3/32"	Nominal Cross Section ACTUAL: .103 ± .003 in. 2.62 ± .08 mm					
SIZE	NOMINAL (in.)		ACTUAL I.D.			
	I.D.	O.D.	in.	±	mm	±
-161	5-1/2	5-11/16	5.487	.035	139.37	.89
-162	5-3/4	5-15/16	5.737	.035	145.72	.89
-163	6	6-3/16	5.987	.035	152.07	.89
-164	6-1/4	6-7/16	6.237	.040	158.42	1.02
-165	6-1/2	6-11/16	6.487	.040	164.77	1.02
-166	6-3/4	6-15/16	6.737	.040	171.12	1.02
-167	7	7-3/16	6.987	.040	177.47	1.02
-168	7-1/4	7-7/16	7.237	.045	183.82	1.14
-169	7-1/2	7-11/16	7.487	.045	190.17	1.14
-170	7-3/4	7-15/16	7.737	.045	196.52	1.14
-171	8	8-3/16	7.987	.045	202.87	1.14
-172	8-1/4	8-7/16	8.237	.050	209.22	1.27
-173	8-1/2	8-11/16	8.487	.050	215.57	1.27
-174	8-3/4	8-15/16	8.737	.050	221.92	1.27
-175	9	9-3/16	8.987	.050	228.27	1.27
-176	9-1/4	9-7/16	9.237	.055	234.62	1.40
-177	9-1/2	9-11/16	9.487	.055	240.97	1.40
-178	9-3/4	9-15/16	9.737	.055	247.32	1.40

1/8"	Nominal Cross Section ACTUAL: .139 ± .004 in. 3.53 ± .10 mm					
SIZE	NOMINAL (in.)		ACTUAL I.D.			
	I.D.	O.D.	in.	±	mm	±
-201	3/16	7/16	.171	.005	4.34	.13
-202	1/4	1/2	.234	.005	5.94	.13
-203	5/16	9/16	.296	.005	7.52	.13
-204	3/8	5/8	.359	.005	9.12	.13
-205	7/16	11/16	.421	.005	10.69	.13
-206	1/2	3/4	.484	.005	12.29	.13
-207	9/16	13/16	.546	.007	13.87	.18
-208	5/8	7/8	.609	.009	15.47	.23
-209	11/16	15/16	.671	.009	17.04	.23
-210	3/4	1	.734	.010	18.64	.25
-211	13/16	1-1/16	.796	.010	20.22	.25
-212	7/8	1-1/8	.859	.010	21.82	.25
-213	15/16	1-3/16	.921	.010	23.39	.25
-214	1	1-1/4	.984	.010	24.99	.25
-215	1-1/16	1-5/16	1.046	.010	26.57	.25
-216	1-1/8	1-3/8	1.109	.012	28.17	.30
-217	1-3/16	1-7/16	1.171	.012	29.74	.30
-218	1-1/4	1-1/2	1.234	.012	31.34	.30
-219	1-5/16	1-9/16	1.296	.012	32.92	.30
-220	1-3/8	1-5/8	1.359	.012	34.52	.30
-221	1-7/16	1-11/16	1.421	.012	36.09	.30
-222	1-1/2	1-3/4	1.484	.015	37.69	.38
-223	1-5/8	1-7/8	1.609	.015	40.87	.38
-224	1-3/4	2	1.734	.015	44.04	.38
-225	1-7/8	2-1/8	1.859	.018	47.22	.46
-226	2	2-1/4	1.984	.018	50.39	.46

1/8"	Nominal Cross Section ACTUAL: .139 ± .004 in. 3.53 ± .10 mm					
SIZE	NOMINAL (in.)		ACTUAL I.D.			
	I.D.	O.D.	in.	±	mm	±
-227	2-1/8	2-3/8	2.109	.018	53.57	.46
-228	2-1/4	2-1/2	2.234	.020	56.74	.51
-229	2-3/8	2-5/8	2.359	.020	59.92	.51
-230	2-1/2	2-3/4	2.484	.020	63.09	.51
-231	2-5/8	2-7/8	2.609	.020	66.27	.51
-232	2-3/4	3	2.734	.024	69.44	.61
-233	2-7/8	3-1/8	2.859	.024	72.62	.61
-234	3	3-1/4	2.984	.024	75.79	.61
-235	3-1/8	3-3/8	3.109	.024	78.97	.61
-236	3-1/4	3-1/2	3.234	.024	82.14	.61
-237	3-3/8	3-5/8	3.359	.024	85.32	.61
-238	3-1/2	3-3/4	3.484	.024	88.49	.61
-239	3-5/8	3-7/8	3.609	.028	91.67	.71
-240	3-3/4	4	3.734	.028	94.84	.71
-241	3-7/8	4-1/8	3.859	.028	98.02	.71
-242	4	4-1/4	3.984	.028	101.19	.71
-243	4-1/8	4-3/8	4.109	.028	104.37	.71
-244	4-1/4	4-1/2	4.234	.030	107.54	.76
-245	4-3/8	4-5/8	4.359	.030	110.72	.76
-246	4-1/2	4-3/4	4.484	.030	113.89	.76
-247	4-5/8	4-7/8	4.609	.030	117.07	.76
-248	4-3/4	5	4.734	.030	120.24	.76
-249	4-7/8	5-1/8	4.859	.035	123.42	.89
-250	5	5-1/4	4.984	.035	126.59	.89
-251	5-1/8	5-3/8	5.109	.035	129.77	.89
-252	5-1/4	5-1/2	5.234	.035	132.94	.89
-253	5-3/8	5-5/8	5.359	.035	136.12	.89
-254	5-1/2	5-3/4	5.484	.035	139.29	.89
-255	5-5/8	5-7/8	5.609	.035	142.47	.89
-256	5-3/4	6	5.734	.035	145.64	.89
-257	5-7/8	6-1/8	5.859	.035	148.82	.89
-258	6	6-1/4	5.984	.035	151.99	.89
-259	6-1/4	6-1/2	6.234	.040	158.34	1.02
-260	6-1/2	6-3/4	6.484	.040	164.69	1.02
-261	6-3/4	7	6.734	.040	171.04	1.02
-262	7	7-1/4	6.984	.040	177.39	1.02
-263	7-1/4	7-1/2	7.234	.045	183.74	1.14
-264	7-1/2	7-3/4	7.484	.045	190.09	1.14
-265	7-3/4	8	7.734	.045	196.44	1.14
-266	8	8-1/4	7.984	.045	202.79	1.14
-267	8-1/4	8-1/2	8.234	.050	209.14	1.27
-268	8-1/2	8-3/4	8.484	.050	215.49	1.27
-269	8-3/4	9	8.734	.050	221.84	1.27
-270	9	9-1/4	8.984	.050	228.19	1.27
-271	9-1/4	9-1/2	9.234	.055	234.54	1.40
-272	9-1/2	9-3/4	9.484	.055	240.89	1.40
-273	9-3/4	10	9.734	.055	247.24	1.40
-274	10	10-1/4	9.984	.055	253.59	1.40

1/8"	Nominal Cross Section ACTUAL: .139 ± .004 in. 3.53 ± .10 mm					
SIZE	NOMINAL (in.)		ACTUAL I.D.			
	I.D.	O.D.	in.	±	mm	±
-275	10-1/2	10-3/4	10.484	.055	266.29	1.40
-276	11	11-1/4	10.984	.065	278.99	1.65
-277	11-1/2	11-3/4	11.484	.065	291.69	1.65
-278	12	12-1/4	11.984	.065	304.39	1.65
-279	13	13-1/4	12.984	.065	329.79	1.65
-280	14	14-1/4	13.984	.065	355.19	1.65
-281	15	15-1/4	14.984	.065	380.59	1.65
-282	16	16-1/4	15.955	.075	405.26	1.91
-283	17	17-1/4	16.955	.080	430.66	2.03
-284	18	18-1/4	17.955	.085	456.06	2.16

3/16"	Nominal Cross Section ACTUAL: .210 ± .005 in. 5.33 ± .13 mm					
SIZE	NOMINAL (in.)		ACTUAL I.D.			
	I.D.	O.D.	in.	±	mm	±
-309	7/16	13/16	.412	.005	10.46	.13
-310	1/2	7/8	.475	.005	12.07	.13
-311	9/16	15/16	.537	.007	13.64	.18
-312	5/8	1	.600	.009	15.24	.23
-313	11/16	1-1/16	.662	.009	16.81	.23
-314	3/4	1-1/8	.725	.010	18.42	.25
-315	13/16	1-3/16	.787	.010	19.99	.25
-316	7/8	1-1/4	.850	.010	21.59	.25
-317	15/16	1-5/16	.912	.010	23.16	.25
-318	1	1-3/8	.975	.010	24.77	.25
-319	1-1/16	1-7/16	1.037	.010	26.34	.25
-320	1-1/8	1-1/2	1.100	.012	27.94	.30
-321	1-3/16	1-9/16	1.162	.012	29.51	.30
-322	1-1/4	1-5/8	1.225	.012	31.12	.30
-323	1-5/16	1-11/16	1.287	.012	32.69	.30
-324	1-3/8	1-3/4	1.350	.012	34.29	.30
-325	1-1/2	1-7/8	1.475	.015	37.47	.38
-326	1-5/8	2	1.600	.015	40.64	.38
-327	1-3/4	2-1/8	1.725	.015	43.82	.38
-328	1-7/8	2-1/4	1.850	.015	46.99	.38
-329	2	2-3/8	1.975	.018	50.17	.46
-330	2-1/8	2-1/2	2.100	.018	53.34	.46
-331	2-1/4	2-5/8	2.225	.018	56.52	.46
-332	2-3/8	2-3/4	2.350	.018	59.69	.46
-333	2-1/2	2-7/8	2.475	.020	62.87	.51
-334	2-5/8	3	2.600	.020	66.04	.51
-335	2-3/4	3-1/8	2.725	.020	69.22	.51
-336	2-7/8	3-1/4	2.850	.020	72.39	.51
-337	3	3-3/8	2.975	.024	75.57	.61
-338	3-1/8	3-1/2	3.100	.024	78.74	.61
-339	3-1/4	3-5/8	3.225	.024	81.92	.61

3/16"	Nominal Cross Section ACTUAL: .210 ± .005 in. 5.33 ± .13 mm					
SIZE	NOMINAL (in.)		ACTUAL I.D.			
	I.D.	O.D.	in.	±	mm	±
-340	3-3/8	3-3/4	3.350	.024	85.09	.61
-341	3-1/2	3-7/8	3.475	.024	88.27	.61
-342	3-5/8	4	3.600	.028	91.44	.71
-343	3-3/4	4-1/8	3.725	.028	94.62	.71
-344	3-7/8	4-1/4	3.850	.028	97.79	.71
-345	4	4-3/8	3.975	.028	100.97	.71
-346	4-1/8	4-1/2	4.100	.028	104.14	.71
-347	4-1/4	4-5/8	4.225	.030	107.32	.76
-348	4-3/8	4-3/4	4.350	.030	110.49	.76
-349	4-1/2	4-7/8	4.475	.030	113.67	.76
-350	4-5/8	5	4.600	.030	116.84	.76
-351	4-3/4	5-1/8	4.725	.030	120.02	.76
-352	4-7/8	5-1/4	4.850	.030	123.19	.76
-353	5	5-3/8	4.975	.037	126.37	.94
-354	5-1/8	5-1/2	5.100	.037	129.54	.94
-355	5-1/4	5-5/8	5.225	.037	132.72	.94
-356	5-3/8	5-3/4	5.350	.037	135.89	.94
-357	5-1/2	5-7/8	5.475	.037	139.07	.94
-358	5-5/8	6	5.600	.037	142.24	.94
-359	5-3/4	6-1/8	5.725	.037	145.42	.94
-360	5-7/8	6-1/4	5.850	.037	148.59	.94
-361	6	6-3/8	5.975	.037	151.77	.94
-362	6-1/4	6-5/8	6.225	.040	158.12	1.02
-363	6-1/2	6-7/8	6.475	.040	164.47	1.02
-364	6-3/4	7-1/8	6.725	.040	170.82	1.02
-365	7	7-3/8	6.975	.040	177.17	1.02
-366	7-1/4	7-5/8	7.225	.045	183.52	1.14
-367	7-1/2	7-7/8	7.475	.045	189.87	1.14
-368	7-3/4	8-1/8	7.725	.045	196.22	1.14
-369	8	8-3/8	7.975	.045	202.57	1.14
-370	8-1/4	8-5/8	8.225	.050	208.92	1.27
-371	8-1/2	8-7/8	8.475	.050	215.27	1.27
-372	8-3/4	9-1/8	8.725	.050	221.62	1.27
-373	9	9-3/8	8.975	.050	227.97	1.27
-374	9-1/4	9-5/8	9.225	.055	234.32	1.40
-375	9-1/2	9-7/8	9.475	.055	240.67	1.40
-376	9-3/4	10-1/8	9.725	.055	247.02	1.40
-377	10	10-3/8	9.975	.055	253.37	1.40
-378	10-1/2	10-7/8	10.475	.060	266.07	1.52
-379	11	11-3/8	10.975	.060	278.77	1.52
-380	11-1/2	11-7/8	11.475	.065	291.47	1.65
-381	12	12-3/8	11.975	.065	304.17	1.65
-382	13	13-3/8	12.975	.065	329.57	1.65
-383	14	14-3/8	13.975	.070	354.97	1.78
-384	15	15-3/8	14.975	.070	380.37	1.78
-385	16	16-3/8	15.955	.075	405.26	1.91
-386	17	17-3/8	16.955	.080	430.66	2.03
-387	18	18-3/8	17.955	.085	456.06	2.16

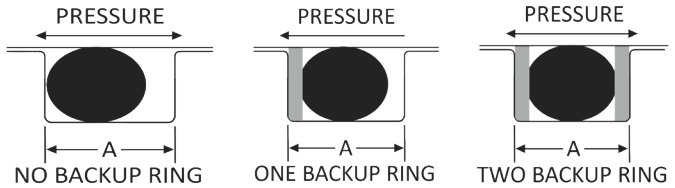
3/16"	Nominal Cross Section ACTUAL: .210 ± .005 in. 5.33 ± .13 mm					
SIZE	NOMINAL (in.)		ACTUAL I.D.			
	I.D.	O.D.	in.	±	mm	±
-388	19	19-3/8	18.955	.090	481.46	2.29
-389	20	20-3/8	19.955	.095	506.86	2.41
-390	21	21-3/8	20.955	.095	532.26	2.41
-391	22	22-3/8	21.955	.100	557.66	2.54
-392	23	23-3/8	22.940	.105	582.68	2.67
-393	24	24-3/8	23.940	.110	608.08	2.79
-394	25	25-3/8	24.940	.115	633.48	2.92
-395	26	26-3/8	25.940	.120	658.88	3.05

1/4"	Nominal Cross Section ACTUAL: .275 ± .006 in. 6.99 ± .15 mm					
SIZE	NOMINAL (in.)		ACTUAL I.D.			
	I.D.	O.D.	in.	±	mm	±
-425	4-1/2	5	4.475	.033	113.67	.84
-426	4-5/8	5-1/8	4.600	.033	116.84	.84
-427	4-3/4	5-1/4	4.725	.033	120.02	.84
-428	4-7/8	5-3/8	4.850	.033	123.19	.84
-429	5	5-1/2	4.975	.037	126.37	.94
-430	5-1/8	5-5/8	5.100	.037	129.54	.94
-431	5-1/4	5-3/4	5.225	.037	132.72	.94
-432	5-3/8	5-7/8	5.350	.037	135.89	.94
-433	5-1/2	6	5.475	.037	139.07	.94
-434	5-5/8	6-1/8	5.600	.037	142.24	.94
-435	5-3/4	6-1/4	5.725	.037	145.42	.94
-436	5-7/8	6-3/8	5.850	.037	148.59	.94
-437	6	6-1/2	5.975	.037	151.77	.94
-438	6-1/4	6-3/4	6.225	.040	158.12	1.02
-439	6-1/2	7	6.475	.040	164.47	1.02
-440	6-3/4	7-1/4	6.725	.040	170.82	1.02
-441	7	7-1/2	6.975	.040	177.17	1.02
-442	7-1/4	7-3/4	7.225	.045	183.52	1.14
-443	7-1/2	8	7.475	.045	189.87	1.14
-444	7-3/4	8-1/4	7.725	.045	196.22	1.14
-445	8	8-1/2	7.975	.045	202.57	1.14
-446	8-1/2	9	8.475	.055	215.27	1.40
-447	9	9-1/2	8.975	.055	227.97	1.40
-448	9-1/2	10	9.475	.055	240.67	1.40
-449	10	10-1/2	9.975	.055	253.37	1.40
-450	10-1/2	11	10.475	.060	266.07	1.52
-451	11	11-1/2	10.975	.060	278.77	1.52
-452	11-1/2	12	11.475	.060	291.47	1.52
-453	12	12-1/2	11.975	.060	304.17	1.52
-454	12-1/2	13	12.475	.060	316.87	1.52
-455	13	13-1/2	12.975	.060	329.57	1.52
-456	13-1/2	14	13.475	.070	342.27	1.78
-457	14	14-1/2	13.975	.070	354.97	1.78

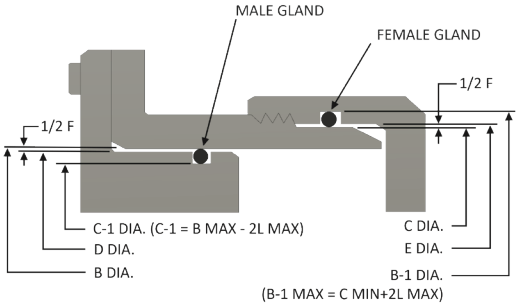
1/4"	Nominal Cross Section ACTUAL: .275 ± .006 in. 6.99 ± .15 mm					
SIZE	NOMINAL (in.)		ACTUAL I.D.			
	I.D.	O.D.	in.	±	mm	±
-458	14-1/2	15	14.475	.070	367.67	1.78
-459	15	15-1/2	14.975	.070	380.37	1.78
-460	15-1/2	16	15.475	.070	393.07	1.78
-461	16	16-1/2	15.955	.075	405.26	1.91
-462	16-1/2	17	16.455	.075	417.96	1.91
-463	17	17-1/2	16.955	.080	430.66	2.03
-464	17-1/2	18	17.455	.085	443.36	2.16
-465	18	18-1/2	17.955	.085	456.06	2.16
-466	18-1/2	19	18.455	.085	468.76	2.16
-467	19	19-1/2	18.955	.090	481.46	2.29
-468	19-1/2	20	19.455	.090	494.16	2.29
-469	20	20-1/2	19.955	.090	506.86	2.41
-470	21	21-1/2	20.955	.090	532.26	2.41
-471	22	22-1/2	21.955	.100	557.66	2.54
-472	23	23-1/2	22.940	.105	582.68	2.67
-473	24	24-1/2	23.940	.110	608.08	2.79
-474	25	25-1/2	24.940	.115	633.48	2.92
-475	26	26-1/2	25.940	.120	658.88	3.05

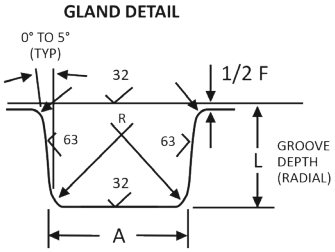
BOSS SEALS O-Rings used for sealing straight thread tube fittings on a boss									
SIZE	TUBE O.D. (in.)	ACTUAL (in.)				ACTUAL (mm)			
		I.D.	±	C.S.	±	I.D.	±	C.S.	±
-901	3/32	.185	.005	.056	.003	4.70	.13	1.42	.08
-902	1/8	.239	.005	.064	.003	6.07	.13	1.63	.08
-903	3/16	.301	.005	.064	.003	7.65	.13	1.63	.08
-904	1/4	.351	.005	.072	.003	8.92	.13	1.83	.08
-905	5/16	.414	.005	.072	.003	10.52	.13	1.83	.08
-906	3/8	.468	.005	.078	.003	11.89	.13	1.98	.08
-907	7/16	.530	.007	.082	.003	13.46	.18	2.08	.08
-908	1/2	.644	.009	.087	.003	16.36	.23	2.21	.08
-909	9/16	.706	.009	.097	.003	17.93	.23	2.46	.08
-910	5/8	.755	.009	.097	.003	19.18	.23	2.46	.08
-911	11/16	.863	.009	.116	.004	21.92	.23	2.95	.10
-912	3/4	.924	.009	.116	.004	23.47	.23	2.95	.10
-913	13/16	.986	.010	.116	.004	25.04	.26	2.95	.10
-914	7/8	1.047	.010	.116	.004	26.59	.26	2.95	.10
-916	1	1.171	.010	.116	.004	29.74	.26	2.95	.10
-918	1-1/8	1.355	.012	.116	.004	34.42	.30	2.95	.10
-920	1-1/4	1.475	.014	.118	.004	37.47	.36	3.00	.10
-924	1-1/2	1.720	.014	.118	.004	43.69	.36	3.00	.10
-928	1-3/4	2.090	.018	.118	.004	53.09	.46	3.00	.10
-932	2	2.337	.018	.118	.004	59.36	.46	3.00	.10

O-RING GLAND DIMENSIONS



O-RING GLAND DESIGN FOR STATIC SEALS

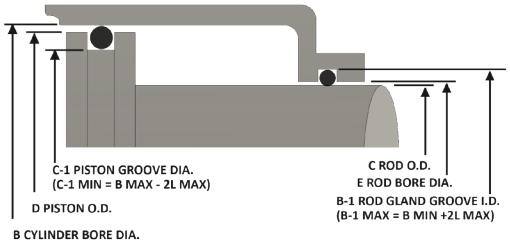


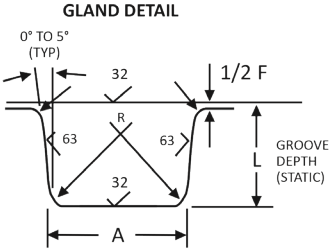


- **B - Bore Dia. (male gland)**
- **B-1 - Groove Dia. (female gland)**
- **C - Tube OD (female gland)**
- **C-1 - Groove Dia. (male gland)**
- **D - Plug Dia. (male gland)**
- **E - Throat Dia. (female gland)**
- **F - Diametrical Clearance**

"CS" O-RING CROSS SECTION	"L" GROOVE DEPTH		SQUEEZE				"F" DIAMETRICAL CLEARANCE MAX.	"A" GROOVE WIDTH ± .005			"R" GROOVE RADIUS	ECCENTRICITY MAX.
			RADIAL		AXIAL			NO BACKUP RING	ONE BACKUP RING	TWO BACKUP RINGS		
	RADIAL	AXIAL	INCHES	%	INCHES	%						
.070	.050-.052	.050 -.054	.015-.023	22-32	.013-.023	19-32	.004	.095	.140	.207	.005-.015	.002
.103	.081-.083	.074-.080	.017-.025	17-24	.020-.032	20-30	.005	.142	.173	.240	.005-.015	.002
.139	.111-.113	.101-.107	.022-.032	16-23	.028-.042	20-30	.006	.189	.210	.277	.010-.025	.003
.210	.170-.173	.152-.162	.032-.045	15-21	.043-.063	21-30	.006	.283	.313	.413	.020-.035	.004
.275	.226-.229	.201-.211	.040-.055	15-20	.058-.080	21-29	.007	.377	.410	.540	.020-.035	.005

O-RING GLAND DESIGN FOR RECIPROCATING SEALS

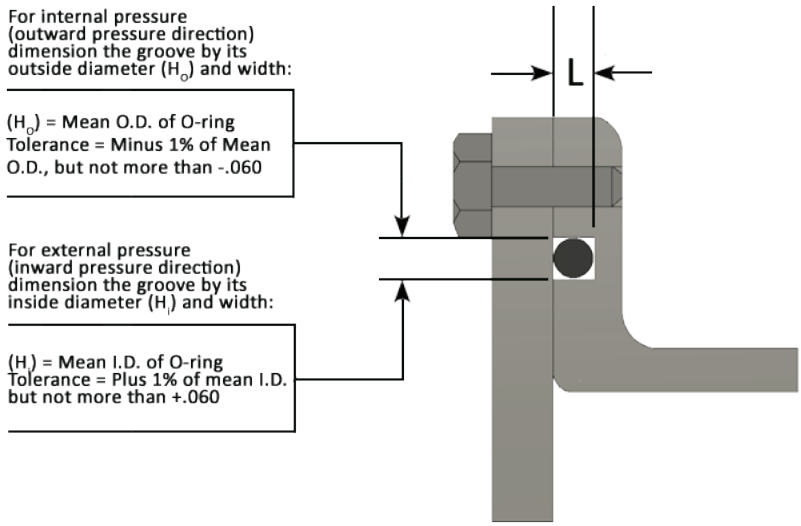


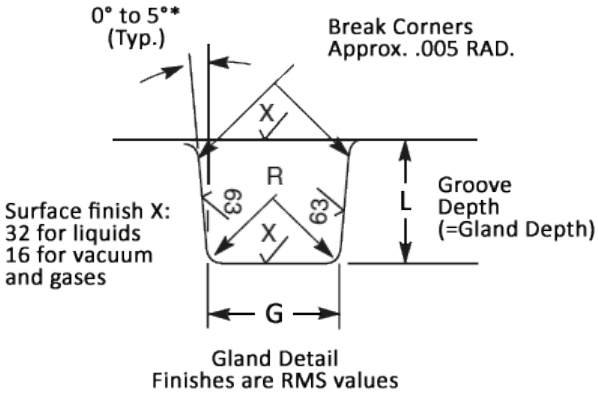


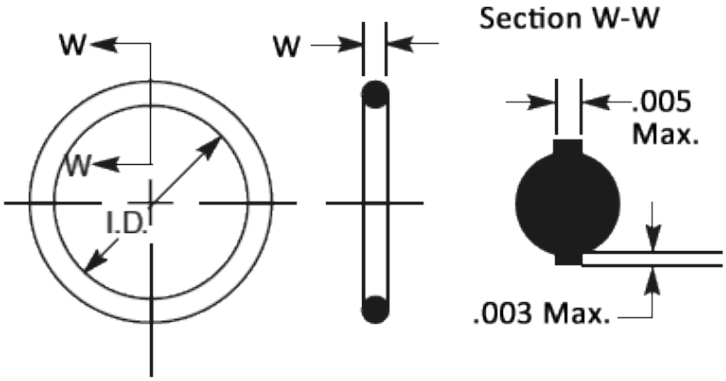
- **B - Bore Dia. of Cylinder**
- **C - OD of Rod**
- **D - OD of Piston**
- **E - Bore Dia. for Rod**
- **F - Diametrical Clearance**

"CS" O-RING CROSS SECTION	"L" GROOVE DEPTH	SQUEEZE		"F" DIAMETRICAL CLEARANCE MAX.	"A" GROOVE WIDTH ± .005			"R" GROOVE RADIUS	ECCENTRICITY MAX.
		INCHES	%		NO BACKUP RING	ONE BACKUP RING	TWO BACKUP RINGS		
.070	.055-.057	.010-.018	15-25	.004	.095	.140	.207	.005-.015	.002
.103	.088-.090	.010-.018	10-17	.005	.142	.173	.240	.005-.015	.002
.139	.121-.123	.012-.022	9-16	.006	.189	.210	.277	.010-.025	.003
.210	.185-.188	.017-.030	8-14	.006	.283	.313	.413	.020-.035	.004
.275	.237-.240	.029-.044	11-16	.007	.377	.410	.540	.020-.035	.005

FACE SEAL GLAND DIMENSIONS







W Cross Section	"L" Groove Depth	Squeeze		"G" Groove Width		"R" Groove Radius
		Actual	%	Liquids	Vacuum and Gases	
.070	.050-.054	.013-.023	19-32	.101-.107	.084-.089	.005-.015
.103	.074-.080	.020-.032	20-30	.136-.142	.120-.125	.005-.015
.139	.101-.107	.028-.042	20-30	.177-.187	.158-.164	.010-.025
.210	.152-.162	.043-.063	21-30	.270-.290	.239-.244	.020-.035
.275	.201-.211	.058-.080	21-29	.342-.362	.309-.314	.020-.035
.375	.276-.286	.082-.106	22-28	.475-.485	.419-.424	.030-.045
.500	.370-.380	.112-.138	22-27	.638-.645	.560-.565	.030-.045