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Seal Selection Compatibility: Seal material selection is critical to ensure compatibility with the fluid or media being sealed in each application. Genuine CAT seals are designed and tested as a system to achieve reliable performance and maximize system safety. Improper seal selection may result in component and/or machine system failure.

Seal Material Acronym	Material Name	Material Trade Name or Common Name	Typical Temperature Range (C)	Air	Diesel Fuel	Biodiesel	Engine & Final Drive Oils	Hydraulic Fluids Petroleum Based	Engine Coolant & Urea
NBR	Buna N Nitrile	Nitrile	-40 to 100	Acceptable	Acceptable	Do Not Use	Acceptable	Acceptable	Acceptable
FKM	Fluorocarbon	Viton	-40 to 175	Preferred	Preferred	Preferred	Preferred	Preferred	Do Not Use
HNBR	Hydrogenated Nitrile	-	-40 to 115	Acceptable	Acceptable	Do Not Use	Acceptable	Acceptable	Do Not use
EPDM	Ethylene Propylene Diene	-	-54 to 121	Acceptable	Do Not Use	Do Not Use	Do Not Use	Do Not Use	Preferred
VMQ	Silicone	-	-55 to 150	Preferred	Do Not use	Do Not use	Acceptable	Do Not use	Do Not Use

SAE AS568 Standard O-rings



Cross Section Dia (mm)	Inner Dia (mm)	Standard Size	NBR (75)	NBR (90)	FKM (75)	FKM (90)	Silicone (70)	HNBR (78)	EPDM (70)
1.78	2.57	5	-	-	8C-3095	-	-	-	-
1.78	2.9	6	6H-9691	-	9N-1749	-	-	-	-
1.78	3.68	7	3H-0442	-	-	168-0268	-	150-4651	-
1.78	4.47	8	8F-7219	6V-5722	-	-	8M-8468	-	-
1.78	5.28	9	8F-9538	3G-1209	192-7117	107-3116	8M-5250	-	-
1.78	6.07	10	2D-6392	6V-5586	9N-1756	-	3L-6768	-	-
1.78	7.65	11	5F-9144	-	061-7538	-	-	9X-7380	-
1.78	7.67	11	-	4J-5477	-	228-7088	-	-	121-4345
1.78	9.25	12	1H-1023	-	464-0509	-	5H-8853	-	6D-7128
1.78	9.27	12	-	6V-8397	-	-	-	-	-
1.78	10.82	13	6M-5062	095-1750	317-0808	9X-7409	-	9X-7381	-
1.78	12.42	14	4K-2039	-	033-6033	-	-	9X-7408	180-8424

1.78	12.47	14	-	6V-8398	-	228-7090	-	-	-
1.78	14	15	5L-4758	095-1751	149-2091	033-6043	5P-6620	9X-7382	-
1.78	15.6	16	4D-2297	-	8L-2746	9X-7737	-	-	6V-5138
1.78	17.17	17	1S-8947	6V-8399	2P-2975	135-2652	-	9X-7383	-
1.78	18.77	18	8M-8997	9X-7454	5P-9757	9X-7681	-	-	250-2343
1.78	20.35	19	-	6V-6580	221-9941	5E-9816	-	-	-
1.78	21.95	20	030-4605	8J-2413	221-9937	-	-	-	-
1.78	23.52	21	8C-3098	-	501-9547	8C-3093	-	-	-
1.78	25.12	22	5L-4759	-	231-2317	310-7258	-	-	-
1.78	26.7	23	077-3241	005-8592	033-6032	136-3377	-	9X-7384	-
1.78	28.3	24	003-8137	4K-4986	5P-5600	-	-	-	-
1.78	29.87	25	6V-0894	-	9X-7734	-	5P-6436	-	-
1.78	30.01	25	-	6V-8400	-	228-7094	-	-	-
1.78	31.47	26	8F-0212	-	179-8128	310-7255	-	-	-
1.78	33.05	27	5D-6539	8T-4827	5P-5601	-	-	-	-
1.78	34.65	28	5D-6543	5K-5221	5P-9658	-	5P-4932	-	-
1.78	37.82	29	-	187-9630	7X-4782	-	-	-	-
1.78	37.98	29	-	8T-0315	-	228-7095	-	-	-
1.78	41	30	3J-9015	5K-6526	-	-	-	-	-
1.78	44.17	31	3P-1979	5K-0227	5E-8767	-	-	-	-
1.78	47.35	32	-	5K-0216	5E-8768	-	5P-8907	-	-
1.78	50.52	33	6V-0895	-	180-3927	-	-	-	-
1.78	53.7	34	-	-	151-8670	-	3P-5859	-	-
1.78	56.87	35	219-1897	-	-	-	-	-	-
1.78	60.05	36	077-5843	095-1753	-	-	-	-	-
1.78	63.22	37	-	-	7X-4745	-	3P-0815	-	-
1.78	66.4	38	-	-	247-6020	-	-	-	-
1.78	69.57	39	-	-	247-6019	-	2P-5820	-	-
1.78	72.75	40	-	9J-5686	-	-	-	-	-
1.78	75.92	41	-	-	6V-3865	-	-	-	-
1.78	82.27	42	5P-2931	-	6V-5778	-	-	-	-
1.78	88.6	43	-	-	8T-6717	-	-	-	8T-2944
1.78	88.62	43	5P-3881	-	-	-	-	-	-
1.78	94.97	44	7X-9372	-	5E-8769	-	201-9933	-	-
1.78	101.32	45	7X-5494	-	6V-1320	-	8T-2572	-	-
1.78	107.67	46	-	9X-7357	-	-	-	-	-
1.78	120.37	48	8C-5237	-	-	-	199-9240	-	-
1.78	126.72	49	-	-	3E-6799	-	-	-	-
1.78	133.07	50	-	-	6V-1934	-	-	-	-
2.62	4.42	106	-	8J-1699	-	-	-	-	-
2.62	5.23	107	8B-7216	5P-4933	-	-	-	-	-
2.62	6.02	108	196-1804	5P-5874	9X-7676	-	-	-	235-5678
2.62	7.59	109	4J-2506	6J-3134	032-8970	-	-	-	-
2.62	9.19	110	6F-5559	4J-5309	330-8196	107-3118	8M-8157	-	-
2.62	10.77	111	5H-6005	4J-9535	8L-2777	109-3204	8M-5127	-	-
2.62	12.37	112	8F-9206	7Y-5219	269-7852	126-7524	8M-5251	-	-
2.62	13.94	113	6F-4855	4J-5268	228-4947	6V-8350	8M-4437	203-3940	-
2.62	15.54	114	8F-3469	5J-2974	112-3102	107-3117	8M-5260	118-5068	-
2.62	17.12	115	6F-6672	4J-5351	323-7347	6V-8351	8M-4438	-	-

2.62	18.72	116	7F-8607	6V-3922	7L-9061	109-3203	8M-5253	-	-
2.62	20.3	117	4M-8303	5P-3108	5P-9186	033-6041	8M-4389	-	-
2.62	21.89	118	9H-6761	361-3549	5P-8356	3E-6786	8M-8283	-	-
2.62	23.47	119	4D-9986	6V-5326	330-8197	6V-8352	9X-4609	-	-
2.62	25.07	120	3D-4245	6V-5556	361-8205	6V-6339	1S-7462	-	-
2.62	26.64	121	3D-2992	7E-4846	6V-6228	114-8718	8M-4431	-	205-4831
2.62	28.24	122	2K-8199	099-8232	5P-7530	6V-4591	8M-8514	-	-
2.62	29.82	123	3S-9233	6V-8978	7X-4744	-	8M-1112	-	243-2646
2.62	31.42	124	2S-4663	096-3044	9X-3979	9X-7722	-	-	297-4854
2.62	32.99	125	2K-8198	6V-8218	250-0466	230-3728	8M-8515	-	-
2.62	34.59	126	5M-2057	096-6100	6V-4367	166-2903	-	-	355-1596
2.62	36.17	127	6J-2419	6V-5393	5P-8065	245-4907	-	107-9570	-
2.62	37.77	128	4D-3107	6V-5391	210-9246	6V-7323	6F-0249	-	8T-5917
2.62	39.34	129	5P-8215	1R-5318	269-7847	6V-1250	-	-	-
2.62	40.94	130	9X-7684	6V-5597	3E-6788	-	-	219-7000	-
2.62	42.52	131	4L-7711	-	9X-7432	188-2199	-	-	-
2.62	44.12	132	2D-0598	5P-2568	330-8195	-	-	-	-
2.62	45.69	133	7D-9749	3E-6771	8C-3078	6E-5413	-	-	204-7844
2.62	47.29	134	032-9882	-	225-6948	-	-	-	-
2.62	48.9	135	3D-2898	-	6V-8676	-	-	-	-
2.62	50.47	136	8C-3080	321-5628	8C-3079	-	-	-	-
2.62	52.07	137	005-8593	-	-	6E-5412	-	-	-
2.62	53.64	138	3D-7805	-	272-2583	-	-	-	8C-5196
2.62	55.25	139	004-1963	-	6V-3832	135-2655	-	-	231-4708
2.62	56.82	140	-	7Y-5269	144-7338	-	-	144-7339	-
2.62	58.42	141	7J-2036	119-7843	5P-5756	-	3S-4489	-	-
2.62	59.99	142	8T-7000	-	009-2061	-	-	-	-
2.62	61.6	143	8S-0768	-	6D-7889	-	-	-	227-5903
2.62	63.17	144	8C-3081	-	009-2062	-	-	-	8T-2929
2.62	64.77	145	-	279-0169	5P-5757	-	5S-4548	-	-
2.62	66.34	146	5M-6509	131-3715	378-0746	-	-	-	-
2.62	67.94	147	107-4057	-	-	-	129-5701	-	-
2.62	69.52	148	004-1964	-	360-2963	-	-	-	-
2.62	71.12	149	3K-4025	-	-	-	-	-	-
2.62	72.69	150	5P-0908	-	8C-5197	-	-	-	-
2.62	75.87	151	7R-8872	119-7844	5E-8770	-	-	-	-
2.62	82.22	152	5P-3863	5P-2569	8C-3089	6V-3551	-	-	-
2.62	88.57	153	6V-2483	-	6V-3834	136-3378	-	-	8T-6340
2.62	94.92	154	4F-4097	-	-	107-3119	-	185-3503	7X-4752
2.62	101.27	155	3K-0715	8T-5049	6D-7146	107-3120	-	-	-
2.62	107.62	156	-	1T-1068	-	133-6578	-	-	9X-7549
2.62	113.97	157	6S-3002	-	6V-7350	-	-	-	-
2.62	120.32	158	-	9X-7566	5E-8771	-	-	-	117-3036
2.62	126.67	159	7J-6285	323-2282	117-8801	-	-	-	9X-7697
2.62	133.02	160	2P-1692	-	-	-	-	-	-
2.62	139.37	161	5J-3886	117-7282	346-8576	-	-	-	-
2.62	145.72	162	1W-9312	9X-7358	346-8577	146-4263	-	-	-
2.62	152.07	163	5P-3864	-	9X-4576	-	-	-	-
2.62	158.42	164	8T-6404	-	9X-7286	-	-	-	-

2.62	164.8	165	-	9X-7391	-	-	-	-	4S-7762
2.62	171.12	166	9D-8042	-	-	-	-	-	-
2.62	177.47	167	5P-5397	-	311-0827	-	-	-	-
2.62	183.82	168	9X-7725	-	-	-	-	-	-
2.62	190.17	169	-	-	9X-7295	-	-	-	-
2.62	202.87	171	-	-	223-8512	9X-7410	7X-4799	-	-
2.62	209.22	172	162-9997	-	316-9962	-	-	-	-
2.62	215.57	173	161-4102	-	-	-	-	-	-
2.62	221.92	174	-	-	261-3307	-	-	-	-
2.62	234.62	176	-	-	107-3114	-	-	-	-
2.62	240.97	177	190-8501	-	-	-	-	-	-
2.62	247.32	178	-	-	154-8741	-	-	-	-
3.53	5.94	202	2H-5001	9J-6491	-	-	8M-8281	-	-
3.53	7.52	203	-	6V-5555	137-8101	-	-	-	-
3.53	9.12	204	2J-6274	6V-0913	7X-4805	6V-3548	-	-	-
3.53	10.69	205	-	-	119-9443	-	-	-	-
3.53	12.29	206	2M-4453	5P-6300	5P-0840	-	8M-4447	147-0182	-
3.53	13.87	207	3H-3385	-	125-1372	219-7001	8M-8282	-	-
3.53	15.47	208	2J-0157	6J-1038	5P-5598	-	8M-4448	-	8C-0504
3.53	17.04	209	-	-	5P-8119	-	-	-	-
3.53	18.64	210	5F-7054	4J-5140	130-0229	189-0193	8M-4435	169-7487	5P-3148
3.53	20.22	211	1H-8171	008-2103	061-7539	-	-	9X-7385	-
3.53	21.82	212	3H-0107	4J-8996	3P-1156	-	8M-4445	112-3132	-
3.53	23.39	213	5H-2767	-	6V-3683	109-3207	8M-4446	-	-
3.53	24.99	214	5F-1678	4J-5267	3P-1155	109-3205	8M-4988	-	-
3.53	26.57	215	4F-8946	180-8722	451-1493	-	8M-4432	-	-
3.53	28.17	216	2H-3932	4J-8997	061-9458	279-2252	8M-5248	121-0145	227-2519
3.53	29.74	217	4F-9029	6V-0357	165-4854	-	8M-4433	-	-
3.53	31.34	218	6F-6673	4J-0519	5P-8210	-	8M-5254	-	-
3.53	32.92	219	4F-7391	4J-0520	295-5609	237-3800	8M-4987	437-4425	-
3.53	34.52	220	3H-1461	4J-0521	330-3517	215-3198	8M-5249	-	7L-4774
3.53	36.09	221	5F-9657	4J-8998	6V-5266	230-3775	1S-9799	-	-
3.53	37.69	222	4F-7952	4J-0522	061-7540	191-2962	8M-4986	118-7214	-
3.53	40.87	223	6F-0711	4J-5573	346-4897	194-9584	8M-4992	118-8586	226-3571
3.53	44.04	224	1H-9696	4J-0523	8J-4351	5P-1480	8M-4443	129-1653	8T-9588
3.53	47.22	225	7F-8267	4J-0524	061-9455	234-3544	8M-5661	-	-
3.53	50.39	226	5F-8000	4J-0525	5P-8211	-	8M-4436	-	384-9992
3.53	53.57	227	7F-8268	4J-0526	124-1858	8C-3077	8M-5010	-	-
3.53	56.74	228	8F-6711	4J-0527	447-7206	6V-4590	8M-4390	112-1577	8T-1703
3.53	59.92	229	175-7894	4J-0528	5P-4892	-	1S-2174	-	-
3.53	63.09	230	1H-5728	3P-0439	061-9457	-	8M-4395	-	-
3.53	66.27	231	8F-8882	3E-6730	6J-2244	-	8M-5252	118-8706	-
3.53	69.44	232	175-7895	6J-2680	425-2519	8T-0568	9M-7539	112-1574	167-4407
3.53	72.62	233	6H-3977	149-0231	6V-1179	-	-	-	-
3.53	75.79	234	175-7896	-	5P-4889	-	5M-3038	-	205-4832
3.53	78.97	235	175-7897	3E-6732	153-1157	170-7098	-	-	-
3.53	82.14	236	2H-3931	6V-6707	6V-1196	170-4821	6L-9965	-	8C-3073
3.53	85.32	237	2H-6338	117-1266	124-1859	-	2P-3538	-	8C-3072
3.53	88.49	238	175-7898	6R-0365	6V-8002	-	3S-1427	224-6079	200-6410

3.53	91.67	239	8H-7521	3E-6735	131-3718	-	2M-2561	258-8738	-
3.53	94.84	240	1H-8128	5P-6302	3E-6773	-	5K-1770	-	-
3.53	98.02	241	175-7900	9X-4611	6V-1197	-	9M-9936	-	-
3.53	101.19	242	1H-6227	-	6V-6353	-	2S-2182	-	-
3.53	104.37	243	4M-0189	-	5D-5957	-	7M-9909	-	-
3.53	107.54	244	2H-3928	-	3E-6785	-	8S-5654	-	213-9397
3.53	110.72	245	175-7902	3E-6703	8T-9527	-	9M-9729	-	-
3.53	113.89	246	5H-6734	190-3011	9X-7287	-	-	271-4928	-
3.53	117.07	247	2J-8163	331-2496	5D-5958	-	5P-1705	-	-
3.53	120.24	248	5F-3144	175-7903	259-4598	-	8M-5255	-	213-9396
3.53	123.42	249	5F-3999	331-2487	6V-8260	-	7M-6637	-	-
3.53	126.59	250	175-7904	031-4392	9X-7371	-	4S-5898	-	-
3.53	129.77	251	3F-5792	-	130-0229	-	5P-3457	-	-
3.53	132.94	252	175-7905	316-2516	6V-7351	-	9N-1619	-	-
3.53	136.12	253	2H-3935	316-2517	6V-1195	-	9N-2693	-	-
3.53	139.29	254	8F-9516	190-3010	-	-	8M-5007	-	-
3.53	142.47	255	2D-8009	-	161-8068	-	6V-1904	129-1609	-
3.53	145.64	256	5H-3252	6J-5541	243-2737	6V-3549	-	-	-
3.53	148.82	257	2K-8257	096-6789	161-8069	-	3S-5135	129-1610	8T-5918
3.53	151.99	258	8F-8733	7D-9014	6V-5553	170-7106	5D-4311	-	-
3.53	158.34	259	2K-4472	-	6V-3319	-	8M-4704	135-2654	-
3.53	164.69	260	6F-4718	-	298-6387	175-5077	1S-4974	-	-
3.53	171.04	261	9F-1399	-	5P-8428	170-4825	2S-4071	311-0828	213-9395
3.53	177.39	262	2K-2939	-	6V-1902	-	5S-4554	-	-
3.53	183.74	263	4H-6520	-	6V-3907	175-5088	1S-6119	-	-
3.53	190.09	264	3J-0634	5J-2383	437-2800	224-6080	-	149-5461	6V-5098
3.53	196.44	265	1H-8278	126-4003	-	-	-	271-4926	8T-2921
3.53	202.79	266	1J-2176	-	227-5538	-	9M-9545	-	-
3.53	209.14	267	9M-5024	7Y-4294	238-6646	224-6081	9N-2694	122-3771	-
3.53	215.49	268	4K-6804	-	156-5198	-	-	122-3772	-
3.53	221.84	269	8F-5900	-	186-3075	-	-	-	-
3.53	228.19	270	8F-6230	-	6V-3684	-	-	-	-
3.53	234.54	271	1T-0132	-	235-3546	-	8L-3017	-	-
3.53	240.89	272	2D-9572	-	170-5942	-	9N-1609	-	-
3.53	247.24	273	5S-3676	-	-	-	-	-	-
3.53	253.59	274	5H-4909	243-4572	-	-	7D-1979	185-3502	-
3.53	266.29	275	8J-8879	-	464-8978	-	-	205-6051	-
3.53	278.99	276	2R-0239	-	180-4365	-	-	-	-
3.53	291.69	277	5P-2545	-	213-9833	-	9N-1520	-	-
3.53	304.39	278	2D-6533	-	165-4852	-	-	-	-
3.53	329.79	279	4D-6695	-	-	-	9N-1552	-	-
3.53	355.19	280	4S-5879	-	5D-5959	-	-	-	-
3.53	380.59	281	4D-1577	-	-	-	-	135-2653	-
3.53	405.26	282	7S-8561	-	-	-	-	-	-
3.53	430.66	283	4S-5924	-	-	-	-	-	-
3.53	454.91	284	7X-1548	-	-	-	-	-	-
5.33	12.06	310	3H-4970	-	8S-5011	-	1S-7104	247-0708	-
5.33	15.24	312	5H-8038	-	6V-3955	-	8M-4990	-	-
5.33	18.42	314	3B-8453	-	6V-3348	-	1S-0004	-	6V-5061

5.33	19.99	315	9H-4557	-	-	-	-	-	-
5.33	21.59	316	6H-5672	-	2N-3350	-	9H-6067	-	6V-5062
5.33	23.16	317	8F-4994	-	112-3540	-	9M-4849	114-2687	7L-4773
5.33	24.77	318	8B-4967	-	6V-4430	-	8M-5266	-	8T-0280
5.33	26.34	319	-	-	8C-3104	-	-	-	-
5.33	27.94	320	5H-7370	-	293-7589	-	8M-4991	-	-
5.33	31.12	322	4F-5607	-	6V-5134	-	5H-7153	-	305-4484
5.33	32.69	323	5M-7423	-	-	-	-	-	-
5.33	34.29	324	5M-5860	-	6V-3830	-	1S-9544	-	5P-7204
5.33	37.47	325	4F-7389	-	5P-8068	-	9M-7002	109-0078	6V-9769
5.33	40.64	326	2H-3927	8S-5953	5P-5846	-	9M-9647	109-0072	6L-7817
5.33	43.82	327	4F-8824	-	8C-5230	-	2S-2251	109-0073	2N-5749
5.33	46.99	328	4F-9653	9S-8307	8C-3107	-	6L-1648	112-3258	6V-1585
5.33	50.17	329	5K-5959	-	113-5304	-	6L-1651	109-0076	171-4358
5.33	53.34	330	4F-7390	-	6V-3831	-	-	112-3260	2N-5243
5.33	56.52	331	3H-2652	7S-4001	109-2332	-	6L-1650	110-7752	2N-0475
5.33	59.69	332	6F-8146	099-4780	3P-0651	-	6L-9284	112-3259	-
5.33	62.86	333	2H-2665	2R-0039	237-7623	-	6L-1649	112-1102	8T-1919
5.33	66.04	334	2H-3933	-	3P-0656	-	8H-1607	-	-
5.33	69.22	335	7F-2122	006-8352	3P-0653	-	8M-4989	109-0075	-
5.33	72.39	336	5F-3092	-	269-7885	-	9M-4218	110-7753	288-5476
5.33	75.57	337	7H-2444	-	6V-5051	-	-	109-0092	-
5.33	78.74	338	9F-4446	-	6V-3833	-	1M-6036	109-0079	-
5.33	81.92	339	4L-9564	5D-1597	287-5812	-	6L-5359	-	-
5.33	85.09	340	8H-2046	-	259-4600	-	9M-4217	259-4597	6V-5066
5.33	88.26	341	1H-0474	-	6V-0973	-	-	112-8186	-
5.33	91.44	342	5F-0149	-	5P-7818	-	9X-7727	109-0074	-
5.33	94.62	343	5H-8624	-	6V-4315	-	-	-	-
5.33	97.79	344	9M-2092	-	5S-9134	-	6V-5188	109-0080	6V-5139
5.33	100.97	345	4F-7387	9X-7458	6V-3908	-	4H-3243	109-0077	416-1498
5.33	104.14	346	1J-2859	-	6V-5052	-	-	-	-
5.33	107.32	347	9F-7283	-	6V-5101	-	1S-1225	-	6V-5504
5.33	110.49	348	1S-7408	-	7D-7111	-	-	-	-
5.33	113.66	349	5H-5672	-	5P-8872	-	8S-5655	112-1580	6V-5140
5.33	116.84	350	5P-4326	-	8C-3103	-	-	-	6V-5067
5.33	120.02	351	1P-9005	331-2485	270-1820	-	-	-	-
5.33	123.19	352	2S-8439	-	310-3954	-	107-3185	109-0081	8T-2903
5.33	126.36	353	068-9002	-	-	-	-	258-8734	-
5.33	129.54	354	8J-1688	371-0443	6V-4314	-	-	258-8733	6V-5068
5.33	132.72	355	5P-1979	-	258-8735	-	-	-	-
5.33	135.89	356	-	-	9X-7562	-	-	-	-
5.33	139.06	357	9M-3786	-	6V-5054	-	3S-1219	-	6V-6809
5.33	142.24	358	6D-9157	-	6V-3835	-	-	-	225-7003
5.33	145.42	359	3S-1223	-	-	-	-	-	-
5.33	148.59	360	6V-5657	-	-	-	-	-	-
5.33	151.77	361	7J-8956	315-7986	6V-5055	-	-	-	-
5.33	158.12	362	8T-6444	491-1544	6V-4297	-	8C-3091	-	-
5.33	164.46	363	8J-1665	-	258-6947	170-4824	7S-8758	-	-
5.33	170.82	364	-	5P-7593	258-8736	-	-	-	-

5.33	177.17	365	8T-7568	-	109-7411	-	9X-7704	107-6280	-
5.33	183.52	366	5K-1787	-	6V-5102	-	-	-	-
5.33	189.86	367	3F-1547	-	-	-	-	-	-
5.33	196.22	368	5M-7142	-	6V-3349	-	-	-	197-8006
5.33	202.56	369	9M-5894	-	375-6181	-	-	-	-
5.33	202.57	369	-	-	177-6911	-	-	-	6V-7703
5.33	208.92	370	4N-1230	-	5P-8429	-	-	259-4596	-
5.33	215.26	371	5P-3092	-	-	-	-	-	253-9950
5.33	221.62	372	5H-4081	1U-3174	6V-5141	-	-	134-5959	-
5.33	227.96	373	-	5P-5374	-	-	5D-9344	-	-
5.33	234.32	374	-	-	6V-5375	-	-	-	-
5.33	240.66	375	-	5P-2235	-	-	-	-	-
5.33	240.67	375	-	-	6V-7701	-	5P-8105	-	-
5.33	247.01	376	-	386-5910	-	-	-	-	-
5.33	253.36	377	8L-9241	320-6169	-	-	-	-	-
5.33	266.06	378	3S-3074	109-5702	174-3357	275-8521	5P-5819	-	-
5.33	278.76	379	-	5P-2236	6V-5554	292-9201	-	-	-
5.33	291.46	380	2M-1309	-	6V-5057	-	-	-	-
5.33	304.17	381	-	6V-3263	159-8802	-	-	158-6563	-
5.33	329.56	382	7S-8554	-	-	-	-	-	-
5.33	329.57	382	-	-	9X-7688	-	-	-	-
5.33	354.97	383	6V-1175	-	8C-3828	-	-	-	-
5.33	380.36	384	2M-3340	-	118-7536	-	-	-	-
5.33	405.3	385	5M-6200	223-5519	-	-	-	-	-
5.33	430.66	386	5P-9806	-	-	-	9L-5650	-	-
5.33	456.06	387	2R-0098	-	6V-5059	-	-	-	-
5.33	481.41	388	8D-4771	-	-	-	-	-	-
5.33	532.21	390	4H-6730	-	-	-	380-1397	-	-
5.33	557.61	391	9H-3360	-	-	-	-	-	-
5.33	582.68	392	3D-8422	-	-	-	-	-	-
5.33	608.1	393	8T-3013	-	-	-	-	-	-
5.33	633.48	394	9H-6832	-	-	-	-	-	-
6.99	113.66	425	114-9275	-	-	-	7S-1156	-	-
6.99	116.84	426	9S-3888	107-6259	170-5941	-	9M-8788	-	-
6.99	120.02	427	-	-	-	-	3H-0976	-	7L-2031
6.99	123.19	428	-	6F-0671	5S-6760	-	-	-	-
6.99	126.36	429	8F-4469	-	6V-5103	-	2M-5173	-	6L-9405
6.99	132.72	431	5H-9524	-	-	-	-	-	-
6.99	135.89	432	4F-7507	-	3E-6751	-	-	-	-
6.99	139.06	433	5H-6733	-	6V-5167	-	6H-1995	-	-
6.99	145.42	435	2Y-8252	384-5137	-	-	-	-	-
6.99	148.59	436	5P-3620	003-2770	269-7886	-	5D-6642	-	-
6.99	151.76	437	8H-0273	6H-4162	5P-8862	-	6L-5473	-	-
6.99	158.12	438	5L-5032	140-0240	-	-	-	467-2620	-
6.99	164.46	439	2H-6124	-	135-6950	-	7M-6952	-	-
6.99	170.82	440	2D-1692	006-8350	-	-	-	192-4309	5P-6619
6.99	177.16	441	4F-9652	-	6V-5095	-	5D-7665	-	-
6.99	183.52	442	2D-1690	-	7X-4810	-	-	-	-
6.99	189.86	443	5F-6222	-	-	-	-	-	201-9701

6.99	202.56	445	2D-1691	-	3P-0658	-	6L-5360	-	-
6.99	215.26	446	4F-7388	-	-	-	-	-	279-3397
6.99	227.96	447	1J-2890	-	-	-	-	-	-
6.99	240.66	448	1M-9015	-	-	-	-	-	-
6.99	253.37	449	3E-6794	-	-	-	-	-	-
6.99	266.06	450	8F-8861	-	-	-	-	-	-
6.99	278.76	451	2H-6340	-	-	-	-	-	-
6.99	291.46	452	8H-8257	-	-	-	-	-	-
6.99	304.16	453	4M-0661	-	-	-	-	-	1W-0118
6.99	316.86	454	4D-4508	-	6V-3967	-	-	-	8T-9047
6.99	329.56	455	5M-4454	-	-	-	-	-	-
6.99	342.26	456	5P-9217	-	6V-6638	-	-	-	-
6.99	354.96	457	4J-1253	-	-	-	-	-	-
6.99	367.67	458	6V-5862	-	-	-	-	-	-
6.99	380.36	459	8F-9960	-	-	-	-	-	-
6.99	393.07	460	5P-4342	-	-	-	-	-	-
6.99	417.96	462	-	-	137-4350	-	-	-	-
6.99	430.66	463	3S-9896	-	241-6948	-	-	-	-
6.99	468.76	466	8T-4811	-	-	-	-	-	-
6.99	481.46	467	5D-1071	-	-	-	-	-	-
6.99	494.16	468	2D-8363	-	6V-5060	-	-	-	-
6.99	532.26	470	3D-8241	-	-	-	380-6914	-	-
6.99	582.68	472	2D-8364	-	-	-	-	-	-
6.99	608.08	473	5D-6428	-	-	-	-	-	-
6.99	659	475	-	-	185-7080	-	-	-	-

Cat Standard O-rings for Fluid Lines

Inch Straight Thread O-Ring (STOR) Seals

Cross Section Dia (mm)	Inner Dia (mm)	Dash Size	Thread Size	NBR (90)	FKM (90)	EPDM (70)
1.63	6.07	-2	5/16 - 24	4J-7533	238-5078	8T-9587
1.63	7.65	-3	3/8 - 24	7J-0204	238-5079	8K-0001
1.83	8.92	-4	7/16 - 20	3J-7354	214-7566	6V-9027
1.83	10.52	-5	1/2 - 20	1J-9671	214-7567	291-8144
1.98	11.89	-6	9/16 - 18	3J-1907	214-7568	6V-3250
2.21	16.36	-8	3/4 - 16	3K-0360	238-5080	6V-6609
2.46	19.18	-10	7/8 - 14	2M-9780	238-5081	6V-3251
2.95	23.47	-12	1-1/16 - 12	3D-2824	238-5082	6V-5063
2.95	26.62	-14	1-3/16 - 12	4K-1388	238-5083	291-8145
2.95	29.74	-16	1-5/16 - 12	7M-8485	238-5084	6V-5064
3	37.47	-20	1-5/8 - 12	2S-4078	228-7096	6V-5065
3	43.69	-24	1-7/8 - 12	6K-6307	238-5086	8C-0562
3	59.36	-32	2-1/2 - 12	030-4606	228-7097	-

Straight Thread O-Ring (STOR)



Metric Straight Thread O-Ring (STOR) Seals

Cross Section Dia (mm)	Inner Dia (mm)	Thread Size	NBR (90)	FKM (90)	EPDM (70)
1.5	6.2	M8 x 1	-	228-7099	-
1.5	8.2	M10 x 1	8T-7876	8C-3076	262-9990
2.1	9.4	M12 X 1.5	6V-9028	228-7100	219-0669
2.1	11.4	M14 X 1.5	6V-6560	228-7101	216-8579
2.1	13.4	M16 X 1.5	8T-6850	228-7102	-
2.1	15.4	M18 X 1.5	8T-7524	228-7103	199-9751
2.1	17.4	M20 X 1.5	8T-7877	228-7104	-
2.1	19.4	M22 X 1.5	6V-7970	228-7105	216-7485
2.8	23.7	M27 X 2	8T-7525	228-7106	216-8578
2.8	29.7	M33 X 2	8T-7526	215-4639	216-8580
2.8	38.7	M42 X 2	8C-5193	228-7108	-
2.8	44.7	M48 X 2	-	-	-
2.8	56.7	M60 X 2	-	209-5798	-

O-Ring Face Seals (ORFS)

Cross Section Dia (mm)	Inner Dia (mm)	Thread Size	NBR (90)	FKM (90)	EPDM (70)
1.78	11.23	9/16 - 18	4J-5477	228-7088	121-4345
1.78	12.83	11/16 - 16	6V-8397	228-7089	6D-7128
1.78	16.03	13/16 - 16	6V-8398	228-7090	180-8424
1.78	19.28	1 - 14	7J-9108	228-7091	6V-5138
1.78	22.5	1-3/16 - 12	6V-9746	228-7092	294-9072
1.78	27.22	1-7/16 - 12	5K-9090	228-7093	-
1.78	33.57	1-11/16 - 12	6V-8400	228-7094	-
1.78	41.54	2 - 12	8T-0315	228-7095	294-9075

O-Ring Face Seal (ORFS)



JIS (Japanese Industrial Standard) O-rings

Cross Section Dia (mm)	Inner Dia (mm)	Standard Size	NBR (75)	NBR (90)	FKM (75)	FKM (90)	HNBR (78)
1.9	2.8	P3	095-1508	095-1571	-	-	-
1.9	3.8	P4	095-1509	7Y-5280	-	206-9288	-
1.9	4.8	P5	095-1510	095-1572	-	-	-
1.9	5.8	P6	3T-7528	095-1573	-	-	-
1.9	6.8	P7	095-1511	095-1574	207-4849	199-0518	-
1.9	7.8	P8	-	095-1575	103-8254	277-2550	-
1.9	8.8	P9	095-1513	095-1576	-	236-2184	-
1.9	9.8	P10	095-1514	095-1578	-	189-9763	-
2.4	9.8	P10A	-	095-1577	-	-	-
2.4	10.8	P11	095-1515	095-1579	-	206-9292	121-7137
2.4	11.8	P12	095-1516	095-1580	-	-	-
2.4	12.3	P12.5	185-0550	095-1581	8T-9522	249-6660	-
2.4	13.8	P14	095-1517	095-1582	-	-	-
2.4	14.8	P15	095-1518	095-1583	103-8255	206-9293	-
2.4	15.8	P16	095-1519	095-1584	273-8316	206-9294	-
2.4	17.8	P18	-	095-1585	-	206-9295	-
2.4	19.8	P20	095-1521	095-1586	-	206-9296	-
2.4	20.8	P21	095-1522	095-1587	-	109-1294	-
2.4	21.8	P22	095-1524	095-1590	-	277-2545	229-4896
3.1	24.4	G25	095-1657	095-1696	-	249-6659	-
3.1	29.4	G30	095-1658	095-1698	-	206-9298	-
3.1	34.4	G35	095-1659	095-1700	-	206-9299	-
3.1	39.4	G40	-	095-1701	-	109-1296	-
3.1	44.4	G45	-	095-1703	-	206-9285	-
3.1	49.4	G50	095-1662	095-1704	-	-	-
3.1	54.4	G55	095-1663	095-1705	-	-	-
3.1	59.4	G60	-	095-1706	-	-	-
3.1	64.4	G65	-	095-1707	-	206-9286	-
3.1	69.4	G70	-	095-1708	-	-	-
3.1	74.4	G75	-	095-1709	-	206-9300	-
3.1	79.4	G80	-	095-1710	193-1736	-	-
3.1	84.4	G85	8T-3338	095-1711	273-8315	-	-
3.1	89.4	G90	-	095-1712	-	-	-
3.1	94.4	G95	095-1671	095-1713	096-3944	249-6657	-
3.1	99.4	G100	6V-8467	095-1714	-	-	-
3.1	104.4	G105	095-1673	095-1715	-	236-6919	-
3.1	109.4	G110	095-1674	095-1716	274-1262	292-3264	-
3.1	114.4	G115	095-1675	095-1717	-	-	-
3.1	119.4	G120	095-1676	095-1718	-	-	-
3.1	124.4	G125	-	095-1719	-	-	-
3.1	129.4	G130	095-1678	095-1720	-	-	-
3.1	134.4	G135	095-1679	095-1721	-	-	-

3.1	139.4	G140	095-1680	095-1722	-	-	-
3.1	144.4	G145	095-1681	095-1723	-	-	-
3.5	21.7	P22A	-	095-1589	-	-	-
3.5	22.1	P22.4	095-1525	095-1591	-	-	-
3.5	23.7	P24	095-1526	095-1592	-	190-7674	-
3.5	24.7	P25	095-1527	095-1593	273-8317	-	-
3.5	25.7	P26	095-1528	095-1594	273-8319	206-9301	-
3.5	27.7	P28	-	095-1595	-	-	-
3.5	28.7	P29	-	095-1596	-	-	-
3.5	29.7	P30	095-1531	095-1597	-	-	-
3.5	30.7	P31	-	095-1598	-	-	-
3.5	31.7	P32	095-1533	095-1599	-	-	-
3.5	33.7	P34	095-1534	095-1600	-	-	-
3.5	34.7	P35	8T-2148	095-1601	-	-	-
3.5	35.7	P36	-	095-1602	-	-	-
3.5	37.69	P38	-	-	-	190-7673	-
3.5	37.7	P38	095-1537	095-1603	-	-	-
3.5	38.7	P39	095-1538	096-5572	273-8318	-	-
3.5	39.7	P40	095-1539	095-1604	-	-	-
3.5	40.7	P41	095-1540	095-1605	-	-	-
3.5	41.7	P42	095-1541	095-1606	-	-	-
3.5	43.7	P44	-	095-1607	-	-	-
3.5	44.7	P45	095-1543	095-1608	-	-	-
3.5	45.7	P46	095-1544	095-1609	-	-	-
3.5	47.7	P48	-	095-1610	-	-	-
3.5	48.7	P49	095-1545	-	-	-	-
3.5	49.7	P50	095-1547	095-1613	-	-	-
5.7	49.6	P50A	-	095-1612	-	-	-
5.7	51.6	P52	096-0121	095-1614	-	-	-
5.7	54.6	P55	8T-6346	095-1616	-	-	-
5.7	55.6	P56	-	095-1617	-	-	-
5.7	57.6	P58	-	095-1618	-	-	-
5.7	59.6	P60	095-1549	095-1619	-	-	-
5.7	61.6	P62	-	095-1620	-	-	-
5.7	64.6	P65	-	095-1621	-	-	-
5.7	66.6	P67	270-6438	-	-	-	-
5.7	69.6	P70	-	095-1622	-	-	-
5.7	74.6	P75	095-1552	-	-	-	-
5.7	79.6	P80	-	095-1623	-	-	-
5.7	84.6	P85	095-1554	095-1624	-	-	-
5.7	89.6	P90	-	095-1625	-	-	-
5.7	94.6	P95	-	095-1626	-	-	-
5.7	99.6	P100	-	095-1627	-	-	-
5.7	104.6	P105	-	-	-	-	-
5.7	109.6	P110	095-1558	095-1628	-	-	-
5.7	111.6	P112	132-3056	-	-	-	-
5.7	114.6	P115	-	095-1630	-	-	-
5.7	119.6	P120	-	095-1631	-	-	-
5.7	124.6	P125	-	096-5382	-	-	-

5.7	129.6	P130	095-1562	095-1632	-	-	-
5.7	139.6	P140	095-1563	095-1633	-	-	-
5.7	144.6	P145	-	095-1634	-	-	-
5.7	149.2	P150	-	-	-	483-3274	-
5.7	149.3	P150	095-1682	-	-	-	-
5.7	149.6	P150	-	095-1635	-	-	-
5.7	154.3	G155	096-4921	095-1725	-	-	-
5.7	159.3	G160	-	095-1726	-	-	-
5.7	164.3	G165	-	095-1727	-	-	-
5.7	169.3	G170	095-1684	095-1728	-	-	081-4674
5.7	179.3	G180	095-1685	095-1730	-	-	-
5.7	184.3	G185	095-1686	-	-	-	-
5.7	189.3	G190	095-1687	095-1731	-	-	-
5.7	194.3	G195	095-1688	-	-	-	-
5.7	199.3	G200	095-1689	095-1732	-	-	-
5.7	209.3	G210	-	095-1733	-	-	-
5.7	219.3	G220	095-1691	095-1734	-	-	-
5.7	229.3	G230	095-1692	095-1735	-	-	-
5.7	249.3	G250	-	095-1736	-	-	-
5.7	259.3	G260	-	095-1737	-	-	-
5.7	269.3	G270	-	-	-	-	-
5.7	279.3	G280	095-1694	-	-	-	-
5.7	289.3	G290	-	-	9X-4623	-	-
5.7	299.3	G300	095-1695	-	-	-	-
8.4	154.5	P155	-	095-1636	-	-	-
8.4	164.5	P165	-	095-1637	-	-	-
8.4	174.5	P175	-	095-1638	-	-	-
8.4	179.5	P180	-	095-1639	-	-	-
8.4	189.5	P190	095-1565	-	-	-	-
8.4	199.5	P200	095-1566	-	-	-	-
8.4	214.5	P215	095-1567	-	-	-	-
8.4	249.5	P250	095-1568	-	-	-	-
8.4	384.5	P385	095-1570	-	-	-	-

BS (British Standard) O-rings

Cross Section Dia (mm)	Inner Dia (mm)	Standard Size	NBR (75)	NBR (90)	FKM (75)	FKM (90)
1.6	11.1	0111-16	-	-	8I-4284	-
1.6	13.1	0131-16	8C-3097	-	-	-
1.6	22.2	0221-16	-	-	8I-4581	-
1.6	27.1	0271-16	8C-3101	-	-	-
2.4	17.6	0176-24a	2U-1571	-	-	-
2.4	47.6	0476-24	-	-	195-7657	-
3	34.5	0345-30a	-	490-8788	-	-
3	37.5	0375-30a	-	2S-4078	5P-7815	228-7096
3	54.5	0545-30	-	-	081-3364	-
3	59.36	0595-30	-	030-4606	5P-7817	228-7097
3	84.5	0845-30	-	-	9X-4622	-
3	104.5	1045-30	-	-	227-5904	-
3	110	1095-30	-	490-8609	-	-
3	120	1195-30	5W-5486	140-0226	-	-
3	124	1245-30	-	8U-2552	-	-
3	125	1245-30	222-5792	-	276-3188	-
3	144.5	1445-30	-	-	192-5167	-
3	150	1495-30	109-5700	-	-	-
3	154.5	1545-30	2U-5345	-	-	-
3	160	1595-30	-	8U-2538	-	-
3	175	1745-30	201-7396	-	-	-
3	179	1795-30	-	-	192-5168	-
3	185	1845-30	270-6871	-	-	-
3	189.5	1895-30	2U-5346	-	-	-
3	200	1995-30	109-5693	-	-	-
3	210	2095-30	-	490-8720	-	-
5.7	52.3	0523-57a	2U-1574	-	-	-
5.7	64.6	0643-57a	-	095-1621	-	-
5.7	69.6	0693-57a	-	095-1622	-	-
5.7	74.6	0743-57a	095-1552	-	-	-
5.7	79.6	0793-57a	-	095-1623	-	-
5.7	84.6	0843-57a	095-1554	095-1624	-	-
5.7	89.6	0893-57a	-	095-1625	-	-
5.7	94.6	0943-57a	-	095-1626	-	-
5.7	99.6	0993-57a	-	095-1627	-	-
5.7	104.6	1043-57a	-	-	-	-
5.7	109.6	1093-57a	095-1558	095-1628	-	-
5.7	114.6	1143-57a	-	095-1630	-	-
5.7	119.6	1193-57a	-	095-1631	-	-
5.7	124.6	1243-57a	-	096-5382	-	-
5.7	129.6	1293-57a	095-1562	095-1632	-	-
5.7	139.6	1393-57a	095-1563	095-1633	-	-
5.7	144.6	1443-57a	-	095-1634	-	-
5.7	149.3	1493-57	095-1682	095-1635	-	483-3274

5.7	154.3	1543-57	096-4921	095-1725	-	-
5.7	159.3	1593-57	-	095-1726	-	-
5.7	164.3	1643-57	-	095-1727	-	-
5.7	169.3	1693-57	095-1684	095-1728	-	-
5.7	179.3	1793-57	095-1685	095-1730	-	-
5.7	184.3	1843-57	095-1686	-	-	-
5.7	189.3	1893-57	095-1687	095-1731	-	-
5.7	194.3	1943-57	095-1688	-	-	-
5.7	199.3	1993-57	095-1689	095-1732	-	-
5.7	209.3	2093-57	-	095-1733	-	-
5.7	219.3	2193-57	095-1691	095-1734	-	-
5.7	229.3	2293-57	095-1692	095-1735	-	-
5.7	249.3	2493-57	-	095-1736	-	-
5.7	259.3	2593-57	-	095-1737	-	-
5.7	269.3	2693-57	-	-	-	-
5.7	279.3	2793-57	095-1694	-	-	-
5.7	289.3	2893-57	-	-	9X-4623	-
5.7	299.3	2993-57	095-1695	-	-	-
5.7	399.3	3993-57	7U-7852	-	-	-
8.4	154.5	1541-84a	-	095-1636	-	-
8.4	164.5	1641-84a	-	095-1637	-	-
8.4	174.5	1741-84a	-	095-1638	-	-
8.4	179.5	1791-84a	-	095-1639	-	-
8.4	189.5	1891-84a	095-1565	-	-	-
8.4	199.5	1991-84a	095-1566	-	-	-
8.4	249.5	2491-84a	095-1568	-	-	-

Non-Standard O-rings

Cross Section Dia (mm)	Inner Dia (mm)	NBR (75)	NBR (90)	FKM (75)	FKM (90)	Silicone (70)	HNBR (78)	EPDM (70)
1.17	10.41			189-3769				
1.35	11.63	1P-8116						
1.4	25.63				9X-7430			
1.42	3.99			5P-9262				
1.5	1.5			179-7400				
1.5	4.5		3E-4288					
1.5	5			8C-3131				
1.5	6	192-7507						
1.5	6.5		3E-4289					
1.5	7		192-7512					
1.5	7.5		192-7513					
1.5	8	192-7514	3E-4296					
1.5	10		3E-4297					
1.5	15	192-7510						
1.5	16			242-4313				
1.5	17				8C-3106			
1.6	14			8C-3132				
1.63	6.07		4J-7533	163-4565	238-5078			8T-9587
1.63	7.65		7J-0204	5P-7813	238-5079			8K-0001
1.78	6.4		147-6603					
1.78	13.34			317-0810			117-2983	
1.78	15.72		7J-9108	136-7226	228-7091			
1.78	60.43			311-6130				
1.78	78.56					5P-3114		
1.78	157.5					415-1704		
1.78	302.03			367-9384				
1.83	8.92		3J-7354	6V-5048	214-7566		9X-7378	6V-9027
1.83	10.52		1J-9671	5P-7814	214-7567			291-8144
1.88	7.98		6V-5324					
1.9	10.8				249-6661			
1.98	11.89		3J-1907	190-7634	214-7568			6V-3250
2	5	192-7506						
2	9			9X-4617				
2	10		9T-4057					
2	11	192-7515						
2	12		3E-4298					
2	15			3E-6749				
2	17				3E-6769			
2	35	242-9574						
2	78			192-7120				
2	84.5	165-9448						

2	149.5	177-2553						
2.1	9.4		6V-9028	199-9267	228-7100			219-0669
2.1	11.4		6V-6560		228-7101	199-9252		216-8579
2.1	13.4		8T-6850		228-7102			291-8174
2.2	9.6				9X-7317			
2.21	16.36		3K-0360	8L-2786	238-5080		112-5282	6V-6609
2.38	22.22			2T-2894				
2.4	16.3				117-8766			
2.4	18.3			8T-9523				
2.4	19.3			9X-4619				
2.4	25.3		3E-6763					
2.44	17.5			351-1904				
2.46	19.18		2M-9780	136-7227	238-5081		114-4427	6V-3251
2.5	10		192-7509					
2.5	16		192-7508					
2.5	17				213-9242			
2.5	25		118-2725					
2.5	33		3E-6764					
2.5	195				3E-6770			
2.62	8.1		356-2456					
2.62	9.8	7W-3983						
2.62	17.96		6V-5325					
2.62	19.4			326-2042				
2.62	24.3			326-2041				
2.62	27.18			263-4016				
2.62	36.54				131-3719			
2.62	79.38	207-2757					107-5769	
2.62	92.41			185-3241				
2.62	93.12		140-7969					
2.62	269.4	8C-5176						
2.62	287.91	201-3321						
2.66	9.87		173-5549					
2.8	22.7		8T-7878					
2.95	23.47		3D-2824	6V-5050	238-5082			6V-5063
2.95	26.59			6V-1903			119-5155	
2.95	29.74		7M-8485	5P-7701	238-5084			6V-5064
2.95	34.42		230-5935		238-5085			
3	32		5W-8039					
3	43.69		6K-6307	5P-7816	238-5086			8C-0562
3	46		123-0373					
3	53.1			9X-3978				8T-2928
3	85				177-0344			
3	102	179-3560						
3.1	174		095-7383					
3.1	190		096-4377					
3.1	191.3				210-0835			
3.15	30			8T-9524				
3.18	34.11	4D-5256						
3.4	285.6	177-8740		273-8314				

3.5	98.5				5W-5480		
3.53	13.21					5M-1868	
3.53	24.77			243-5739			
3.53	39.27	2J-1826					
3.53	39.9			243-5741			
3.53	43.3			243-5742			
3.53	55.6	137-3623					
3.53	65.07	5B-4399					
3.53	214.3	2M-0340					
3.53	230.67					146-7311	
3.53	238.23					146-7312	
3.53	269.88	9H-5548					
3.53	282.37	6V-7991					
3.53	307.57			5P-9035			
3.53	316.87	5P-2861					
3.53	317.91					6V-2406	
3.53	323.44		5J-1086				
3.53	340.99	171-9375					
3.53	345	116-5897					
3.53	351	171-9298					
3.53	367.89	6D-0692					
3.53	385.34	8D-2714		6V-5058			
3.53	399.8	5P-9147					
3.53	412.34	2P-3628					
3.53	421.84	295-9234					
3.53	434						269-9158
3.53	470	8C-5240					
3.53	481.46	2D-6507					
3.53	484.86	6W-4310					
3.53	523.47	7D-7519					
3.53	552.04	4D-0449					
3.53	570					9X-7550	
3.53	698.09	6D-1355					
3.53	749	5P-4076				359-0854	
3.53	985					202-7482	
3.53	1108					150-8791	
3.55	160	283-6090					
3.55	185	123-2003					
4	35			207-2755			
4	75		112-6921				
4	112			8U-2359			
4	171	287-8400					
4	545			282-2935			
4.29	9.52	7B-0305					
4.3	9.53					3S-5496	
4.31	140.2			142-6217			142-7072
4.31	141					110-2220	
4.39	113.8						3S-3977
4.39	117.1						456-5581

4.78	7.92	2A-3307					
4.78	469.9	4F-2411					
4.88	139.8						3S-3978
4.88	152.4						6L-7812
4.88	165.1						6L-7815
4.88	175						7N-2046
5.33	7.14			4G-4972			
5.33	46.2				9M-2610		
5.33	199.39		8J-4386				
5.33	211.19					134-5958	
5.33	270.21				2W-2073		
5.33	287			8C-9023			
5.33	310.13	5H-4082					
5.33	317.24			6V-7702			
5.33	325						1W-0115
5.33	335			6V-3602			
5.33	342.9	2M-3818					
5.33	372			8T-0098			
5.33	390			6V-4244			
5.33	399.42	7S-4571					
5.33	411.48	5M-7329					
5.33	421.7			8T-8883			
5.33	422	144-8299					
5.33	440.69	6M-5218			381-8976		
5.33	488			179-4551			
5.33	494.66	9H-0846		6V-5043			
5.33	514.65	9M-5892					
5.33	548.64				8S-6251		
5.33	587.54			228-7098			
5.33	643.38	8D-5096			381-8975		
5.33	684.28	5D-7523					
5.33	736.6	2D-6506					
5.33	760	5P-4057					
5.33	786.76	3D-3295					
5.33	795				186-3712		
5.33	838.2	279-8816					
5.33	843				5P-9519		
5.33	885.92				422-1004		
5.33	920				111-1503		
5.33	940				6V-6557		
5.33	970				433-7022		
5.33	1180				152-0985		
5.33	1275				152-7039		
5.7	226					162-7473	
5.84	72.39			346-7703			
6	180	145-6735					
6.22	49.23	2B-8293					
6.35	53.98						6L-7816
6.99	31.12						8C-5209

6.99	56.52	7D-1195						
6.99	61.6	5P-8432						
6.99	64.26	1T-0136						
6.99	69.22	1M-0556						
6.99	75.56	5H-2824						
6.99	81					4L-8337		
6.99	81.92			310-3953				
6.99	88.26			130-5694		5S-1188		
6.99	94.61					5H-7704		
6.99	94.62			6V-3917				
6.99	100.96			6V-2695		5H-1039		
6.99	107.31			6V-5166		6H-1871		
6.99	208.9			170-4822				
6.99	210.9	161-4511						
6.99	218.5			6V-3603				
6.99	268.44	5P-3487		9X-7442				
6.99	310.13	4M-0737						
6.99	386.24			137-4349				
6.99	460					289-2270		
6.99	520.07	5P-2587						
6.99	564.5					143-6387		
6.99	955			180-2923				
6.99	1091			172-5635				
7.5	56	175-6176						
9	96						367-8465	
10	124.7						367-8466	
10	155						367-8468	
10	175						367-8469	
10	200						367-8470	
10	210						367-8471	
10	250						367-8473	