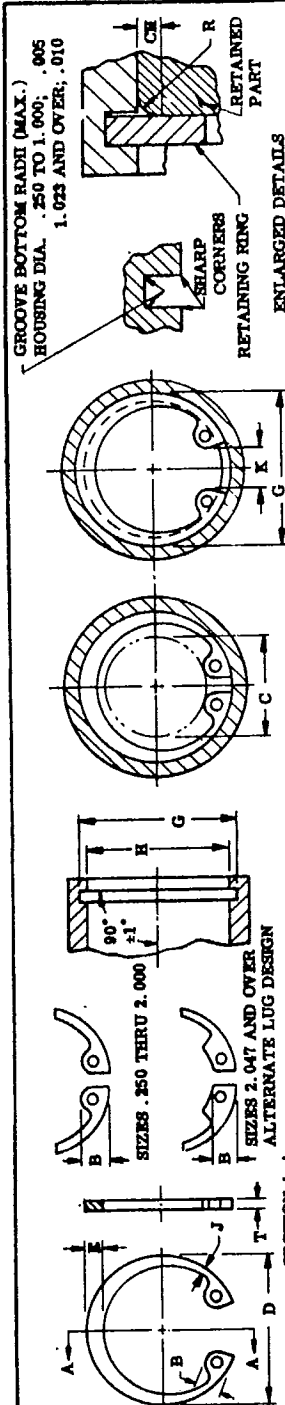


This military standard is approved by the Department of Defense and is mandatory for use by all Departments and Agencies of the Department of Defense. Selection for all new engineering and design applications and for reactivities use shall be made from this document.



ENLARGED DETAILS

SECTION A-A

© ENTIRE STANDARD REVISED

P.A. NAVY - 08

Other Cust
ARMY - WC
AIR FORCE - 11

PROCUREMENT SPECIFICATION
MIL-R-21248 TY. I CL. 1

TITLE

**RING, RETAINING, INTERNAL, BASIC
(TAPERED SECTION TYPE)**

SUPERSEDES:

MILITARY STANDARD

MS16625

SHEET 1 OF 10

PLATE NO 15323

DD FORM 672-1 (Coordinated)

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USER SYMBOLS:
NAVY - MC
ARMY - AT, MU, ME

REVIEWER SYMBOLS:
NAVY - OS
ARMY - WC, MI, AV
AIR FORCE - 82, 85

"Reviewer/user information is current as of the date of this document. For future confirmation of changes to this document, draft circulation should be based on the information in the current DODISS."

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H		D		B		E		J		I		G		W		K		C		R		CH	
HOUSING DIAMETER		FREE DIAMETER		BASIC TOL.		BASIC TOL.		BASIC TOL.		BASIC TOL.		RECOMMENDED GROOVE		WIDTH		GAP		MAX.		MAX.		OF PART	
INCH	MM	INCH	MM	INCH	MM	INCH	MM	INCH	MM	INCH	MM	INCH	MM	INCH	MM	INCH	MM	INCH	MM	INCH	MM	INCH	MM
1.562	39.7	1.734	44.0	.202	5.1	.157	4.0	.078	2.0	.062	1.6	1.658	.086	.338	8.6	1.14	.050	.050	.050	.050	.050	.050	.050
1.575	40.0	1.734	44.0	.202	5.1	.157	4.0	.078	2.0	.062	1.6	1.671	.086	.374	9.5	1.15	.064	.064	.064	.064	.064	.064	.064
1.625	41.3	1.804	45.8	.227	5.8	.164	4.2	.082	2.1	.062	1.6	1.725	.086	.339	8.7	1.15	.064	.064	.064	.064	.064	.064	.064
1.653	42.0	1.835	46.7	.227	5.8	.167	4.3	.085	2.1	.062	1.6	1.755	.086	.348	8.9	1.17	.064	.064	.064	.064	.064	.064	.064
1.688	42.9	1.874	47.6	.234	5.9	.170	4.3	.085	2.1	.062	1.6	1.792	.086	.357	9.1	1.21	.064	.064	.064	.064	.064	.064	.064
1.750	44.4	1.942	49.5	.234	5.9	.171	4.3	.083	2.1	.062	1.6	1.858	.086	.372	9.4	1.26	.064	.064	.064	.064	.064	.064	.064
1.812	46.0	2.012	51.0	.234	5.9	.170	4.3	.084	2.1	.062	1.6	1.922	.086	.382	9.7	1.32	.064	.064	.064	.064	.064	.064	.064
1.850	47.0	2.054	52.1	.234	5.9	.170	4.3	.085	2.1	.062	1.6	1.962	.086	.392	9.9	1.36	.064	.064	.064	.064	.064	.064	.064
1.875	47.6	2.072	52.6	.234	5.9	.170	4.3	.085	2.1	.062	1.6	1.989	.086	.420	10.7	1.39	.064	.064	.064	.064	.064	.064	.064
1.938	49.2	2.141	54.5	.240	6.1	.170	4.3	.085	2.1	.062	1.6	2.056	.086	.438	11.2	1.45	.064	.064	.064	.064	.064	.064	.064
2.000	50.8	2.210	56.1	.240	6.1	.170	4.3	.085	2.1	.062	1.6	2.122	.086	.453	11.6	1.50	.064	.064	.064	.064	.064	.064	.064
2.047	52.0	2.280	58.0	.250	6.4	.186	4.7	.091	2.3	.078	2.0	2.171	.086	.488	12.4	1.52	.076	.061	.061	.061	.061	.061	.061
2.062	52.4	2.280	58.0	.250	6.4	.186	4.7	.091	2.3	.078	2.0	2.186	.086	.488	12.4	1.54	.078	.062	.062	.062	.062	.062	.062
2.125	54.0	2.350	59.4	.260	6.6	.195	4.9	.096	2.4	.078	2.0	2.251	.086	.480	12.3	1.58	.078	.062	.062	.062	.062	.062	.062
2.165	55.0	2.415	61.3	.264	6.7	.199	5.0	.098	2.4	.078	2.0	2.295	.086	.439	11.3	1.61	.078	.062	.062	.062	.062	.062	.062
2.188	55.6	2.415	61.3	.264	6.7	.199	5.0	.098	2.4	.078	2.0	2.318	.086	.489	12.5	1.64	.078	.062	.062	.062	.062	.062	.062
2.250	57.1	2.490	63.0	.270	6.9	.203	5.1	.099	2.4	.078	2.0	2.382	.086	.478	12.2	1.69	.078	.062	.062	.062	.062	.062	.062
2.312	58.7	2.560	65.1	.270	6.9	.206	5.2	.100	2.4	.078	2.0	2.450	.086	.504	12.8	1.75	.078	.062	.062	.062	.062	.062	.062
2.375	60.3	2.630	66.8	.270	6.9	.207	5.2	.102	2.4	.078	2.0	2.517	.086	.518	13.2	1.81	.078	.062	.062	.062	.062	.062	.062
2.440	62.0	2.702	68.6	.280	7.1	.209	5.3	.103	2.4	.078	2.0	2.584	.086	.532	13.6	1.86	.078	.062	.062	.062	.062	.062	.062
2.500	63.5	2.775	70.3	.280	7.1	.210	5.3	.103	2.4	.078	2.0	2.648	.086	.532	13.6	1.91	.078	.062	.062	.062	.062	.062	.062
2.531	64.3	2.775	70.3	.280	7.1	.210	5.3	.103	2.4	.078	2.0	2.681	.086	.597	15.1	1.94	.078	.062	.062	.062	.062	.062	.062
2.562	65.1	2.844	72.5	.290	7.4	.222	5.6	.109	2.4	.093	2.3	2.714	.103	.540	13.7	1.95	.088	.070	.070	.070	.070	.070	.070
2.625	66.7	2.910	74.3	.290	7.4	.226	5.7	.111	2.4	.093	2.3	2.781	.103	.558	14.2	2.02	.088	.070	.070	.070	.070	.070	.070
2.677	68.0	2.980	75.7	.300	7.6	.230	5.8	.113	2.4	.093	2.3	2.837	.103	.539	13.8	2.05	.090	.072	.072	.072	.072	.072	.072
2.688	68.3	2.980	75.7	.300	7.6	.230	5.8	.113	2.4	.093	2.3	2.848	.103	.568	14.5	2.06	.090	.072	.072	.072	.072	.072	.072
2.750	69.8	3.050	77.7	.300	7.6	.234	5.9	.115	2.4	.093	2.3	2.914	.103	.590	15.2	2.12	.092	.074	.074	.074	.074	.074	.074
2.812	71.4	3.121	79.4	.300	7.6	.230	5.8	.115	2.4	.093	2.3	2.980	.103	.615	15.6	2.18	.088	.070	.070	.070	.070	.070	.070
2.835	72.0	3.121	79.4	.300	7.6	.230	5.8	.115	2.4	.093	2.3	3.006	.103	.676	17.3	2.21	.088	.070	.070	.070	.070	.070	.070
2.875	73.0	3.191	81.3	.310	7.9	.240	6.1	.120	2.4	.093	2.3	3.051	.103	.626	15.9	2.22	.092	.074	.074	.074	.074	.074	.074
2.953	75.0	3.325	84.8	.310	7.9	.250	6.3	.122	2.4	.093	2.3	3.135	.103	.619	15.7	2.30	.092	.074	.074	.074	.074	.074	.074
3.000	76.2	3.325	84.8	.310	7.9	.250	6.3	.122	2.4	.093	2.3	3.182	.103	.738	18.8	2.35	.092	.074	.074	.074	.074	.074	.074
3.062	77.8	3.418	86.9	.310	7.9	.254	6.4	.126	2.4	.109	2.3	3.248	.120	.651	16.5	2.41	.097	.078	.078	.078	.078	.078	.078
3.125	79.4	3.486	88.6	.310	7.9	.259	6.5	.129	2.4	.109	2.3	3.315	.120	.655	16.6	2.47	.099	.079	.079	.079	.079	.079	.079
3.149	80.0	3.523	89.5	.310	7.9	.262	6.6	.129	2.4	.109	2.3	3.341	.120	.650	16.4	2.49	.100	.080	.080	.080	.080	.080	.080
3.156	80.2	3.523	89.5	.310	7.9	.262	6.6	.129	2.4	.109	2.3	3.348	.120	.668	16.9	2.50	.100	.080	.080	.080	.080	.080	.080
3.250	82.5	3.623	91.8	.342	8.7	.269	6.8	.135	2.4	.109	2.3	3.446	.120	.698	17.8	2.54	.104	.083	.083	.083	.083	.083	.083
3.346	85.0	3.734	95.0	.342	8.7	.276	7.0	.140	2.4	.109	2.3	3.546	.120	.705	18.0	2.63	.108	.086	.086	.086	.086	.086	.086
3.469	88.1	3.857	98.0	.342	8.7	.286	7.3	.144	2.4	.109	2.3	3.675	.120	.783	19.9	2.78	.108	.086	.086	.086	.086	.086	.086
3.500	88.9	3.890	98.9	.342	8.7	.289	7.3	.144	2.4	.109	2.3	3.710	.120	.774	19.7	2.79	.110	.088	.088	.088	.088	.088	.088
3.543	90.0	3.936	100.0	.342	8.7	.292	7.4	.142	2.4	.109	2.3	3.755	.120	.842	21.3	2.83	.110	.088	.088	.088	.088	.088	.088
3.562	90.5	3.936	100.0	.342	8.7	.292	7.4	.142	2.4	.109	2.3	3.776	.120	.842	21.3	2.85	.110	.088	.088	.088	.088	.088	.088
3.625	92.1	4.024	102.4	.342	8.7	.299	7.5	.150	2.4	.109	2.3	3.841	.120	.833	21.1	2.91	.116	.093	.093	.093	.093	.093	.093

FED. SUP CLASS
5340

APPROVED 11 DEC 1958 REVISED (C) FOR CHANGES SEE SHEETS 1 THROUGH 10

REVIEWER SYMBOLS:
NAVY - OS
ARMY - WC, MI, AV
AIR FORCE - 82, 85

USE SYMBOLS:
NAVY - MC
ARMY - AT, MU, ME

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P.A.	Other Cust	TITLE	H		D	B		E		J		T	G		W	GAP	°C	°CH
			HOUSING DIAMETER	FREE DIAMETER		BASIC	TOL.	BASIC	TOL.	BASIC	TOL.		RECOMMENDED GROOVE DIAMETER	WIDTH		MIN.		
NAVY - OS ARMY - WC AIR FORCE - 11	MIL-R-21248 TY. I CL. 1	RING, RETAINING, INTERNAL, BASIC (TAPERED SECTION TYPE)	3.740	95.0	4.157	.342	.309	.155	.109	.109	.109	.109	3.964	.120	.844	3.02	120	.096
			3.750	95.2	4.157	.342	.309	.155	.109	.109	.109	.109	3.974	.120	.871	3.03	120	.096
MIL-R-21248 TY. I CL. 1	SUPERSEDES:		3.875	98.4	4.291	.370	.319	.160	.108	.108	.108	.108	4.107	.120	.891	3.11	123	.096
			3.938	100.0	4.358	.370	.324	.161	.108	.108	.108	.108	4.174	.120	.905	3.17	124	.096
MIL-R-21248 TY. I CL. 1	SUPERSEDES:		4.000	101.6	4.424	.370	.330	.166	.109	.109	.109	.109	4.240	.120	.918	3.23	128	.102
			4.125	104.3	4.558	.370	.330	.171	.109	.109	.109	.109	4.365	.120	.94	3.36	130	.104
MIL-R-21248 TY. I CL. 1	SUPERSEDES:		4.250	108.0	4.691	.370	.335	.180	.109	.109	.109	.109	4.490	.120	.96	3.48	138	.110
			4.331	110.0	4.756	.405	.343	.180	.109	.109	.109	.109	4.571	.120	.98	3.50	142	.114
MIL-R-21248 TY. I CL. 1	SUPERSEDES:		4.500	114.3	4.940	.405	.351	.181	.109	.109	.109	.109	4.740	.120	.98	3.66	146	.117
			4.625	117.5	5.076	.405	.360	.183	.109	.109	.109	.109	4.865	.120	.98	3.79	151	.121
MIL-R-21248 TY. I CL. 1	SUPERSEDES:		4.724	120.0	5.213	.405	.370	.183	.109	.109	.109	.109	4.969	.120	.96	3.88	154	.123
			4.750	120.6	5.213	.405	.370	.183	.109	.109	.109	.109	4.995	.120	1.03	3.90	154	.123
MIL-R-21248 TY. I CL. 1	SUPERSEDES:		5.000	127.0	5.485	.435	.390	.186	.109	.109	.109	.109	5.260	.120	.97	4.08	158	.126
			5.250	133.3	5.770	.455	.408	.198	.125	.125	.125	.125	5.520	.139	.97	4.31	168	.134
MIL-R-21248 TY. I CL. 1	SUPERSEDES:		5.375	138.5	5.910	.455	.408	.198	.125	.125	.125	.125	5.650	.139	1.12	4.41	168	.134
			5.500	139.7	6.066	.455	.408	.198	.125	.125	.125	.125	5.770	.139	1.09	4.53	168	.134
MIL-R-21248 TY. I CL. 1	SUPERSEDES:		5.750	146.0	6.336	.455	.408	.198	.125	.125	.125	.125	6.020	.139	1.11	4.78	168	.134
			6.000	152.4	6.620	.455	.408	.198	.125	.125	.125	.125	6.270	.139	1.13	5.03	168	.134
MIL-R-21248 TY. I CL. 1	SUPERSEDES:		6.250	158.7	6.895	.485	.423	.211	.156	.156	.156	.156	6.530	.174	1.16	5.24	177	.142
			6.500	165.1	7.170	.485	.438	.219	.156	.156	.156	.156	6.790	.174	1.25	5.49	181	.145
MIL-R-21248 TY. I CL. 1	SUPERSEDES:		6.625	168.3	7.308	.485	.447	.221	.156	.156	.156	.156	6.925	.174	1.28	5.60	183	.146
			6.750	171.4	7.445	.530	.456	.224	.156	.156	.156	.156	7.055	.174	1.21	5.65	188	.150
MIL-R-21248 TY. I CL. 1	SUPERSEDES:		7.000	177.8	7.720	.530	.474	.232	.156	.156	.156	.156	7.315	.174	1.26	5.88	196	.157
			7.250	184.1	7.995	.560	.489	.238	.187	.187	.187	.187	7.575	.209	1.32	6.08	202	.162
MIL-R-21248 TY. I CL. 1	SUPERSEDES:		7.500	190.5	8.270	.560	.507	.247	.187	.187	.187	.187	7.840	.209	1.39	6.33	208	.166
			7.750	196.8	8.545	.560	.523	.255	.187	.187	.187	.187	8.100	.209	1.44	6.58	214	.171
MIL-R-21248 TY. I CL. 1	SUPERSEDES:		8.000	203.2	8.820	.600	.540	.262	.187	.187	.187	.187	8.360	.209	1.50	6.75	220	.176
			8.250	209.5	9.095	.600	.558	.270	.187	.187	.187	.187	8.620	.209	1.53	7.00	228	.183
MIL-R-21248 TY. I CL. 1	SUPERSEDES:		8.500	215.9	9.285	.660	.573	.277	.187	.187	.187	.187	8.880	.209	1.71	7.13	235	.188
			8.750	222.2	9.558	.660	.591	.286	.187	.187	.187	.187	9.145	.209	1.77	7.38	241	.193
MIL-R-21248 TY. I CL. 1	SUPERSEDES:		9.000	228.6	9.830	.660	.609	.294	.187	.187	.187	.187	9.405	.209	1.83	7.63	249	.199
			9.250	235.0	10.102	.660	.625	.298	.187	.187	.187	.187	9.688	.209	1.87	7.88	253	.202
MIL-R-21248 TY. I CL. 1	SUPERSEDES:		9.500	241.3	10.375	.735	.642	.304	.187	.187	.187	.187	9.930	.209	1.91	7.98	258	.206
			9.750	247.7	10.648	.735	.658	.309	.187	.187	.187	.187	10.190	.209	2.00	8.23	263	.210
MIL-R-21248 TY. I CL. 1	SUPERSEDES:		10.000	254.0	10.920	.735	.675	.315	.187	.187	.187	.187	10.450	.209	2.01	8.48	270	.216

*T = DIMENSIONS AND TOLERANCES APPLY TO UNPLATED BERYLLIUM COPPER RINGS ONLY. FOR PLATED AND CORROSION RESISTING STEEL RINGS SIZE 1.023 AND SMALLER, THE MAXIMUM T DIMENSION SHALL NOT EXCEED THE MINIMUM W DIMENSION MINUS .002 INCH. FOR PLATED AND CORROSION RESISTING STEEL RINGS SIZE 1.062 AND LARGER THE MAXIMUM T DIMENSION MAY EXCEED THE LISTED T DIMENSION (T + TOLERANCE) BY A MAXIMUM OF .002 INCH.

*K = MINIMUM GAP WIDTH WHEN THE RING IS SPRUNG INTO THE HOUSING, PRIOR TO INSTALLATION INTO THE GROOVE. (DESIGN REFERENCE DIMENSION.)

*C = ACTUAL CLEARANCE DIAMETER WHEN THE RING IS SPRUNG INTO THE HOUSING, PRIOR TO INSTALLATION INTO THE GROOVE. (DESIGN REFERENCE DIMENSION.)

*R AND *CH = RADI OR CHAMFER ALLOWABLE ON PARTS TO BE RETAINED BY THE RING. THRUST LOADS OF RINGS, RETAINING PARTS WITH CORNER RADI OR CHAMFERS AS LISTED ABOVE ARE TABULATED ON SHEET 9.

TIR = (TOTAL INDICATOR READING) IS THE MAXIMUM ALLOWABLE DEVIATION OF CONCENTRICITY BETWEEN THE GROOVE AND THE HOUSING.

DIMENSIONS IN INCHES, UNLESS OTHERWISE SPECIFIED.

SUPPLEMENTARY MANUFACTURING DIMENSIONS ARE INCLUDED IN PROCUREMENT SPECIFICATION MIL-R-21248.

FED. SUP CLASS
5340

MILITARY STANDARD

MS16625

SHEET 3

DD FORM 1 SEP 57 672-1 (Coordinated)

PREVIOUS EDITIONS OF THIS FORM ARE OBSOLETE.

PLATE NO 15320

PROBLEM HARD COPY

USER SYMBOLS:
NAVY - MC
ARMY - AT, MU, ME

REVIEWER SYMBOLS:
NAVY - OS
ARMY - WC, MI, AV
AIR FORCE - 82, 85

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H HOUSING DIAMETER	STEEL CADMIUM PLATED	STEEL PHOSPHATE COATED	STEEL CORROSION RESISTING	BERYLLIUM COPPER	FED. SUP CLASS 5340
	DASH NO.	DASH NO.	DASH NO.	DASH NO.	
.250	MS16625 -1025	MS16625 -3025	MS16625 -4025	MS16625 -5025	
.312	-1031	-3031	-4031	-5031	
.375	-1037	-3037	-4037	-5037	
.438	-1043	-3043	-4043	-5043	
.453	-1045	-3045	-4045	-5045	
.500	-1050	-3050	-4050	-5050	
.512	-1051	-3051	-4051	-5051	
.562	-1056	-3056	-4056	-5056	
.625	-1062	-3062	-4062	-5062	
.688	-1068	-3068	-4068	-5068	
.750	-1075	-3075	-4075	-5075	
.777	-1077	-3077	-4077	-5077	
.812	-1081	-3081	-4081	-5081	
.866	-1086	-3086	-4086	-5086	
.875	-1087	-3087	-4087	-5087	
.901	-1090	-3090	-4090	-5090	
.938	-1093	-3093	-4093	-5093	
1.000	-1100	-3100	-4100	-5100	
1.025	-1102	-3102	-4102	-5102	
1.062	-1106	-3106	-4106	-5106	
1.125	-1112	-3112	-4112	-5112	
1.181	-1118*	-3118*	-4118*	-5118*	
1.188	-1118*	-3118*	-4118*	-5118*	
1.250	-1125*	-3125*	-4125*	-5125*	
1.259	-1125*	-3125*	-4125*	-5125*	
1.312	-1131	-3131	-4131	-5131	
1.375	-1137*	-3137*	-4137*	-5137*	
1.378	-1137*	-3137*	-4137*	-5137*	
1.438	-1143	-3143	-4143	-5143	
1.456	-1145	-3145	-4145	-5145	
1.500	-1150	-3150	-4150	-5150	
1.562	-1156*	-3156*	-4156*	-5156*	
1.575	-1156*	-3156*	-4156*	-5156*	
1.625	-1162	-3162	-4162	-5162	
1.653	-1165	-3165	-4165	-5165	
1.688	-1168	-3168	-4168	-5168	
1.750	-1175	-3175	-4175	-5175	
1.812	-1181	-3181	-4181	-5181	
1.850	-1185	-3185	-4185	-5185	
1.875	-1187	-3187	-4187	-5187	
1.938	-1193	-3193	-4193	-5193	
2.000	-1200	-3200	-4200	MS16625-5200	
2.047	-1206*	-3206*	-4206*	-4206*	
2.062	-1206*	-3206*	-4206*	-4206*	
2.125	-1212	-3212	-4212	-4212	
2.165	-1218*	-3218*	-4218*	-4218*	
2.188	-1218*	-3218*	-4218*	-4218*	
2.250	-1225	-3225	-4225	-4225	
2.312	-1231	-3231	-4231	-4231	
2.375	-1237	-3237	-4237	-4237	
2.440	-1244	-3244	-4244	-4244	
2.500	-1250*	-3250*	-4250*	-4250*	
2.531	-1250*	-3250*	-4250*	-4250*	
2.562	-1256	-3256	-4256	-4256	
2.625	-1262	-3262	-4262	-4262	
2.677	-1268*	-3268*	-4268*	-4268*	
2.688	MS16625-1268*	MS16625-3268*	MS16625-4268*		

APPROVED 11 DEC 1968 REVISED (C) FOR CHANGES SEE SHEETS 1 THROUGH 10

P.A. NAVY - OS Other Cust ARMY - WC AIR FORCE - 11	TITLE RING, RETAINING, INTERNAL, BASIC (TAPERED SECTION TYPE)	MILITARY STANDARD MS16625
PROCUREMENT SPECIFICATION MIL-R-21248 TY. I CL. 1	SUPERSEDES:	SHEET 4

USER SYMBOLS:
NAVY - MC
ARMY - AT, MU, ME

REVIEWER SYMBOLS:
NAVY - OS
ARMY - WC, MI, AV
AIR FORCE - 82, 85

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H HOUSING DIAMETER	STEEL CADMIUM PLATED	STEEL PHOSPHATE COATED	STEEL CORROSION RESISTING	FED. SUP CLASS 5340
	DASH NO.	DASH NO.	DASH NO.	
2.750	MS16625-1275	MS16625-3275	MS16625-4275	
2.813	-1281*	-3281*	-4281*	
2.834	-1281*	-3281*	-4281*	
2.875	-1287	-3287	-4287	
2.953	-1300*	-3300*	-4300*	
3.000	-1300*	-3300*	-4300*	
3.062	-1306	-3306	-4306	
3.125	-1312	-3312	-4312	
3.149	-1315*	-3315*	-4315*	
3.156	-1315*	-3315*	-4315*	
3.250	-1325	-3325	-4325	
3.346	-1334	-3334	-4334	
3.469	-1346	-3346	-4346	
3.500	-1350	-3350	-4350	
3.643	-1354*	-3354*	-4354*	
3.562	-1354*	-3354*	-4354*	
3.625	-1362	-3362	-4362	
3.740	-1375*	-3375*	-4375*	
3.750	-1375*	-3375*	-4375*	
3.875	-1387	-3387	-4387	
3.938	-1393	-3393	-4393	
4.000	-1400	-3400	-4400	
4.125	-1412	-3412	-4412	
4.250	-1425	-3425	-4425	
4.330	-1433	-3433	-4433	
4.500	-1450	-3450	-4450	
4.625	-1462	-3462	-4462	
4.724	-1475*	-3475*	-4475*	
4.750	-1475*	-3475*	-4475*	
5.000	-1500	-3500	-4500	
5.250	-1525	-3525	-4525	
5.375	-1537	-3537	-4537	
5.500	-1550	-3550	-4550	
5.750	-1575	-3575	-4575	
6.000	-1600	-3600	-4600	
6.250	-1625	-3625	-4625	
6.500	-1650	-3650	-4650	
6.625	-1662	-3662	-4662	
6.750	-1675	-3675	-4675	
7.000	-1700	-3700	-4700	
7.250	-1725	-3725	-4725	
7.500	-1750	-3750	-4750	
8.000	-1800	-3800	-4800	
8.250	-1825	-3825	-4825	
8.500	-1850	-3850	-4850	
8.750	-1875	-3875	-4875	
9.000	-1900	-3900	-4900	
9.250	-1925	-3925	-4925	
9.500	-1950	-3950	-4950	
9.750	-1975	-3975	-4975	
10.000	MS16625-2000	MS16625-4000	MS16625-5000	

* SAME DASH NUMBERS SUITABLE FOR EITHER HOUSING DIAMETER (INCHES OR MM.)

P.A. NAVY - OS Other Cust ARMY - WC AIR FORCE - 11	TITLE RING, RETAINING, INTERNAL, BASIC (TAPERED SECTION TYPE)	MILITARY STANDARD MS16625
PROCUREMENT SPECIFICATION MIL-R-21248 TY. I CL.1	SUPERSEDES:	SHEET 5

APPROVED 11 DEC 1958 REVISED C FOR CHANGES SEE SHEETS 1 THROUGH 10

USER SYMBOLS:
NAVY - MC
ARMY - AT, MU, ME

REVIEWER SYMBOLS:
NAVY - OS
ARMY - WC, MI, AV
AIR FORCE - 82, 85

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SUBSTITUTION TABLE				FED. SUP CLASS 5340
CROSS REFERENCE OF PART NUMBERS				
H HOUSING DIAMETER	INACTIVE	INACTIVE	SUBSTITUTE	
	STEEL /1	STEEL ZINC PLATED	STEEL CADMIUM PLATED	
	DASH NO.	DASH NO.	DASH NO.	
.250	MS16625 -25	MS16625 -2025	MS16625 -1025	
.312	-31	-2031	-1031	
.375	-37	-2037	-1037	
.438	-43	-2043	-1043	
.453	-45	-2045	-1045	
.500	-50	-2050	-1050	
.512	-51	-2051	-1051	
.562	-56	-2056	-1056	
.625	-62	-2062	-1062	
.688	-68	-2068	-1068	
.750	-75	-2075	-1075	
.777	-77	-2077	-1077	
.812	-81	-2081	-1081	
.866	-86	-2086	-1086	
.875	-87	-2087	-1087	
.901	-90	-2090	-1090	
.938	-93	-2093	-1093	
1.000	-100	-2100	-1100	
1.023	-102	-2102	-1102	
1.062	-106	-2106	-1106	
1.125	-112	-2112	-1112	
1.181	-118	-2118	-1118	
1.188	-118	-2118	-1118	
1.250	-125	-2125	-1125	
1.259	-125	-2125	-1125	
1.312	-131	-2131	-1131	
1.375	-137	-2137	-1137	
1.378	-137	-2137	-1137	
1.438	-143	-2143	-1143	
1.456	-145	-2145	-1145	
1.500	-150	-2150	-1150	
1.562	-156	-2156	-1156	
1.575	-156	-2156	-1156	
1.625	-162	-2162	-1162	
1.653	-165	-2165	-1165	
1.688	-168	-2168	-1168	
1.750	-175	-2175	-1175	
1.812	-181	-2181	-1181	
1.850	-185	-2185	-1185	
1.875	-187	-2187	-1187	
1.938	-193	-2193	-1193	
2.000	-200	-2200	-1200	
2.047	-206	-2206	-1206	
2.062	-206	-2206	-1206	
2.125	-212	-2212	-1212	
2.165	-218	-2218	-1218	
2.188	-218	-2218	-1218	
2.250	-225	-2225	-1225	
2.312	-231	-2231	-1231	
2.375	-237	-2237	-1237	
2.440	-244	-2244	-1244	
2.500	-250	-2250	-1250	
2.531	-250	-2250	-1250	
2.562	-256	-2256	-1256	
2.625	-262	-2262	-1262	
2.677	-268	-2268	-1268	
2.688	-268	-2268	-1268	
2.750	-275	-2275	-1275	
2.813	-281	-2281	-1281	
2.834	-281	-2281	-1281	
2.875	MS16625 -287	MS16625 -2287	MS16625 -1287	

P.A. NAVY - OS Other Cust ARMY - WC AIR FORCE - 11	TITLE RING, RETAINING, INTERNAL, BASIC (TAPERED SECTION TYPE)	MILITARY STANDARD MS16625
PROCUREMENT SPECIFICATION MIL-R-21248 TY. I CL. 1	SUPERSEDES	SHEET 6

APPROVED 11 DEC 1958 REVISED (C) FOR CHANGES SEE SHEETS 1 THROUGH 10

USER SYMBOLS:
NAVY - MC
ARMY - AT, MU, ME

REVIEWER SYMBOLS:
NAVY - OS
ARMY - WC, MI, AV
AIR FORCE - 62, 65

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SUBSTITUTION TABLE				FED. SUP CLASS 6340
CROSS REFERENCE OF PART NUMBERS				
H HOUSING DIAMETER	INACTIVE	INACTIVE	SUBSTITUTE	
	STEEL Δ	STEEL ZINC PLATED	STEEL CADMIUM PLATED	
	DASH NO.	DASH NO.	DASH NO.	
2.953	MS16625-300	MS16625-2300	MS16625-1300	
3.000	-300	-2300	-1300	
3.062	-306	-2306	-1306	
3.125	-312	-2312	-1312	
3.149	-316	-2316	-1316	
3.156	-316	-2316	-1316	
3.250	-325	-2325	-1325	
3.348	-334	-2334	-1334	
3.469	-346	-2346	-1346	
3.500	-350	-2350	-1350	
3.543	-354	-2354	-1354	
3.562	-354	-2354	-1354	
3.625	-362	-2362	-1362	
3.740	-375	-2375	-1375	
3.750	-375	-2375	-1375	
3.875	-387	-2387	-1387	
3.938	-393	-2393	-1393	
4.000	-400	-2400	-1400	
4.125	-412	-2412	-1412	
4.250	-425	-2425	-1425	
4.330	-433	-2433	-1433	
4.500	-450	-2450	-1450	
4.625	-462	-2462	-1462	
4.724	-475	-2475	-1475	
4.750	-475	-2475	-1475	
5.000	-500	-2500	-1500	
5.250	-525	-2525	-1525	
5.375	-537	-2537	-1537	
5.500	-550	-2550	-1550	
5.570	-575	-2575	-1575	
6.000	-600	-2600	-1600	
6.250	-625	-2625	-1625	
6.500	-650	-2650	-1650	
6.625	-662	-2662	-1662	
6.750	-675	-2675	-1675	
7.000	-700	-2700	-1700	
7.250	-725	-2725	-1725	
7.500	-750	-2750	-1750	
8.000	-800	-2800	-1800	
8.250	-825	-2825	-1825	
8.500	-850	-2850	-1850	
8.750	-875	-2875	-1875	
9.000	-900	-2900	-1900	
9.250	-925	-2925	-1925	
9.500	-950	-2950	-1950	
9.750	-975	-2975	-1975	
10.000	MS16625-1000	MS16625-3000	MS16625-2000	

Δ SUBSTITUTE CORROSION RESISTING STEEL WHEN USED IN TEMPERATURES OVER 450° F AND FOR FOOD MACHINERY.

P.A. NAVY - OS Other Cust ARMY - WC AIR FORCE - 11	TITLE RING, RETAINING, INTERNAL, BASIC (TAPERED SECTION TYPE)	MILITARY STANDARD MS16625
PROCUREMENT SPECIFICATION MIL-R-21248 TY. I CL. 1	SUPERSEDES:	SHEET 7

APPROVED 11 DEC 1968 REVISED (C) FOR CHANGES SEE SHEETS 1 THROUGH 10

USER SYMBOLS:
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REVIEWER SYMBOLS:
NAVY - OS
ARMY - WC, MI, AV
AIR FORCE - 82, 85

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FED. SUP CLASS
5340

RECOMMENDED DESIGN LIMITATIONS AND USAGE:

- (a) INTENDED USE - TO PROVIDE SHOULDERS FOR POSITIONING AND RETAINING MACHINE COMPONENTS IN HOUSINGS (BORES). TAPERED DESIGN PRINCIPLE PERMITS RINGS TO MAINTAIN CONSTANT CIRCULARITY AND PRESSURE AGAINST BOTTOM OF GROOVE. THE USE OF THE FOLLOWING FORMULAS IS BASED ON THE FACT THAT THE RING WILL NOT FAIL IN COMPRESSION.

- (b) ALLOWABLE THRUST LOAD CAPACITY OF THE RINGS. ABUTTING COMPONENTS TO HAVE SHARP CORNERS.

$$P = \frac{WHTX}{F} \quad \text{WHERE:}$$

P = ALLOWABLE THRUST LOAD (POUNDS).
H = HOUSING DIAMETER (INCHES).
T = RING THICKNESS (INCHES).
X = ULTIMATE SHEAR STRENGTH OF THE RING MATERIAL (P.S.I.).
F = FACTOR OF SAFETY, F = 4, IS RECOMMENDED, SINCE THE RING UNDER LOAD IS SUBJECTED NOT ONLY TO PURE SHEAR STRESSES BUT ALSO TO BENDING STRESSES.

- (c) ALLOWABLE LOAD CAPACITY OF GROOVE WALL =

$$P = \frac{WHdY}{F}$$

P = ALLOWABLE COMPRESSION LOAD (POUNDS).
H = HOUSING DIAMETER (INCHES).
d = GROOVE DEPTH (INCHES).
Y = YIELD STRENGTH IN COMPRESSION OF THE GROOVE MATERIAL (P.S.I.).
F = FACTOR OF SAFETY - TO INSURE A SAFE WORKING LOAD A SAFETY FACTOR, F = 2, IS RECOMMENDED.

- (d) MINIMUM DISTANCE BETWEEN OUTER GROOVE WALL AND END OF HOUSING =

$$Z = 3d \quad \text{WHERE:}$$

Z = MINIMUM DISTANCE BETWEEN OUTER GROOVE WALL AND END OF HOUSING (INCHES).
d = GROOVE DEPTH (INCHES).

- (e) ALLOWABLE HOUSING DIAMETER =

$$H = \sqrt{\frac{G^2 - 4FP}{Y}}$$

H = ALLOWABLE HOUSING DIAMETER.
G = GROOVE DIAMETER.
F = FACTOR OF SAFETY (SEE FORMULA (c) ABOVE).
P = DESIGN LOAD.
Y = YIELD STRENGTH IN COMPRESSION OF GROOVE MATERIAL (P.S.I.).

- (f) DIFFERENTIAL ROTATION:

THE CONDITIONS UNDER WHICH A RETAINING RING MAY BE USED WHEN ADJACENT PARTS ROTATE RELATIVE TO IT, FALL INTO TWO CATEGORIES:

- (1) WHERE NO THRUST IS EXERTED BY ADJACENT PART: IN THIS CASE, DIFFERENTIAL ROTATION OF RING AND ADJACENT PART CREATES NO ELEMENT OF RISK IN THE APPLICATION OF THE RINGS BECAUSE NO FRICTIONAL TORQUE IS EXERTED BY THE MACHINE PART ON THE RING.
- (2) CONSIDERATION MUST BE GIVEN TO THE MAGNITUDE OF THE THRUST INVOLVED. THE FRICTION MOMENT MAY NOT EXCEED THE BENDING MOMENT, WHICH THE RING CAN TOLERATE WITHOUT RELEASING ITS PRESSURE AGAINST THE BOTTOM OF THE GROOVE, FORMULATED AS FOLLOWS:

$$fPn < \frac{sTE^2}{18} \quad \text{OR} \quad P < \frac{sTE^2}{f18N}$$

P = ALLOWABLE THRUST LOAD EXERTED BY ADJACENT PART (POUNDS).
f = COEFFICIENT OF FRICTION.
s = WORKING STRESS OF RING UNDER MAXIMUM CONTRACTION (P.S.I.).
T = RING THICKNESS (INCHES).
E = GREATEST WIDTH SECTION OF RING (INCHES).
N = NEUTRAL RING DIAMETER (INCHES) = FREE DIAMETER MINUS 3/4 E DIMENSION.

IN SUCH CASES WHERE DIFFERENTIAL ROTATION OCCURS THE CALCULATION SHOULD BE BASED ON THE MAXIMUM POSSIBLE VALUE OF THE COEFFICIENT OF FRICTION.

- (g) IMPACT CAPACITY OF RING OR GROOVE WALL:

$$I_R = \frac{PT}{2} \quad \text{FOR THE RING (INCH POUNDS) ABUTTING COMPONENTS TO HAVE SHARP CORNERS.}$$

$$I_G = \frac{Pd}{2} \quad \text{FOR THE GROOVE (INCH POUNDS).}$$

WHERE:

P = ALLOWABLE THRUST LOAD OF RING OR GROOVE (POUNDS).
T = RING THICKNESS (INCHES).
I_G = IMPACT CAPACITY OF GROOVE WALL (INCH POUNDS).
d = GROOVE DEPTH (INCHES).
I_R = IMPACT CAPACITY OF RING (INCH POUNDS).

- * FOR RINGS OF STEEL X = 120,000 P.S.I. ULTIMATE SHEAR STRENGTH FOR RING SIZES UP TO 3/4 INCH.
X = 150,000 P.S.I. ULTIMATE SHEAR STRENGTH FOR RING SIZES 3/4 INCH AND OVER.
s = 250,000 P.S.I. WORKING STRESS.
- * FOR RINGS OF BERYLLIUM COPPER X = 110,000 P.S.I. ULTIMATE SHEAR STRENGTH FOR ALL SIZES.
s = 180,000 P.S.I. WORKING STRESS.

APPROVED 11 DEC 1958 REVISED C FOR CHANGES SEE SHEETS 1 THROUGH 10

P.A. NAVY - OS Other Cust ARMY - WC / AIR FORCE - 11	TITLE RING, RETAINING, INTERNAL, BASIC (TAPERED SECTION TYPE)	MILITARY STANDARD MS16625
PROCUREMENT SPECIFICATION MIL-R-21248 TY. I CL. 1	SUPERSEDES.	SHEET 8

DD FORM 1 SEP 57 672-1 (Coordinated)

PREVIOUS EDITIONS OF THIS FORM ARE OBSOLETE

PLATE NO 13220

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USER SYMBOLS:
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ARMY - AT, MU, ME

REVIEWER SYMBOLS:
NAVY - OS
ARMY - WC, ML, AV
AIR FORCE - 82, 85

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FED. SUP CLASS
6340

(h) LOAD CAPACITY, WITH THE RETAINED PART RADIUS OR CHAMFERED:
WHEN THE RADIUS OR CHAMFER OF THE RETAINED PART DOES NOT EXCEED THE MAXIMUM RADIUS ALLOWED FOR THE BOTTOM OF THE RING GROOVE, THE LESSER LOAD CAPACITY COMPUTED FROM THE FORMULAS ON SHEET 8 WILL APPLY. THE CORNER RADI AND CHAMFERS LISTED ON SHEETS 1 THRU 3 WERE CHOSEN AS LARGE AS POSSIBLE FOR THE RING SIZES INVOLVED AND ARE RELATED TO THE MAXIMUM THRUST LOADS LISTED IN THE TABLE BELOW.
IF THE CORNER RADI OR CHAMFERS ARE SMALLER THAN THOSE LISTED, THEN THE THRUST LOADS INCREASE PROPORTIONALLY, IN ACCORDANCE WITH THE FOLLOWING FORMULAS:

$$p^1 = \frac{PCH}{CH^1} \quad \text{OR} \quad p^1 = \frac{PR}{R^1}$$

WHERE:

p^1 = NEW ALLOWABLE THRUST LOAD.
 p = LISTED ALLOWABLE THRUST LOAD.
 CH^1 = NEW (SMALLER) CHAMFER.
 CH = LISTED CHAMFER.
 R^1 = NEW (SMALLER) CORNER RADIUS.
 R = LISTED CORNER RADIUS.

LIMIT LOADS LISTED BELOW ARE BASED ON RINGS OF STEEL OR STAINLESS STEEL (WORKING STRESS = 250,000 P.S.I. - TABLE I) AND OF BERYLLIUM COPPER (WORKING STRESS = 180,000 P.S.I. - TABLE II). IF THE ALLOWABLE GROOVE CAPACITY LOADS, AS CALCULATED BY USING THE FORMULA ON SHEET 8 ARE LESS THAN THEY SHOULD BE USED.

NOMINAL RING SIZE		ALLOWABLE THRUST LOAD FOR RING ASSEMBLIES WITH PARTS HAVING MAXIMUM CORNER RADI OR CHAMFERS.	
FROM	TO	TABLE I STEEL OR STAINLESS STEEL	TABLE II BERYLLIUM COPPER
.250	.312	190 LB	140 LB
.375	.453	530 LB	380 LB
.500	.750	1100 LB	800 LB
.777	.938	1650 LB	1200 LB
1.000	1.500	2400 LB	1700 LB
1.562	2.000	3900 LB	2800 LB
2.062	2.531	6200 LB	
2.652	3.000	9000 LB	
3.062	5.000	12000 LB	
5.250	6.000	15000 LB	
6.250	7.000	23000 LB	
7.250	10.000	34000 LB	

NOTE: THE ABOVE FORMULAS ARE NOT TO BE USED FOR BRITTLE MATERIALS SUCH AS CAST IRON, ETC.
WARNING: RINGS SHOULD NOT BE EXCESSIVELY CONTRACTED DURING INSTALLATION SINCE THIS WILL LEAD TO RING FAILURE. IF RING HAS PLAY BETWEEN THE GROOVE DIAMETER AND THE OUTSIDE RING DIAMETER THIS INDICATES THAT THE RING HAS BEEN EXCESSIVELY CONTRACTED, (PROVIDING GROOVE DIAMETER HAS BEEN MACHINED TO RECOMMEND DIMENSIONS).

APPROVED 11 DEC 1958 REVISED (C) FOR CHANGES SEE SHEETS 1 THROUGH 10

P.A. NAVY - OS Other Cust ARMY - WC AIR FORCE - 11	TITLE RING, RETAINING, INTERNAL, BASIC (TAPERED SECTION TYPE)	MILITARY STANDARD MS16625
PROCUREMENT SPECIFICATION MIL-R-21248 TY. I CL. 1	SUPERSEDES:	SHEET 9

DD FORM 1 SEP 57 672-1 (Coordinated)

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PLATE NO. 13370

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This military standard is approved by the Department of Defense and is mandatory for use by all Departments and Agencies of the Department of Defense. Selection for all new engineering and design applications and for repetitive use shall be made from this document.

		FED. SUP CLASS 5340																																			
NOTES: 1 - MATERIAL: (a) STEEL, CARBON, FEDERAL STANDARD 66, STEEL NOS. 1066 THRU 1090, STEEL, CORROSION RESISTING, (SEE PROCUREMENT SPECIFICATION). (b) BERYLLIUM COPPER, FEDERAL SPECIFICATION QQ-C-533. 2 - HARDNESS: <table border="1"> <thead> <tr> <th>HOUSING DIA.</th> <th>STEEL</th> <th>HOUSING DIA.</th> <th>CORROSION RESISTING STEEL</th> <th>BERYLLIUM COPPER</th> </tr> </thead> <tbody> <tr> <td>.250 AND .312</td> <td>ROCKWELL 15N-86-88</td> <td>.250 AND .312</td> <td>ROCKWELL 15N-82.5-86</td> <td>ROCKWELL 15N-77-82</td> </tr> <tr> <td>.375 TO .512 INCL.</td> <td>ROCKWELL 30N-69.5-73</td> <td>.375 TO 1.023</td> <td>ROCKWELL 30N-63-69.5</td> <td>ROCKWELL 30N-54-62</td> </tr> <tr> <td>.562 TO .777 INCL.</td> <td>ROCKWELL 30N-67.5-72</td> <td>1.062 AND OVER</td> <td>ROCKWELL C-44-51</td> <td>ROCKWELL C-34-43</td> </tr> <tr> <td>.812 TO 1.023 INCL.</td> <td>ROCKWELL 30N-66-71</td> <td></td> <td></td> <td></td> </tr> <tr> <td>1.062 TO 3.000 INCL.</td> <td>ROCKWELL C-47-52</td> <td></td> <td></td> <td></td> </tr> <tr> <td>3.062 AND OVER</td> <td>ROCKWELL C-46-52</td> <td></td> <td></td> <td></td> </tr> </tbody> </table> 3 - PROTECTIVE COATINGS AND TREATMENTS: (a) CADMIUM PLATING, QQ-P-416, TYPE II, CLASS 3. (b) CORROSION RESISTING STEEL RINGS SHALL BE PASSIVATED, QQ-P-35. (c) PHOSPHATE COATING, MIL-G-16232, TYPE II. 4 - PART NUMBER - (MS NUMBER) - (RING DASH NUMBER). EXAMPLE - MS16625-1100 IS THE PART NUMBER FOR A STEEL, INTERNAL RETAINING RING FOR USE IN A 1.000 DIAMETER HOUSING. 5 - DIMENSIONS IN INCHES, UNLESS OTHERWISE SPECIFIED. DIMENSIONING AND TOLERANCING SHALL BE IN ACCORDANCE WITH USAS Y14.5. 6 - INACTIVATE FOR NEW DESIGN, UNCOATED STEEL AND ZINC PLATED STEEL, (SEE SUBSTITUTION SHEET 6 AND 7). 7 - THE GOVERNMENT HAS A ROYALTY FREE LICENSE UNDER WALDES KOHINOOR INC. COPYRIGHTS PERTINENT TO PORTIONS OF THE INFORMATION CONTAINED HEREIN AND UNDER THE FOLLOWING LISTED PATENT FOR THE BENEFIT OF MANUFACTURERS OF THE ITEM FOR THE GOVERNMENT OR FOR USE IN EQUIPMENT TO BE DELIVERED TO THE GOVERNMENT. (U. S. PATENT NO. 2,861,824).			HOUSING DIA.	STEEL	HOUSING DIA.	CORROSION RESISTING STEEL	BERYLLIUM COPPER	.250 AND .312	ROCKWELL 15N-86-88	.250 AND .312	ROCKWELL 15N-82.5-86	ROCKWELL 15N-77-82	.375 TO .512 INCL.	ROCKWELL 30N-69.5-73	.375 TO 1.023	ROCKWELL 30N-63-69.5	ROCKWELL 30N-54-62	.562 TO .777 INCL.	ROCKWELL 30N-67.5-72	1.062 AND OVER	ROCKWELL C-44-51	ROCKWELL C-34-43	.812 TO 1.023 INCL.	ROCKWELL 30N-66-71				1.062 TO 3.000 INCL.	ROCKWELL C-47-52				3.062 AND OVER	ROCKWELL C-46-52			
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FOR DESIGN FEATURE PURPOSES, THIS STANDARD TAKES PRECEDENCE OVER PROCUREMENT DOCUMENTS REFERENCED HEREIN. REFERENCED DOCUMENTS SHALL BE OF THE ISSUE IN EFFECT ON DATE OF INVITATIONS FOR BID.																																					
P.A. NAVY - OS Other Cust ARMY - WC AIR FORCE - 11	TITLE RING, RETAINING, INTERNAL, BASIC (TAPERED SECTION TYPE)	MILITARY STANDARD MS16625																																			
PROCUREMENT SPECIFICATION MIL-R-21248 TY. I CL. 1	SUPERSEDES	SHEET 10																																			

APPROVED 11 DEC 1958 REVISED (C) FOR CHANGES SEE SHEETS 1 THROUGH 10

DD FORM 1 SEP 57 672-1 (if unclassified)

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