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MS3215 — external E retaining ring, reinforced, reduced section

MS3215: external e retaining ring, reinforced for .094 to .562 shafts.

Specification

Item	Value
Type	External E retaining ring, reinforced
Material	Carbon steel, grade 1060 thru 1095 (ASTM A568/A568M or ASTM A684/A684M); corrosion-resistant steel, SAE-AMS 5520 (UNS S15700); beryllium copper, alloy 170 (UNS C17000) or 172 (UNS C17200), ASTM B194
Finish	Carbon steel, by dash number: cadmium plate (SAE-AMS-QQ-P-416, Type II, Class 3, or ASTM B696, Type II, Class 5), zinc coat (ASTM B633, Type II, Class Fe/Zn5, or ASTM B695, Type II, Class 5) or phosphate coat (MIL-DTL-16232, Type I, Class 2); corrosion-resistant steel: cleaned, descaled and passivated (SAE-AMS2700)
Procurement	MIL-R-21248, Type I, Class 9
Status	Check the current issue before design use.

Dimensions by size

Dimension, in	.094	.125	.156	.188	.219	.250	.312	.375	.438	.500	.562
D — D free dia, basic	.072	.093	.113	.143	.182	.204	.242	.292	.332	.385	.430
D tolerance	+.001/-.003	+.001/-.003	+.002/-.003	±.003	±.003	±.003	±.003	±.004	±.004	±.004	±.004
E — E large section height, ref	.067	.089	.111	.116	.132	.156	.173	.184	.207	.212	.220
T — T thickness, basic	.015	.015	.025	.025	.025	.025	.025	.035	.035	.042	.042
T tolerance	±.002	±.002	±.002	±.002	±.002	±.002	±.002	±.002	±.002	±.002	±.002
G — G groove dia, basic	.074	.095	.116	.147	.188	.210	.250	.303	.343	.396	.437
G tolerance	+.002/-.000	+.002/-.000	+.002/-.000	+.002/-.000	±.002	±.002	±.003	±.003	±.003	±.003	±.003
FIM — Groove concentricity, FIM	.0015	.0015	.0015	.0015	.002	.002	.003	.003	.003	.004	.004
W — W groove width, basic	.020	.020	.030	.030	.030	.030	.030	.040	.040	.047	.047
W tolerance	+.002/-.000	+.002/-.000	+.003/-.000	+.003/-.000	+.003/-.000	+.003/-.000	+.003/-.000	+.003/-.000	+.003/-.000	+.003/-.000	+.003/-.000
R — R max, retained part	.045	.045	.065	.065	.065	.065	.070	.070	.070	.080	.080
CH — CH max, retained part	.033	.033	.050	.050	.050	.050	.055	.055	.055	.060	.060
Y — Y free outside dia, ref	.206	.270	.335	.375	.446	.516	.588	.660	.746	.810	.870

Dimensions in inches, as tabulated in the standard (letters as on its drawing). Groove and retained-part figures are recommendations (ref).

Part numbers

.094 5 part numbers

Part no.	Material and finish
MS3215-1009	Carbon steel, cadmium plate
MS3215-2009	Carbon steel, zinc coat
MS3215-3009	Carbon steel, phosphate coat
MS3215-4009	Corrosion-resistant steel
MS3215-5009	Beryllium copper

.125 5 part numbers

Part no.	Material and finish
MS3215-1012	Carbon steel, cadmium plate
MS3215-2012	Carbon steel, zinc coat
MS3215-3012	Carbon steel, phosphate coat
MS3215-4012	Corrosion-resistant steel
MS3215-5012	Beryllium copper

.156 5 part numbers

Part no.	Material and finish
MS3215-1015	Carbon steel, cadmium plate
MS3215-2015	Carbon steel, zinc coat
MS3215-3015	Carbon steel, phosphate coat
MS3215-4015	Corrosion-resistant steel
MS3215-5015	Beryllium copper

.188 5 part numbers

Part no.	Material and finish
MS3215-1018	Carbon steel, cadmium plate
MS3215-2018	Carbon steel, zinc coat
MS3215-3018	Carbon steel, phosphate coat
MS3215-4018	Corrosion-resistant steel
MS3215-5018	Beryllium copper

.219 5 part numbers

Part no.	Material and finish
MS3215-1021	Carbon steel, cadmium plate
MS3215-2021	Carbon steel, zinc coat
MS3215-3021	Carbon steel, phosphate coat
MS3215-4021	Corrosion-resistant steel
MS3215-5021	Beryllium copper

.250 5 part numbers

Part no.	Material and finish
MS3215-1025	Carbon steel, cadmium plate
MS3215-2025	Carbon steel, zinc coat
MS3215-3025	Carbon steel, phosphate coat
MS3215-4025	Corrosion-resistant steel
MS3215-5025	Beryllium copper

.312 5 part numbers

Part no.	Material and finish
MS3215-1031	Carbon steel, cadmium plate
MS3215-2031	Carbon steel, zinc coat
MS3215-3031	Carbon steel, phosphate coat
MS3215-4031	Corrosion-resistant steel
MS3215-5031	Beryllium copper

.375 5 part numbers

Part no.	Material and finish
MS3215-1037	Carbon steel, cadmium plate
MS3215-2037	Carbon steel, zinc coat
MS3215-3037	Carbon steel, phosphate coat
MS3215-4037	Corrosion-resistant steel
MS3215-5037	Beryllium copper

.438 5 part numbers

Part no.	Material and finish
MS3215-1043	Carbon steel, cadmium plate
MS3215-2043	Carbon steel, zinc coat
MS3215-3043	Carbon steel, phosphate coat
MS3215-4043	Corrosion-resistant steel
MS3215-5043	Beryllium copper

.500 5 part numbers

Part no.	Material and finish
MS3215-1050	Carbon steel, cadmium plate
MS3215-2050	Carbon steel, zinc coat
MS3215-3050	Carbon steel, phosphate coat
MS3215-4050	Corrosion-resistant steel
MS3215-5050	Beryllium copper

.562 5 part numbers

Part no.	Material and finish
MS3215-1056	Carbon steel, cadmium plate
MS3215-2056	Carbon steel, zinc coat
MS3215-3056	Carbon steel, phosphate coat
MS3215-4056	Corrosion-resistant steel
MS3215-5056	Beryllium copper

How to read the part number

Part	Meaning
Format	MS3215-<dash>
Example	MS3215-1025 — Carbon steel, cadmium plate, for a .250 shaft

Reference data. The aircraft manufacturer's documentation (SRM / IPC) takes precedence.

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Table II: hardness

Shaft dia (ref), in	Carbon steel	Corrosion-resistant steel	Beryllium copper
.094 and .125	84.5 - 87 HR15N	82.5 - 86 HR15N	77 - 82 HR15N
.156 to .12 incl.	66.5 - 71 HR30N	63 - 69.5 HR30N	54 - 62 HR30N
.375 to .562 incl.	47 - 52 HRC	44 - 51 HRC	34 - 43 HRC

As printed in MS3215C Table II; its middle row (".156 to .12 incl.") covers the shaft sizes .156 to .312.

Notes

- Thickness T applies to unplated rings; for corrosion-resistant steel and plated rings add .002 to the maximum tolerance (±.002 becomes +.004/-.002).
- FIM (full indicator movement): maximum allowable deviation of concentricity between the groove and the shaft.
- R and CH: radii or chamfers allowable on the parts retained by the ring.
- Use corrosion-resistant steel in food processing machinery, in fuel or lubrication systems, or above 450°F.
- Calculated RPM limits (apply the required safety factor), shafts .125, .188, .250, .375 and .500: carbon and corrosion-resistant steel 70000, 50000, 38000, 28000 and 20000; beryllium copper 45000, 32000, 24000, 18000 and 13000.
- Applied radially; intended to give large shoulders that withstand strong push-out forces, vibration and shock. Do not over-expand the ring at installation.

SOURCES · MS3215 Rev. C, Oct 2011 — Ring, Retaining, External, "E", Reinforced

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