Metal Washers / Collars

	Shape	Size	Ordering Code	Accuracy	Material (Raw Material)	Material (Hardened Products)	Surface Treatment	Catalog Page
Washer	Standard	O.D. D 4~60 I.D. V 2~30 Thickness T 1~10	Selectable	Standard Grade Precision Grade	EN 1.1191 Equiv. Standard Grade is EN 1.1191 Equiv. EN 1.4301 Equiv. Standard Grade is EN 1.4301 Equiv.	EN 1.1191 Equiv. Standard Grade is EN 1.1191 Equiv. EN 1.4031 Equiv.	None Black Oxide Electroless Nickel Plating	P.113 P.114 P.119
		O.D. D 4~30 I.D. V 2~25	Configurable	Standard Grade Precision Grade	EN 1.1191 Equiv. EN 1.4301 Equiv.	-	None Black Oxide Electroless Nickel Plating	P.113 P.114
		Thickness T 1~10	0.5mm Increment					
		O.D. D 4~100 I.D. V 0~90 Thickness T 1~10	Dimension Configurable	Standard Grade Precision Grade Tolerance Selection	EN 1.0038 Equiv. EN 1.1191 Equiv. EN 1.4301 Equiv. EN AW-2017 Equiv. Brass (JIS EN CW614N Equiv.)	EN 1.1191 Equiv. EN 1.2510 Equiv. EN 1.4031 Equiv. EN 1.4125 Equiv. for Precision Grade	None Black Oxide Electroless Nickel Plating LTBC Plating Anodize (Clear, Black)	P.115 P.120
	Flanged	D Dim. 5~60 H Dim. 7~70 V Dim. 2~58 L Dim. 2~10	Dimension Configurable	Standard Grade Precision Grade	EN 1.0038 Equiv. EN 1.1191 Equiv. EN 1.4301 Equiv.	EN 1.4031 Equiv. EN 1.2510 Equiv.	None Black Oxide Electroless Nickel Plating	P.122
	Counterbored	O.D. D 10~60	Selectable	Standard Grade	EN 1.1191 Equiv. EN 1.4301 Equiv.	EN 1.1191 Equiv. EN 1.4031 Equiv. EN 1.4125 Equiv. for Precision Grade	None Black Oxide Electroless Nickel Plating	P.123
		I.D. P 3.5~11	-					
		Thickness T 6~20	Selectable					
		O.D. D 10~30	Configurable	Standard Grade Precision Grade	EN 1.1191 Equiv. EN 1.4301 Equiv.	-	None Black Oxide Electroless Nickel Plating	P.123
		I.D. P 3.5~9	-					
		Thickness T 3~20	0.5mm Increment					
		O.D. D 10~100 I.D. P 3~88 Thickness T 3~50	Dimension Configurable	Standard Grade Precision Grade	EN 1.1191 Equiv. EN 1.4301 Equiv. EN 1.0038 Equiv. EN AW-2017 Equiv.	EN 1.1191 Equiv. EN 1.4031 Equiv. EN 1.2510 Equiv.	None Black Oxide Electroless Nickel Plating Clear Anodize	P.124
	Tapped	O.D. D 10~60 M Dia. 2~20 Thickness T 3~20	Selectable	Standard Grade	EN 1.1191 Equiv. EN 1.4301 Equiv.	-	None Black Oxide Electroless Nickel Plating	P.125
		O.D. D 6~30 M Dia. 2~12	Configurable	Standard Grade	EN 1.1191 Equiv. EN 1.4301 Equiv.	-	None Black Oxide Electroless Nickel Plating	P.125
		Thickness T 3~20	0.5mm Increment					
		Thickness T 3~50	Dimension Configurable	Standard Grade	EN 1.1191 Equiv. EN 1.4301 Equiv. EN AW-2017 Equiv.	-	None Black Oxide Electroless Nickel Plating Clear Anodize	P.125
	Countersunk	O.D. D 14~30 Applicable Countersunk M Dia. 4~10 Thickness T 2.5~8	Selectable	Standard Grade	EN 1.1191 Equiv. EN 1.4301 Equiv.	-	None Black Oxide Electroless Nickel Plating	P.126
		O.D. D 10~60 Applicable Countersunk M Dia. 2~30 Thickness T 2~10	Dimension Configurable	Standard Grade	EN 1.1191 Equiv. EN 1.4301 Equiv. EN AW-2017 Equiv.	-	None Black Oxide Electroless Nickel Plating Clear Anodize	
	With Screw Holes	O.D. D 20~60 Applicable Countersunk M Dia. 3~28 Thickness T 1~10	Dimension Configurable	Standard Grade	EN 1.1191 Equiv. EN 1.4301 Equiv. EN AW-2017 Equiv.	-	None Black Oxide Electroless Nickel Plating Clear Anodize	P.126
	Shape Selectable	O.D. D 10~50 I.D. V 3~30 Thickness T 3~10	Dimension Configurable	Standard Grade	EN 1.1191 Equiv. EN 1.4301 Equiv.	-	None Black Oxide Electroless Nickel Plating	P.127
Collar	Standard	I.D. V 3~25 O.D. D 5~30 Thickness L 10~35	Selectable	Standard Grade	EN 1.1191 Equiv. EN 1.4301 Equiv.	-	None Black Oxide Electroless Nickel Plating	P.131
		O.D. D 4~60 I.D. V 2~30	Configurable	Standard Grade Precision Grade	EN 1.1191 Equiv. EN 1.4301 Equiv. EN AW-2017 Equiv.	-	None Black Oxide Electroless Nickel Plating Clear Anodize	P.132 P.137
		Thickness L 10~100	0.1mm Increment					
		I.D. V 2~90 O.D. D 4~100 Thickness L 10~100	Dimension Configurable	Standard Grade Precision Grade Tolerance Selectable	EN 1.1191 Equiv. EN 1.4301 Equiv. EN 1.0038 Equiv. EN AW-2017 Equiv. Brass (EN CW614N Equiv.)	EN 1.1191 Equiv. EN 1.4031 Equiv. EN 1.2510 Equiv.	None Black Oxide Electroless Nickel Plating LTBC Plating Anodize (Clear, Black)	P.133
	Flanged	I.D. V 2~30	Selectable	Standard Grade	EN 1.1191 Equiv. EN 1.4301 Equiv. EN AW-2017 Equiv.	-	None Black Oxide Electroless Nickel Plating Clear Anodize	P.139
		O.D. D 5~60 Length L 10~100	0.1mm Increment					
		V Dim. 2~55 D Dim. 4~60 H Dim. 6~70 T Dim. 1~20 L Dim. 10~100	Dimension Configurable	Standard Grade Precision Grade	EN 1.1191 Equiv. EN 1.4301 Equiv. EN 1.0038 Equiv. EN AW-2017 Equiv. Brass (EN CW614N Equiv.)	EN 1.1191 Equiv. EN 1.4031 Equiv. EN 1.2510 Equiv.	None Black Oxide Electroless Nickel Plating Anodize (Clear, Black)	P.140
	Thin-Walled Metal Collar	O.D. D 2~7	-	Standard Grade	EN 1.4301 Equiv.	-	None	P.128
		I.D. V 1~5	Selectable					
		Length L 3~20	0.5mm Increment					
	Hollow Collar	O.D. D 10.5~48.6	-	Standard Grade	EN 1.0035 Equiv. EN 1.0254 Equiv. (Sch40/80)	-	None Black Oxide	P.128
		I.D. d 5.7~41.6	-					
		Length L 6~200	0.5mm Increment					

Application Based Product		Features	Catalog Page
Slotted Hole		The slotted hole allows fine-adjustment of bolt position.	P.127
Spacers		Can be used as a reinforcement at the time of tightening the softwood with screw.	P.128
Simultaneous Grinding Spacers		When multiple are used, the height variation is within ±5μ.	P.129
Stepped Spacers		Can be used as cover.	P.130