

# Precision Washers



Our Precision Washers have  $\pm 0.0005$ " thickness tolerance and are offered in 1045 steel or 440C stainless steel. The thickness tolerance is much tighter compared to the Precision Washers on the previous page. These washers can be used as precise spacers and shims, and they are available in standard dimensions as well as configurable dimensions where you can specify all the dimensions within listed ranges.

Material	Surface Treatment	Hardness	Standard	Configurable
1045 Steel	-	-	-	U-FWASC
	Black Oxide	-	U-WASB	U-FWASB
304 Stainless Steel	-	-	U-WASM	U-FWASM
	Electroless Nickel Plating	-	U-WASS	-
1045 Steel	-	45-50HRC	-	U-FWASCH
	Black Oxide	45-50HRC	-	U-FWASBH
440C Stainless Steel	-	45-50HRC	-	U-FWASMH
	Electroless Nickel Plating	45-50HRC	-	U-FWASSH

Material Characteristics P. 628, 629

When  $D \leq 0.500$ ,  $C = 0.005 - 0.010$   
When  $D > 0.500$ ,  $C = 0.020 \text{ max.}$

Surface Roughness: Unless otherwise specified

Type	Part No.			Selection D (Callout)												Selection T							
	Callout	Actual	Screw Size	1/4	5/16	3/8	7/16	1/2	5/8	3/4	7/8	1"	1-1/4	1-1/2	1-3/4	2"	1/16	5/64	3/32	1/8	3/16	3/8	
U-WASB	0.11	0.112	#4	0.25													0.063						
	0.11	0.112	#4		0.31	0.38											0.063	0.078					
	0.14	0.138	#6		0.31	0.38	0.44										0.063	0.078					
	0.16	0.164	#8		0.38	0.44	0.50										0.063	0.078	0.125				
U-WASM	0.19	0.190	#10			0.44	0.50	0.63									0.078	0.094	0.125				
	0.25	0.250	1/4			0.50	0.63	0.75									0.078	0.125	0.188				
	0.31	0.313	5/16			0.63	0.75	0.88									0.094	0.125	0.188				
U-WASS	0.38	0.375	3/8			0.75	0.88	1.00									0.094	0.125	0.188				
	0.38	0.375	3/8					1.25									0.125	0.188					
	0.50	0.500	1/2					0.88	1.00	1.25	1.50						0.125	0.188					
	0.63	0.625	5/8						1.25	1.50	1.75						0.125	0.188	0.375				
	0.75	0.750	3/4							1.50	1.75	2.00					0.125	0.188	0.375				
1.00	1.000	1"								1.75	2.00					0.125	0.188	0.375					

Order Example The part number consists only of the fields with blue characters. Please refer to the table below for technical information.

Part No.

Type

Technical Information

Callout	D Nominal	Actual Diameter
0.25	1/4	0.250
0.31	5/16	0.313
0.38	3/8	0.375
0.44	7/16	0.438
0.50	1/2	0.500
0.63	5/8	0.625
0.75	3/4	0.750
0.88	7/8	0.875
1.00	1"	1.000
1.25	1-1/4	1.250
1.50	1-1/2	1.500
1.75	1-3/4	1.750
2.00	2"	2.000

Days to Ship **6** Days Non-Returnable P. 30

Price Quantity Discount Rate

Quantity Rate	1-19	20-49	50-99	100-
Rate	-	5%	10%	15%

For larger quantity orders "Days to Ship" may differ from published catalog term. P. 29

\$ Unit Price (Qty. 1-19)	D												
	0.25	0.31	0.38	0.44	0.50	0.63	0.75	0.88	1.00	1.25	1.50	1.75	2.00
U-WASB	1.80	1.80	2.50	2.50	2.50	3.00	3.00	3.00	3.00	3.20	3.40	3.80	4.60
U-WASM	2.50	2.50	3.00	3.00	3.00	3.40	3.40	3.40	3.40	4.00	4.70	5.80	7.80
U-WASS	3.50	3.50	4.40	4.40	4.90	5.00	6.00	8.00	8.00	9.60	11.80	14.50	19.20

## Configurable

Part No.	V Choose in 0.001" Increments	D Choose in 0.01" Increments	T Choose in 0.0005" Increments
		0 (No Hole)	0.19 ~ 2.38
	0.078 ~ 0.250	2.39 ~ 4.00	0.1875 ~ 0.5000
		0.19 ~ 2.38	0.0465 ~ 0.5000
		2.39 ~ 4.00	0.1875 ~ 0.5000
U-FWASC	U-FWASCH	0.251 ~ 0.625	0.39 ~ 2.38
		2.39 ~ 4.00	0.0465 ~ 0.5000
U-FWASB	U-FWASBH	0.626 ~ 1.063	0.76 ~ 2.38
		2.39 ~ 4.00	0.1875 ~ 0.5000
U-FWASM	U-FWASMH	1.064 ~ 1.438	2.39 ~ 4.00
		1.20 ~ 2.38	0.0465 ~ 0.5000
		2.39 ~ 4.00	0.1875 ~ 0.5000
		1.57 ~ 2.38	0.0465 ~ 0.5000
		2.39 ~ 4.00	0.1875 ~ 0.5000
		1.876 ~ 2.250	2.39 ~ 4.00
		2.01 ~ 2.38	0.0465 ~ 0.5000
		2.39 ~ 4.00	0.1875 ~ 0.5000
		2.251 ~ 2.750	2.39 ~ 4.00
		2.751 ~ 3.750	3.01 ~ 4.00
			0.1875 ~ 0.5000

Selection Criteria: 1: When  $D \leq 2.38$ ,  $D \geq V + 0.125$  When  $D \geq 2.39$ ,  $D \geq V + 0.250$  2:  $D \leq 2.38$  for U-FWASSH.  
 U-FWASSH (440C stainless type) may be discolored due to the hardening process.  
 The part number consists only of the fields with blue characters.

Order Example Part No.

Quantity Discount Rate Price

Quantity Rate	1-19	20-49	50-99	100-
Rate	-	5%	10%	15%

For larger quantity orders "Days to Ship" may differ from published catalog term. P. 29

D	T	\$ Unit Price (Qty. 1-19)						
		U-FWASC	U-FWASB	U-FWASM	U-FWASCH	U-FWASBH	U-FWASMH	U-FWASSH
0.19 ~ 0.38	0.0465 ~ 0.0625	4.70	4.80	4.80	5.90	6.10	6.10	7.90
	0.0630 ~ 0.2500	5.50	5.80	5.80	7.00	7.20	7.20	9.40
	0.2505 ~ 0.5000	7.30	7.60	7.60	9.20	9.50	9.50	12.50
0.39 ~ 0.75	0.0465 ~ 0.0625	7.20	7.70	8.20	8.90	9.60	9.80	12.10
	0.0630 ~ 0.2500	7.60	8.30	8.60	9.60	10.10	10.60	13.10
	0.2505 ~ 0.5000	9.80	10.30	10.80	12.20	12.70	13.20	16.80
0.76 ~ 1.19	0.0465 ~ 0.0625	9.00	10.00	10.10	11.20	12.20	12.40	15.40
	0.0630 ~ 0.2500	10.00	11.00	11.20	12.50	13.60	13.70	17.30
	0.2505 ~ 0.5000	12.70	13.80	13.90	16.00	16.80	17.20	21.80
1.20 ~ 1.56	0.0465 ~ 0.0625	11.20	12.40	14.30	13.90	15.00	15.70	19.10
	0.0630 ~ 0.2500	13.60	14.80	15.40	17.00	18.10	18.80	23.30
	0.2505 ~ 0.5000	16.40	17.40	18.10	20.40	21.60	22.20	27.80
1.57 ~ 2.00	0.0465 ~ 0.0625	12.70	15.00	16.10	18.10	20.40	21.50	25.80
	0.0630 ~ 0.2500	14.90	17.30	18.20	20.90	23.20	24.20	29.50
	0.2505 ~ 0.5000	17.50	19.90	20.90	24.40	26.60	27.60	34.20
2.01 ~ 2.38	0.0465 ~ 0.0625	16.70	18.80	19.90	20.60	22.90	24.00	28.30
	0.0630 ~ 0.2500	18.80	21.00	22.10	23.40	25.70	26.80	32.00
	0.2505 ~ 0.5000	21.50	23.60	24.70	26.90	29.20	30.10	36.70
2.39 ~ 3.00	0.1875 ~ 0.5000	29.60	32.90	34.30	37.30	40.40	41.60	-
	3.01 ~ 4.00	36.40	40.10	41.90	45.60	49.30	50.90	-

Days to Ship Standard **6** Days Non-Returnable P. 30

Express **4** Days  \$ 2.00/piece P. 30  
 A flat charge of \$5.40 for 3 or more identical pieces.

Optional Modifications Part No.     (Ordering Code: SC, WSC, KC)

**6** Days Express Option is not available Non-Returnable P. 30  
 Modifications are only available for "Configurable"

Optional Modifications	Ordering Code	Details	\$Price Adder
KC		Adds an internal notch. Example: KC $D \geq D_{min}$ Only applicable for V equaling values in table below. $D2.39 - 4.00$ not available.	3.00
SC		Adds a machined flat. Example: SC $SC = 0.01$ " Increments $SC \geq V/2 + 0.10$ $D0.19 - 0.38$ not available.	2.00
WSC		Adds two flats. Example: WSC 0.25 $WSC = 0.01$ " Increments $WSC \geq V + 0.20$ $D0.19 - 0.38$ not available.	4.00

When using Optional Modifications, add the "Price Adder" to the standard "Unit Price".

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