


# Metal Washers

Standard / Precision Grade with Configurable Dimensions and Tolerances

**Metal Washers – Standard / Precision Grade with Configurable Dimensions and Tolerances**



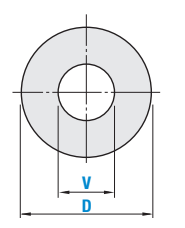
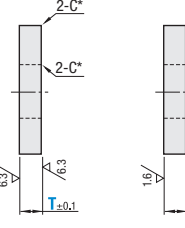
RoHS10

Part Number		Material	Surface Treatment
Standard Grade	Precision Grade		
SWSC	SWMC	1045 Carbon Steel or Equivalent	—
SWSB	SWMB		Black Oxide
SWSM	SWMM		Electroless Nickel Plating
SWSS	SWMS	304 Stainless Steel	—

D	D Tolerance			
	G	H	N	X
5.0–8.5	g6	h7	—	—
9.0–10.0	-0.005 -0.014	0 -0.015	-0.1 -0.3	0 -0.2
10.5–18.0	-0.006 -0.017	0 -0.018		
18.5–30	-0.007 -0.020	0 -0.021	-0.1 -0.3	0 -0.2
31–50	-0.009 -0.025	0 -0.025		
51–60	-0.010 -0.029	0 -0.030		

V	V Tolerance		
	H	N	X
3.0	+0.010 0	—	—
3.5–6.0	+0.012 0		
6.5–10.0	+0.015 0	+0.3 +0.1	+0.2 0
10.5–18.0	+0.018 0		
18.5–30.0	+0.021 0	+0.3 +0.1	+0.2 0
30.5–50.0	+0.025 0		
50.5–58.0	+0.030 0		

Standard Grade:  Precision Grade: 

\*D=16 or less; C0.2 or less  
D=16.5 or more; C0.5 or less

## Standard Class

Part Number	D Tolerance Selection	V Tolerance Selection	D	V 0.5 mm Increment	T 0.1 mm Increment
SWSC SWSB SWSM SWSS	G H N X	H N X	5.0–10.0 0.5 mm Increment	3.0–58.0 (V≤D-2) Refer to the following	1.0–2.9* 3.0–10.0
			10.5–20.0 0.5 mm Increment		
			21–30 1 mm Increment		
			31–40 1 mm Increment		
			41–50 1 mm Increment		
51–60 1 mm Increment					

**Part Number Example**

Part Number - Tolerance Selection - D - V - T

SWSC - G H - D10.0 - V4.0 - T1.0

D	V	T
9–30	D–V≥6	1–10
31–60	D–V≥12	2–10

- Ⓛ \* Tolerances 1, 2, and 3 are not available for SWSS.
- Ⓛ T≥3 for SWSS
- Ⓛ No specification available for sizes without declaration of value.
- Ⓛ D must ≥9 when G or H is selected as the tolerance values of D and V. The dimension ranges of V and T are shown in the table below.

# Metal Washers

Standard / Precision Grade with Configurable Dimensions and Tolerances, *continued*

## Precision Grade

Part Number	D Tolerance Selection	V Tolerance Selection	D	V 0.5 mm Increment	T 0.1 mm Increment
SWMC SWMB SWMM SWMS	G H N X	H N X	5.0–10.0 0.5 mm Increment	3.0–58.0 (V≤D-2) Refer to the following	1.0–2.9* 3.0–10.0
			10.5–20.0 0.5 mm Increment		
			21–30 1 mm Increment		
			31–40 1 mm Increment		
			41–50 1 mm Increment		
51–60 1 mm Increment					


D	V	T
9–30	D–V≥6	1–10
31–60	D–V≥12	2–10

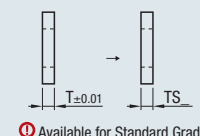
- Ⓛ \* Tolerances 1, 2, and 3 are not available for SWSS.
- Ⓛ T≥3 for SWMS
- Ⓛ No specification available for sizes without declaration of value.
- Ⓛ D must ≥9 when G or H is selected as the tolerance values of D and V. The dimension ranges of V and T are shown in the table below.

**Part Number Alterations**

Part Number - Tolerance Selection - D - V - T - (TCB / TSC / TSD / TSE)

SWMC - G H - D10.0 - V4.0 - T1.0 - TSB

Alterations	Negative Tolerance	Positive Tolerance	Zero Negative Tolerance	Zero Positive Tolerance
<b>Code</b>	<b>TCB</b>	<b>TCC</b>	<b>TCD</b>	<b>TCE</b>
 <p>Standard Grade T Tol.</p>	Changes Thickness Tolerance (T) T -0.1 T -0.3 <b>Ordering Code: TCB</b>	Changes Thickness Tolerance (T) T +0.3 T +0.1 <b>Ordering Code: TCC</b>	Changes Thickness Tolerance (T) T 0 T -0.2 <b>Ordering Code: TCD</b>	Changes Thickness Tolerance (T) T +0.2 T 0 <b>Ordering Code: TCE</b>

Alterations	Negative Tolerance	Positive Tolerance	Zero Negative Tolerance	Zero Positive Tolerance
<b>Code</b>	<b>TSB</b>	<b>TSC</b>	<b>TSD</b>	<b>TSE</b>
 <p>Precision Grade T Tol.</p>	Changes Thickness Tolerance (T) T -0.01 T -0.03 <b>Ordering Code: TSB</b>	Changes Thickness Tolerance (T) T +0.03 T +0.01 <b>Ordering Code: TSC</b>	Changes Thickness Tolerance (T) T 0 T -0.02 <b>Ordering Code: TSD</b>	Changes Thickness Tolerance (T) T +0.02 T 0 <b>Ordering Code: TSE</b>