

Metal Washers / Slotted Hole Washers

Selectable Shape / Flat / With Pilot

Metal Washers – Selectable Shape

Part Number	Material	Surface Treatment
KWSC	1045 Carbon Steel or Equivalent	—
KWSB	1045 Carbon Steel or Equivalent	Black Oxide
KWSM	1045 Carbon Steel or Equivalent	Electroless Nickel Plating
KWSS	304 Stainless Steel	—

A $\varnothing (D-V)/2 \geq 3$
B $\varnothing X \geq V/2+2$, $X \leq D/2-1$
C $\varnothing X \geq V+4$, $X \leq D-2$
D $\varnothing X \geq V+2$, $V \leq D/2-4$, $X \leq D-V-3$
E $\varnothing V \leq D/2-4$, $\varnothing X \leq (D-V)/2-1.5$

Part Number	Shapes Selection	D	V 1 mm Increment	X 0.1 mm Increment	T 0.1 mm Increment
KWSC KWSB KWSM KWSS	A B C D E	10.0–20.5 0.5 mm Increment	3–30	4.0–48.0	3.0–10.0
		21–30 1 mm Increment			
		31–40 1 mm Increment			
		41–50 1 mm Increment			

Part Number Example
Part Number - Shapes - D - V - X - T
KWSB - B - D12.0 - V5 - X5.0 - T3.0

Part Number Alterations
Part Number - Shapes - D - V - T - (HH)
KWSB - A - D29 - V10 - T3 - HH

Alteration	Code	Spec.
	HH	Hardens the washer in the shape of A. Hardness: 45–50 HRC min. Ordering Code: HH ⚠ Available for KWSB / KWSC only. ⚠ Deformation may occur in some cases due to heat treatment.

Slotted Hole Washers – Flat / Pilot

Type	Material	Surface Treatment
WLM	1045 Carbon Steel or Equivalent	Electroless Nickel Plating
WLS	304 Stainless Steel	—

Type	Material	Surface Treatment
WLHM	1045 Carbon Steel or Equivalent	Electroless Nickel Plating
WLHS	304 Stainless Steel	—

Flat

Part Number	D	T	K	W	Applicable Screw
WLM	3	18	5	3.5	M3
	4	20	6	4.5	M4
	5	22	7	5.5	M5
	6	26	8	6.6	M6
	8	30	10	9	M8
	10	38	12	11	M10
	12	46	16	14	M12

With Pilot

Part Number	D	D ₁	T	K	W	Applicable Screw
WLHM	4	20	14	6	4.5	M4
	5	22	16	7	5.5	M5
	6	26	18	8	6.6	M6
	8	30	22	10	9	M8
	10	38	28	12	11	M10
	12	46	36	16	14	M12

Part Number Example
Part Number
WLM5
WLHS4

Application Example

For the Pilot Type (WLHM / WLHS), drill a hole on Angle Plate or Base Plate, etc. to insert the pilot part (with D₁) prior to use (see the right figure). The slotted hole allows fine-adjustment of K dimension.

Thin-Walled Metal Collars / Hollow Collars / Spacers

Thin-Walled Metal Collars

Type	Material
TASC	304 Stainless Steel

L Dimension	Tolerance
3.0–10.0	±0.05
10.5–20.0	±0.1

Part Number	t	L	D
TASC	0.5	3.0–20.0	10.5
	1		15.0
	2		20.0
	3		25.0
	4		30.0
	5		35.0

Part Number Example
Part Number - t - L
TASC1 - 0.5 - 3.0

Hollow Collars

Type	Material	Surface Treatment
SGP	SGP	—
SGPBB	SGP	Black Oxide
STPG	STPG370 (Sch40)	—
STPGB	STPG370 (Sch40)	Black Oxide
STPGH	STPG370 (Sch80)	—
STPGHB	STPG370 (Sch80)	Black Oxide

⚠ This tube has a welding seam on the inner diameter surface.
 ⚠ Only SGP and SGPBB have 0.5–1 mm weld seam rise inside.

Part Number	L	D	d
SGP SGPBB STPG STPGB STPGH STPGHB	6.0–80.0	10.5	6.5
		13.8	9.2
	10.0–150.0	17.3	12.7
		21.7	16.1
		27.2	21.6
		34.0	27.6
	20.0–200.0	42.7	35.7
		48.6	41.6

Part Number Alterations
Part Number - L - (LKC)
SGP6A - 45.0 - LKC

Alteration	Code	Spec.
L Dimension Tolerance	LKC	Changes L Dimension Tolerance from ±0.2 to ±0.05. Ordering Code: LKC

Part Number Example
Part Number - L
SGP6A - 45.0

Spacers

Type	Material	Surface Treatment
SMKB	Low Carbon Steel Equivalent	Trivalent Chromate (Black)

L Dimension	Tolerance
3 4 5 8 10	±0.05
12 15 20	±0.1
30	±0.15

⚠ The circularity may be slightly deformed due to manufacturing process.

Part Number	L Selection	D	d
SMKB	2 3 4 5 8 10	3	2
	2.6 3 4 5 8 10	3.65	2.65
	3 3 4 5 8 10 12 15 20	4	3
	4 3 4 5 8 10 12 15 20 30	5.3	4.1
	5 3 4 5 8 10 12 15 20 30	6.3	5.1
	6 3 4 5 8 10 12 15 20 30	7.8	6.2
	8 4 5 8 10 12 15 20 30	10	8.2
	10 5 8 10 12 15 20 30	12.2	10.2

Application Example

Part Number Example
Part Number - L
SMKB2.6 - 10