

Metal Washers / Slotted Hole Washers

Shape Selectable Flat / Pilot

Metal Washers

Part Number **M**Material **S**Surface Treatment

KWSC EN 1.1191 Equiv. Black Oxide

KWSB EN 1.1191 Equiv. Electroless Nickel Plating

KWSM EN 1.4301 Equiv. -

KWSS EN 1.4301 Equiv. -

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

$X \leq D - V - 3$ $X \leq D - 2$ $X \leq (D-V) / 2 - 1.5$

Through $2-C0.5$ or Less $C0.5$ or Less $C0.5$ or Less

$D \pm 0.3$ $V \pm 0.3$ $X \pm 0.1$ $D \pm 0.2$ $T \pm 0.1$

RoHS 10

Part Number	Shape Selection	D	V 0.5mm Increment	X 0.1mm Increment	T 0.1mm Increment	Unit Price																			
						KWSC					KWSB					KWSM					KWSS				
						A	B	C	D	E	A	B	C	D	E	A	B	C	D	E	A	B	C	D	E
KWSC KWSB KWSM KWSS	A B C D E	10.0-20.5 0.5mm Increment	3~30	4.0~48.0	3.0-5.0																				
		21~30 1mm Increment			3.0-5.0																				
					5.1~10.0																				
		31~40 1mm Increment			3.0-5.0																				
					5.1~10.0																				
		41~50 1mm Increment			3.0-5.0																				
					5.1~10.0																				

Ordering Example: **KWSB** - **B** - **D12.0** - **V5** - **X5.0** - **T3.0**

Alterations: **KWSB** - **A** - **D20** - **V10** - **T3** - **HH**

Alteration	Code	Spec.
	HH	Hardens the washer in the shape of A. Hardness: 45 ~ 50HRC Ordering Code: HH Applicable to KWSB and KWSC only. Deformation may occur in some cases due to heat treatment.

Slotted Hole Washers

Type **M**Material **S**Surface Treatment

WLM EN 1.1191 Equiv. Electroless Nickel Plating

WLS EN 1.4301 Equiv. -

Flat $2-C0.5$ $2-C0.5$

Pilot $2-C0.5$ $2-C0.5$

K $W \pm 0.3$ $D \pm 0.2$ $T \pm 0.1$ 3 ± 0.1

RoHS 10

Flat

Part Number		D	T	K	W	Applicable Screw	Unit Price	
Type	No.						WLM	WLS
WLM WLS	3	18	3	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	4	12	11	M10		
	12	46	5	16	14	M12		

Pilot

Part Number		D	D1	T	K	W	Applicable Screw	Unit Price	
Type	No.							WLHM	WLHS
WLHM WLHS	4	20	14	3	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	4	12	11	M10		
	12	46	36	5	16	14	M12		

Ordering Example: **WLM5** **WLHS4**

Example: **WLS** **WLHM** **WLHS**

For 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 **M**Material **S**Surface Treatment

TASC EN 1.4301 Equiv. -

$2-C0.2$ or Less $2-C0.2$ or Less

L Dimension T Tolerance

$3.0-10.0$ ± 0.05

$10.5-20.0$ ± 0.1

Seam (Elimination of Weld Bead)

Part Number	V	t	L	D	Unit Price
Type			0.5mm Increment	t0.5 t1	L3.0-5.0 L5.5-10.0 L10.5-15.0 L15.5-20.0
TASC	1	0.5	3.0 / 20.0	2	3
	1.5			2.5	3.5
	2			3	4
	2.5			3.5	4.5
	3			4	5
	3.5			4.5	5.5
	4			5	6
	5			6	7

Ordering Example: **TASC1** - **0.5** - **3.0**

Hollow Collars

Type **M**Material **S**Surface Treatment

SGP EN 1.0035 Equiv. Black Oxide

SGPBB EN 1.0035 Equiv. Black Oxide

STPG EN 1.0254 Equiv. (Sch40) Black Oxide

STPGB EN 1.0254 Equiv. (Sch40) Black Oxide

STPGH EN 1.0254 Equiv. (Sch80) Black Oxide

STPGHB EN 1.0254 Equiv. (Sch80) Black Oxide

This tube has a welding seam on the I.D. surface.

Only EN 1.0035 Equiv. and SGPBB have 0.5 ~ 1mm weld seam rise inside.

$2-C0.5$ $2-C0.5$

D d $L \pm 0.2$

Part Number		L		D	EN 10005 Equiv.	JIS-STPG	STPG	STPGB	STPGH	STPGHB	Unit Price											
Type	No.	0.5mm Increment	1mm Increment								SGP	SGPBB	STPG	STPGB	STPGH	STPGHB						
SGP	6A	6.0-80.0	10.5	6.5	7.1	5.7																
	8A		13.8	9.2	9.4	7.8																
	10A		17.3	12.7	12.7	10.9																
	15A	10.0-150.0	21.7	16.1	16.1	14.3																
	20A		27.2	21.6	21.4	19.4																
	25A		34.0	27.6	27.2	25.0																
STPGH	32A	20.0-200.0	42.7	35.7	35.5	32.9																
	40A		48.6	41.6	41.2	38.4																

Ordering Example: **SGP6A** - **45.0**

Alterations: **STPG15A** - **80** - **LKC**

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

Spacers

Type **M**Material **S**Surface Treatment

SMKB EN 1.0330 Equiv. Trivalent Chromate (Black)

L Dimension T 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		D	d	Unit Price		
Type	No.	Selection				L3-10	L12-20	L30
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			

Ordering Example: **SMKB2.6** - **10**

Example: **Resin, Rubber** **TASC** **SGP** etc. **TASC** **SMKB** etc.