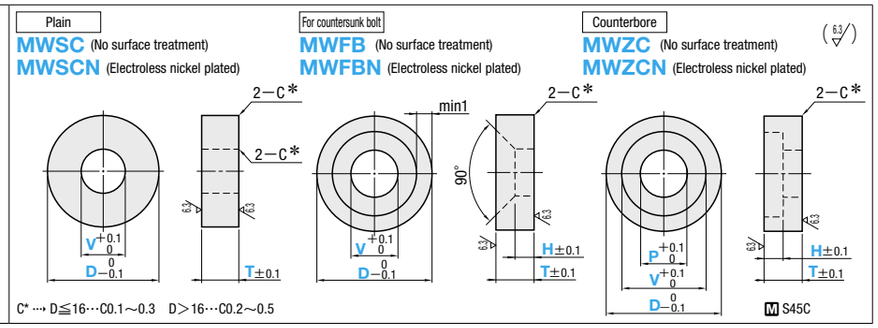
FREE WASHERS
—PLAIN／FOR COUNTERSUNK BOLT／COUNTERBORE—

Plain
MWSC (No surface treatment)
MWSCN (Electroless nickel plated)

For countersunk bolt
MWFB (No surface treatment)
MWFBN (Electroless nickel plated)

Counterbore
MWZC (No surface treatment)
MWZCN (Electroless nickel plated)



C* ··· D≦16···C0.1～0.3　D＞16···C0.2～0.5

M S45C

Part Number	D	0.1mm increments T	V	P	H	U/Price 1～9 MWSC	MWFB	MWZC	MWSCN	MWFBN	MWZCN
Plain MWSC (No surface treatment) MWSCN (Electroless nickel plated)	5.0～10.0 (0.1mm increments)	1.0～ 5.0 5.1～10.0 10.1～20.0 20.1～30.0 30.1～40.0 40.1～50.0	Plain For countersunk bolt 3.0～70.0		For countersunk bolt 0≦H＜T	Quotation					
	10.1～20.0 (0.1mm increments)	1.0～ 5.0 5.1～10.0 10.1～20.0 20.1～30.0 30.1～40.0 40.1～50.0									
	20.5～30.0 (0.5mm increments)	1.0～ 5.0 5.1～10.0 10.1～20.0 20.1～30.0 30.1～40.0 40.1～50.0									
For countersunk bolt MWFB (No surface treatment) MWFBN (Electroless nickel plated)	30.5～40.0 (0.5mm increments)	1.0～ 5.0 5.1～10.0 10.1～20.0 20.1～30.0 30.1～40.0 40.1～50.0		Counterbore only 3.0～68.0							
	40.5～60.0 (0.5mm increments)	1.0～ 5.0 5.1～10.0 10.1～20.0 20.1～30.0 30.1～40.0 40.1～50.0									
Counterbore (D≧10　T≧3.0) MWZC (No surface treatment) MWZCN (Electroless nickel plated)	60.5～80.0 (0.5mm increments)	2.0～ 5.0 5.1～10.0 10.1～20.0 20.1～30.0 30.1～40.0 40.1～50.0	Counterbore 5.0～70.0		Counterbore 1.0≦H≦48.0						
	80.5～100.0 (0.5mm increments)	2.0～ 5.0 5.1～10.0 10.1～20.0 20.1～30.0 30.1～40.0 40.1～50.0									

Plain
D＞50 ··· T≧ 2: To make D size larger than 50mm, the thickness (T) must be T2 or more.
D−V≧2 ··· The wall thickness must be 1mm or more on each side.

For countersunk bolt
D＞50 ··· T≧2 : To make D size larger than 50mm, the thickness (T) must be T2 or more.
$\frac{D-V}{2}$ −(T−H)≧1 ··· The wall thickness must be at least 1mm.

Counterbore
(D−V)/2≧1 ··· The wall thickness (T) must be at least 1mm on each side.
(V−P)≧2 ··· A step of 1mm or more is required on each side.
P×8≧(T−H)≧2 ··· The bearing bore length (T-H) is between 2mm and P×8.

Order

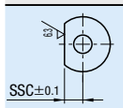
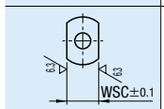
Part Number	D	T	V	P	H
MWSC	D20.0	T6.0	V6.0		H3.0
MWFB	D20.0	T6.0	V6.0		H3.0
MWZC	D20.0	T6.0	V6.0	P4.0	H3.0

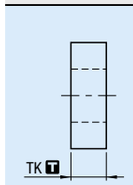
Quotation

Alterations

Part Number	D	T	V	P	H	(SSC・WSC・TK)
MWFB	D30.0	T3.0	V10.0		H1.0	TK1

Quotation

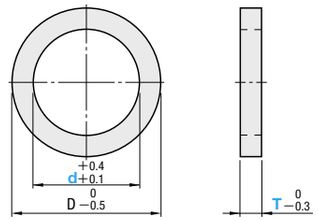
Alterations	Code	Spec.	1Code
 SSC±0.1	SSC	Cuts a face. SSC=1mm increments SSC≧V/2+2 SSC≦D/2−1 ⊗ Not available for D5～D8.	Quotation
 WSC±0.1	WSC	Cuts two faces. WSC=1mm increments WSC≧V+4 WSC≦D−2 ⊗ Not available for D5～D8.	

Alterations	Code	Spec.	1Code
 TK T	TK1	Changes T dimension tolerance. T±0.1 ··· $T^{+0.01}_{0}$ T dimension can be designated in 0.01mm increments when using TK1	Quotation
	TK2	Changes T dimension tolerance. T±0.1 ··· $T^{+0.02}_{+0.01}$ T dimension can be designated in 0.01mm increments when using TK2	
	TK3	Changes T dimension tolerance. T±0.1 ··· T±0.005 T dimension can be designated in 0.01mm increments when using TK3	

URETHANE WASHERS

Non JIS material definition is listed on P.1351 - 1352

UW



Although urethane itself has a heat resistant temperature of 100℃, when used continuously its durability falls, so use it at a temperature of no more than 80℃.

H Shore D58

D	d	Part Number Type	Part Number d	T	U/Price 1～19 T1.5	T3
16	10	UW	10	1.5 3	Quotation	
18	13		13			
24	16		16			
27	20		20			

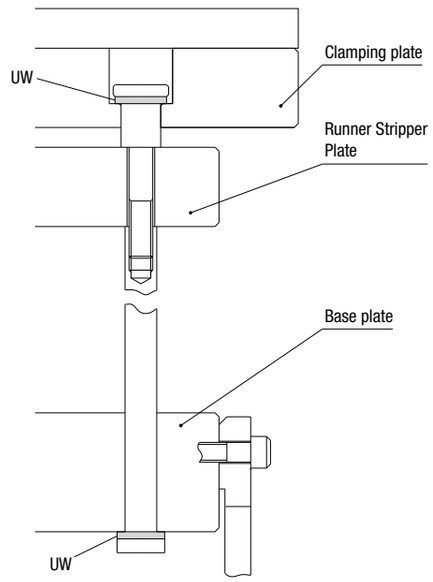
Order

Part Number	−	T
UW10	−	1.5

Days to Ship — Quotation

Price — Quotation

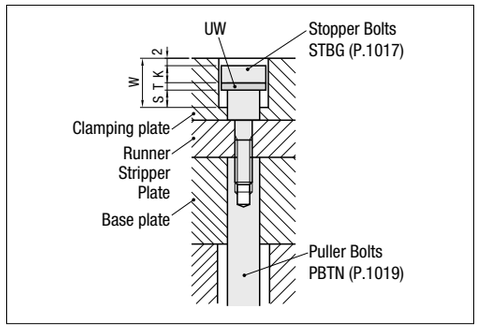
Example — Use for sound proofing when the mold is being opened.



■Characteristic comparison (With Shore A95)

Characteristics	Unit	Shore D58	Shore A95
Tensile strength	MPa	47.8	39.2
Elongation	%	440	400
Tearing strength	kgf/cm	153	107
Repulsion elasticity	%	53	40
Permanent warp	%	39	45
Heatproof temperature	℃	100	80

The above value is the reference value. It is not a guarantee value.



- When using a urethane washer on the stopper bolt, be careful of the counterbore depth (W) in order to secure the necessary stroke (S) .
- The dimension of the stopper bolt has been set so that the head is recessed 2mm below the clamping plate. (Refer to stopper bolt STBG P.1011.) When a urethane washer is used, the relationship between the counterbore depth (W) and the stroke (S) becomes as follows : [W=S+ urethane washer thickness T+stopper bolt flange thickness K+2].

■Stopper Bolts STBG (P.1011) Size K table

STBG	
D diameter	K head
10	8
13	8
16	13
20	13