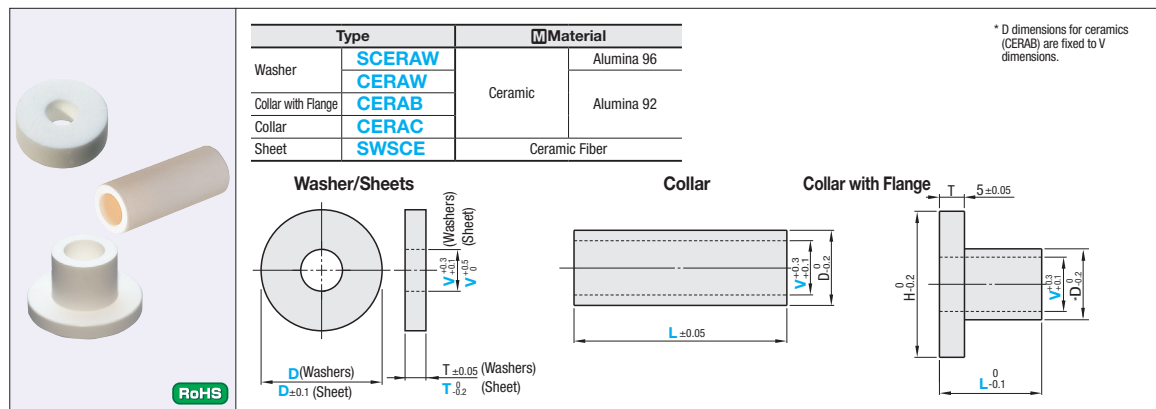
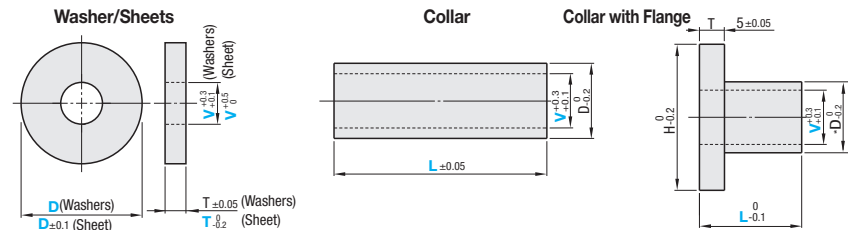


Ceramic Washers / Sheets / Collars



Type	Material
Washer	SCERAW CERAW CERAB CERAC
Collar with Flange	CERAB
Collar	CERAC
Sheet	SWSCE



Washer (Alumina 92)

Part Number	Type	D	V	T	Unit Price
10	CERAW	3	3	3	
12	CERAW	4	4	3	
15	CERAW	5	5	3	
20	CERAW	6	6	3	
25	CERAW	8	8	3	
30	CERAW	10	10	3	
35	CERAW	12	12	3	
40	CERAW	16	16	3	
45	CERAW	20	20	3	

Ordering Example
Part Number
CERAW10 - 3 - 5

Collar with Flange (Alumina 92)

Part Number	Type	V	L Selection	H	D	Unit Price
3	CERAB	8	10 15	10	6	
4	CERAB	10	15 20	12	8	
5	CERAB	12	20 25	15	10	
6	CERAB	15	25 30	20	12	
8	CERAB	20	30 35	25	14	
10	CERAB	25	35 40	30	16	
12	CERAB	30	40 45	35	18	
15	CERAB	35	45 50	40	20	
20	CERAB	40	50 55	45	22	

Ordering Example
Part Number
CERAB6 - 10 - 10

Collar (Alumina 92)

Part Number	Type	V	L Selection	H	D	Unit Price
3	CERAC	6	6	6	6	
4	CERAC	8	8	8	8	
5	CERAC	10	10	10	10	
6	CERAC	12	12	12	12	
8	CERAC	15	15	15	15	
10	CERAC	20	20	20	20	
12	CERAC	25	25	25	25	
15	CERAC	30	30	30	30	
20	CERAC	35	35	35	35	

Ordering Example
Part Number
CERAC16 - 55

Washer (Alumina 96)

Part Number	Type	D	V Selection	T	Unit Price
10	SCERAW	3	4 5	3	
12	SCERAW	4	5 6	3	
15	SCERAW	5	6 8	3	
20	SCERAW	6	8 10	3	

Ordering Example
Part Number
SCERAW10 - 5

Sheet (Ceramic Fiber)

Part Number	Type	D	V Selection	T	Unit Price
8	SWSCE	3	4	1	
10	SWSCE	4	5 6	1	
12	SWSCE	5	6 8	1	
15	SWSCE	6	8 10	1	
20	SWSCE	8	10 12	1	
25	SWSCE	10	12 15	1	
30	SWSCE	12	15 20	1	

Ordering Example
Part Number
SWSCE10 - 4 - 1

Property Values of Alumina 92 / Alumina 96 / Ceramic Fiber (Reference: The data in the table are the values of materials.)

Properties	Material Name	Alumina 92	Alumina 96	Ceramic Fiber
Dielectric Breakdown Parallel to Lamination	kV/mm	~10	10	-
Volume Resistance Force	$\Omega \cdot \text{cm}$	~ 10^{14}	~ 10^{14}	-
Bending Strength	kN/cm ²	24~34	33	-
Compression Strength	kN/cm ²	147~245	210	-
Tensile Strength	MPa	1000~1200	1500	0.6
Expansion Coefficient	1/°C	8×10^{-6}	7.6×10^{-6}	-
Thermal Conductivity	cal/cm · sec · °C	$3.6 \sim 5.0 \times 10^{-2}$	5.0×10^{-2}	1.7×10^{-4}
Heat Resistance	°C	1000~1200	1500	1300
Water Absorption Ratio	%	0	0	-
Specific Gravity	-	3.7	3.8	0.25
Main Material	-	Al ₂ O ₃ (92%)	Al ₂ O ₃ (96%)	-

*These materials are fragile. Please handle with care.

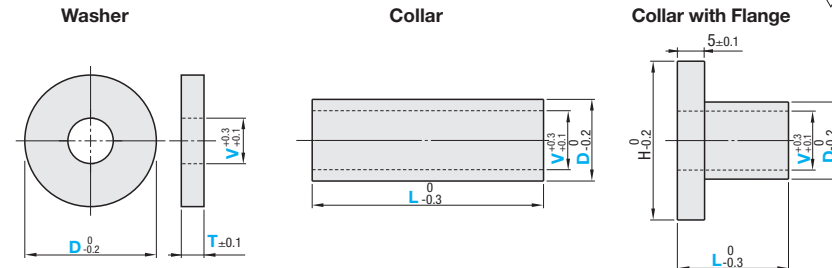
Thermal Insulation Washers / Collars

*This material excels in insulation resistance as well as heat insulation.



Type	Material
Washer	DJW
Collar	DJC
Collar with Flange	DJB

*The same material as for HIPLA on P.1679 is used.



Washer (Heat Insulation Material)

Part Number	Type	D	V Selection	T Selection	Unit Price
10	DJW	3	4 5	3 5	
12	DJW	4	5 6	3 5	
16	DJW	5	6 8	3 5	
20	DJW	6	8 10	3 5	
25	DJW	8	10 15	3 5	

Ordering Example
Part Number
DJW10 - 3 - 5

Collar (Heat Insulation Material)

Part Number	Type	D	V Selection	L	Unit Price
8	DJC	3	4 5	10	
10	DJC	4	5 6	10	
12	DJC	5	6 8	10	
16	DJC	6	8 10	10	
20	DJC	8	10 15	10	

Ordering Example
Part Number
DJC8 - 3 - 10

Collar with Flange (Heat Insulation Material)

Part Number	Type	D	V Selection	L	H	Unit Price
3	DJB	8	10	12	12	
4	DJB	10	12	15	14	
5	DJB	12	15	20	15	
6	DJB	15	20	25	20	
8	DJB	20	25	30	25	
10	DJB	25	30	35	30	

Ordering Example
Part Number
DJB4 - 8 - 15

Properties of Heat Insulation Material (Values shown below are for reference only.)

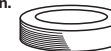
Mechanical Properties			Thermal and Electrical Characteristics		
Tensile Strength	MPa	108	Deflection Temperature under Load (1.82Mpa)	°C	400~
Elongation	%	0.7	Linear Expansion Coefficient	1/°C	$2.6 \sim 3.5 \times 10^{-5}$
Bending Strength	Vertical	145~130 ^{*1}	Thermal Conductivity	W/m · K (cal/cm · sec · °C)	0.24 (5.7x10 ⁻⁴)
Flexural Modulus	MPa	17900	Dielectric Constant (1MHz)	-	3.8
Compression Strength	Vertical	439~410 ^{*1}	Dissipation Factor (1MHz)	-	0.005
	Parallel	98 ~ 90 ^{*1}	Volume Resistivity	$\Omega \cdot \text{cm}$	1.0×10^{14}
Izod Impact Strength (Notched)	J/cm	2.9	Dielectric Breakdown Strength (Breakdown Voltage)	kV/mm	15
Rockwell Hardness	R	R113	Arc Resistance	sec	345
Glass Fiber Content	-	Available	Moisture Absorption (At 23°Cx24h)	%	0.05
Specific Gravity	-	2.0	Ambient Operating Temperature	°C	~400

*1 Bending Strength maintains the minimum value even at 400 degrees Celsius.
*2 2.6 = ambient temperature ~ 200°C, 3.5 = ambient temperature ~ 400°C.

About Direction of Material Lamination

Laminated directions of washer and collar are different (Figure below). Therefore, mechanical strength varies depending on direction of the lamination.

• Washers are laminated in the vertical direction.



• Collar and Collar with Flange are laminated in the radial direction. Please note that the mechanical strength is less than washer*.



The above are reference images. Actual products may differ from the images.