


Ceramic Washers / Sheets / Collars

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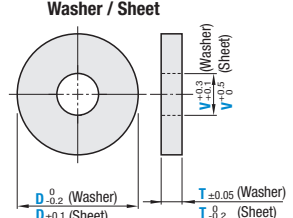


RoHS10

Type	Material
Washers	Alumina 96
Collar with Flange	Alumina 92
Sheet	Ceramic Fiber

*D dimensions for ceramics (CERAB) are fixed to V dimensions.

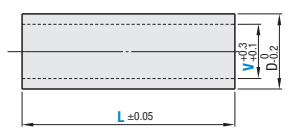
Washer / Sheet



$D_{\pm 0.2}$ (Washer)
 $D_{\pm 0.1}$ (Sheet)

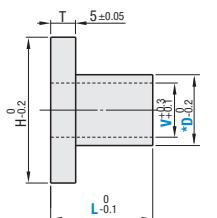
$T_{\pm 0.05}$ (Washer)
 $T_{\pm 0.2}$ (Sheet)

Collar



$L_{\pm 0.05}$

Collar with Flange



$H_{\pm 0.2}$

$L_{\pm 0.1}$

Washer (Alumina 92)

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

Part Number Example: CERAW10

Collar with Flange (Alumina 92)

Part Number	V	L Selection	H	D
CERAB	3	8 10 15	10	6
	4		12	8
	5		15	10
	6		20	10
	8		25	12
	10		30	14
	12	35	20	20
	16	40	20	
	20	45	25	

Part Number Example: CERAB6 - 10

Collar (Alumina 92)

Part Number	V	L Selection	D
CERAC	3	5-50	6
	4		8
	5		10
	6		10
	8		12
	10		14
	12	20	20
	16	20	
	20	25	

Part Number Example: CERAC16 - 55

Washer (Alumina 96)

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

Part Number Example: SCERAW10 - 5

Sheet (Ceramic Fiber)

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

Part Number Example: SWSCE10 - 4 - 1


Property Values of Alumina 92 / Alumina 96 / Ceramic Fiber

Properties	Material Name	Alumina 92	Alumina 96	Ceramic Fiber
Dielectric Breakdown Parallel to Lamination	KV/mm	-10	10	—
Volume Resistance Force	Ω -cm	-10^{14}	-10^{14}	—
Bending Strength	KN/cm ²	24-34	33	—
Compression Strength	KN/cm ²	147-245	210	—
Tensile Strength	Mpa	1,000-1,200	1,500	0.77
Expansion Coefficient	1/°C	8×10^{-6}	7.6×10^{-6}	—
Thermal Conductivity	cal / cm / sec / °C	$3.6-5.0 \times 10^{-2}$	5.0×10^{-2}	5.5×10^{-4}
Heat Resistance	°C	1,000-1,200	1,500	1,300
Water Absorption Ratio	%	0	0	—
Specific Gravity	—	3.7	3.8	0.25
Main Material	—	Al2O3 (92%)	Al2O3 (96%)	—

⚠ These materials are fragile. Please handle with care.

Thermal Insulation Washers / Collars

Thermal Insulation Washers / Collars

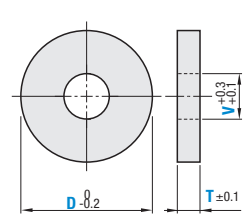


RoHS10

Type	Material
Washers	Thermal Insulation Material
Collar	
Collar with Flange	

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

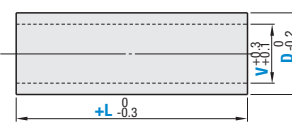
Washers



$D_{\pm 0.2}$

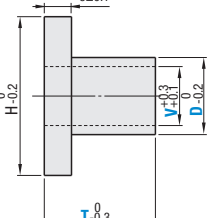
$T_{\pm 0.1}$

Collar



$L_{\pm 0.3}$

Collar with Flange



$H_{\pm 0.2}$

$L_{\pm 0.3}$

Washer Heat Insulation Material

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

Part Number Example: DJW10 - 3 - 5

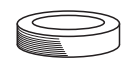
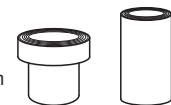
Collar Heat Insulation Material

Part Number	D	V Selection	L
DJC	8	3 4 5	10
	10	4 5 6	
	12	4 5 6 8	
	16	5 6 8	
	20	5 6 8 10	30

Part Number Example: DJC8 - 3 - 5

About Direction of Material Lamination

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

- Washers are laminated in the vertical direction. 
- Collars and Collars with Flange are laminated in the radial direction. Please note that the mechanical strength is less than washers. 

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

Collar with Flange Heat Insulation Material

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

Part Number Example: DJB4 - 8 - 15

Characteristics of Heat Insulation Material

Mechanical Properties		Thermal and Electrical Characteristics	
Tensile Strength	Mpa	108	
Elongation	%	0.7	
Bending Strength	Vertical	145-130 ^{*1}	
Flexural Modulus		17,900	
Compression Strength	Vertical	439-410 ^{*1}	
	Parallel	98-90 ^{*1}	
Izot Impact Strength (Notched)	J/m	29	
Rockwell Hardness	R	R113	
Glass Fiber Content	—	Available	
Specific Gravity	—	2.0	
Deflection Temperature under Load (1.82 Mpa)	°C	400~	
Linear Expansion Coefficient	1/°C	$2.6-3.5 \times 10^{-5}$	
Thermal Conductivity	W/(mk)	0.24	
	(cal/cm/sec/°C)	(5.7×10^{-4})	
Dielectric Constant (1 MHz)	—	3.8	
Dissipation Factor (1 MHz)	—	0.005	
Volume Resistivity	Ω -cm	1.0×10^{14}	
Dielectric Breakdown Strength	KV/mm	15	
Arc Resistance	sec	345	
Moisture Absorption (At 23°C x 24 h)	%	0.05	
Ambient Operating Temperature	°C	~400	

*1 Bending Strength maintains the minimum value even at 400°C.

*2 2.6 = ambient temperature ~200°C, 3.5 = ambient temperature ~400°C