

Ceramic Washers / Sheets / Collars

RoHS

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

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

Washers / Sheets

Collar

Collar with Flange

Washer (Alumina 92)

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

Bushings for Locating Pins - Ceramics Type (P1-1442), Ceramics Rods (P304), and Ceramics Circular Plates (P937) are also available.

Collar with Flange (Alumina 92)

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

Collar (Alumina 92)

Part Number	V	L	Unit Price
3		6	
4		8	
5	5-50	10	
6		10	
8		12	
10		14	
12		20	
16	5-100	20	
20		25	

Ordering Example: CERAW10

Days to Ship: [Configure Online](#)

Price: [Configure Online](#)

Ordering Example: CERAB6 - L 10

Days to Ship: [Configure Online](#)

Price: [Configure Online](#)

Ordering Example: CERAC16 - L 55

Days to Ship: [Configure Online](#)

Price: [Configure Online](#)

Washer (Alumina 96)

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

Ordering Example: SCERAW10 - V 5

Days to Ship: [Configure Online](#)

Price: [Configure Online](#)

Sheet (Ceramic Fiber)

Part Number	D	V	T	Unit Price	
8	3	4			
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

Ordering Example: SWSCE10 - V 4 - T 1

Days to Ship: [Configure Online](#)

Price: [Configure Online](#)

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	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	1000~1200	1500	0.6
Expansion Coefficient	1/°C	8x10 ⁻⁶	7.6x10 ⁻⁶	-
Thermal Conductivity	cal/cm·sec/°C	3.6~5.0x10 ⁻²	5.0x10 ⁻²	1.7x10 ⁻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

RoHS

Type	Material
Washers	Thermal Insulation Material
Collar	
Collar with Flange	

This material excels in electrical insulation as well as heat insulation.
The same material as for HIPLA in P1565 is used.

Washers

Collar

Collar with Flange

Washer (Heat Insulation Material)

Part Number	D	V	T	Unit Price
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	6	8	10	3.5

Ordering Example: DJW10 - V 3 - T 5

Part Number: DJC8 - V 3 - L 10

Part Number: DJB4 - D 8 - L 15

Collar (Heat Insulation Material)

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

Ordering Example: DJC8 - V 3 - L 10

Days to Ship: [Configure Online](#)

Price: [Configure Online](#)

Collar with Flange (Heat Insulation Material)

Part Number	D	L	H	Unit Price	
3	8	10	12		
4	8	10	15		
5	10	12	10	15	20
6	10	12	10	15	20
8	12	10	15	20	25
10	20	10	15	20	30

Ordering Example: DJB4 - D 8 - L 15

Characteristics 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	2.6~3.5x10 ⁻⁵
Bending Strength	Vertical	MPa	Thermal Conductivity	W/m·K (cal/cm·sec/°C)	0.24 (5.7x10 ⁻⁴)
			Dielectric Constant (1MHz)	-	3.8
Flexural Modulus		MPa	Dissipation Factor (1MHz)	-	0.005
Compression Strength	Vertical	439~410 ¹⁾	Volume Resistivity	Ω-cm	1.0x10 ¹⁴
	Parallel	98~90 ¹⁾	Dielectric Breakdown Strength	kV/mm	15
Izot Impact Strength (Notched)	J/cm	2.9	Arc Resistance	sec	345
Rockwell Hardness	R	R113	Moisture Absorption (At 23°Cx24h)	%	0.05
Glass Fiber Content	-	Available	Ambient Operating Temperature	°C	~400
Specific Gravity	-	2.0			

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

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. Actual products may differ from the images.