



Gel Vibration Insulators, Bushings, Chips and Sheets

GENERAL FEATURES:

Highly Durable - Our gels are highly resistant to ozone, UV Rays and chemicals, making them ideal for a large range of diverse applications.

Consistent Performance - Even in extreme conditions (-40°C to 200°C) the gels provide stable performance.

Safe - the gels are non-toxic, non-allergenic and emit no harmful gasses when burned.



Vibration Insulators

Excellent vibration dampening qualities for loads 2Kg - 300Kg

Ideal for low frequency and micro vibration due to resonance point designed to be set low.



Gel Bushings

Suitable for small loads from 0.2Kg to 32Kg.

Although only small, they also perform well at shock absorption and resist horizontal drift.

Each bushing should sandwich the PCB or component and then be secured with a bolt.



SN Sheets and Gel Chips

Simple to use in a wide range of applications. Also available with adhesive on one side and as a tape.

Note: These items are newly released. Please check stock levels before ordering.

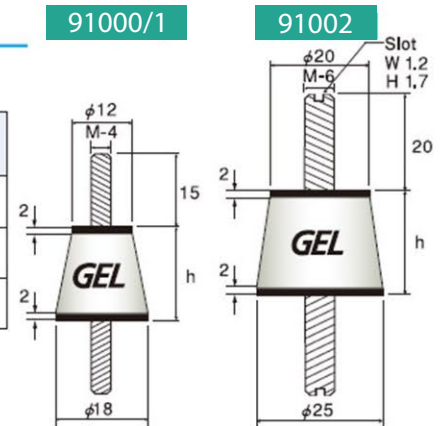
Vibration Dampeners

- [Features]**
- Ideal for low frequency and micro vibration due to resonance point designed to be set low.
 - Wide selection to choose from: from 2 kg to 300 kg.
 - Pick the best fit for your application based on the load (weight).
 - The published data are based on 4 points of support (usage).

Type θ

Part No.	Optimum Load (kg/4 points)	Resonance Point (Hz)	Resonance Magnification (dB)	Recommended Frequency (Hz)	h (mm)
91000	2.0 ~ 3.2	16 ~ 15	12	23 ~	13
91001	1.6 ~ 2.4	13 ~ 11	13 ~ 12	18 ~	18
91002	3.2 ~ 8.0	14 ~ 12	13 ~ 12	20 ~	18

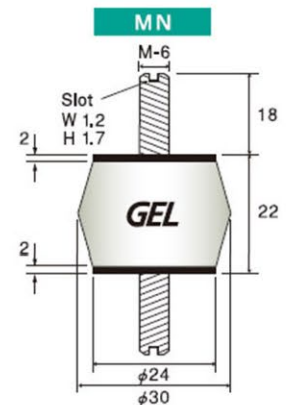
Bolt material : Iron with trivalent chromate plating



Type MN

Part No.	Optimum Load (kg/4 points)	Resonance Point (Hz)	Resonance Magnification (dB)	Recommended Frequency (Hz)
91003	8 ~ 14	12 ~ 10	12	17 ~
91004	14 ~ 22	11 ~ 10	14 ~ 13	16 ~
91005	22 ~ 34	11 ~ 10	16 ~ 15	16 ~
91006	34 ~ 50	11 ~ 10	20 ~ 18	16 ~

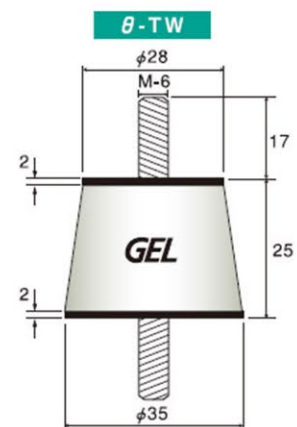
Bolt material : Iron with trivalent chromate plating



Type θ -TW

Part No.	Optimum Load (kg/4 points)	Resonance Point (Hz)	Resonance Magnification (dB)	Recommended Frequency (Hz)
91007	50 ~ 100	10 ~ 8	20 ~ 19	14 ~

Bolt material : Iron with trivalent chromate plating



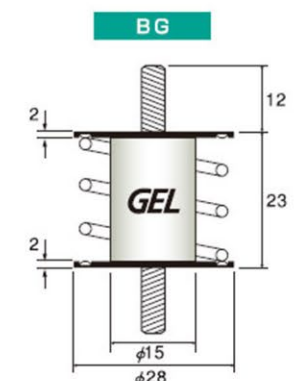
Type BG

Supported by a spring, type BG is effective for vertical vibration damping in particular.

Part No.	Optimum Load (kg/4 points)	Resonance Point (Hz)	Resonance Magnification (dB)	Recommended Frequency (Hz)	Bolt Diameter
91008	3.2 ~ 6.4	10 ~ 8	16 ~ 14	14 ~	M - 3
91009	6 ~ 16	10 ~ 8	18 ~ 16	14 ~	M - 6

Bolt material : Brass

Spring material : SWPA with trivalent chromate plating



Vibration Dampeners (cont)



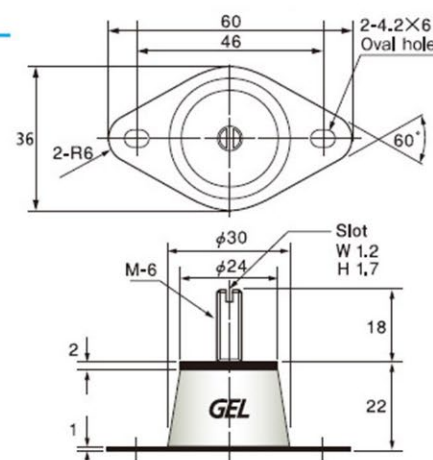
Type SF

For applications where a bottom plate is preferred instead of a bolt.

Part No.	Optimum Load (kg/4 points)	Resonance Point (Hz)	Resonance Magnification (dB)	Recommended Frequency (Hz)
91010	5 ~ 13	15 ~ 10	12 ~ 13	22 ~
91011	13 ~ 30	13 ~ 9	15 ~ 16	19 ~
91012	30 ~ 50	12 ~ 9	19 ~ 21	17 ~

Upper bolt material : Iron with trivalent chromate plating

Bottom plate material : SUS304



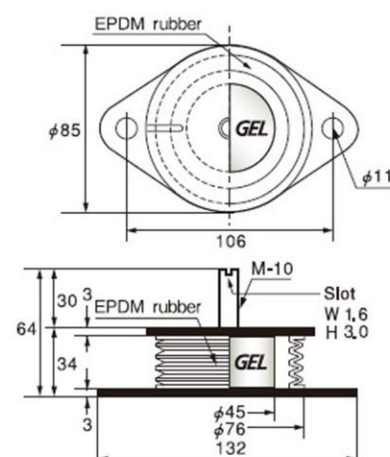
(Rubber-coated) Type SF

- For applications where a bottom plate is preferable and there is a need for damping heavy-load vibration.
- Good for outdoor use in particular due to reinforced durability deriving from Gel wrapped by bellows-type EPDM rubber.
- Stable performance in the -20°C to 90°C range.

Part No.	Optimum Load (kg/4 points)	Resonance Point (Hz)	Resonance Magnification (dB)	Recommended Frequency (Hz)
91013	100 ~ 140	8 ~ 9	18 ~ 19	13 ~
91014	120 ~ 300	10 ~ 15	12 ~ 18	15 ~

Metal parts have a choice between following 1 and 2.

- 1.Upper bolt material : Iron with trivalent chromate plating
Bottom plate material : Iron with trivalent chromate plating
2.Upper bolt material : SUS304 / Bottom plate material : SUS304

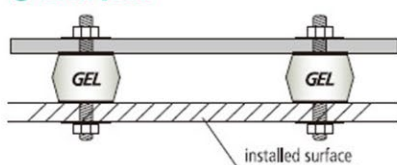


Installation

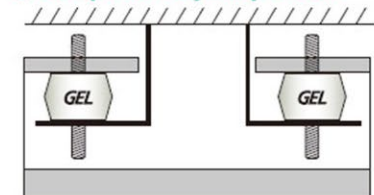
Always use in compression.

Correct Use

① Even load

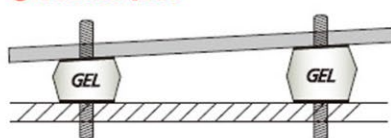


② Compressively suspended

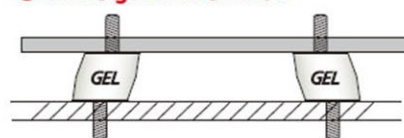


Incorrect Use

① Uneven load



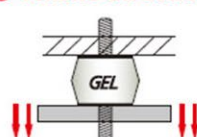
② Misaligned bolt hole



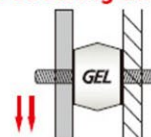
③ Twist



④ Tensile direction



⑤ Shearing direction



- * The height of the insulator may vary as the Gel is compressed under load.
- * The direction of the slot on the head of stud is not controlled.
- * Do not remove the Gel burr around the edge of metal. This could cause detachment of Gel from metal.

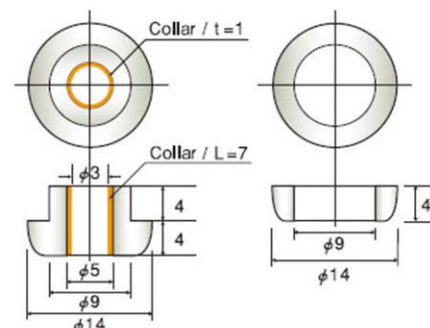
Gel Bushings

- [Features]**
- Designed to damp tiny-to-light-load and micro vibration.
 - Effective for minimizing horizontal drift, using a bolt running through Gel Bush.
 - Along with its shock absorbing capability, Gel Bush is ideal for light and fragile objects including PCBs (printed circuit boards).
 - Available for loads from 0.2 kg to 32 kg with 4 points of support.

Type A

Part No.	Optimum Load (kg/4 points)	Resonance Point (Hz)	Resonance Magnification (dB)	Recommended Frequency (Hz)
91033	0.5 ~ 2.5	67 ~ 35	9 ~ 10	0.5kg : 95 ~ 2.5kg : 50 ~
91034	2.5 ~ 4.0	49 ~ 37	15 ~ 16	2.5kg : 70 ~ 4.0kg : 55 ~

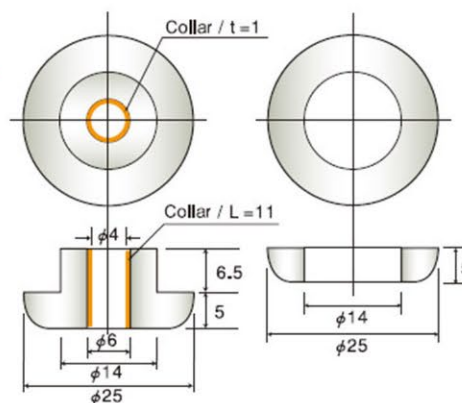
Collar material: Brass



Type B

Part No.	Optimum Load (kg/4 points)	Resonance Point (Hz)	Resonance Magnification (dB)	Recommended Frequency (Hz)
91035	4 ~ 15	49 ~ 23	15 ~ 17	4kg : 70 ~ 15kg : 35 ~
91036	15 ~ 32	38 ~ 20	19 ~ 23	15kg : 40 ~ 32kg : 25 ~

Collar material: Brass

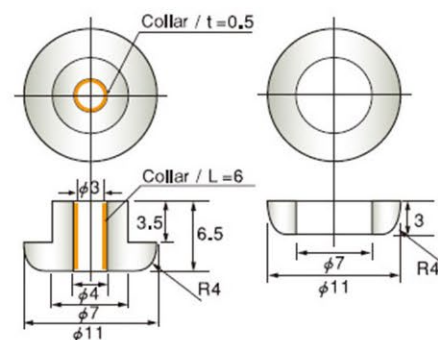


Type S

Part No.	Optimum Load (kg/4 points)	Resonance Point (Hz)	Resonance Magnification (dB)	Recommended Frequency (Hz)
91037	0.2 ~ 0.75	64 ~ 42	7 ~ 9	0.2kg : 90 ~ 0.75kg : 60 ~

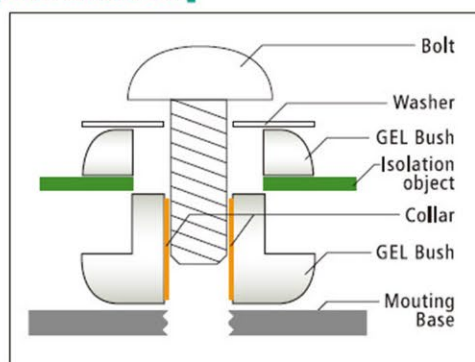
Collar material: Brass

- These data were obtained with 1.2mm -thick PCB sandwiched for type A, 1.5mm for type B, and 1.0mm for type S.
- Recommended frequency depends on loads.
- Since this product is very soft and easily damaged, please handle with care.

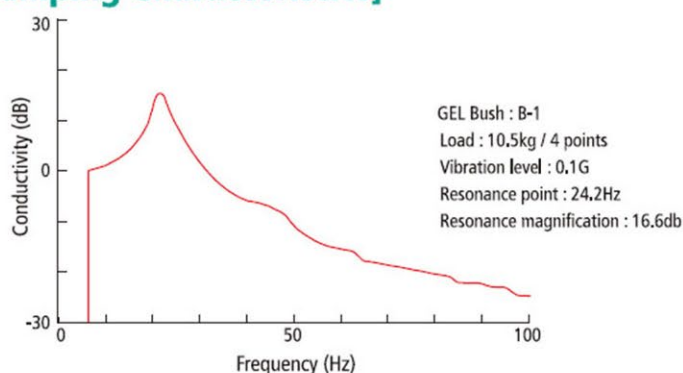


- [Notes]**
- Tighten the bolt all the way to the collar.
 - Usable bolts are M3 or smaller for type A, M4 or smaller for type B, and M3 or smaller for type S.
 - Use a washer equal to or bigger than the diameter of the upper portion of Gel Bush.
 - Collar inside the Gel Bush can be removed for use.

[Installation]



[Damping Characteristics]



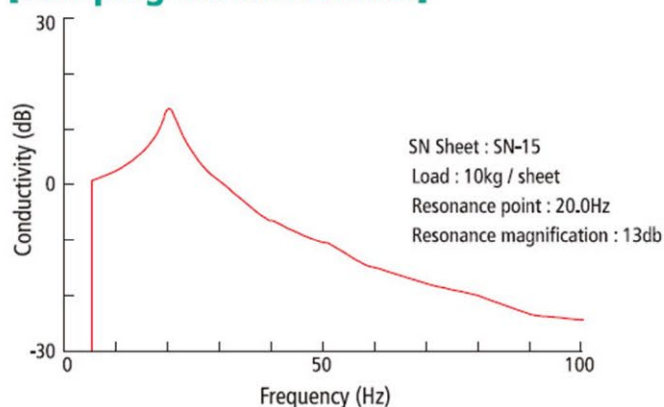
SN Sheets

- [Features]**
- Add more or divide SN Sheet flexibly for a wide range of load requirements.
 - Just place it under the device. Removable anytime.
 - Stable with small resonance magnification and little horizontal distortion.

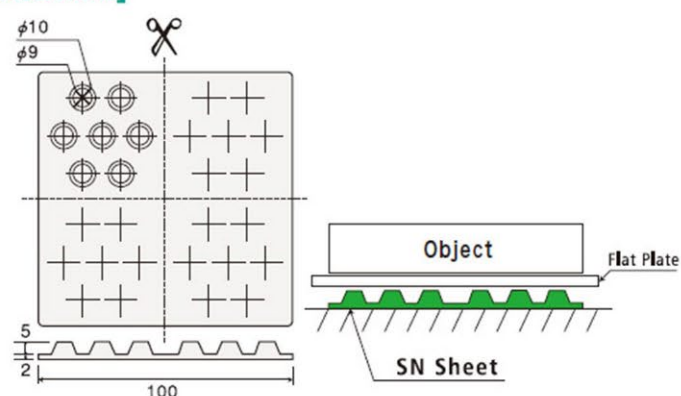
Part No.	Optimum Load (kg/1 Sheet)	Resonance Point (Hz)	Resonance Magnification (dB)	Recommended Frequency (Hz)	Deflection (mm)	Color
91029	0.5 ~ 2	27 ~ 21	6	38 ~	1.4 ~ 3.0	yellow
91030	2 ~ 5	29 ~ 23	8	40 ~	1.5 ~ 2.5	green
91031	5 ~ 15	26 ~ 18	13	37 ~	1.1 ~ 2.2	orange
91032	15 ~ 50	22 ~ 15	20 ~ 18	30 ~	0.7 ~ 2.0	blue

- [Notes]**
- Place SN Sheet (or portions of them) so that the vibrating object becomes stable.
 - Place SN Sheet so that the load of the vibrating object is spread evenly on the projections.
 - Placing a flat plate on the top surface of SN Sheet helps.
 - Remove the protective PET film from the bottom face before use.

[Damping Characteristics]



[Installation]



Application guideline:

- For 0.3 kg load, add a plate to exceed 0.5 kg or use at least three squares of the divided SN-2.
- For 10 kg load, use a sheet of SN-15 as it is or at least three squares of the divided SN-15.
- For 80 kg load, use 2 sheets of SN-50.

Terminology

Optimum Load

Each of our vibration damping products is designed to work best for a certain range of weight (optimum load). Select the best one based on the load of the vibrating object. Optimum load assumes 4 points of support (one sheet for SN Sheet).

Resonance Point (Hz)

Resonance point is the frequency at which the object reaches maximum vibration when it is externally vibrated on a vibration damping product. Resonance point is determined by the spring constant of the vibration damping products and the weight of the vibrating object.

Resonance Magnification (dB)

Resonance magnification is the ratio, at resonance point, of the vibration amplitude with the vibration damping products to that without them. The vibrating object will vibrate at about twice the amplitude at 6dB, at about five times at 14dB, and at about ten times at 20dB, compared to when no vibration damping products are used.

Recommended Frequency (Hz)

For effective vibration damping, the frequency of the vibrating object needs to be at least $\sqrt{2}$ the resonance point. Recommended frequency is defined as the range above this frequency. Select the best one based on the frequency of the vibrating object.

Gel Tape and Chips

- [Features]**
- Simple and easy solution for vibration isolation and shock absorption with adhesive on one side.
 - Wide selection to choose from based on width and thickness.
 - Very easy and effective solution for shock absorption and vibration damping where no space is allowed for insulators or bushes.
 - Wide temperature range from -40°C to 100°C.

GEL Tape

Item	W (mm) × L (mm) × T (mm)
91015	10 × 1,000 × 1
91016	20 × 1,000 × 1
91017	10 × 1,000 × 2
91018	20 × 1,000 × 2
91019	10 × 1,000 × 3
91020	20 × 1,000 × 3

※ Custom size could be available.

GEL Chip

Item	W (mm) × L (mm) × T (mm)
91021	10 × 10 × 3
91022	10 × 10 × 5
91023	15 × 15 × 3
91024	15 × 15 × 5
91025	15 × 15 × 10
91026	20 × 20 × 3
91027	20 × 20 × 5
91028	20 × 20 × 10

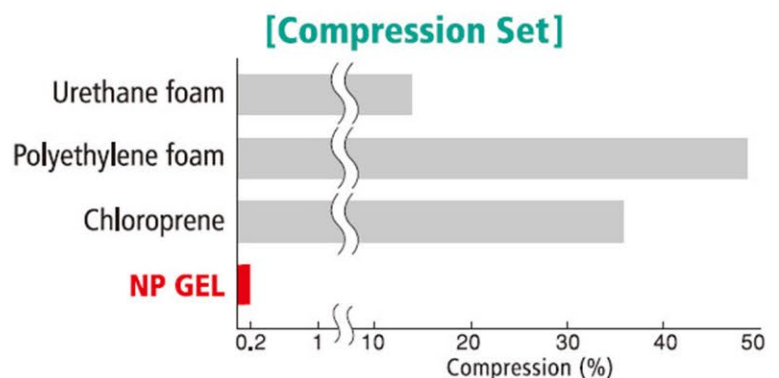
※ Each item is delivered in min. 25 pcs / sheet.

- [Notes]**
- Before use, remove dust from the object.
 - Attach with even pressure after removing the separation liner paper.
 - Apply sufficient pressure to securely attach PSA (pressure-sensitive adhesive).
 - Powder is applied to the surface of Gel to prevent sticking.

NP Gel

- [Features]**
- Lightweight and highly durable foamed type.
 - With low compression set, performance of NP Gel is maintained even after repeated compression.
 - Highly flame retardant and operable in the -40°C to 200°C range.
 - Good for outdoor use because it is highly resistant to weather and ozone.

Item	W (mm) × L (mm) × T (mm)
Green	450 × 2,000~ × 3
White	300 × 1,000~ × 6



※Measurement (JIS K 6401)

① Compress by 50% and maintain for 22 hours at 70°C.

② Release compression and measure after 30 minutes at normal temperature.

Gel Sheets and Paste

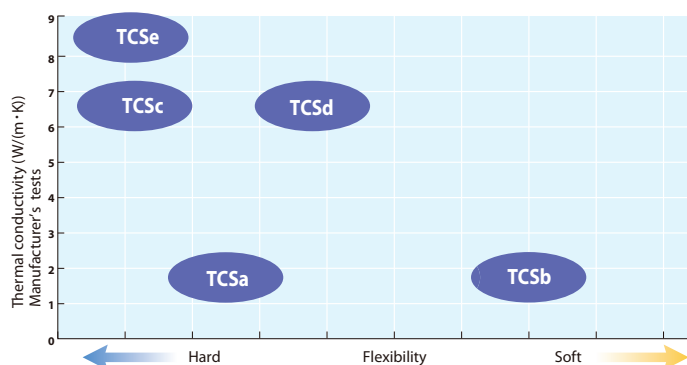
- Gel Sheets are used for thermal conductivity, electromagnetic absorption and electric insulation.
- Soft, sticky and conformable, Gel Sheets often exhibit performance much better than expected due to close contact.
- Gel Sheets and Paste adhere to rough surfaces where it's possible to eliminate air gaps.

Sheet Size: 400mm x 400mm

Paste Volume: 30cc

Item	Name	Grade	Thickness
91040	Thermal Conductive Sheet	TCSa	0.5mm
91041	Thermal Conductive Sheet		1.0mm
91042	Thermal Conductive Sheet		2.0mm
91043	Thermal Conductive Sheet		3.0mm
91044	Thermal Conductive Sheet	TCSb	0.5mm
91045	Thermal Conductive Sheet		1.0mm
91046	Thermal Conductive Sheet		2.0mm
91047	Thermal Conductive Sheet		3.0mm
91048	Thermal Conductive Sheet	TCSc	0.5mm
91049	Thermal Conductive Sheet		1.0mm
91050	Thermal Conductive Sheet		2.0mm
91051	Thermal Conductive Sheet		3.0mm
91052	Thermal Conductive Sheet	TCSd	1.0mm
91053	Thermal Conductive Sheet		2.0mm
91054	Thermal Conductive Sheet		3.0mm
91055	Thermal Conductive Sheet	TCSe	1.0mm
91056	Thermal Conductive Sheet		2.0mm
91057	Thermal Conductive Sheet		3.0mm
91058	Thermal Conductive Paste	TCPa	
91059	Thermal Conductive Paste		

Thermal Conductivity and Flexibility



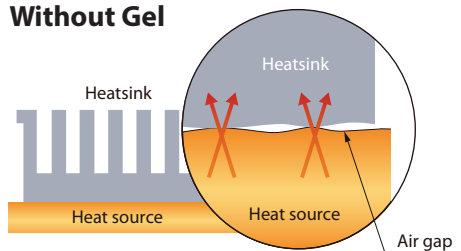
Gel Sheets and Paste (cont)

Gel Properties

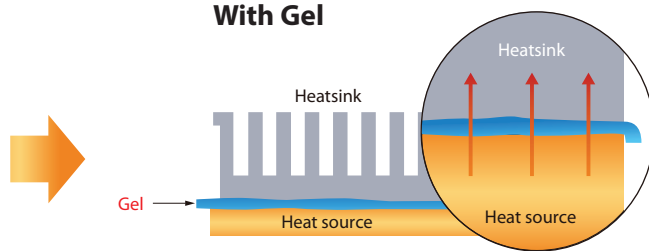
Grade of Gel		TCSa	TCSb	TCSc	TCSd	TCSe
Characteristics		Few low molecular weight Siloxane	High damping	Few low molecular weight Siloxane	High thermal conductivity + High damping	High thermal conductivity
Thermal conductivity (W/(m*K))	Manufact. tests	1.9	1.9	6.5	6.5	8.2
	Hot Wire Method	1.2	1.2	2.1	2.1	3.1
Hardness (Needle penetration • 1/10mm)		60	90	45	65	-
Appearance		White	Blue	Grey	Reddish brown	Grey
Specific gravity		1.7	1.7	2.9	2.8	3.0
Tensile strength (MPa)		0.21	0.14	0.35	0.10	0.69
Volume resistivity ($\Omega \cdot \text{cm}$)		6.1×10^{13}	3.1×10^{13}	7.1×10^{13}	4.4×10^{12}	1.2×10^{12}
Dielectric breakdown voltage (kv/mm)		18.8	16.5	12.5	13.6	11.6
Elongation (%)		205	480	68	132	35
Compression set (%)		15	51	72	75	63
Dielectric constant	(50Hz)	4.8	4.6	5.6	6.8	8.4
	(1kHz)	4.3	4.2	5.0	6.5	7.3
	(1MHz)	4.0	3.9	5.5	6.0	6.5
Dielectric dissipation factor	(50Hz)	0.071	0.055	0.006	0.058	0.171
	(1kHz)	0.046	0.034	0.002	0.041	0.060
	(1MHz)	0.007	0.006	0.0004	0.011	0.0151
Temperature range (°C)		-40~150	-40~150	-40~150	-40~150	-40~150

Gel helps to reduce air gaps between heat source and heatsink.

Without Gel



With Gel



Hard thermal conductive sheet stresses IC and PCB.

Hard thermal conductive sheet

