

ALGEL[®]
Discover Softness.

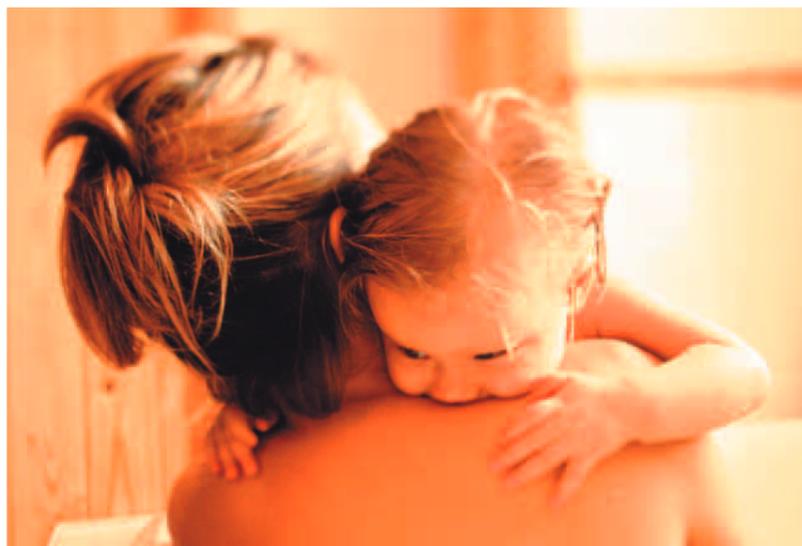


Infratron GmbH · Tel.: 089/158 126-0 · Web: www.infratron.de · E-Mail: info@infratron.de



For human beings. For the earth. For the future.

Living, working and serving in harmony with the environment.



*Identifying and tapping into possibilities in softness — with multi-faceted proprietary **ALGEL** technologies and beyond — for increased well-being and comfort for people around the globe. This is what Taica is all about.*

*Softness inherent to **ALGEL**.
Softness is not just a catalyst for function or added comfort.
Softness embraces and protects our lives.
Softness is where we loosen up and feel relaxed.
Softness, flexibility and suppleness are the basis for that soothing tenderness that brings us joy and happiness.
Representing these underlying core values, essential to lively well-being, **ALGEL** goes beyond mere functional material.*

This understanding is at the heart of all we do, as we listen to the varying and changing needs of the user, and proactively and creatively continue to offer an enhanced level of comfort.

● **Excellent Cushioning and Vibration Damping Performance**

ALGEL's (Alpha GEL) softness allows for deflection required for shock absorption and vibration damping, providing excellent cushioning and vibration damping performance.

● **Superior Durability**

ALGEL is highly resistant to ozone, UV rays and chemicals, making it possible to use in a variety of locations. In addition, its performance is maintained even after repeated compression.

● **Stable Performance Even In a Harsh Environment**

ALGEL's properties show little change in the -40°C (-40°F) to 200°C (392°F) range, providing stable performance.

● **Extremely High Safety**

ALGEL's composition makes it harmless to the human body and to the environment, causing no allergies when touched, and emitting no harmful gases when burned.

● **Outstanding Platform for Additional Functions and Enhanced Performance**

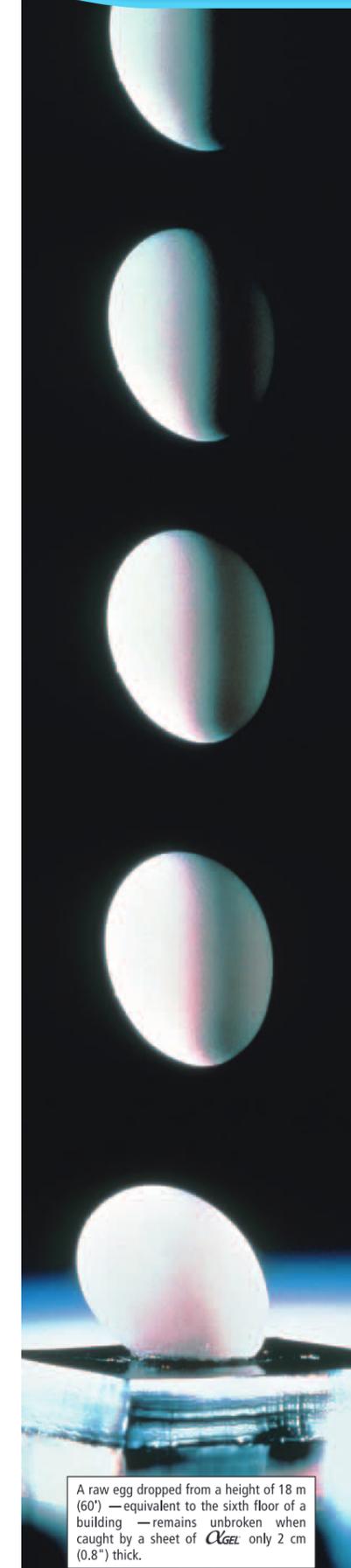
On top of the unique combination of excellent features, **ALGEL** also works as a reliable foundation for additional functions and for enhancing performance without compromising the merits softness brings.



● **Taica's Know-how**

You can count on us for enhanced cushioning, vibration damping, tender feel, and more. Years of accumulated expertise and know-how, mastery of fine-tuning softness, designing and making optimum gel parts --- together all of these help cope with a variety of changing environments and needs of customers around the globe.

ALGEL is a silicone-based gel.

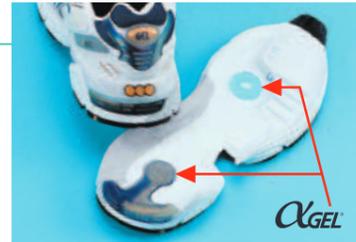


A raw egg dropped from a height of 18 m (60') — equivalent to the sixth floor of a building — remains unbroken when caught by a sheet of **ALGEL** only 2 cm (0.8") thick.

As proven through an egg-drop test in which a raw egg remains unbroken even when dropped from a height of 18m (about 60'), **αGEL** (Alpha GEL) has amazing shock absorbing capability. From sports to industrial applications, **αGEL** is the answer to various shock absorption needs.

Shoe Cushioning

αGEL protects the knee from the impact of landing, said to be three times the weight of the body. Its performance remains stable even with vigorous movement during sports.



Golf Iron

αGEL embedded in the high-rebound head of a golf iron absorbs excess force from the face of the head, allowing a soft, comfortable feeling of impact while providing distance of flight.



Outdoor Radio (Gel Chip)

αGEL provides stable performance even under severe conditions such as direct exposure to sunlight and moisture, as well as changes in external temperature, etc., protecting your radio from various types of shock resulting from being dropped or hit during outdoor use.



Recoil Pad

An **αGEL**-embedded recoil pad for rifle jackets protects the body from the impact of gun shooting.



Hip Protectors

αGEL protects the thighbone of elderly people suffering from osteoporosis or other conditions, from fracture due to falling.



Helmet Cushioning (NP Gel)

The addition of a foam gel sheet only 3 mm thick effectively absorbs shock. This makes it possible to decrease the thickness of the helmet, making it lighter, and further extending the possibilities of design.



αGEL vibration isolators and bushes - ideal for light loads and microvibration. **αGEL**'s easy adjustability in shape and firmness makes vibration damping possible from low frequency—which had previously been very difficult—to high frequency.

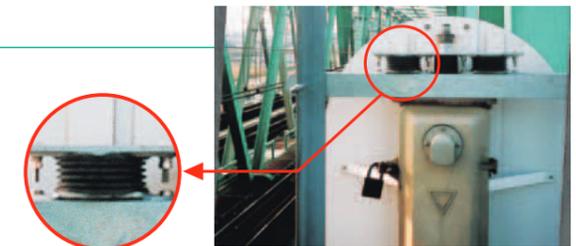
Vacuum Pump and Compressor (Insulator)

αGEL vibration insulators can absorb low frequency vibration, difficult to be isolated by conventional dampers such as rubber.



Railroad Signal (Insulator)

With a proven record of more than 10 years in the field, **αGEL** insulators protect the device from shock and vibration, often the causes of signal malfunction.



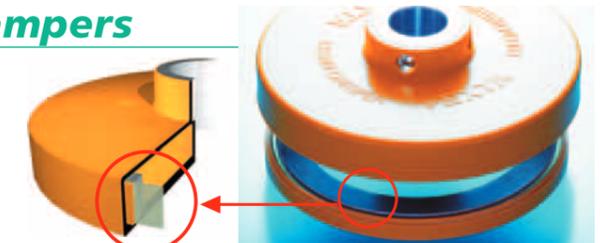
PC Boards (Gel Bush)

αGEL isolators are ideal primarily for light-load items such as PC boards. Its softness and mechanically reinforced strength allow for miniaturization of the final product and ensure long-term high performance.



Stepping Motor Inertia Dampers

Thanks to inserted **αGEL**, inertia is effectively utilized to rapidly converge vibration through repulsive force generated when the motor stops, dramatically increasing processing capacity.

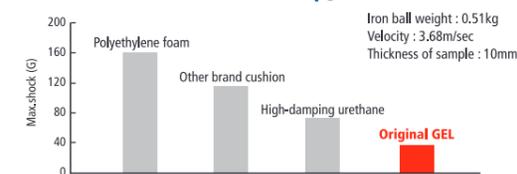


Testing Machines (SN Sheet)

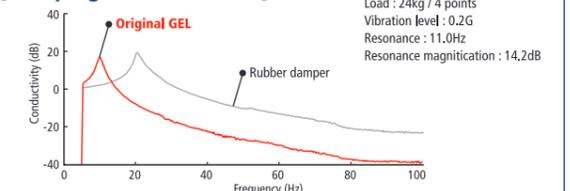
αGEL is often a very simple answer. **αGEL**, even in the form of a sheet, works wonders to suppress noise and vibration under precision instruments and testing machines.



[Maximum Shock : Iron ball drop]



[Damping Characteristics]



Soft & Smooth Feel / Pressure Dispersion

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αGEL (Alpha Gel) softly embraces and distributes pressure three-dimensionally, minimizing repercussion. Its inherent softness and flexibility allow a nice, smooth fit to the human skin and trigger a relaxing and even soothing feel, making αGEL more than just a functional material.

Pen Grip

An αGEL grip provides a soothing, soft feel that gently fits any fingers. It helps decrease the chance of forming calluses, even when writing for a long time, making it a highly popular item.



Supporting Breast Pad

The αGEL's natural elasticity helps to fit elegantly to the body's lines. So light that it places no burden on the body, the pad can be worn without worry. Lightweight, safe and soft, the breast pad feels like part of the body.



Camera Grip

αGEL's softness changes little even in harsh environments, making it ideal for outdoor use. Further, soft αGEL gently fits in the hand, providing a comfortable touch.



Packing

Lids can be sealed effortlessly thanks to αGEL's unrivaled softness, not possible with traditional rubber. Due to its inherent long-term durability, sealing performance is maintained even after repeated use.



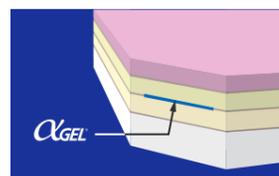
Stroller Headrests

A foam gel, safe for prolonged contact with skin, gently embraces the baby's head and effectively disperses the pressure on the head. Its shock absorbing capacity further increases safety.



Bed Mattresses

αGEL helps to effectively disperse body pressure and support a natural sleeping posture, providing a comfortable sleep.



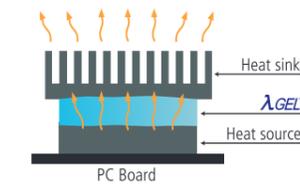
Reliable Platform for Additional Functions

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With its natural softness and superior physical characteristics nearly intact, αGEL becomes a reliable, safe platform for various functions. The optimum solution is exemplified through a proven process including selecting fillers, fine-tuning softness to the needs of a customer, etc.

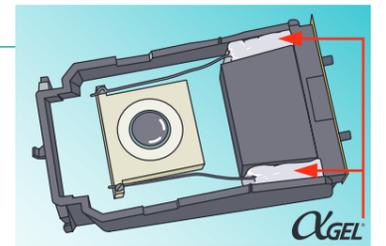
Semiconductor Device Heat Dissipation (COH Series and DP Series)

A soft thermal-conductive GEL effectively transfers the heat generated from IC to heat sink, preventing malfunction of the PC and destruction of the devices. Soft thermal-conductive paste/grease GEL is ideal for areas where sheet-type GEL is not applicable.



Ultra-Precise Device (UV Curing GEL)

UV Curing GEL is used mainly as damping material for optical pick up device. UV Curing GEL is supplied in liquid state.



Automobile ECU (Electronic Control Unit)

αGEL protects the ECU, which electronically controls the engine and electronic parts, from heat and shock.



Cellular Phones

αGEL increasingly finds a critical space in miniaturized products such as cell phones due to its excellent shock absorption as well as superior heat conductivity. In addition, electromagnetic waves are effectively absorbed by the RE Series lineup.



High-Resolution Television

Heat-conductive GEL also plays an important role inside advanced TVs such as high-resolution, plasma, LCD and rear projection TVs by ensuring high picture quality.



OPT αGEL (Optical Transparent GEL)

Contrast and luminance of LCD displays are improved by OPT αGEL. It is also effective for shock resistance, stress release and parallax decrease.



OPT αGEL

Vibration Damping **Vibration Insulators**

Various insulators are available for loads from 2 (4.4 lb) to 300 kg (661.4 lb) with 4 points of support. Micro-vibrations as well as light-load vibration can be damped thanks to easily deflectable α GEL.



Vibration Damping **GEL Bush**

Various bushes (or mounts) are available for tiny-to-small loads from 0.2 (0.44 lb) to 32 kg (70.55 lb) with 4 points of support. While small, they also excel in shock absorption and resistance to horizontal drift. Each bush should sandwich PCB and then be secured with a bolt.



Vibration Damping **SN Sheet**

Easy and simple to use. Place it under the device for instant and prolonged vibration damping. Addition and division of SN sheets flexibly accommodates a wide range of load requirements.



Shock Absorption Vibration Damping **GEL Tape & GEL Chip**

α GEL's softness and high performance are also readily applicable with an adhesive on one side in a variety of forms of tape or chip.



Shock Absorption **NP GEL**

Lightweight and flame retardant, NP GEL, soft foam α GEL, is durable and weather resistant. Available for use in the -40°C (-40°F) to 200°C (392°F) range, it has low compression set.



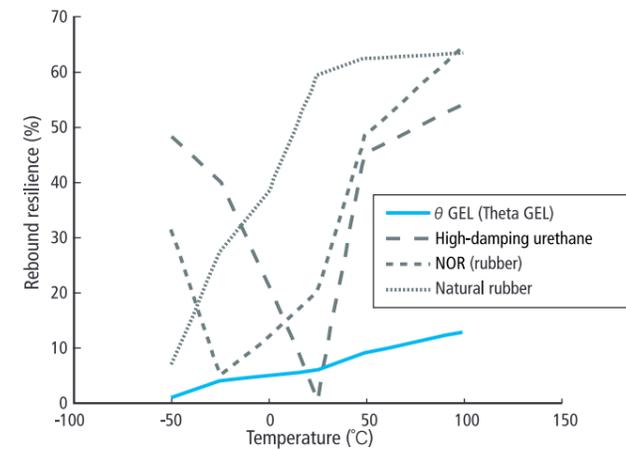
Reliable Platform for Additional Functions **λ GEL (Lambda GEL)**

With its softness intact, α GEL can be crafted to become thermal conductive, electromagnetic wave absorbent, electro-conductive, etc. Soft, sticky and conformable, λ GEL often exhibits performance much better than published specifications due to close contact.



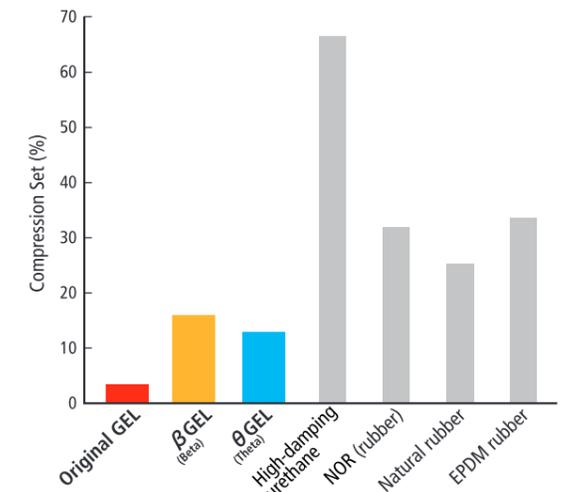
[Rebound Resilience]

α GEL is temperature-independent when compared with other comparable materials.



[Compression Set]

Even after prolonged compression, α GEL returns to its original state.



※Measurement (JIS K 6262)
 ① Compress by 25% and maintain for 22 hours at 70°C.
 ② Release compression and measure after 30 minutes at normal temperature.

[Physical Characteristics]

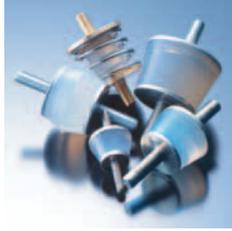
Item (unit)	Physical Value							Remark
	Original GEL	β GEL	θ -7	θ -5	θ -6	θ -8	NPGEL	
Appearance	Transparent	White	Translucent	Translucent	Translucent	Translucent	Green or White	
Specific Gravity	0.98	0.56	1.06	1.05	1.06	1.07	0.26	
Hardness	Needle penetration(1/10mm) ①	150	100	100	55	-	-	JIS K 2207
	Asker C ②	-	-	-	-	33	52.5	SRIS 0101 ③
Tensile Strength (MPa)	0.03	0.14	0.23	1.17	1.58	2.35	0.32	JIS K 6251
Elongation (%)	340	220	480	710	480	300	73	JIS K 6251
Young's Modulus (kPa)	28.9	150.7	37.5	119.5	670.3	1432.6	269.5	
Specific Heat (J/g·K)	1.55	1.61	1.51	1.52	1.51	1.52	1.15	DSC
Thermal Conductivity (W/m·K)	0.18	0.10	0.20	0.20	0.20	0.20	0.06	④
Specific Volume Resistance Ratio (Ω ·cm)	2.1×10^{14}	3.7×10^{12}	2.9×10^{14}	4.0×10^{14}	3.2×10^{14}	6.6×10^{14}	3.8×10^{14}	JIS K 6911
Dielectric Breakdown Strength (KV/mm)	16.7	17.1	16.3	15.1	18.4	18.7	3.8	JIS C 2110
Chemical Resistance	Toluene	×	×	×	×	×	×	JIS K 6258 room temperature ×168h
	Acetone	×	×	×	×	×	×	
	Methanol	○	×	○	○	○	○	
	Distilled H ₂ O	○	○	○	○	○	○	
	Fuel Oil	×	×	×	×	×	×	
	Lubricant Oil	×	×	×	×	×	×	
	NaCl (10%)	○	○	○	○	○	○	
HCl (10%)	○	○	○	○	○	○		
NaOH (5%)	○	○	○	○	○	○		
Normal Temperature Range (°C)	-40~+200	-40~+120	-40~+200	-40~+200	-40~+200	-40~+200	-40~+200	
Normal Temperature Range (°F)	-40~+392	-40~+248	-40~+392	-40~+392	-40~+392	-40~+392	-40~+392	

① Hardness is represented by the depth of the needle going into GEL. ② Rubber Hardness Meter. Hardness is represented by rebounding distance when the needle contacts GEL surface.
 ③ The Society of Rubber Industry, Japan ④ QTM 500 (KYOTO)

[Note]※Silicone oil may bleed depending upon applications.

※Low molecular siloxane is included in this product which basically composed of silicone.

※Above data are measured data, not guaranteed specifications.



[Features]

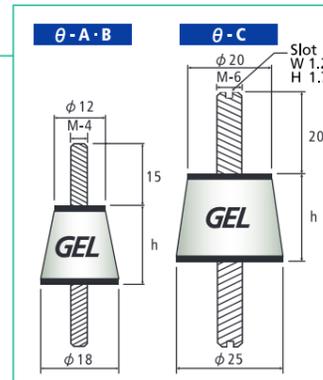
- Ideal for low frequency and micro vibration due to resonance point designed to be set low.
- Wide selection to choose from: from 2 kg (4.4 lb) to 300 kg (661.4 lb).
- Pick the best fit for your application based on the load (weight).
- The published data are based on four points of support (usage).



Type θ

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

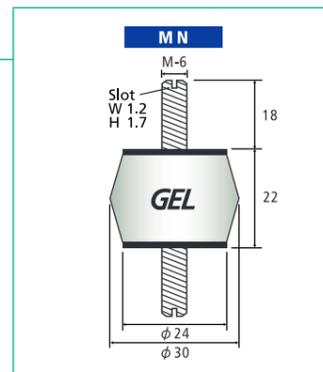
Bolt material : Iron with trivalent chromate plating



Type MN

Part No.	Optimum Load (kg/4 points)	Resonance Point (Hz)	Resonance Magnification (dB)	Recommended Frequency (Hz)
MN-3	8 ~ 14	12 ~ 10	12	17 ~
MN-5	14 ~ 22	11 ~ 10	14 ~ 13	16 ~
MN-7	22 ~ 34	11 ~ 10	16 ~ 15	16 ~
MN-10	34 ~ 50	11 ~ 10	20 ~ 18	16 ~

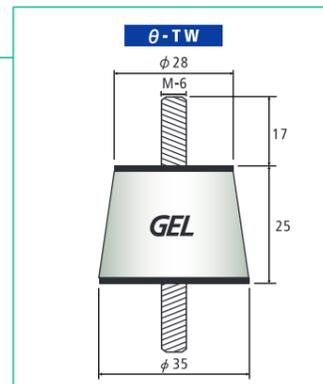
Bolt material : Iron with trivalent chromate plating



Type θ -TW

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

Bolt material : Iron with trivalent chromate plating

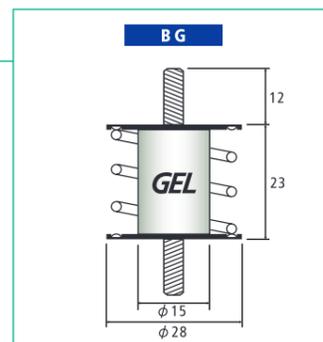


Type BG

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
BG-7	3.2 ~ 6.4	10 ~ 8	16 ~ 14	14 ~	M - 3
BG-8	6 ~ 16	10 ~ 8	18 ~ 16	14 ~	M - 6

Bolt material : Brass
Spring material : SWPA with trivalent chromate plating

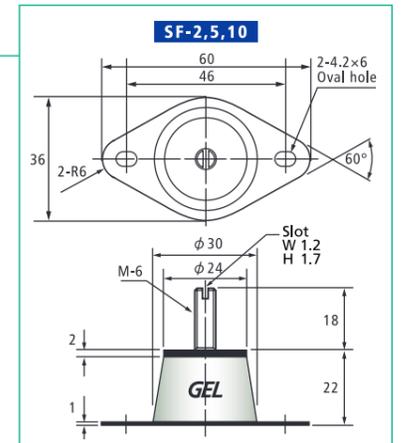


Type SF

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

Part No.	Optimum Load (kg/4 points)	Resonance Point (Hz)	Resonance Magnification (dB)	Recommended Frequency (Hz)
SF-2	5 ~ 13	15 ~ 10	12 ~ 13	22 ~
SF-5	13 ~ 30	13 ~ 9	15 ~ 16	19 ~
SF-10	30 ~ 50	12 ~ 9	19 ~ 21	17 ~

Upper bolt material : Iron with trivalent chromate plating
Bottom plate material : SUS304



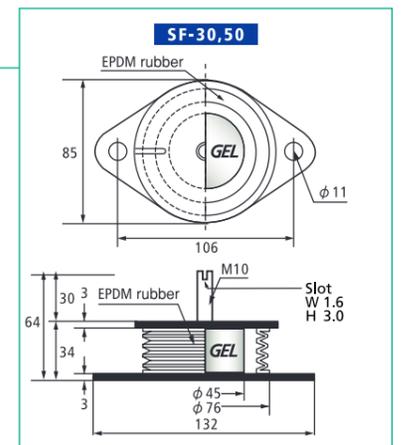
(Rubber-coated) Type SF

- For application 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 α GEL wrapped by bellows-type EPDM rubber.
- Stable performance in the -20°C (-4°F) to 90°C (194°F) range.

Part No.	Optimum Load (kg/4 points)	Resonance Point (Hz)	Resonance Magnification (dB)	Recommended Frequency (Hz)
SF-30	100 ~ 140	8 ~ 9	18 ~ 19	13 ~
SF-50	120 ~ 300	10 ~ 15	12 ~ 18	15 ~

Metal parts have a choice between following 1. and 2.

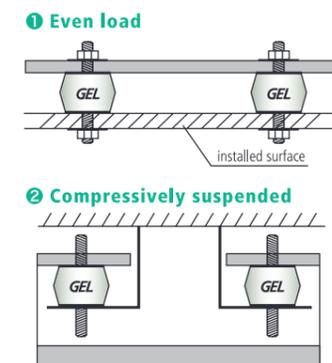
1. Upper bolt material : Iron with trivalent chromate plating
Bottom plate material : Iron with trivalent chromate plating
2. Upper bolt material : SUS304 / Bottom plate material : SUS304



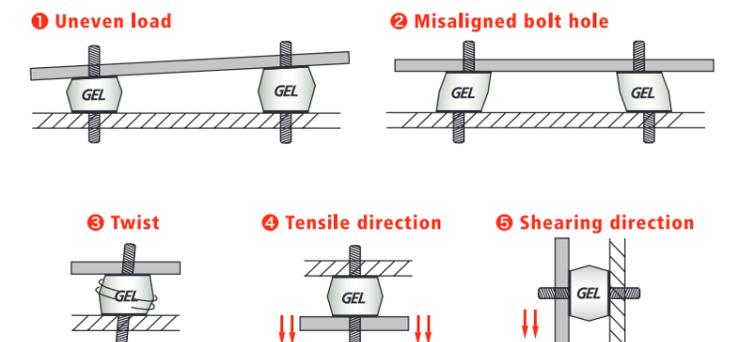
Installation

Always use in compression.

Correct Use



Incorrect Use



- ※ 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.

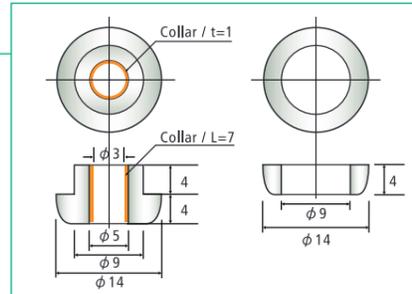


[Features]

- Designed to damp tiny-to-light-load and micro vibration.
- Effective for minimizing horizontal drift, using a bolt running through the bush.
- Along with its shock absorbing capability, the GEL bush is ideal for light and fragile objects including PCBs (printed circuit boards).
- Available for loads from 0.2 kg (0.44 lb) to 32 kg (70.55 lb) with 4 points of support.

Type A

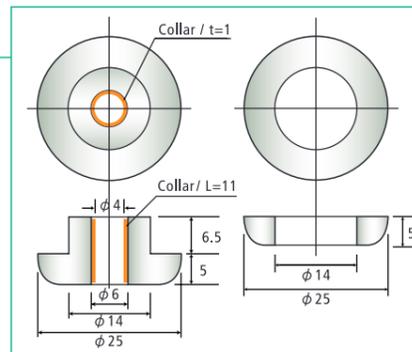
Part No.	Optimum Load (kg/4 points)	Resonance Point (Hz)	Resonance Magnification (dB)	Recommended Frequency (Hz)
A-1	0.5 ~ 2.5	67 ~ 35	9 ~ 10	0.5kg · 95 ~ 2.5kg · 50 ~
A-2	2.5 ~ 4.0	49 ~ 37	15 ~ 16	2.5kg · 70 ~ 4.0kg · 55 ~



Collar material : Brass

Type B

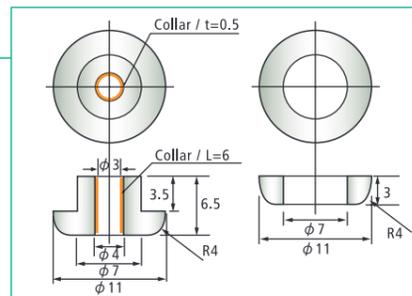
Part No.	Optimum Load (kg/4 points)	Resonance Point (Hz)	Resonance Magnification (dB)	Recommended Frequency (Hz)
B-1	4 ~ 15	49 ~ 23	15 ~ 17	4kg · 70 ~ 15kg · 35 ~
B-2	15 ~ 32	38 ~ 20	19 ~ 23	15kg · 40 ~ 32kg · 25 ~



Collar material : Brass

Type S

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

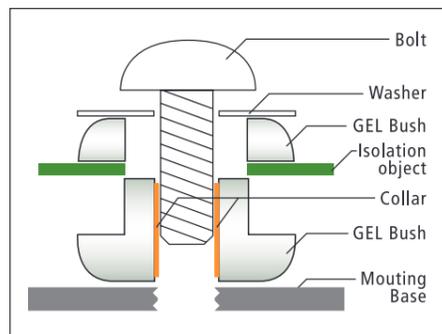


Collar material : Brass

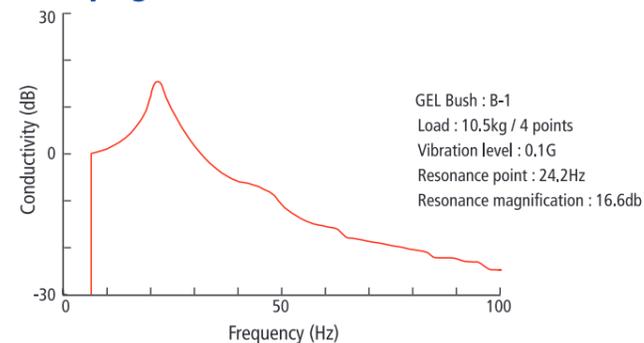
※ These data were obtained with 1.2mm -thick PCB sandwiched for type A, 1.5mm for type B, and 1.0mm for type S.
※ Recommended frequency depends on loads.

- ### [Notes on Use]
- 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 the GEL bush.
 - ※ Collar inside the GEL bush can be removed for use.

[Installation]



[Damping Characteristics]



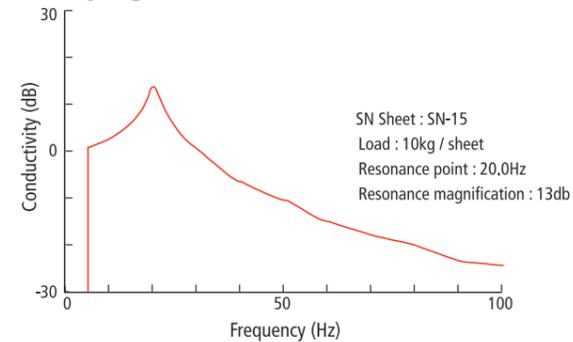
[Features]

- Add more or divide the 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.

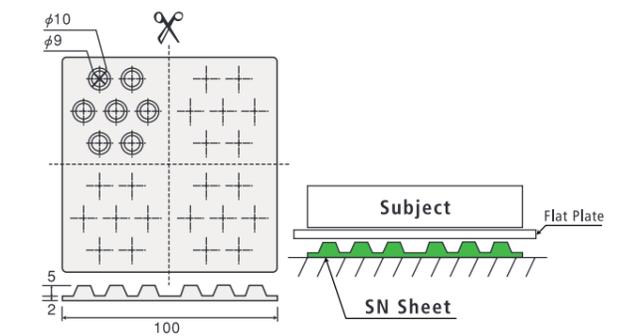
Part No.	Optimum Load (kg/1 Sheet)	Resonance Point (Hz)	Resonance Magnification (dB)	Recommended Frequency (Hz)	Deflection (mm)	Color
SN-2	0.5 ~ 2	27 ~ 21	6	38 ~	1.4 ~ 3.0	yellow
SN-5	2 ~ 5	29 ~ 23	8	40 ~	1.5 ~ 2.5	green
SN-15	5 ~ 15	26 ~ 18	13	37 ~	1.1 ~ 2.2	orange
SN-50	15 ~ 50	22 ~ 15	20 ~ 18	30 ~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

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

Damping Characteristics



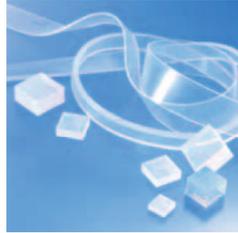
[Installation]



- ### 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 four 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.



[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 (-40°F) to 100°C (212°F).

GEL Tape

Item	W (mm) × L (mm) × T (mm)
GT-1	10 × 1,000 × 1
GT-2	20 × 1,000 × 1
GT-3	10 × 1,000 × 2
GT-4	20 × 1,000 × 2
GT-5	10 × 1,000 × 3
GT-6	20 × 1,000 × 3

※ Custom size could be available.

GEL Chip

Item	W (mm) × L (mm) × T (mm)
GC-1	10 × 10 × 3
GC-2	10 × 10 × 5
GC-3	15 × 15 × 3
GC-4	15 × 15 × 5
GC-5	15 × 15 × 10
GC-6	20 × 20 × 3
GC-7	20 × 20 × 5
GC-8	20 × 20 × 10

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

[Notes on Use]

- 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).

[Note]

- Powder is applied to the surface of the gel to prevent sticking.

NP GEL



[Features]

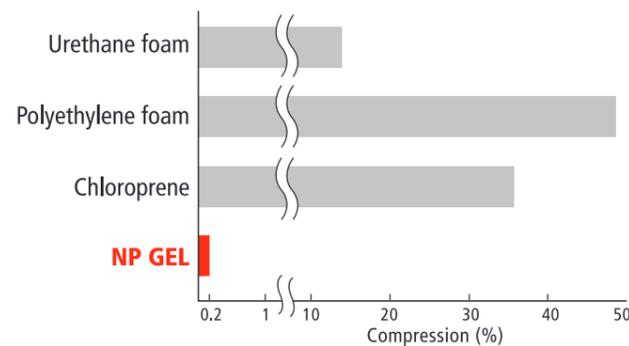
- Lightweight and highly durable foam type α GEL.
- With low compression set, performance of the NP GEL is maintained even after repeated compression.
- Highly flame retardant and operable in the -40°C (-40°F) to 200°C (392°F) range.
- Good for outdoor use because it is highly resistant to weather and ozone.

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

[Notes on Use]

- Powder is applied to the surface as a standard.

[NP GEL Compression Set]



※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.



[Features]

- λ GEL (Lambda GEL) is α GEL-based functional material for thermal conductivity, electromagnetic absorption and electric insulation.
- Soft, sticky and conformable, λ GEL often exhibits performance much better than published specifications due to close contact.

Thermal Conductive Material

[COH series] Sheet-type

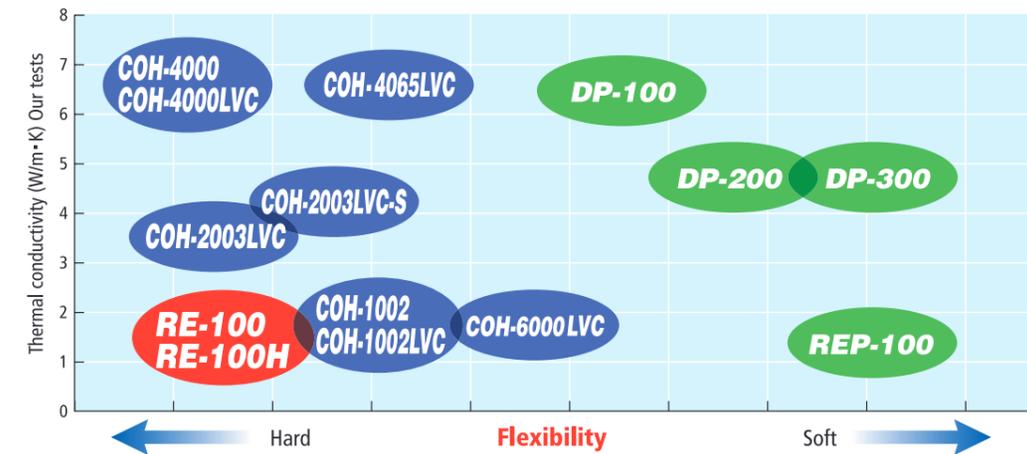
[DP series] Paste-type

Thermal Conductive Material + Electromagnetic Absorbent

[RE series] Sheet-type

- Refer to the separate brochures for details of the λ GEL series.

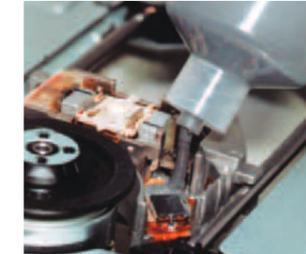
[Thermal conductivity and flexibility]



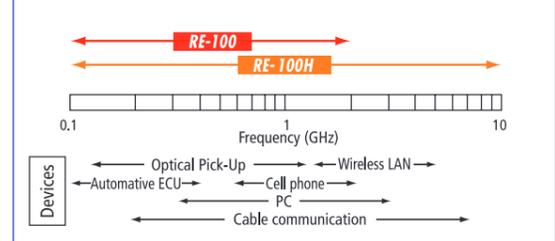
Sheet-type



Paste-type



Frequency range



[Note] Under certain conditions such as hard-pressed use, silicone oil may bleed.

[Note]

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