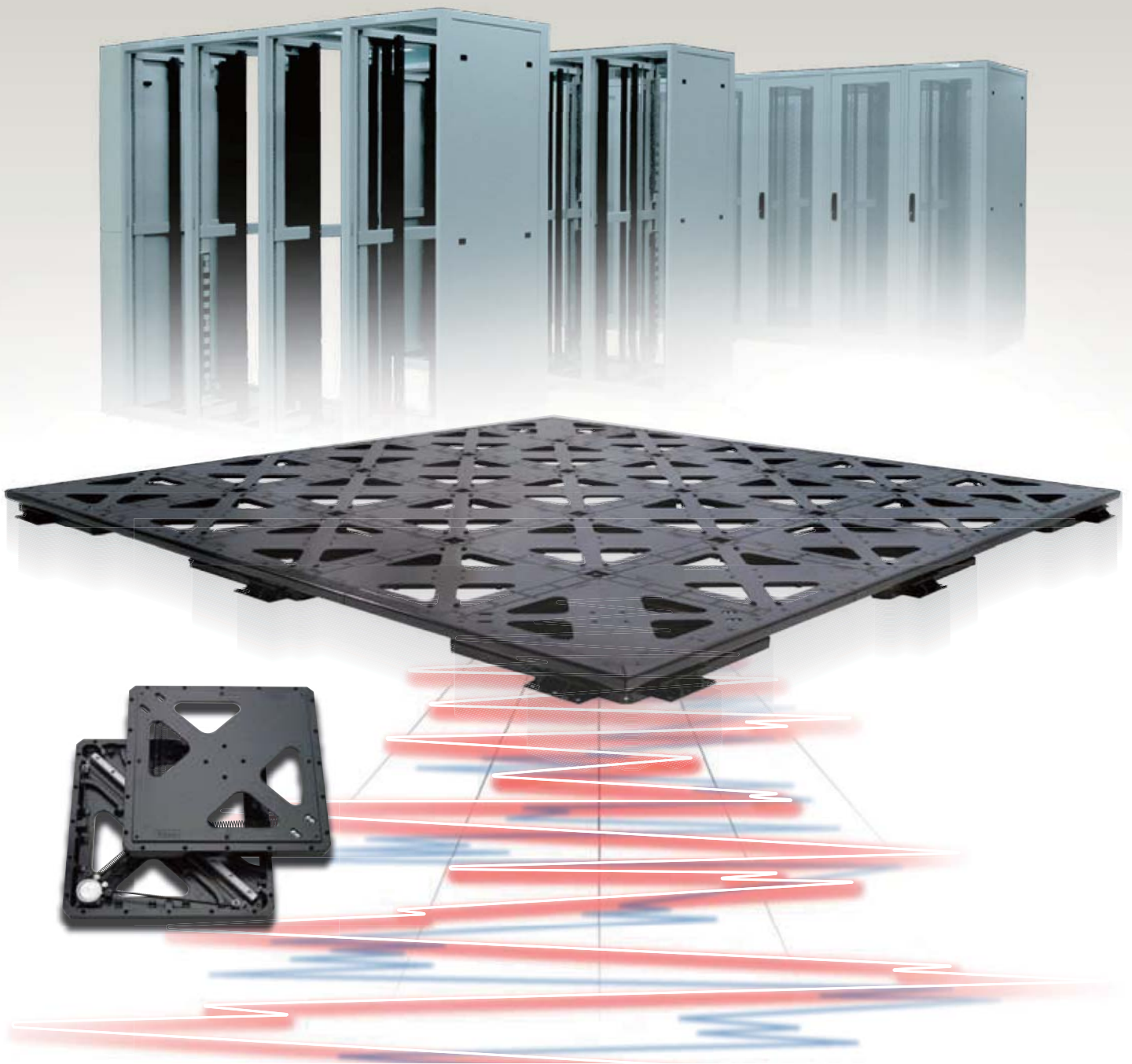




Support for Heavy-Load / Floor Seismic Isolation

Seismic Isolation Module Model TGS

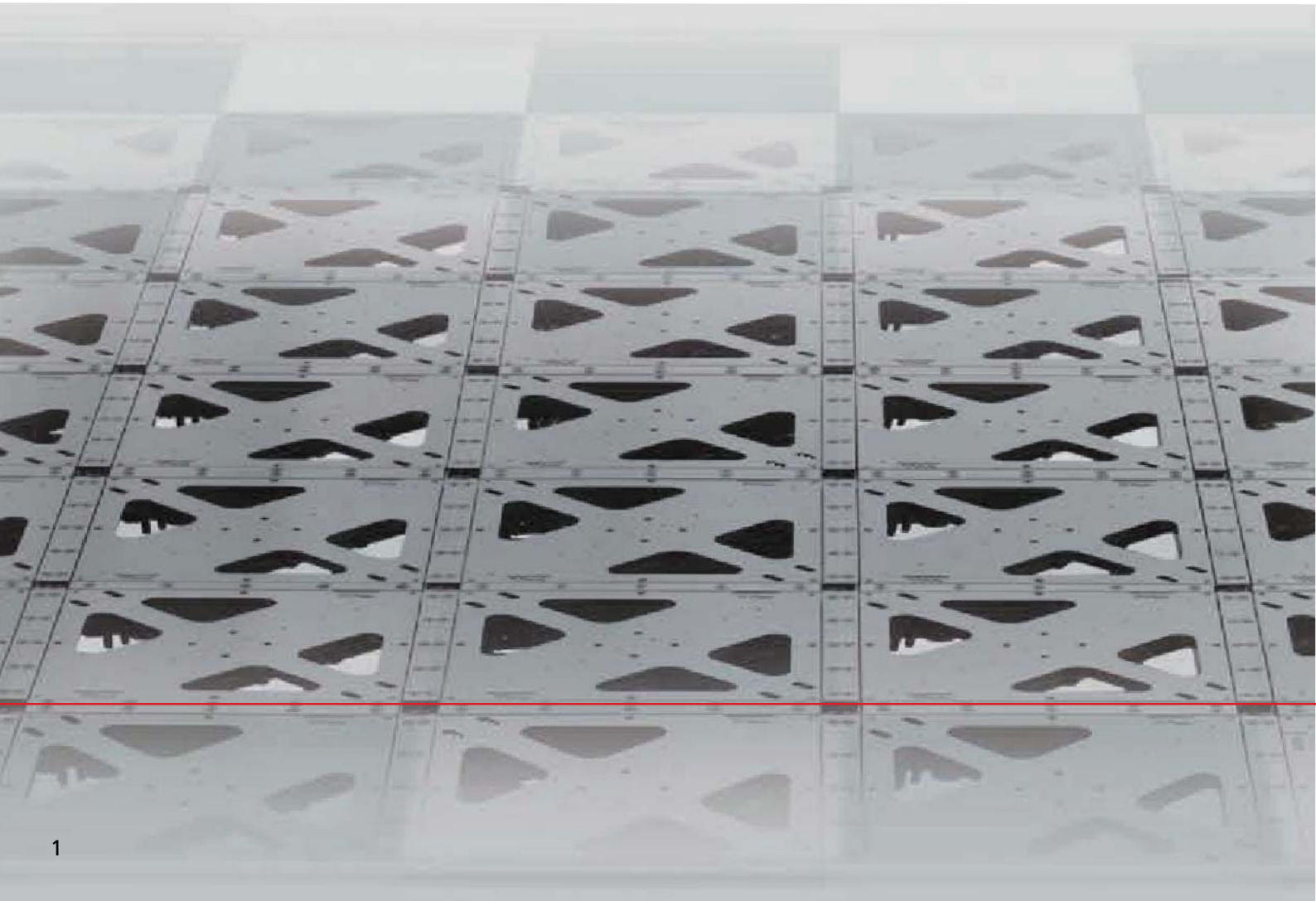
**To help ensure business continuity
when earthquakes strike**



Seismic isolation for individual server computers or for the entire floor of your operations center: optimal protection tailored to your needs.

The TGS offers access to a whole new level of earthquake readiness, further improving your prospects for seamless business continuity.

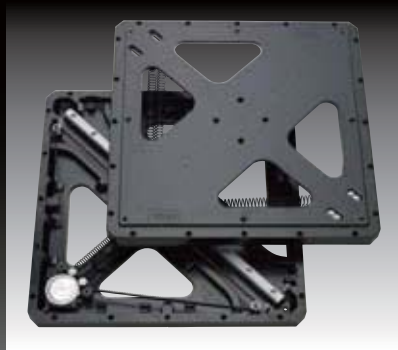
By combining the capabilities of a damping device and the superior performance of THK's LM Guide—a key component with a proven record in the field of industrial machinery, including semiconductor production equipment—the TGS can support loads up to 3,000 kgf per square meter, providing protection for server computers, precision instruments, Artworks, and other vital assets. It can also provide seismic isolation for the entire floor of a server room or operations center.



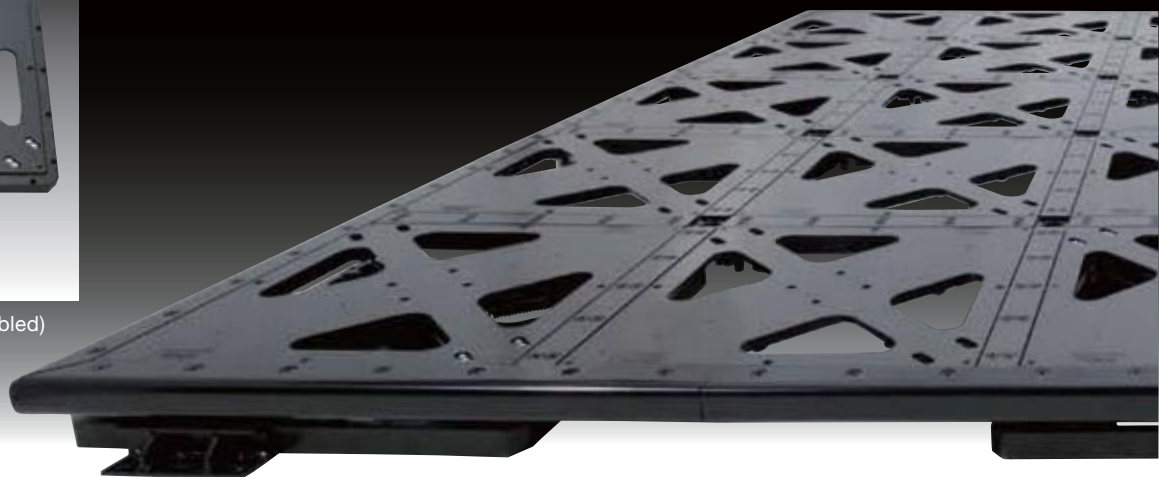


Seismic isolation is now available for the entire floor.





TGS module (partially disassembled)



Seismic Isolation Module Model TGS Features

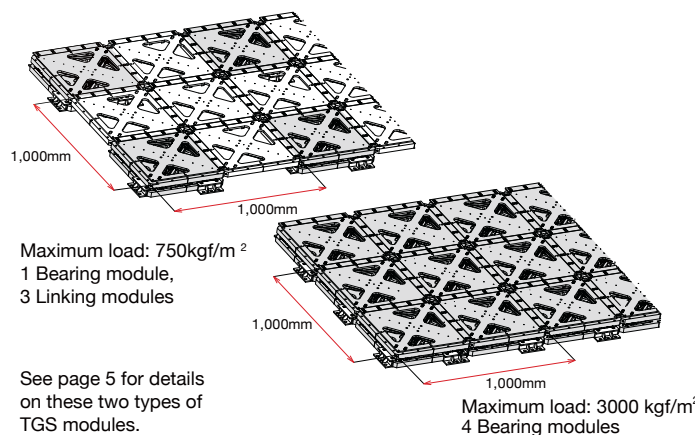
Seismic isolation in a compact package

The TGS provides the support, recovery, and damping functions required for effective seismic isolation, delivered in a compact module: 500mm (w) x 500mm (d) x 100mm (h). Its lightweight die-cast aluminum frame enables high-precision motion.



Handles heavy loads and pulling force

Thanks to the use of LM Guides, TGS modules not only accommodate heavy loads but also resist floating when pulling force is applied. Each module can bear an evenly distributed load of up to 750 kgf, enabling this model to accommodate evenly distributed heavy loads up to 3,000 kgf per square meter. (When dealing with a more concentrated load, please consult THK.)



Countless possible configurations

TGS modules can be configured to accommodate loads of almost any shape or form. The smallest possible configuration, two modules on each side, measures 1,000mm x 1,000mm; an unlimited number of modules can be connected.



Easy to install

The TGS arrives fully assembled and ready to set up. The compact size and lightweight construction of the modules makes them easy to configure and install.





Model TGS sample configuration (load weight: 750 kgf/m²)

Core technology:
The world-renowned LM Guide in industrial devices.

THK LM Guides, the Seismic Isolation Module's core component, turn linear motion into rolling motion, reducing friction resistance and deftly deflecting earthquake tremors. Since its introduction in 1972, the LM Guide has radically improved the capabilities of mechatronics devices and is now employed around the world as the de facto standard for manufacturing equipment and machine tools.

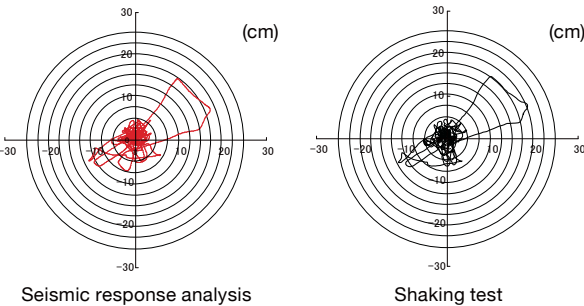


LM Guides

Optimal seismic isolation

Seismic response analysis, which takes into account factors such as setup location, load weight, and anticipated seismic vibrations, makes it possible to deliver optimal seismic isolation with the TGS.

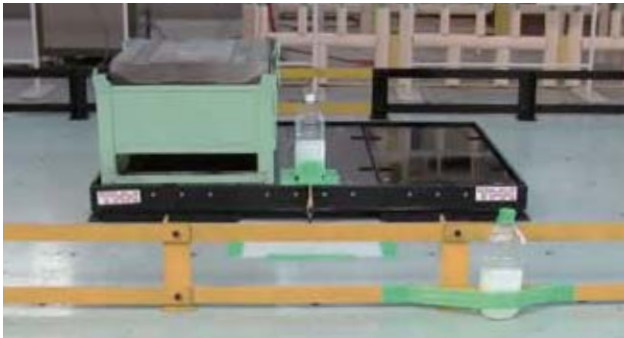
Seismic response analysis
and shaking test results



Seismic wave used: Taft 1952 (EW), generated at 4:52 a.m., July 21, 1952. Magnitude 7.7. Standardized wave, based on 50cm per sec.

Resists twisting

The high rigidity of its well-connected surfaces, together with the use of LM Guides in the moving elements, ensure there will be virtually no twisting even when a moderately eccentric load is applied.



Unbalanced-load test

Broad versatility

The dimensions of TGS modules match those of standard 500mm x 500mm floor panels, making it easy to provide seismic isolation for flooring in server rooms, operation centers, and other locations housing vital equipment. Their low 100 mm height makes them suitable for use older in buildings with lower ceilings.



Seismic Isolation Modules installed under flooring

Seismic Isolation Module Model TGS

Technical Data

Structure



Frame

Made of die-cast aluminum for light weight and precision motion.

Pulley

The module's motion is transmitted to the damper using a timing belt.

Disk damper

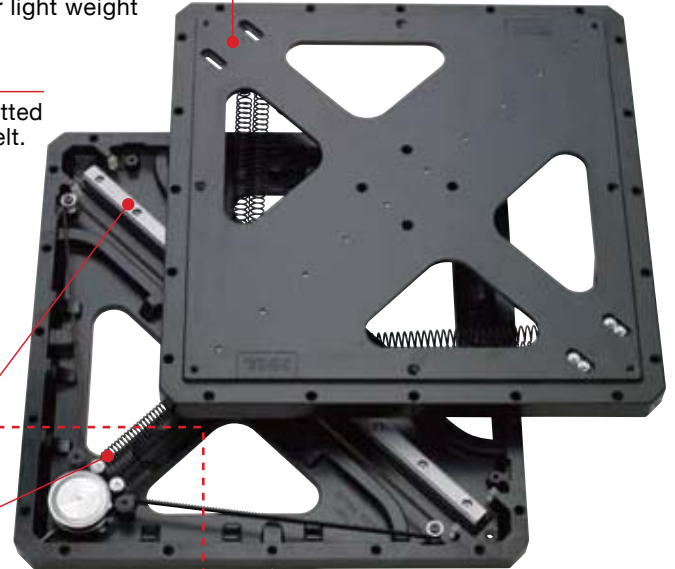
Seismic energy is damped by viscous material incorporated into the lower section of the pulley.

LM Guide

The incorporation of crossed LM Guides enables the module to glide back and forth and side to side, deflecting earthquake vibrations.

Tension spring

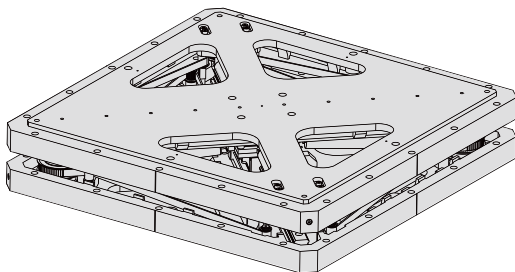
Returns the frame, which shifts in response to seismic vibrations, to its original position.



THK's patented Model TGS Seismic Isolation Module

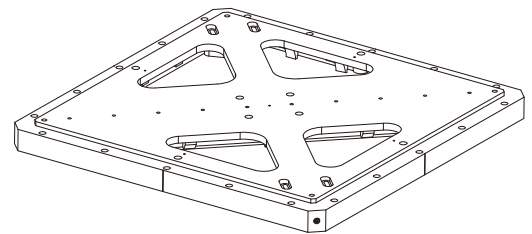
Module Types

Bearing module



- Supports the load.
- Recovery and damping functions can be adjusted to suit location and load weight.

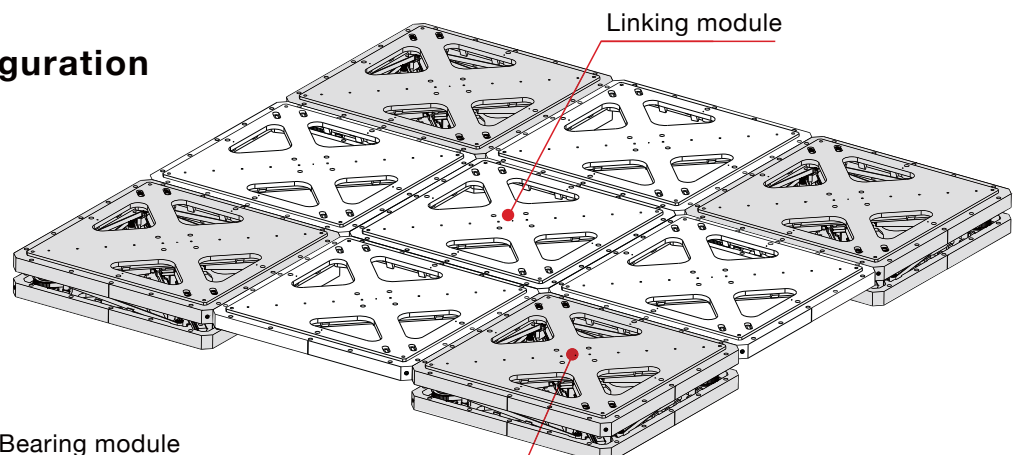
Linking module



- Connects bearing modules.

Module Sample configuration

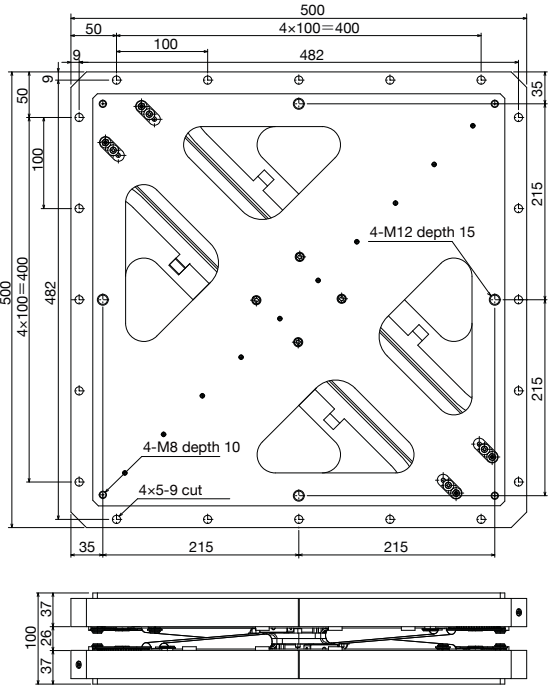
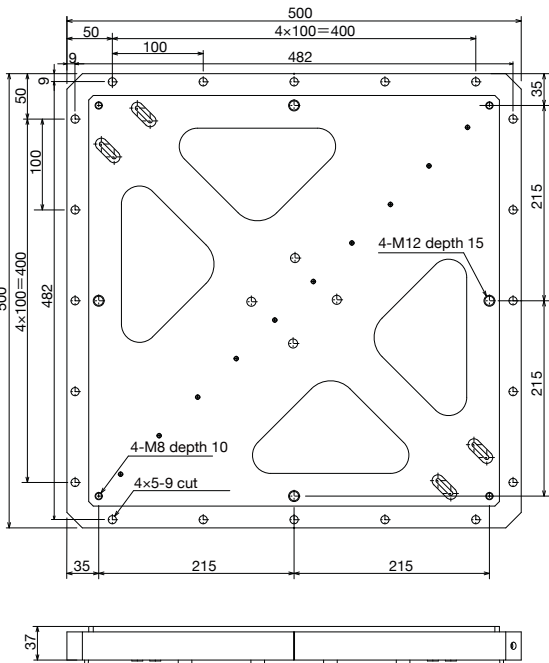
Easy to connect. Surface structure ensures high rigidity.



Bearing module

Linking module

Dimensions

Type	Bearing module	Linking module
Dimensions		
	500mm (w) × 500mm (d) × 100mm (h)	500mm (w) × 500mm (d) × 37mm (h)
Maximum displacement	±250mm	—
Load weight	750 kgf per module, maximum	—
Orientation	Horizontal	
Module weight	approx. 19kg	approx. 9kg

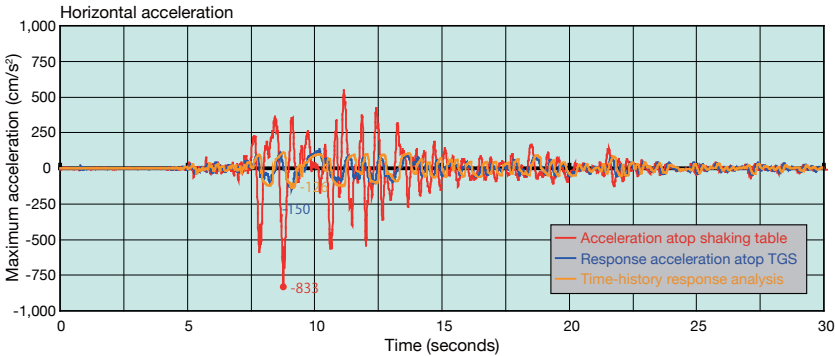
Large-scale shaking table test

For the test the Great Hanshin Earthquake seismic wave was replicated. Shaking was reduced to about one-sixth of input.

Horizontal acceleration

833 cm/s² → 150 cm/s² (about one-sixth of input)

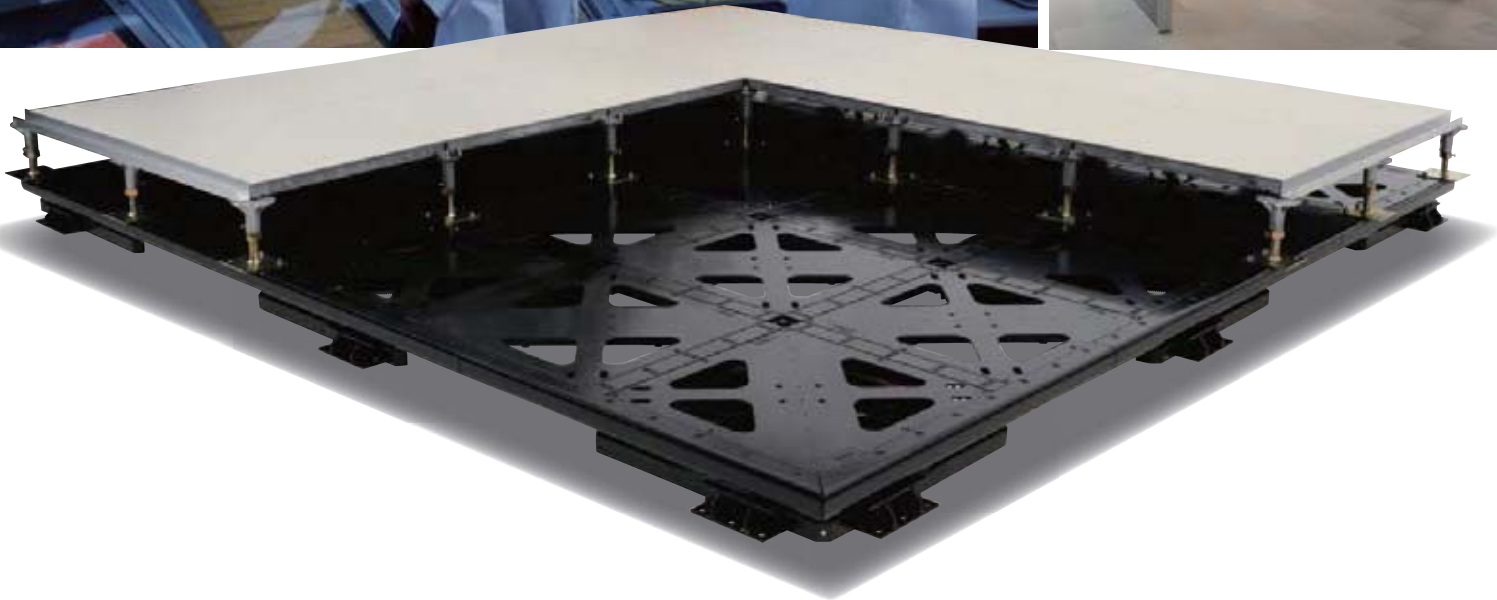
Earthquake	Measuring point	Max. acceleration (cm/s ²)	
		North-south	Up-down
	Top of shaking table	833	400
Great Hanshin Earthquake, Jan. 17, 1995, as recorded at the JMA Kobe	TGS surface	Test	150
		Analysis	126



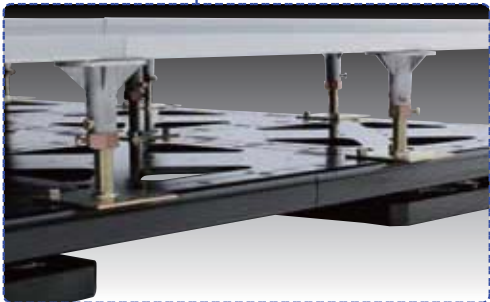
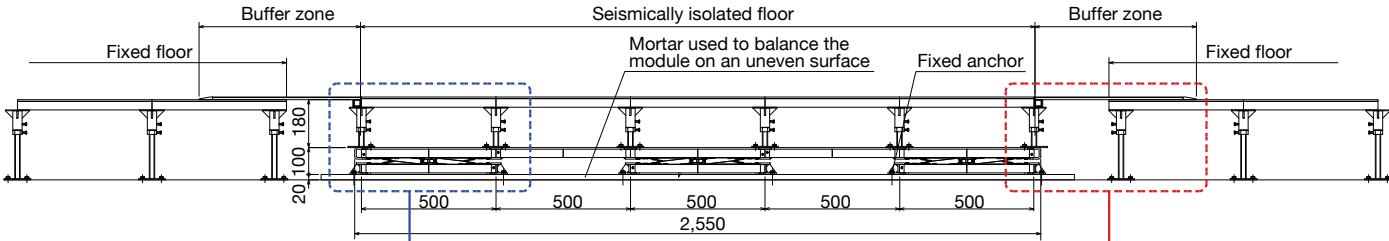
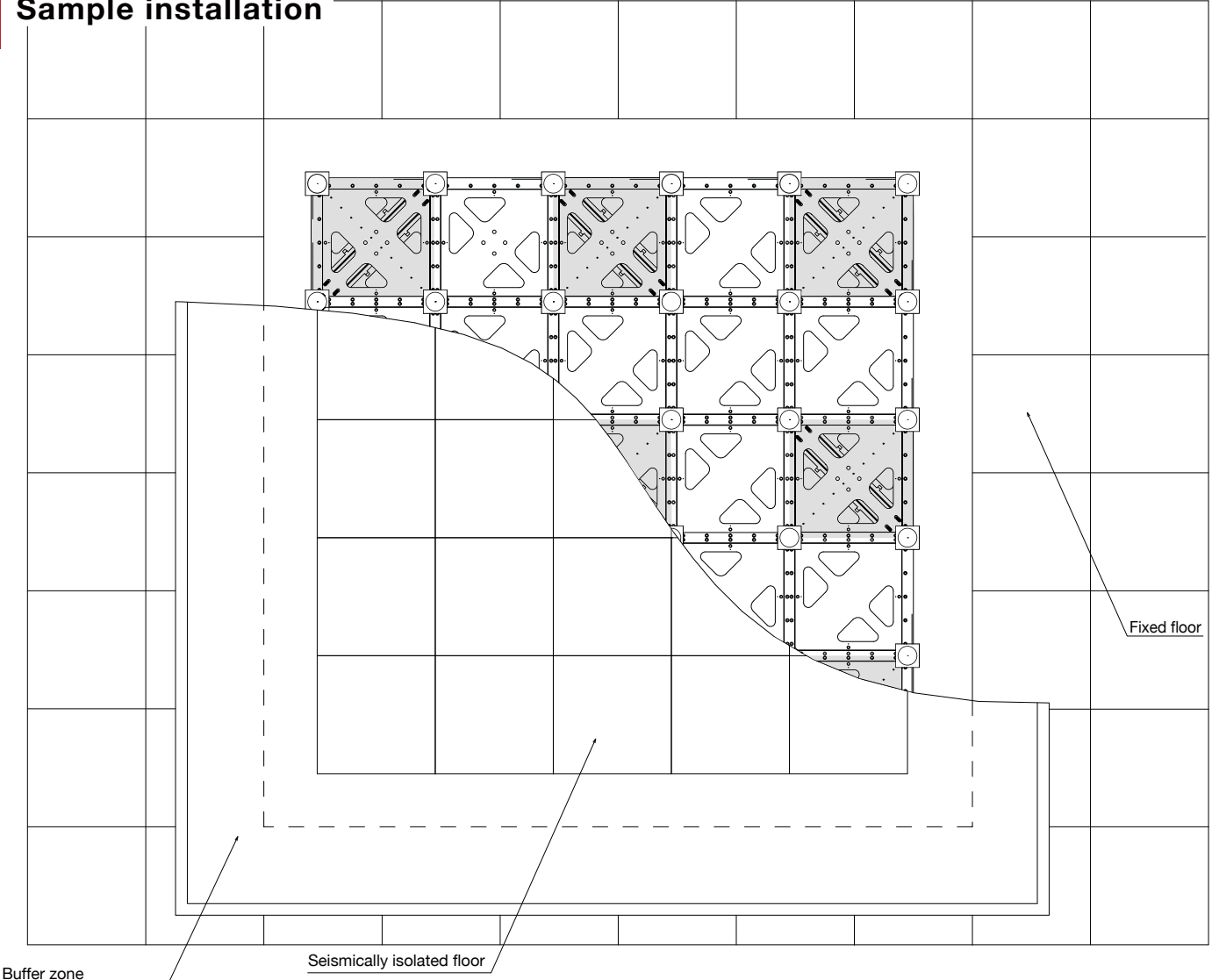
Testing agency: Urban & Housing Technology Research Institute, Urban Renaissance Agency.

Seismic isolation for the entire floor

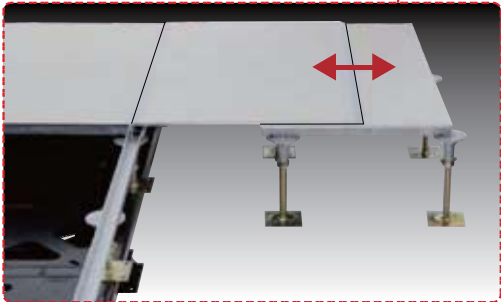
Scenarios for seismically isolated floors



Sample installation



Wiring space



Buffer zone

Seismic isolation just where it's needed

Seismically isolated server computers at fire department headquarters



TGS modules



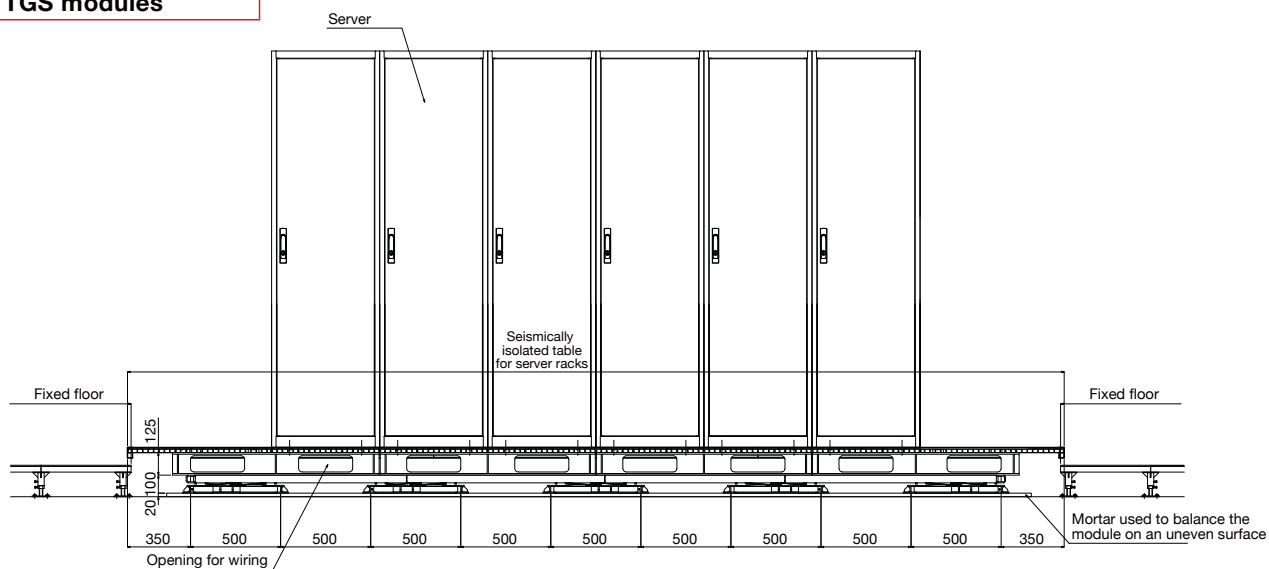
9 pairs of TGS modules



Steel plate mounted on steel frame (optional)



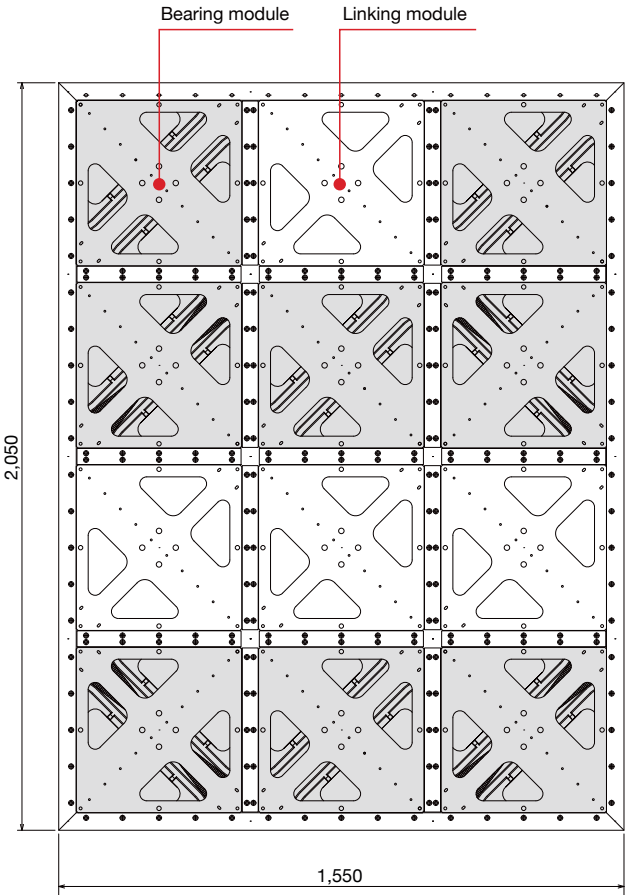
Complete setup



Seismically isolated semiconductor manufacturing equipment



Semiconductor manufacturing device
Weight: 2 tons



TGS module configuration

TGS modules



TGS: 12-module configuration (3 x 4)

THK Seismic Isolation Module Model TGS

Safety precautions

Use of Seismic Isolation Modules

- Please read the instruction manual carefully before using the Seismic Isolation Module.
- Do not dismantle or attempt to modify the Seismic Isolation Module. Any such action could cause the product to malfunction.
- Seismic Isolation Modules are designed for indoor use only.

Setup

- To prevent the possibility of injury during an earthquake, make sure there are no objects within the product's range of motion (the maximum displacement stated in the catalog) and that all personnel stay clear as well.
- To ensure proper performance, make sure the load is within the weight range stated in the catalog. Do not load the product with any object that has a high center of gravity or that would topple if pushed.
- For proper seismic isolation, the product must be placed on a level, even surface; placement on a slanted or uneven surface could cause misalignment, undue strain or irregular movement. When dealing with slanted or uneven surfaces, please obtain professional assistance or consult your local distributor.

In the event of an earthquake

- If a seismic tremor occurs, move away from Seismic Isolation Modules immediately to prevent any possibility of injury through accidental contact with a moving module.
- If an earthquake of intensity-level 6 or greater (on the Japanese scale) occurs, review the post-setup checklist in the instruction manual following the earthquake and follow the directions provided.

Warranty

- (1) This product is designed to attenuate horizontal seismic motion; it is not intended to be effective against vertical seismic motion. This product will reduce the effect of tremors on an object loaded onto it, but there is no guarantee that the object will not move or topple.
- (2) In the event of seismic motion stronger than this product is designed to absorb, the modules can be expected to strike the stopper, exerting an impact on any object atop the modules.

Warranty period

The warranty period is one year from the date of delivery.

Scope of warranty

This warranty covers repairs to or replacement of a Seismic Isolation Module. It does not cover accidental damage, loss of business profits, interruption of business activities, loss or alteration of data, or the like, arising from the use of this product or due to the product being out of service.

Disclaimer

THK is not liable for any Seismic Isolation Module malfunction arising from any of the following:

- Tsunami, lightning, flooding, fire, or another such accident or disaster.
- Damage to or collapse of a building due to an earthquake.
- Damage caused by the actions of a third party, intentional or unintentional misuse of the product by the customer, or use of the product under abnormal conditions.
- Loading of an object that is not within the load weight range stated in the product specifications.
- Seismic input exceeding the product capacity stated in the specifications or input exceeding the maximum displacement stated in the specifications.
- Damage to an object located within range of maximum displacement or caused by the presence of an object that obstructs the product's movement.
- Loading of an object that does not conform to the stated restrictions concerning loads.
- Placement or setup of a Seismic Isolation Module other than in conformity with the instructions for correct placement and setup set forth in the instruction manual.

● LM Guide, Ball Retainer, and are registered trademarks of THK CO., LTD.

- Discrepancies may exist between photographic representations of products and the products themselves.
- Modifications may be made, without prior notice, to a product's appearance and specifications; please consult THK before using the product.
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