The Japan Society of Seismic Isolation

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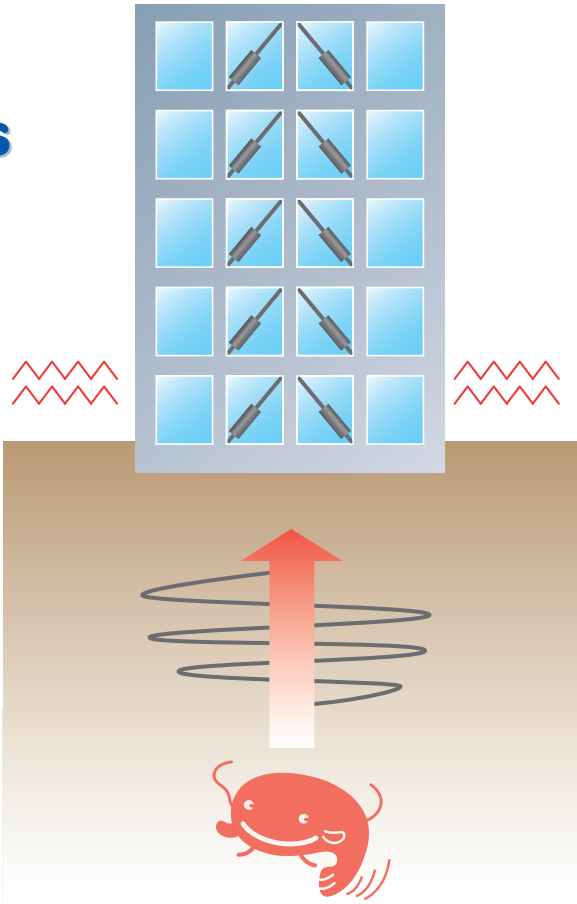
Vibration Control

Vibration Control

to Protect Buildings from Earthquakes



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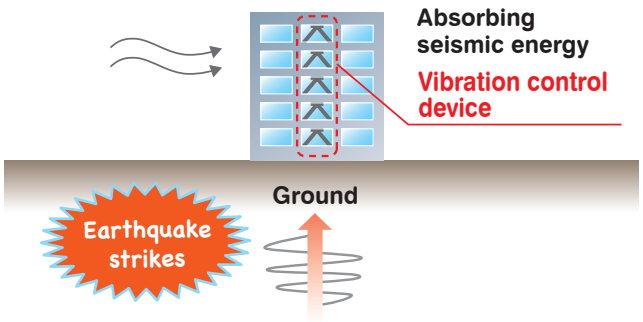
What is Vibration Control?

Protecting lives and property from earthquakes

Mechanism of a Vibration-Control Building

Vibration control is a method of protecting buildings from major earthquakes.
"Vibration control devices" are installed in a building to reduce the shaking of the building.
How much an earthquake shakes a building depends on the energy of the earthquake.
In an ordinary building, the energy of an earthquake is transmitted directly to the building, causing it to sway significantly. Absorbing some of the energy of an earthquake, which reduces the shaking of the building.
A building installed vibration control devices is called a "vibration control building".



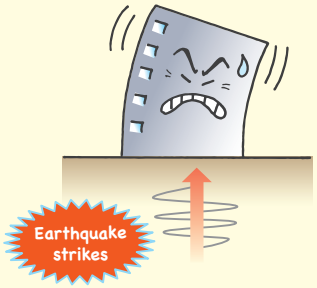
Vibration control is used in a wide range of applications from residential to high-rise buildings.

It is sometimes adopted to cope with wind vibration.

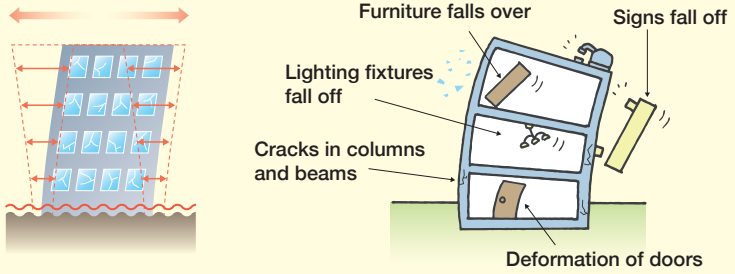
How Buildings Shake During Earthquakes

Conventional Building

The shaking of an earthquake is transmitted directly to the building.



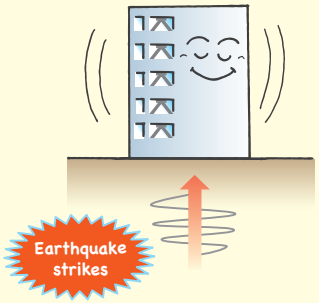
Shaking violently when an earthquake strikes



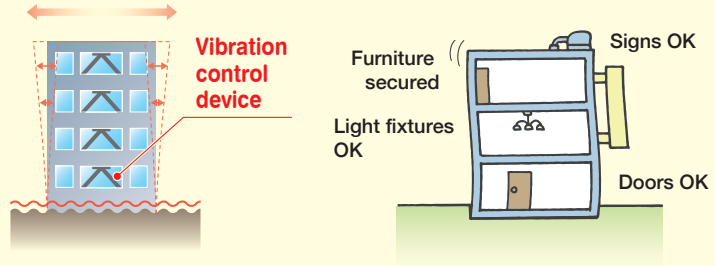
Buildings shake violently, causing furniture and other objects to fall over and possibly endangering people's lives.

Vibration Control Building

Reduces seismic swaying



Less swaying compared to conventional buildings



Vibration control devices absorb part of the energy of an earthquake, reducing the amount of shaking transmitted to the building and making it more difficult for furniture and other objects to fall over.

Functions of Vibration Control Devices

Family of Vibration Control Devices and Types of Installation

Metal-based Vibration Control Devices

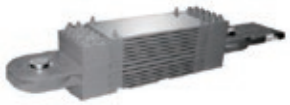
As the metal deforms, it absorbs and dissipates seismic energy by converting it into heat energy, thereby reducing building sway.

Liquid-based Vibration Control Devices

Oil or other viscous materials injected into the device resist flow and absorb and dissipate seismic energy by converting it into thermal energy, thereby reducing building sway.

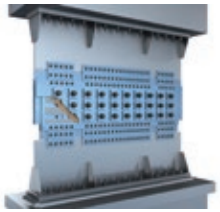
Vibration Control Devices Using Soft Materials

By installing soft materials such as rubber inside the vibration control device, the soft materials deform greatly during an earthquake, absorbing and dissipating seismic energy by converting it into heat energy, thereby reducing building shaking.



Friction-based Vibration Control Device

Friction materials such as metal and sliding materials are tightened together to reduce building sway by absorbing and dissipating seismic energy by converting it into thermal energy through the frictional force generated when the materials move.



Brace type

Wall type

Stud type

Vibration control devices are sometimes added as seismic reinforcement.