SINOTECH Fluid Viscous Dampers offer comprehensive protection to both new and existing structures against earthquakes and wind, all while minimizing the introduction of substantial additional structural stiffness.

Device Features

How Our Fluid Viscous Damper Works

At the core of our technology lies the fluid viscous damper, a sophisticated device designed to dissipate kinetic energy and reduce vibration. Its seamless construction features a specialized piston within an oil cylinder. In the event of an earthquake, the piston within our fluid viscous damper swings into action, converting the building's movement into thermal energy. This process significantly diminishes the forces transmitted through the structure, thereby lessening the potential for damage and improving the building's seismic resilience.

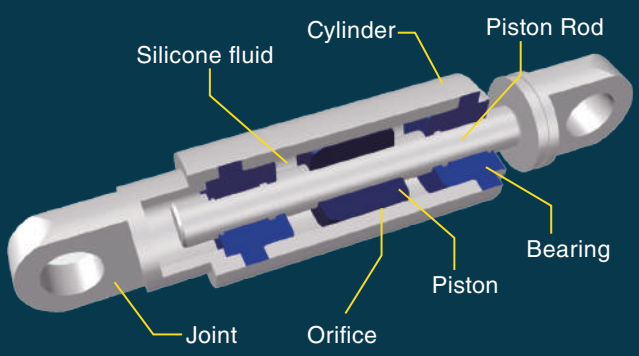
The output force of FVD can be evaluated using the following equation:

$$F=C \cdot V^{\alpha}$$

F : Output force
C : Damping coefficient
V : Relative Velocity across the damper
α : Constant exponent

Our fluid viscous dampers are designed with unique properties that enhance building safety:

- They're non-rigid, meaning they don't alter the natural period of the structures.
- Their damping forces are synchronized with velocity and offset by 90 degrees from displacement, providing optimal energy dissipation.
- The key to their performance lies in their customizable C and α values, allowing for superior nonlinear energy dissipation when α is less than 1, even with consistent design damping forces.



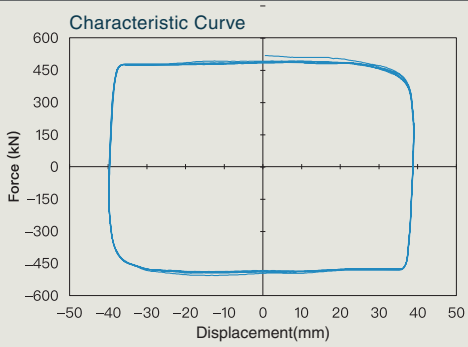
Key Advantages of our Fluid Viscous Damper

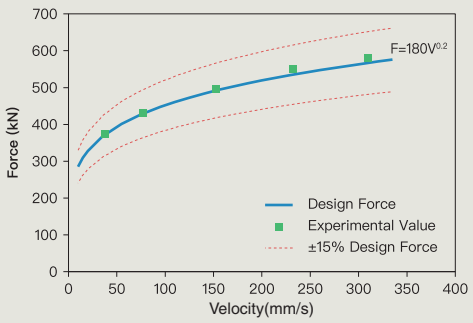
- **Superior Performance:** Our dampers are precision-engineered to surpass design expectations, achieving consistency well beyond industry standards.
- **Unmatched Durability:** Crafted with exceptional quality, our dampers require no maintenance throughout their extensive lifespan.
- **Effective Vibration Control:** Our dampers can be installed easily, they swiftly enhance structural damping, ensuring immediate seismic and vibrational mitigation.
- **Simplified Analysis:** With a well-defined dynamic damping force equation, our products streamline the process of dynamic simulation and analysis.

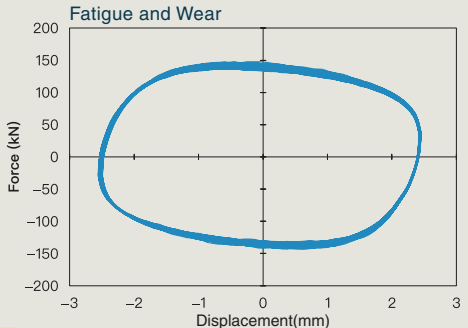
Precision-Engineered Damping Solutions

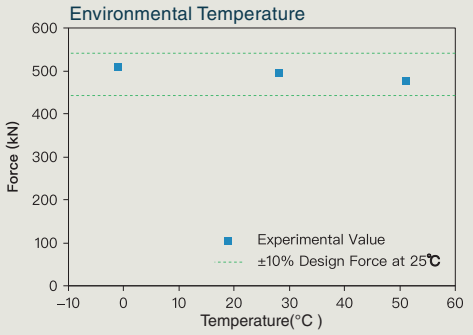
Certified Excellence: Each series of SINOTECH Fluid Viscous Dampers (FVD) undergoes stringent testing. We select a representative sample from every series for validation by TAF-accredited laboratories, ensuring consistent quality and performance across our entire product line.

Unmatched Reliability: We stand confidently behind our product. Each SINOTECH FVD is backed by an extensive 15-year warranty, offering peace of mind and assurance of long-term reliability.

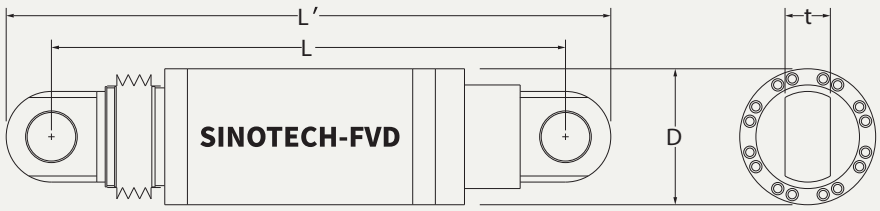








Spec Sheet



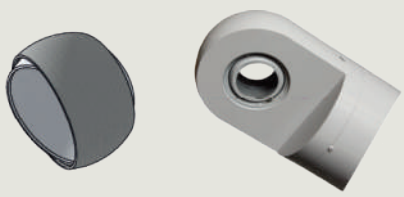
Type	Force (kN)	Stroke (mm)	L (mm)	L' (mm)	D (mm)	t (mm)	PINΦ (mm)
SFVD0600S0080	600	±40	740	L+150	206	80	60
SFVD0600S0100		±50	790				
SFVD0600S0120		±60	840				
SFVD0600S0140		±70	890				
SFVD0600S0160		±80	940				
SFVD0800S0100	800	±50	860	L+170	246	90	70
SFVD0800S0120		±60	910				
SFVD0800S0140		±70	960				
SFVD0800S0160		±80	1010				
SFVD0800S0180		±90	1060				
SFVD0800S0200		±100	1110				
SFVD1000S0100	1000	±50	920	L+190	266	100	80
SFVD1000S0120		±60	970				
SFVD1000S0140		±70	1020				
SFVD1000S0160		±80	1070				
SFVD1000S0180		±90	1120				
SFVD1000S0200		±100	1170				
SFVD1500S0120	1500	±60	1130	L+240	326	120	100
SFVD1500S0140		±70	1180				
SFVD1500S0160		±80	1230				
SFVD1500S0180		±90	1280				
SFVD1500S0200		±100	1330				
SFVD1500S0220		±110	1380				
SFVD1500S0240		±120	1430				
SFVD2000S0120	2000	±60	1230	L+260	366	130	110
SFVD2000S0140		±70	1280				
SFVD2000S0160		±80	1330				
SFVD2000S0180		±90	1380				
SFVD2000S0200		±100	1430				
SFVD2000S0220		±110	1480				
SFVD2000S0240		±120	1530				

Please contact us for customizable specifications

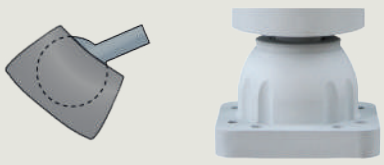
How to install our Fluid Viscous Damper

Type of FVD connections

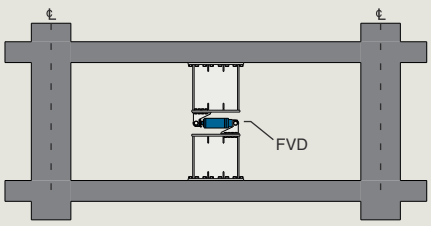
- Spherical Bearing Joint- cost-effective

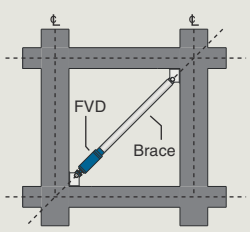


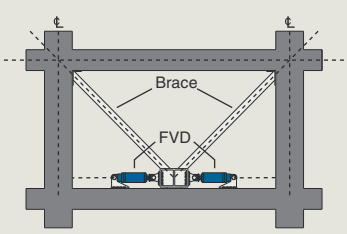
- Ball Joint- responsive



Typical layout for FVDs





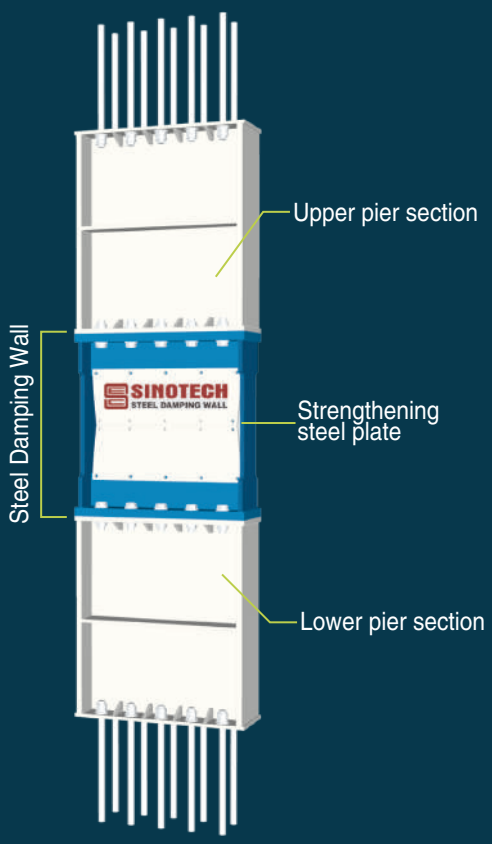


SINOTECH ENGINEERING CONSULTANTS, INC.

SDW
STEEL DAMPING WALL

SINOTECH Inc.'s Steel Damping Wall (SDW) offers supplementary structural stiffness and ductility. Ensuring controllable story displacement during minor earthquakes, while incorporating metal yielding to enhance structural damping ratio, thereby absorbing seismic energy during major earthquakes.

Device Features



Mechanism

The Steel Damping Wall is a displacement-type seismic energy dissipation device. Its fundamental principle leverages the stress-strain behavior inherent in the steel plate material to provide additional stiffness and damping ratio to the structure. Carefully designed, this product exhibits the following characteristics primarily when in operation:

Small Displacement / Minor Earthquake:
The Steel Damping Wall, yet to yield, provides additional stiffness and strength to the structure based on Hooke's Law in its dynamic behavior. This effectively suppresses the overall structural displacement, reducing the probability of cracking and the need for renovations

Large Displacement / Major Earthquake:
The core steel plate of the Steel Damping Wall undergoes full-section plastic yield, utilizing the post-yield plastic hysteresis behavior to dissipate seismic energy, ensuring the safety of both the building and occupants.

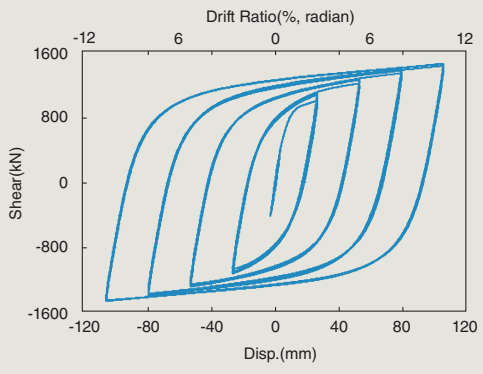
Product Highlights

- High Performance : The unique design incorporates an energy dissipation mechanism,designed through theoretical analysis and verified by testing, to meet real-world requirements. The products have been tested by certified laboratories.
- High Stability : Job variability is below the specification requirements due to the stabilized manufacturing process and outstanding assembly quality.
- High Cost-Effectiveness : With optimized process and easy product installation, the application cost are low, resulting in overall high efficiency.
- High Safety : Designed with multiple energy-dissipating unit and non-immediate destruction mode, to extend the post-seismic repair and replacement time.

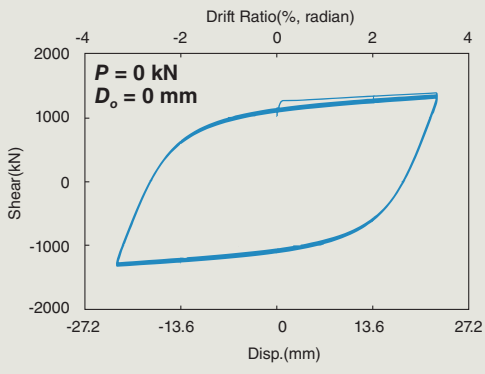
Experimental Performance

Steel Damping Wall has passed certification examinations conducted by accredited laboratories, ensuring that the product quality meets specification and design requirements.

Experiment of Steel Damping Wall
(National Center for Research on Earthquake Engineering)



The shear-displacement relationship diagram under the first stage testing for the specimen



The shear-displacement relationship diagram under the fatigue stage testing for the specimen

Customized Specifications

Project Customization

We offer customized services to meet the varied demands of different structural design projects for improved stiffness and ductility. In our approach, we tailor products to the specific needs of each customer's project, considering seismic requirements such as effective output, displacement, and any equipment size limitations.

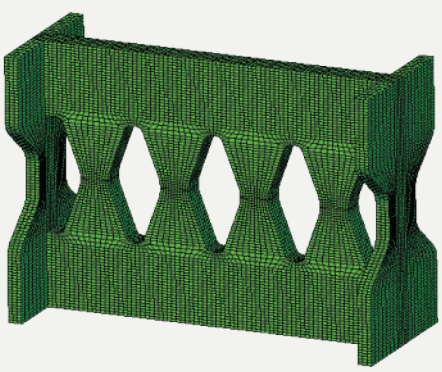
Please contact us for more details on customization services.

Customized Steel Damping Wall site construction

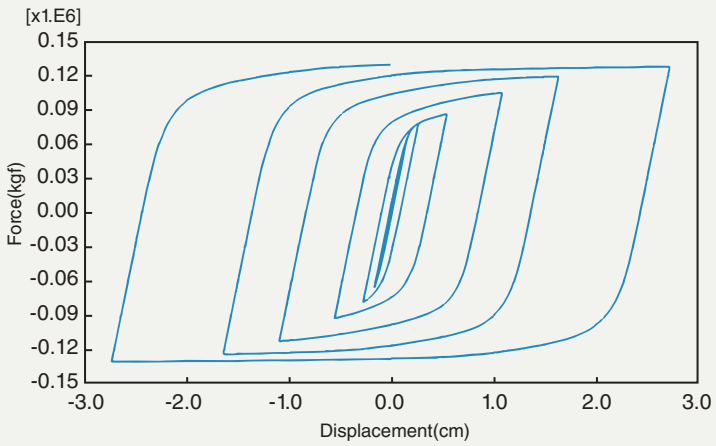
Steel Damping Wall(front)

Design Method

SINOTECH Inc.'s development team designed the core steel plate and the strengthening steel plate according to customized order requirements. The Steel Damping Wall mechanical behavior has been precisely understood through the utilization of energy-dissipating plate design technology and finite element analysis model. This ensures the optimal effectiveness of energy dissipation by the customized Steel Damping Wall.



Finite element analysis model



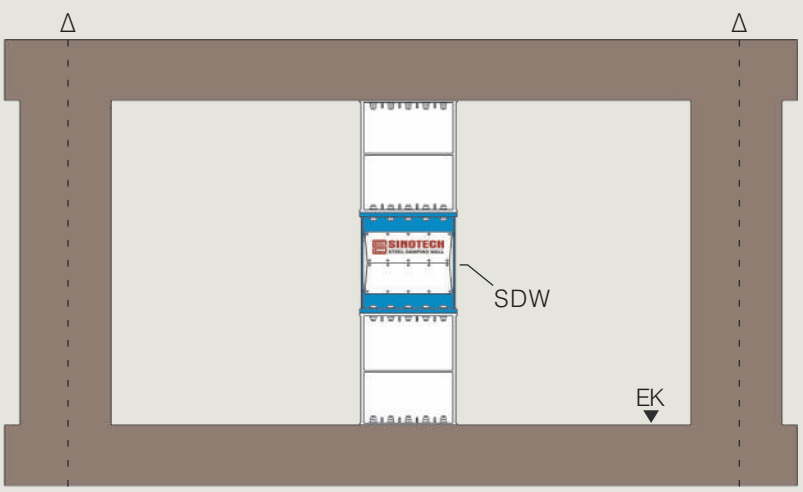
Mechanism behavior analysis result of Steel Damping Wall

Product Arrangement

The customization outcome of the Steel Damping Wall product is as shown above. For actual installation, it is necessary to additionally consider the design of the upper and lower pier to ensure the optimal performance of the product.

For the product installation, it is recommended to adopt a supplemental column configuration. The choice of pier type, such as steel structure or reinforced concrete structure, can be based on the specific project construction requirements. Please refer to the illustration for installation guidance.

The overall impact of the Steel Damping Wall on space is minimal. If coordinated with interior decoration efforts, it can also be concealed within the building partitions.



Supplemental column configuration of steel damping wall

SINOTECH ENGINEERING CONSULTANTS, INC.

SDB
STEEL DAMPING BRACE

SINOTECH Inc.'s Steel Damping Brace (SDB) is a structural anti-seismic and energy dissipation component. It can effectively dissipate seismic energy, reduce displacement, and minimize seismic forces. Sinotech SDB also possesses high stiffness, high ductility, and excellent dissipation performance characteristics.

Device Features

Mechanism

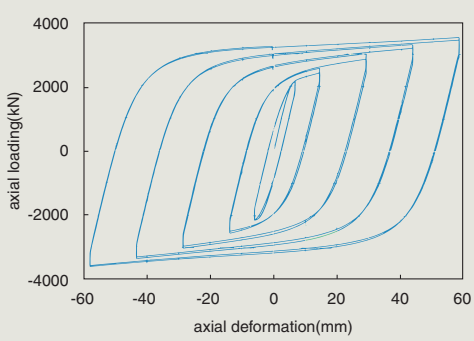
The Steel Damping Brace restricts inter-story displacement and axial deformation of brace caused by earthquakes to concentrate on the "energy-dissipating gusset plate" enabling the gusset plate to yield and dissipate seismic energy through its strain capacity, while the brace section's buckling-restrained behavior is well-considered.

Product Highlights

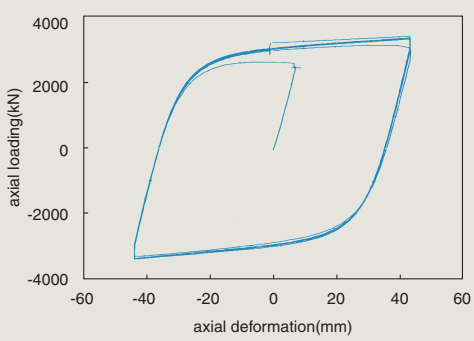
- **Easy to install** : The structural strength design and construction method are the same as traditional concentric braces, ensuring easy installation.
- **Customization** : The energy-dissipating core section undergoes special design, allowing for precise strength control and easy adjustment, facilitating alignment with design requirements.
- **Stabilization** : Sinotech SDB exhibits ductility during severe seismic damage, directing plastic deformation to the energy-dissipating core section to protect the main components and maintain overall structural stability.
- **Safety** : Designed with multiple energy-dissipating units, it avoids instantaneous failure, allowing for a shorter replacement time after a severe earthquake.
- **Technology** : Monitoring devices can be utilized to track the SDB status and evaluate the necessity of maintenance after a severe earthquake.

Experimental Performance

The Steel Damping Brace had passed performance experiment in qualified laboratories, ensuring that the quality meets specified standards and design requirements.



Hysteresis loop of the standard loading process



Hysteresis loop of the fatigue loading process (1.5Δbm@10cycle)

The experiment of SDB
(Architecture and Building Research Institute, Ministry of the Interior)

Customized Specifications

Project Customization

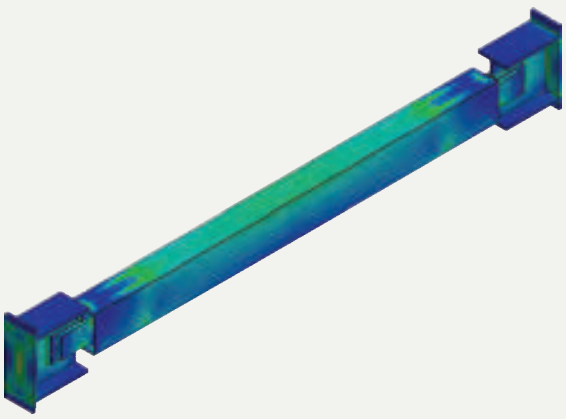
We offer customized service to meet the stiffness and ductility requirement in various structural projects. We provide customized products based on the case requirements, including force, displacement, and equipment size.

Please contact us for more details on customization services.

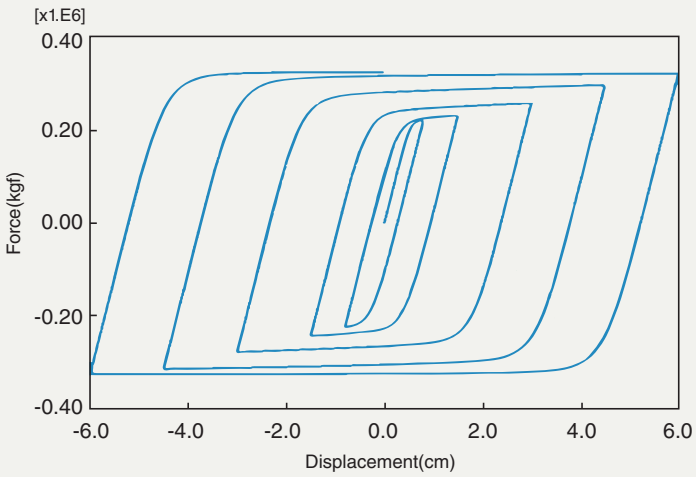
Customization Case of SDB

Design Method

SINOTECH Inc.'s development team designed the core energy-dissipating core section and brace elements by utilizing finite element analysis of steel plastic behavior on the gusset plate to meet customized project requirements which guarantees the energy-dissipating performance.



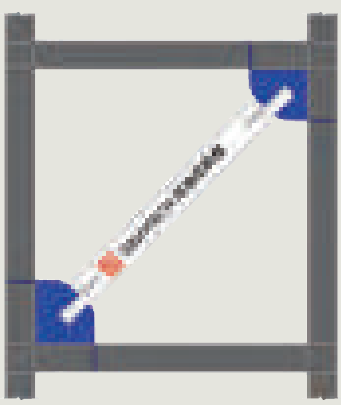
Finite Element Analysis Model



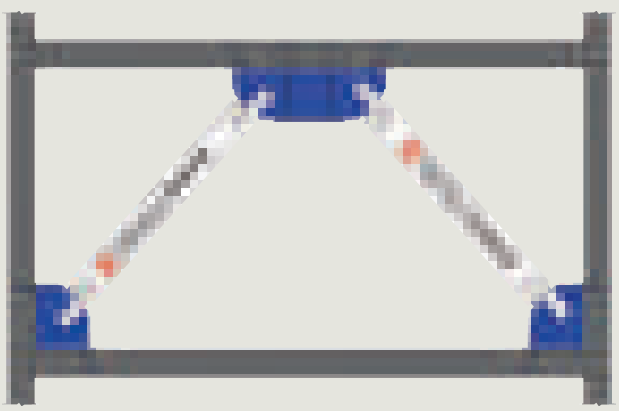
The Mechanical Analysis Results of Energy-Dissipating Braces

Product Arrangement

The Steel Damping Brace can be categorized into single bracing and double bracing, as shown in the figure below. The optimal configuration can be selected based on the environment, and the braces can be installed on the steel frame through either welding or bolting methods.



Single Brace Type



Double Brace Type