

# GENIEMAT<sup>®</sup> GBV

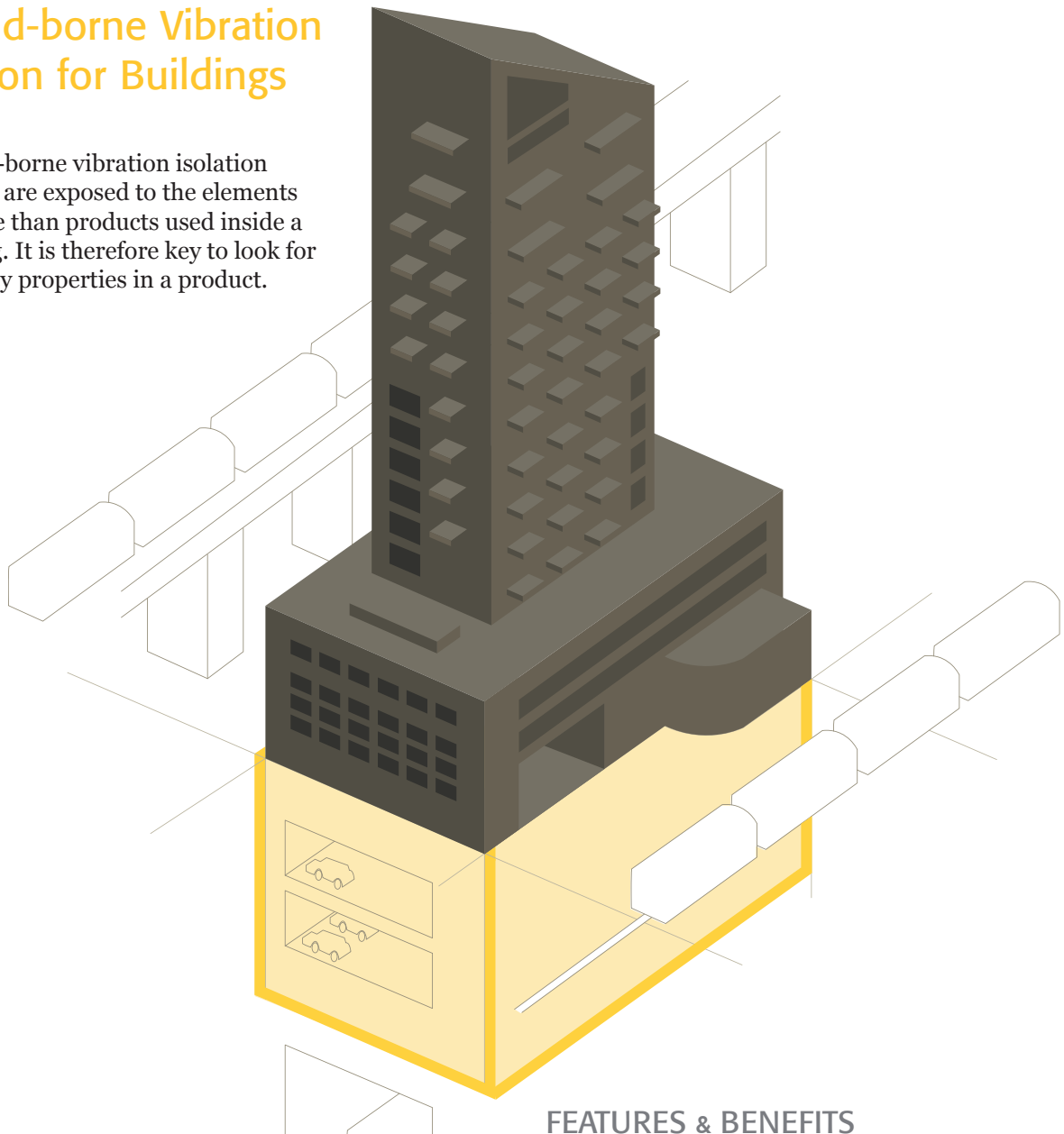
GROUND-BORNE VIBRATION  
ISOLATION FOR BUILDINGS



# GENIEMAT<sup>®</sup> GBV

## Ground-borne Vibration Isolation for Buildings

Ground-borne vibration isolation systems are exposed to the elements far more than products used inside a building. It is therefore key to look for some key properties in a product.

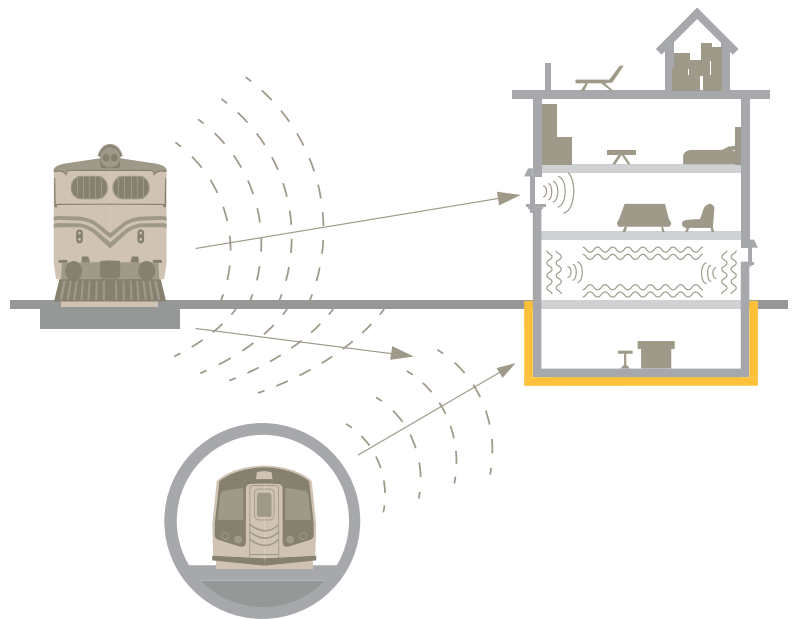


### FEATURES & BENEFITS

- Dynamically soft for excellent vibration isolation
- Mold, bacteria, fungi, and water resistant
- No potential mold-producing fiberglass
- Will not break down or move under load
- Easy to install

# GROUND-BORNE VIBRATION ISOLATION FOR BUILDINGS

As cities continue to grow exponentially, the ability to successfully develop adjacent to rail infrastructure has become project critical. Depending on the construction and use type of the building, these sensitive adjacencies open a potential avenue for increased tenant turnover. Since every building is unique, it is necessary to engage expert acoustic consultants to design ground-borne vibration isolation systems using **Pliteq's GenieMat GBV**.



## DOES MY BUILDING NEED GROUND-BORNE VIBRATION IMPACT ASSESSMENT?

The Federal Transit Administration's Transit Noise and Vibration Impact Assessment Manual requires engaging an expert acoustic consultant if your building meets the following proximity criteria:

Building Use Type	Screening Distance from Property Line*	
	Commuter Rail Road	LRT & Streetcars
Special-Use Facilities : Buildings sensitive to vibration which require special consideration. Examples: concert halls, theaters, TV & recording studios.	Special care required on a case by case basis.	
High Sensitivity: Buildings with machinery that is highly sensitive to vibration. Examples: research facilities, manufacturing facilities, hospitals.	183 metre	137 metre
Residential: All residential construction where people normally sleep. Examples: Apartments, condominiums, town homes, developments.	61 metre	46 metre
Institutional: Includes all institutions and offices where vibration can interfere with activity. Examples: schools, churches, offices.	37 metre	30 metre

\*These screening distances should identify the majority of potentially impacted buildings, however, areas with a history of problems with ground-borne vibration should increase the above distances by a factor of 1.5.

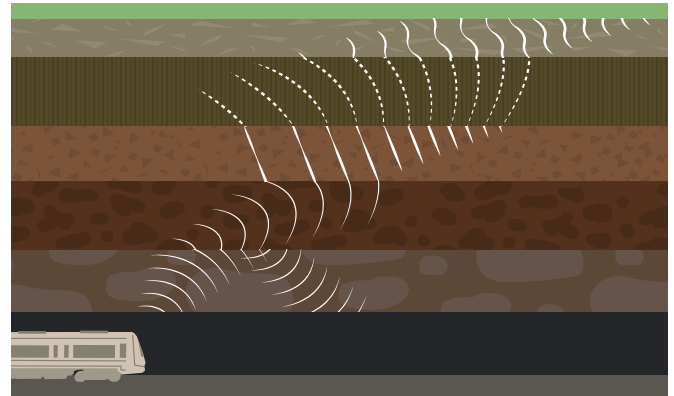
# OTHER FACTORS AFFECTING GROUND-BORNE VIBRATION TRANSMISSION

## SOIL & FOUNDATION TYPES

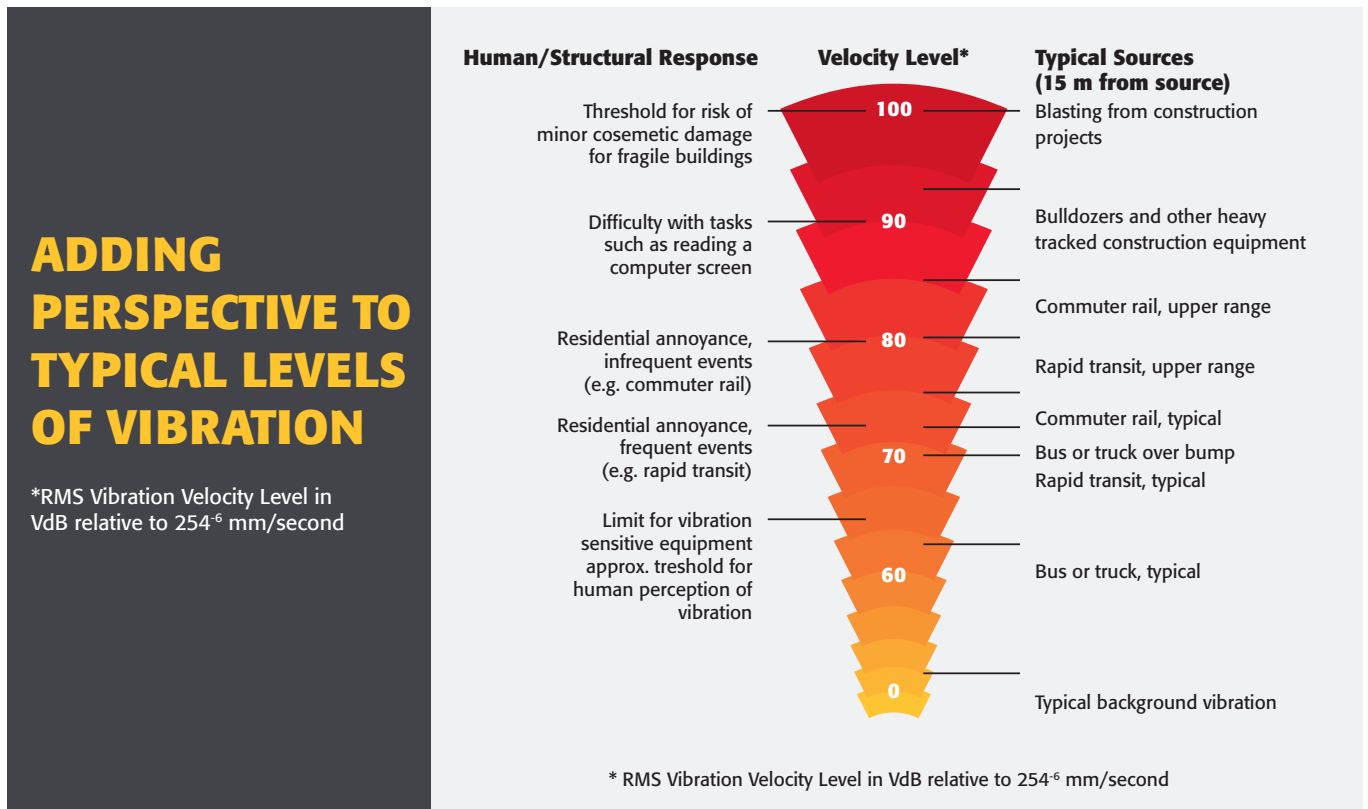
Geological conditions are important; the stiffer the soil, the higher the vibration levels. It is generally accepted that vibration levels are higher in stiff clay-type soils than in loose sandy soil. In this same manner, vibration levels do not attenuate as rapidly in rock as they do in soil.

## TYPES OF CONSTRUCTION:

Each building responds differently to vibration, but it is typical for lighter buildings to be most sensitive to ground-borne vibration. Each component in the building will have a resonant frequency at which the maximum vibration amplitudes occur.



**Figure 1:** The dynamic properties of differing layers of soil can have an impact on how vibration propagates from an underground source to a building.



**Figure 2:** Subjective vibration levels with context provided by the FTA’s transit Noise and Vibration Impact Assessment Manual.

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## Typical Construction Details for Ground-borne Vibration

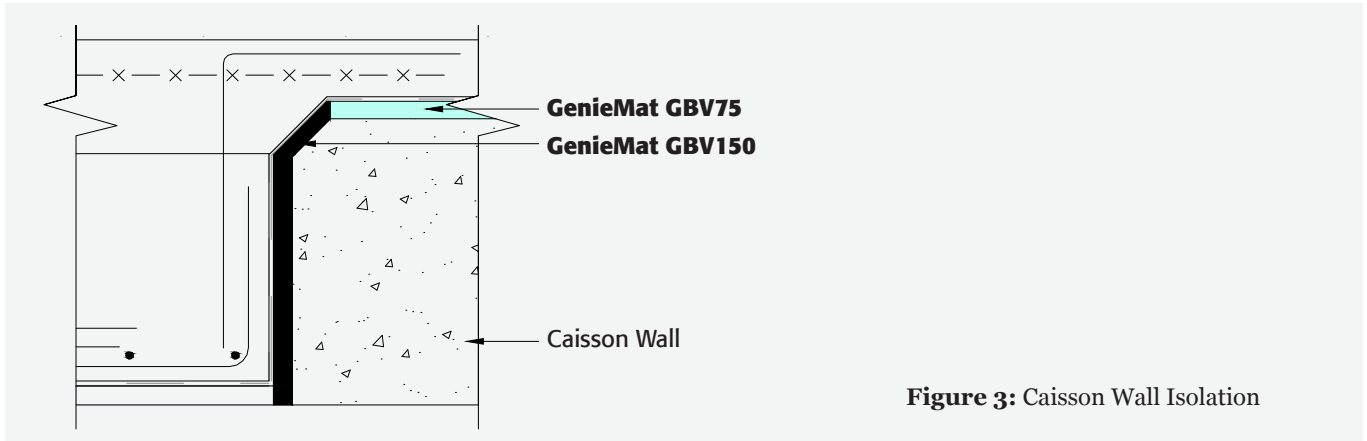


Figure 3: Caisson Wall Isolation

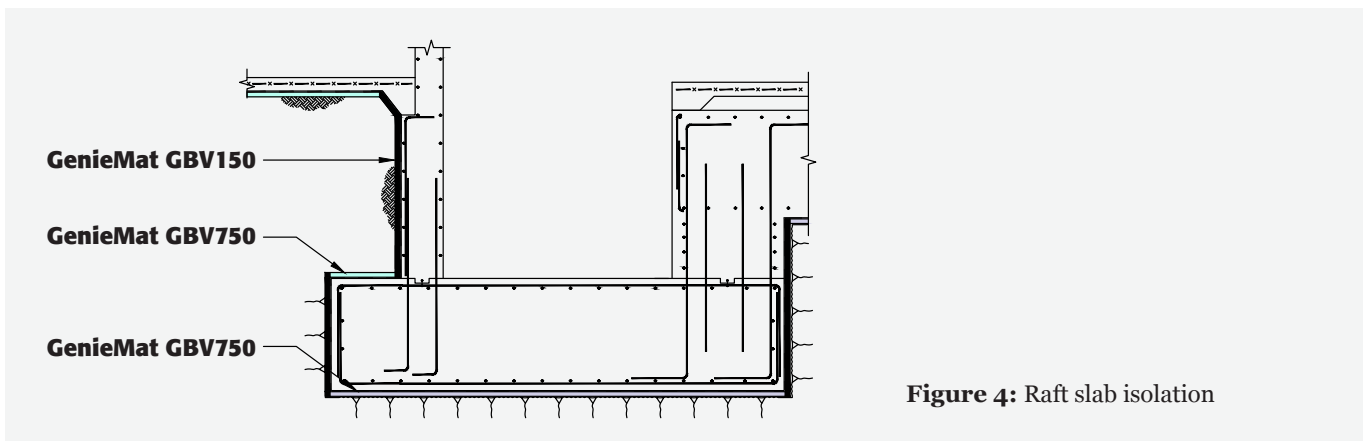


Figure 4: Raft slab isolation

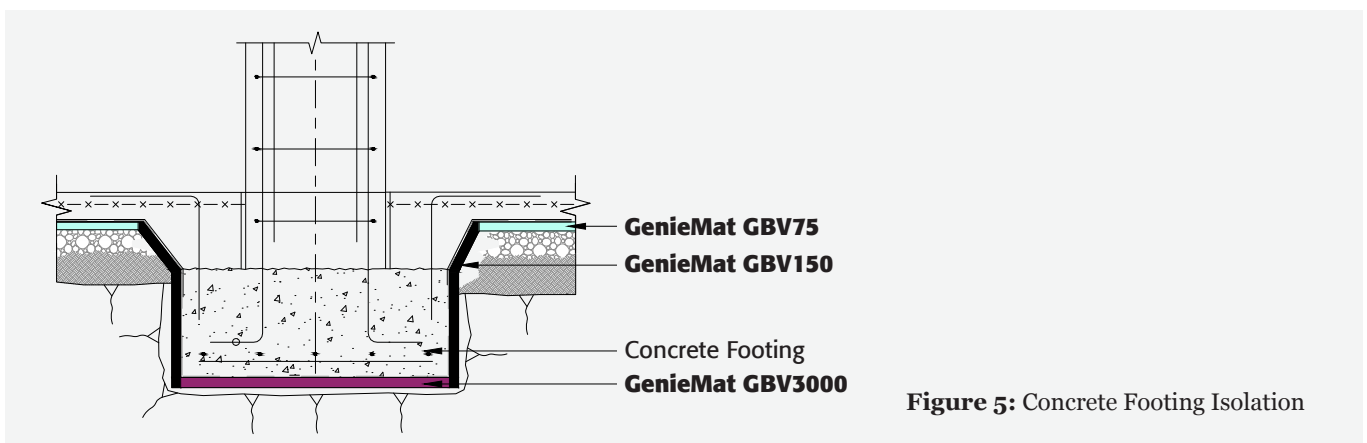


Figure 5: Concrete Footing Isolation

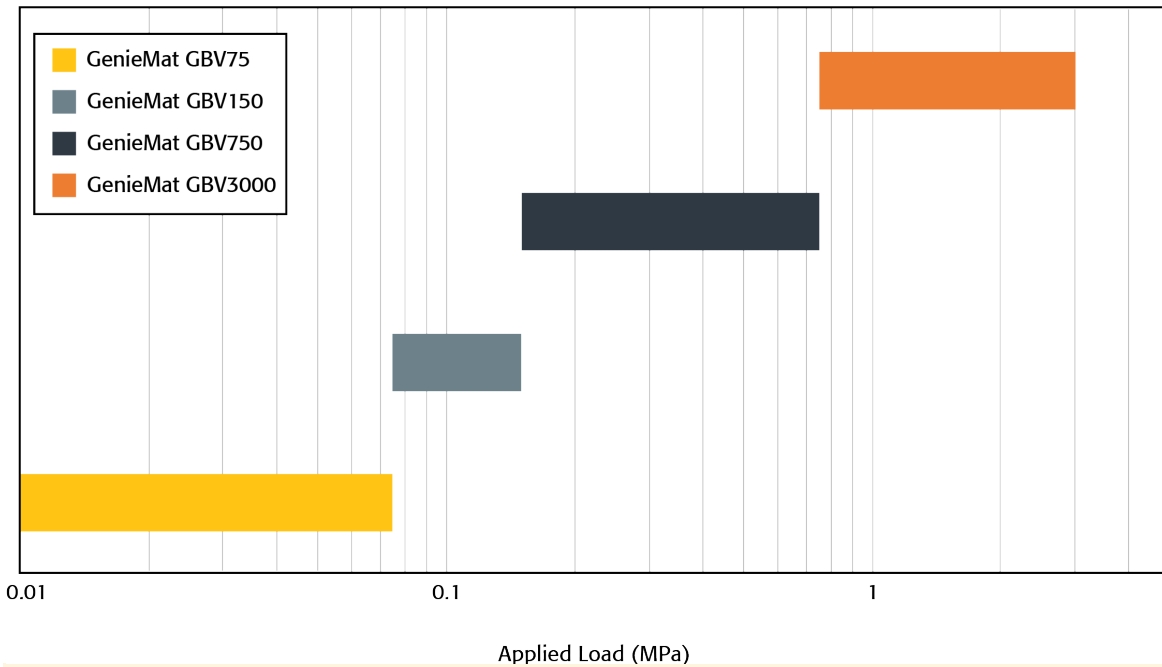
NOTE: Project conditions and loads will vary.

# GENIEMAT® GBV75

## Ground-Borne Vibration Isolation



### PRODUCT RANGE



### PRODUCT SPECIFICATIONS

<b>PRODUCT NAME</b>	GenieMat GBV75
<b>DESCRIPTION</b>	Dynamically soft rebonded-rubber material capable of withstanding high loads. Used in a variety of applications when superior vibration mitigation is required.
<b>THICKNESS</b>	50 mm (2 layers of 25 mm)
<b>OPERATING LOAD LIMIT</b>	Suitable for loads up to 75 kPa
<b>FEATURES &amp; BENEFITS</b>	<ul style="list-style-type: none"> <li>• Dynamically soft for excellent vibration isolation</li> <li>• Mold, bacteria, fungi, and water resistant</li> <li>• Resistant to long-term creep, deflects uniformly over time</li> <li>• Will not break down or move under load</li> <li>• Easy to install</li> </ul>
<b>DIMENSION</b>	Rolls: 1220 mm x 4575 mm (4' x 15')
<b>SHEET AREA</b>	5.56 m <sup>2</sup> (60 ft <sup>2</sup> )
<b>LEAD TIME</b>	4 weeks after receipt of order

# GENIEMAT® GBV75

## Ground-Borne Vibration Isolation



### TECHNICAL DATA

<b>OPERATING LOAD LIMIT</b>	Suitable for loads up to 75 kPa
<b>PEAK LOAD LIMIT (infrequent short term loads)</b>	500 kPa
<b>MECHANICAL LOSS FACTOR</b>	0.15*
<b>TEMPERATURE STABILITY</b>	-40°C to +80°C (-40°F to +176°F)
<b>THERMAL CONDUCTIVITY</b>	0.13 W/m °C
<b>R-VALUE @ 2"</b>	2.1 ft <sup>2</sup> h °F/Btu

### OPERATING LOAD DATA      0.05 MPa LOADING

<b>NATURAL FREQUENCY</b>	13 Hz
<b>30 Hz DYNAMIC MODULUS</b>	1.9 MPa

\* Load and frequency dependent

# GENIEMAT<sup>®</sup> GBV75

## Ground-Borne Vibration Isolation

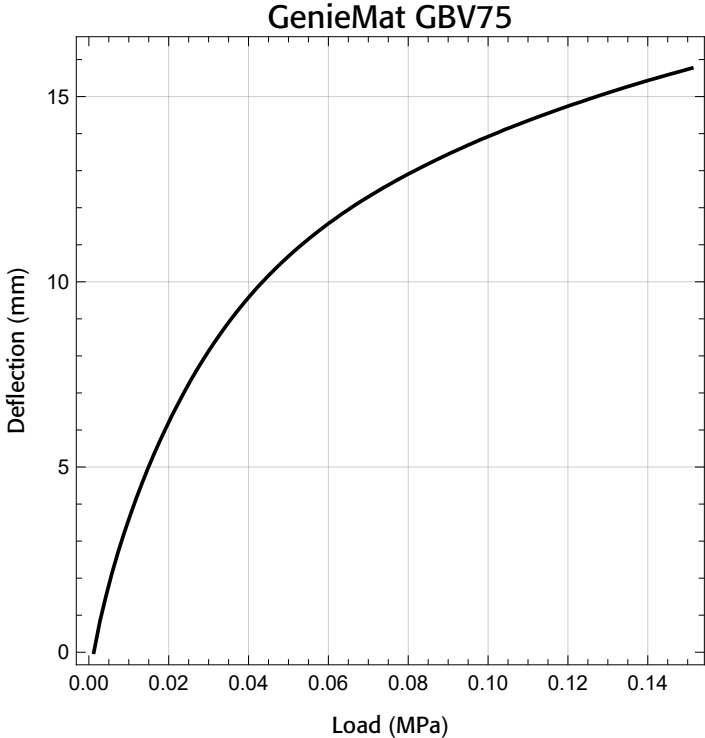


Fig. 1: Applied Load vs Deflection

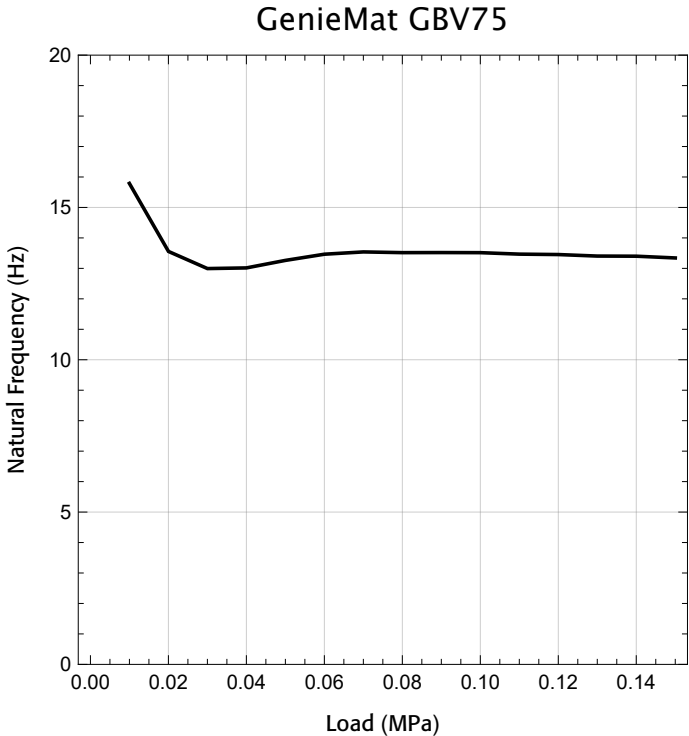


Fig. 2: Load vs Natural Frequency



# GENIEMAT® GBV75

## Ground-Borne Vibration Isolation

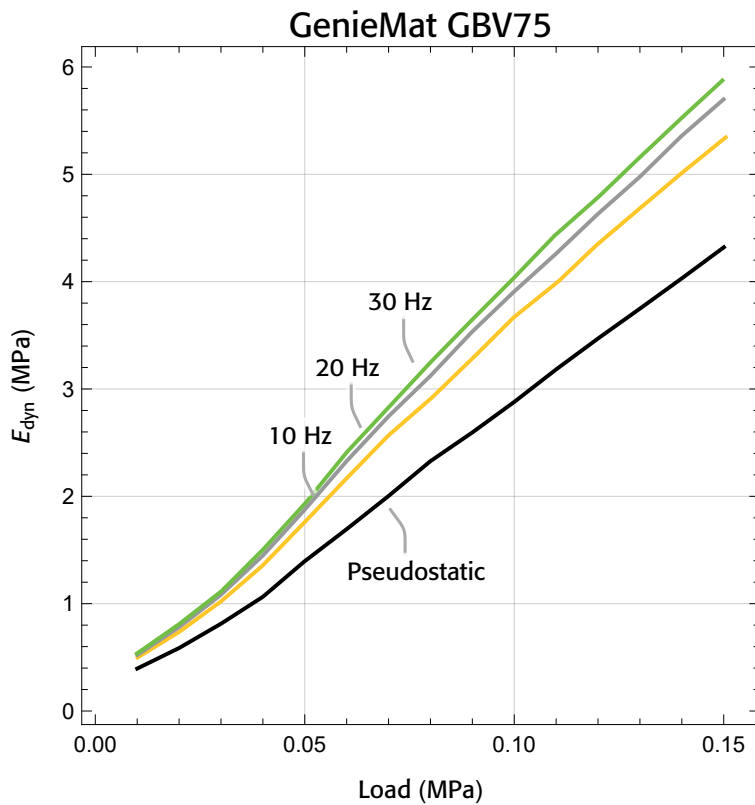


Fig. 3: Applied Load vs Dynamic Modulus

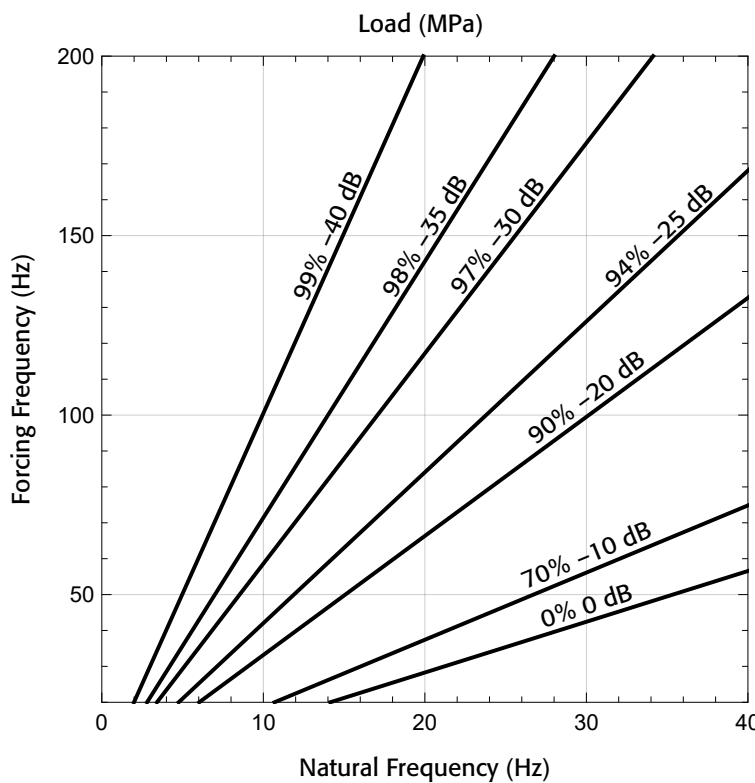


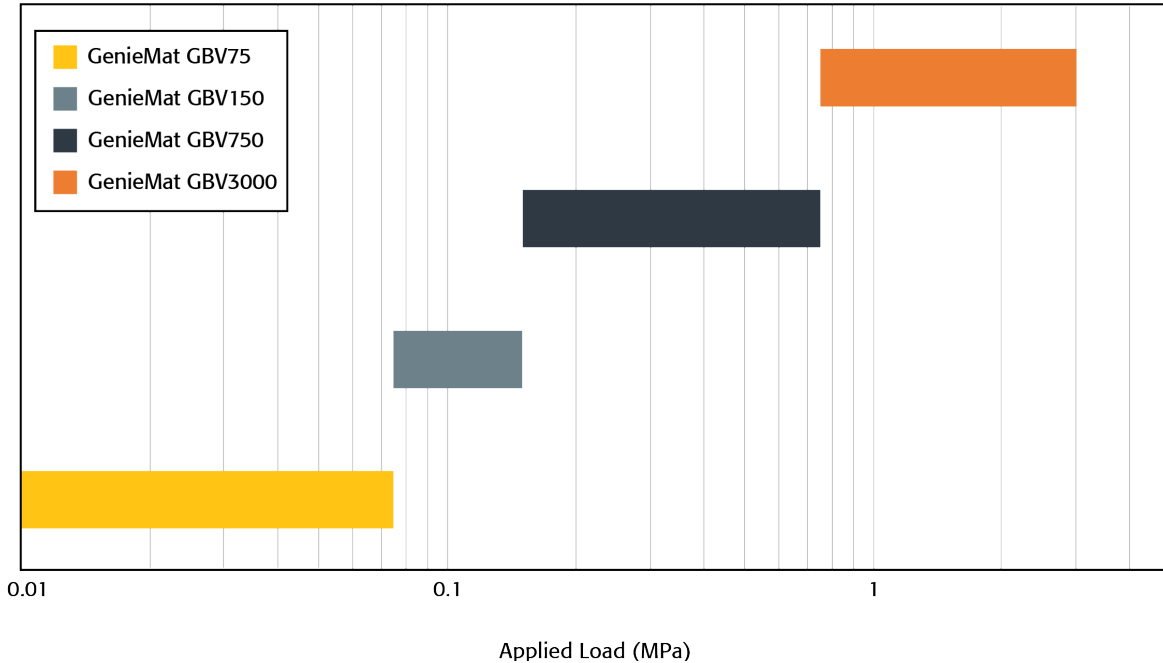
Fig. 4: Isolation Efficiency

# GENIEMAT® GBV150

## Ground-Borne Vibration Isolation



### PRODUCT RANGE



### PRODUCT SPECIFICATIONS

<b>PRODUCT NAME</b>	GenieMat GBV150
<b>DESCRIPTION</b>	Dynamically soft rebonded-rubber material capable of withstanding high loads. Used when superior lateral vibration decoupling is required for building isolation.
<b>APPLICATION</b>	Suitable for loads up to 150 kPa
<b>FEATURES &amp; BENEFITS</b>	<ul style="list-style-type: none"> <li>• Dynamically soft for excellent vibration isolation</li> <li>• Mold, bacteria, fungi, and water resistant</li> <li>• No potential mold -producing fiberglass</li> <li>• Will not break down or move under load</li> <li>• Easy to install</li> </ul>
<b>THICKNESS</b>	50 mm (2")
<b>DIMENSION</b>	Sheets: 610 mm x 1220 mm (24" x 48")
<b>SHEET AREA</b>	0.74 m <sup>2</sup> (8 ft <sup>2</sup> )
<b>LEAD TIME</b>	4 weeks after receipt of order

# GENIEMAT® GBV150

## Ground-Borne Vibration Isolation



### TECHNICAL DATA

<b>OPERATING LOAD LIMIT</b>	150 kPa
<b>PEAK LOAD LIMIT</b>	450 kPa
<b>CREEP RATE</b>	<1.0% per decade
<b>MECHANICAL LOSS FACTOR</b>	0.13*
<b>TEMPERATURE STABILITY</b>	-40°C to +80°C (-40°F to +176°F)
<b>THERMAL CONDUCTIVITY</b>	0.13 W/m °C
<b>R-VALUE @ 2"</b>	2.1 ft² h °F/Btu

### OPERATING LOAD DATA

### 0.1 MPa LOADING

<b>NATURAL FREQUENCY</b>	11.5 Hz
<b>40 Hz DYNAMIC MODULUS</b>	3.2 MPa

\* Load and frequency dependent

# GENIEMAT® GBV150

## Ground-Borne Vibration Isolation

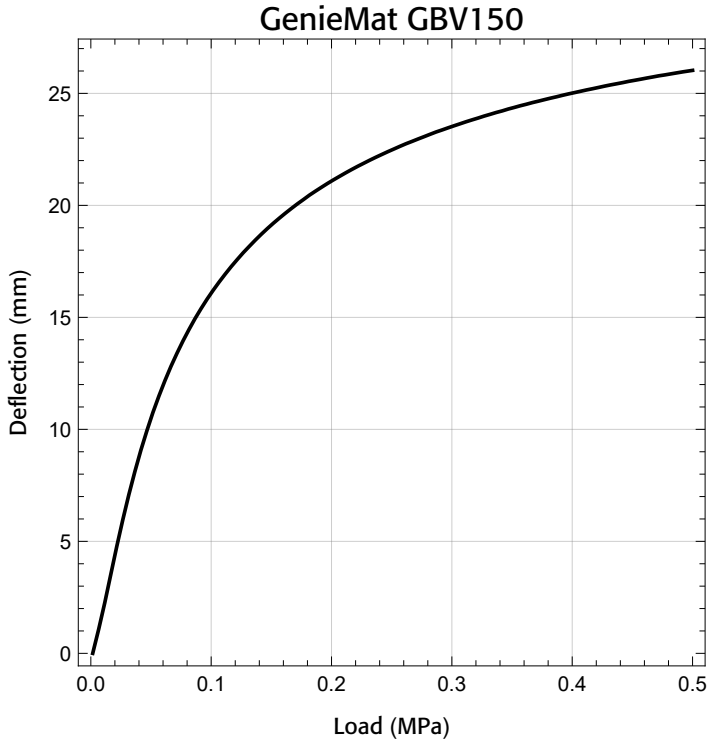


Fig. 1: Applied Load vs Deflection

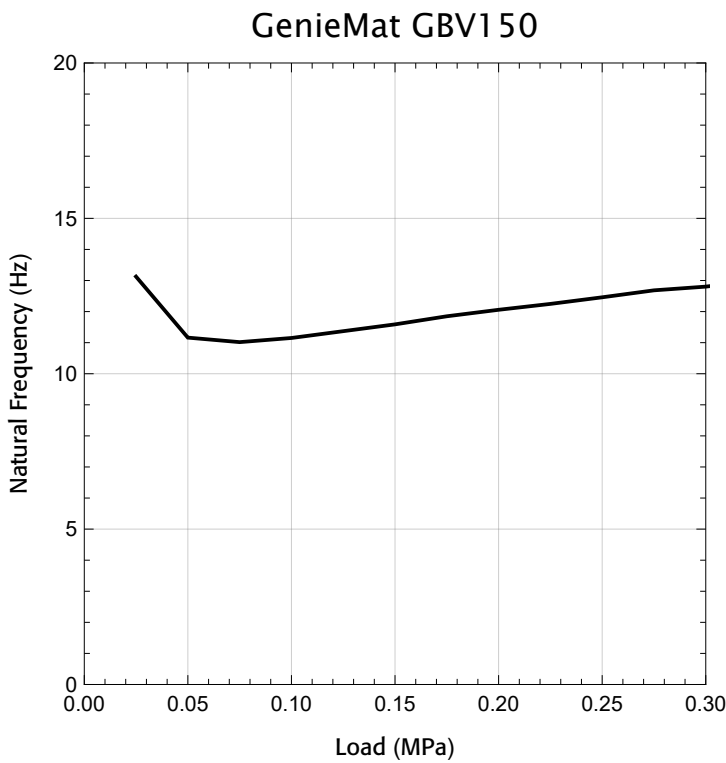


Fig. 2: Applied Load vs Natural Frequency

# GENIEMAT® GBV150

## Ground-Borne Vibration Isolation

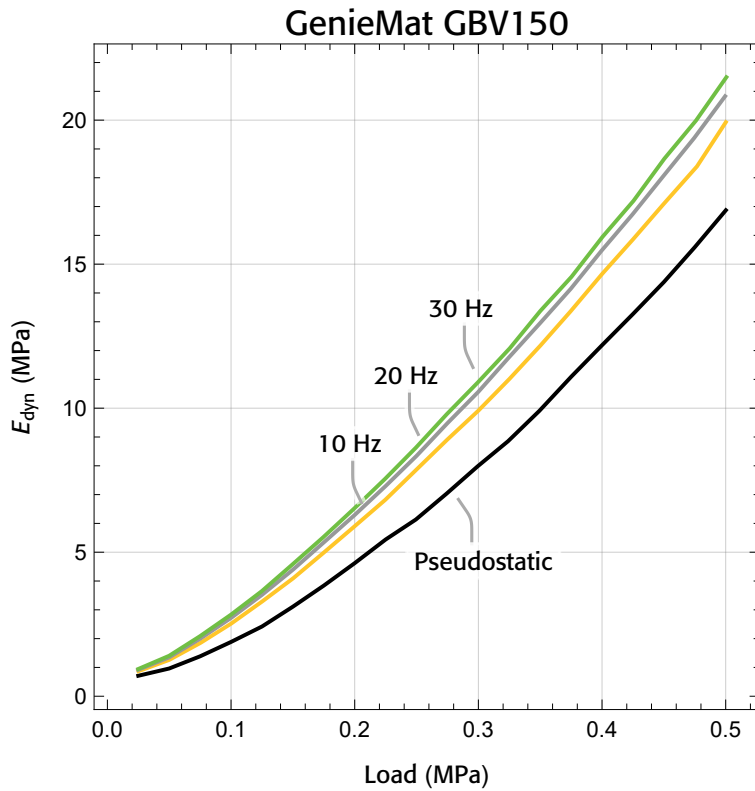


Fig. 3: Applied Load vs Dynamic Modulus

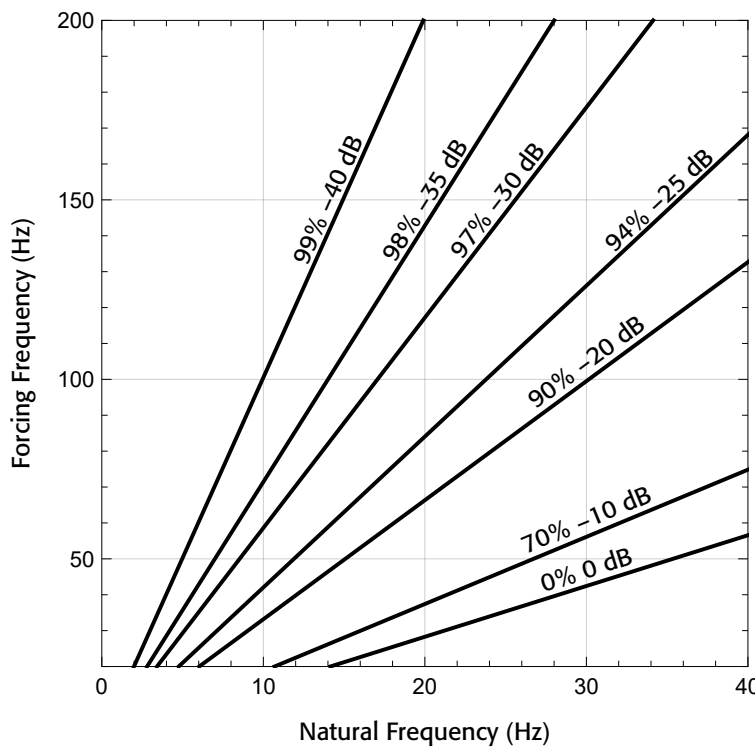


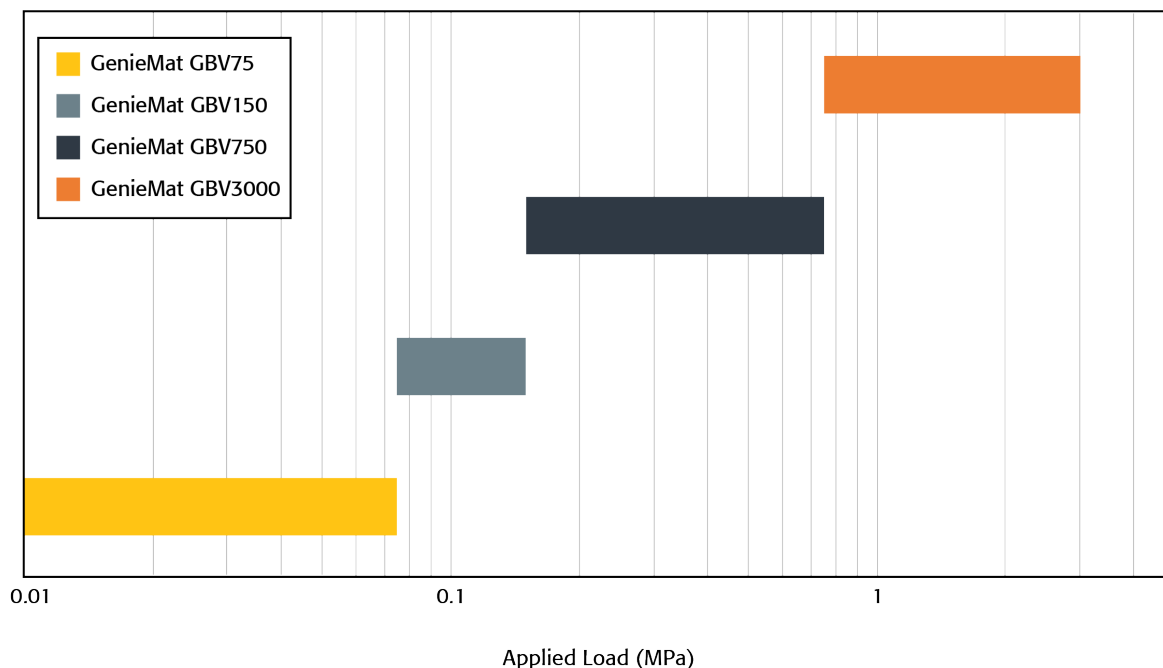
Fig. 4: Isolation Efficiency

# GENIEMAT® GBV750

## Ground-Borne Vibration Isolation



### PRODUCT RANGE



### PRODUCT SPECIFICATIONS

<b>PRODUCT NAME</b>	GenieMat GBV750
<b>DESCRIPTION</b>	Dynamically soft rebonded-rubber material capable of withstanding high loads. Used when superior lateral vibration decoupling is required for building isolation.
<b>APPLICATION</b>	Suitable for loads up to 750 kPa
<b>FEATURES &amp; BENEFITS</b>	<ul style="list-style-type: none"> <li>• Dynamically soft for excellent vibration isolation</li> <li>• Mold, bacteria, fungi, and water resistant</li> <li>• No potential mold -producing fiberglass</li> <li>• Will not break down or move under load</li> <li>• Easy to install</li> </ul>
<b>THICKNESS</b>	50 mm (2")
<b>DIMENSION</b>	Sheets: 305 mm x 1220 mm (12" x 48")
<b>SHEET AREA</b>	0.37 m <sup>2</sup> (4 ft <sup>2</sup> )
<b>LEAD TIME</b>	4 weeks after receipt of order

# GENIEMAT® GBV750

## Ground-Borne Vibration Isolation



### TECHNICAL DATA

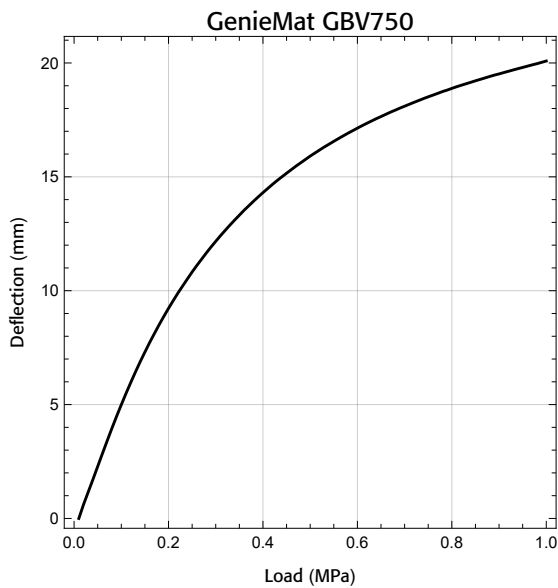
<b>OPERATING LOAD LIMIT</b>	750 kPa
<b>PEAK LOAD LIMIT</b>	3 MPa
<b>CREEP RATE</b>	1.0% per decade
<b>MECHANICAL LOSS FACTOR</b>	0.14*
<b>TEMPERATURE STABILITY</b>	-40°C to +80°C (-40°F to +176°F)
<b>THERMAL CONDUCTIVITY</b>	0.13 W/m °C
<b>R-VALUE @ 2"</b>	2.1 ft² h °F/Btu

### OPERATING LOAD DATA

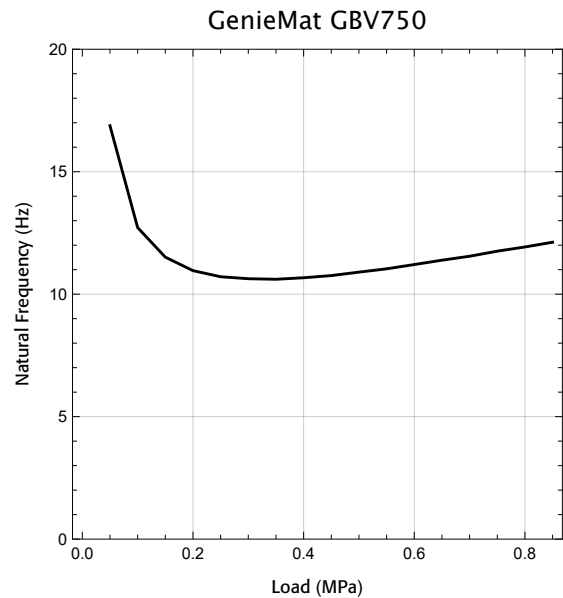
### 0.5 MPa LOADING

<b>NATURAL FREQUENCY</b>	11 Hz
<b>40 Hz DYNAMIC MODULUS</b>	13.6 MPa

\* Load and frequency dependent



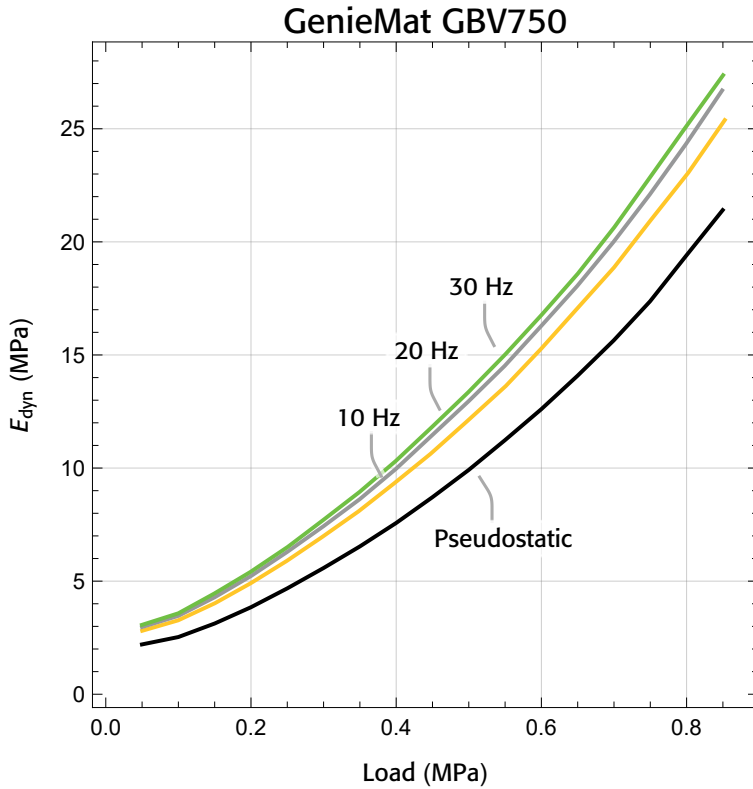
Applied Load vs Deflection



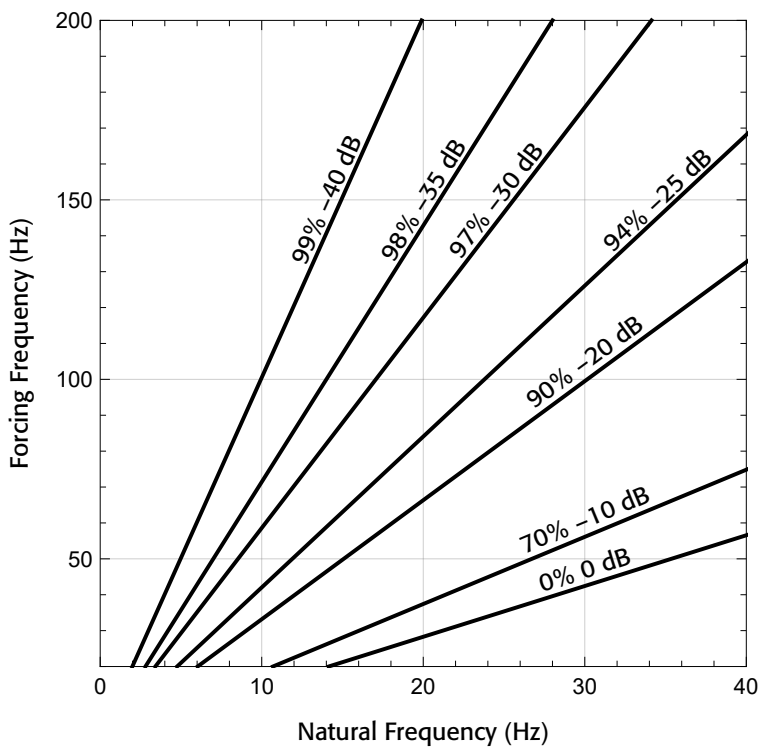
Applied Load vs Natural Frequency

# GENIEMAT® GBV750

## Ground-Borne Vibration Isolation



Applied Load vs Dynamic Modulus



Isolation Efficiency

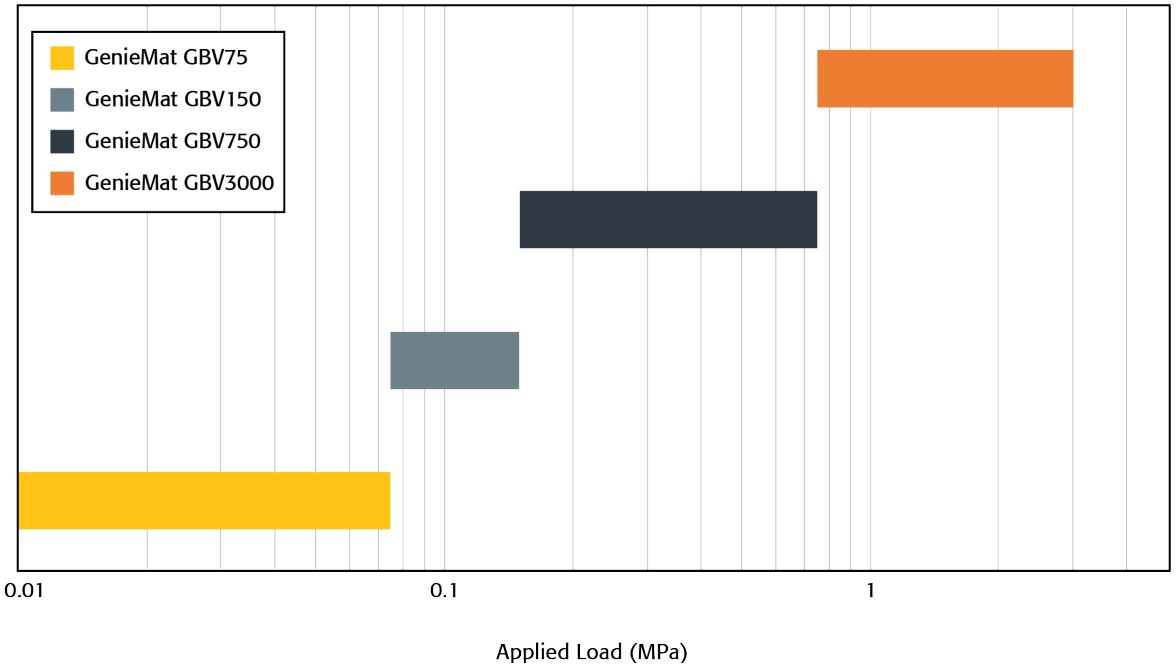


# GENIEMAT® GBV3000

## Ground-Borne Vibration Isolation



### PRODUCT RANGE



### PRODUCT SPECIFICATIONS

<b>PRODUCT NAME</b>	GenieMat GBV3000
<b>DESCRIPTION</b>	Dynamically soft rebonded-rubber material capable of withstanding high loads. Used when superior lateral vibration decoupling is required for building isolation.
<b>APPLICATION</b>	Suitable for loads up to 3000 kPa
<b>FEATURES &amp; BENEFITS</b>	<ul style="list-style-type: none"> <li>• Dynamically soft for excellent vibration isolation</li> <li>• Mold, bacteria, fungi, and water resistant</li> <li>• No potential mold -producing fiberglass</li> <li>• Will not break down or move under load</li> <li>• Easy to install</li> </ul>
<b>THICKNESS</b>	50 mm (2")
<b>DIMENSION</b>	Sheets: 610 mm x 610 mm (24" x 24")
<b>SHEET AREA</b>	0.37 m <sup>2</sup> (4 ft <sup>2</sup> )
<b>LEAD TIME</b>	4 weeks after receipt of order

# GENIEMAT<sup>®</sup> GBV3000

## Ground-Borne Vibration Isolation



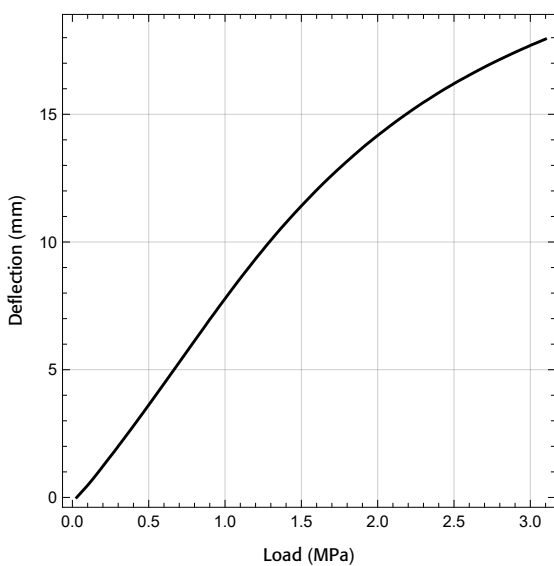
### TECHNICAL DATA

<b>OPERATING LOAD LIMIT</b>	3 MPa
<b>PEAK LOAD LIMIT</b>	4.5 MPa
<b>CREEP RATE</b>	1.0% per decade
<b>MECHANICAL LOSS FACTOR</b>	0.14*
<b>TEMPERATURE STABILITY</b>	-40°C to +80°C (-40°F to +176°F)
<b>THERMAL CONDUCTIVITY</b>	0.13 W/m °C
<b>R-VALUE @ 2"</b>	2.1 ft <sup>2</sup> h °F/Btu

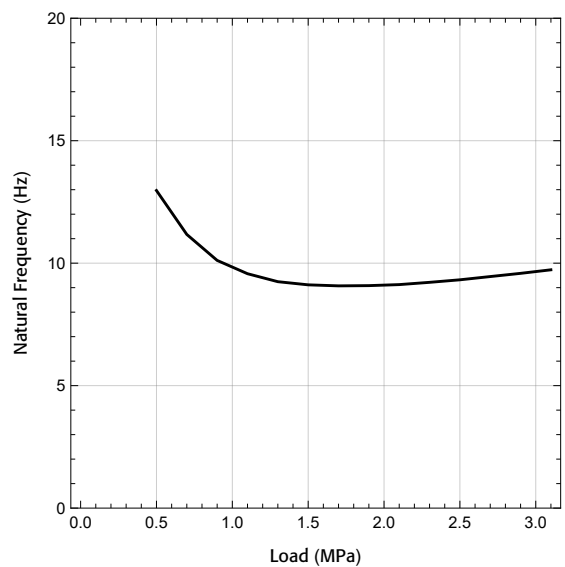
### OPERATING LOAD DATA      1.5 MPa LOADING

<b>NATURAL FREQUENCY</b>	9 Hz
<b>30 Hz DYNAMIC MODULUS</b>	3.1 MPa

\* Load and frequency dependent



Applied Load vs Deflection



Applied Load vs Natural Frequency

# GENIEMAT® GBV3000

## Ground-Borne Vibration Isolation

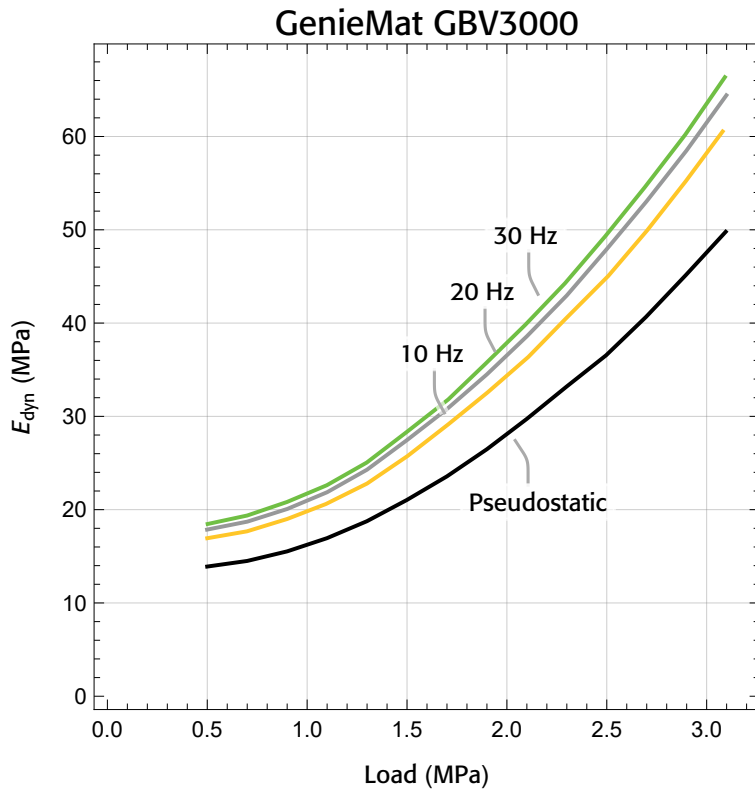


Fig. 3: Applied Load vs Dynamic Modulus

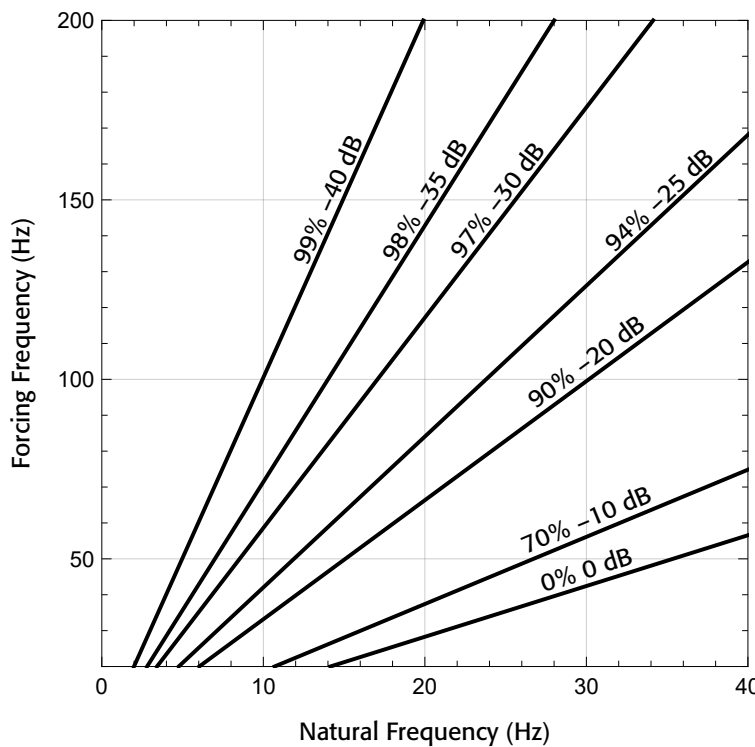


Fig. 4: Isolation Efficiency



CONTACT US

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