

CALMFLOOR ADVANTAGE GUIDE



Scope of applications

Existing buildings

CALMFLOOR is an out-of-the-box solution that resolves vibration issues fast – without costly structural intervention and disruption.

Building retrofits and change of use

CALMFLOOR elevates the performance of repurposed buildings up to lab-standard requirements, delivering substantial cost, carbon and time savings.

New builds

CALMFLOOR enables lighter, smarter, more sustainable buildings, delivers design freedom and 24/7 building data and supports Net Zero targets.

Type	Sub-Type	Applicable	Comment
Office/commercial	Offices	✓	Response factors (RF) of 4–8 are often considered acceptable but can generate complaints. CALMFLOOR can reduce vibrations below RF=4, significantly reducing perceptible vibration.
	Shopping malls	✓	
	Exhibitions & conference centres	✓	Suitable for general loading from human pedestrians. High-level loading from dancing/concerts requires special consideration.
Healthcare/labs	Consulting rooms	✓	
	Operating theatres	✓	Response factors as low as ISO RF=1 (Operating Theatre) are achievable.
	Laboratories	✓	Response factors as low as ISO RF=1 (Operating Theatre) are achievable.
Education	School classrooms	✓	
	University teaching spaces	✓	
	Research labs	✓	Response factors as low as ISO RF=1 (Operating Theatre) are achievable.
Sports/leisure	Gyms	✓	Rhythmic vibrations from activities such as treadmill-running can be controlled. Noise from dropped weights cannot.
	Dance studios		
	Music venues		
	Esports/simulators	✓	Floor vibrations from moving simulators can be controlled.
	Sports halls	✓	
Museums/libraries	✓		
Residential	Low-rise dwellings	✓	Suspended floors can be controlled, particularly in large rooms with long spans. Slabs on grade cannot.
	High-rise apartment buildings/condos	✓	Footfall noise to ceilings cannot be addressed.
	Loft conversions	✓	
Building circulation	Staircases	✓	Suitable for structures with frequencies of 3Hz and above.
	Internal pedestrian walkways	✓	Suitable for structures with frequencies of 3Hz and above.
Transportation	Airport concourses	✓	
	Car parks	✓	
	Ship decks	✓	Long-span decks with spans and configurations similar to floors in buildings.

CALMFLOOR USPs



Patented, **out-of-the-box** active floor vibration technology



Reduces vibration by up to 90%



Can achieve performance up to **ISO Operating Theatre**



Compact and discreet (67kg / 148lbs) – installs in just hours



Bolt-in, bolt-out flexibility with 4-bolt system simplicity



No structural intervention required



Low-cost, low-carbon solution



Reduces dependence on excessive steel and concrete in controlling floor vibration



On-site demo and site testing for complete confidence



Provides floor vibration serviceability as a service with **potential tax savings**



24/7 health and performance data via CALM Connect smart portal

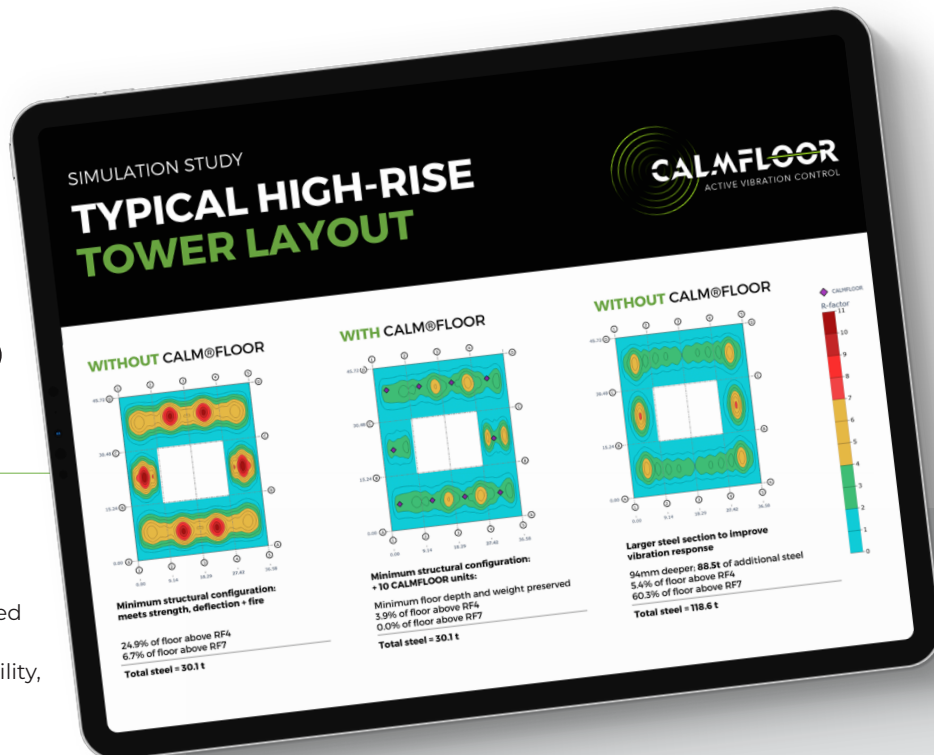


Tailored SLAs for **full support and peace of mind**

BUILD LIGHTER, REDUCE EMBODIED CARBON

CALMFLOOR active mass dampers (AMDs) reduce embodied carbon in building floors by saving unnecessary extra concrete and steel to meet required vibration performance. This patented technology can seamlessly align architectural ambitions with enhanced performance, sustainability, cost-effectiveness and a strong commitment to reducing carbon emissions.

The operating emission of a CALMFLOOR AMD over a 50-year period is 548 kg CO₂e. Emissions from material extraction, production and manufacturing is 480kg CO₂e.



- 30.1 t of structural steel is ~55.7 tCO₂e
- 30.1 t of structural steel plus 10 CF units is ~60.7 tCO₂e (each CF unit is 0.5 tCO₂e)
- 118.6 t of structural steel is ~219.4 tCO₂e (assuming 1.85 tCO₂e per 1.0 t fabricated structural steel)

FREQUENTLY ASKED QUESTIONS

What kind of excitation can CALMFLOOR reduce vibrations from?

CALMFLOOR works by adding damping to structural resonances in the frequency range 3-30Hz. Anything that excites a floor can be mitigated by CALMFLOOR, including human pedestrian excitation, ground-borne excitation from road/rail traffic, and machinery-induced excitation.

How much floor area does a single CALMFLOOR damper cover?

A single CALMFLOOR damper can cover up to 250m² (2691sq.ft) of floor, depending on the framing layout. Typically, CALMFLOOR dampers are not required over an entire floor area – they are deployed strategically to deal with vibration hotspots only.

Can CALMFLOOR be used for external applications?

CALMFLOOR is designed for use in internal environments and is not IP-rated for external use. However, it is possible to install CALMFLOOR within environmentally protected enclosures, if this is required.

How effective is CALMFLOOR for resonant and transient vibrations?

CALMFLOOR is suitable for modes between 3-30Hz. CALMFLOOR really excels in the frequency range of 4-12Hz – the range that to which humans are most sensitive for office, public venues and building environments in general. Vibrations less than 12Hz are typically exacerbated by resonance and are our sweet spot where we achieve significant reductions. For high-frequency floors that are dominated by transient response, CALMFLOOR units can still provide vibration reductions to various degrees.

Simulation analysis is recommended for such floors due to the nature of the impulse forces, stringent performance requirements and floor dynamic behaviour.

How many units are needed?

The number of units depends on vibration levels, problematic zones and excitation sources. For example, for typical walking speed and a large office floor area, a single unit will be required on a floor bay (also termed 'floor panel') to achieve

the required office environment performance. However, this varies from project to project subject to a range of different factors. An increased number of units may be required for high force applications (e.g. gyms) and where response limits are very stringent.

Where will the units be installed?

Locations of CALMFLOOR units are flexible and, for maximum best performance, units can be placed at vibration hotspots, but this will differ according to project-specific requirements and constraints. The units can be mounted on top of a floor plate (concrete or other material), underneath or mounted to the web of a steel beam. The unit dimensions are L630mm (24.8") x H386mm (14.97") x W125mm (4.93"). A CALMFLOOR unit weighs approximately 67kg (148lbs). Internal moving masses are 35kg (77lbs).

What floors can CALMFLOOR be used on?

CALMFLOOR is suitable for all types of floors from commercial buildings, retail units, gym, entertainment, hospital, lab and life sciences, offices, airport lounges, etc. The application list is not exhaustive and largely depends on the structural dynamics of the floor and the level of vibration that needs to be controlled.

How wide a frequency range can a CALMFLOOR unit control?

CALMFLOOR controls multiple frequencies of vibrations – the levels of vibration reduced varies. The simultaneous control of several frequencies is one of the key advantages of CALMFLOOR technology compared with passive tuned mass damper technology.

What are typical vibration reductions?

Typical vibration reductions are in the range of 60% to 90%. As each floor structure is by definition a unique prototype, the exact level of vibration control differs from one project to another due to features such as: column layout, floor type, vibration modes, modal properties, excitation forces, location of CALMFLOOR unit, etc. Simulation analysis is recommended to provide more detailed insights and potential vibration reductions for a specific floor structure.

What is the equivalent damping ratio of a CALMFLOOR unit?

CALMFLOOR controls multiple modes of vibration and their associated frequencies. The increase in modal damping ratio for each controlled modal frequency varies. As a rule of thumb, a 10% or higher modal damping ratio (to take into account both the existing and CALMFLOOR-generated damping force) is what we have recorded over the many floors on which CALMFLOOR has been operating.

How much do CALMFLOOR AMDs cost?

Cost is dependent on the number of AMDs required – please request a price list.

What are the distinguishing features of CALMFLOOR?

- CALMFLOOR is the only active mass damper (AMD) that employs advanced sensor technologies to monitor and analyse floor movements in real-time, swiftly detecting vibrations originating from a source and controlling vibration levels within a millisecond.
- CALMFLOOR AMDs are compact in size, relatively lightweight and have low embodied carbon.
- CALMFLOOR AMDs control multiple frequencies and require no passive tuning.
- Power consumption is typically only around 20-25W and, at its highest peak, not more than 350W. Each AMD needs to have access to a power supply 110-240VAC single phase and each unit has a CAT 5 ethernet connection to access the portal and interact with the vibration data. CALMFLOOR can work without the ethernet connection, if necessary, but it is not recommended.
- CALMFLOOR units reduce embodied carbon in building floors by saving unnecessary extra construction materials (concrete, steel, etc.) to meet required vibration performance. By making the existing floor perform better we can often 'save the floor' and avoid pouring any additional concrete.