

# CALM<sup>®</sup>FLOOR enables versatile long span floors with no extra embodied carbon.

1.

## T H E P R O B L E M

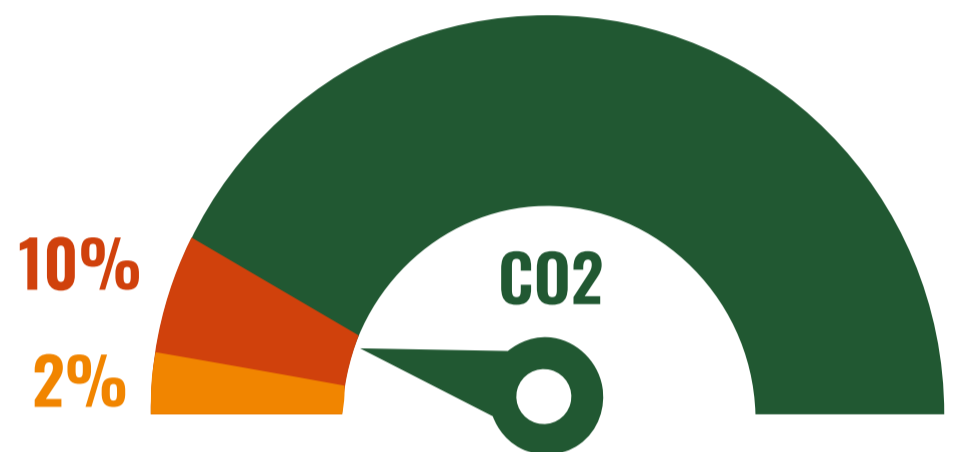
According to the UN, **230bn m<sup>2</sup>** of floors will need to be built in the next 30 to 40 years.

That equates to one city of Paris per week being built on planet Earth.

**39%** of all global greenhouse gas emissions are due to buildings and construction.

More specifically, recent estimates indicate that the construction of floors may be generating a staggering **10%** of greenhouse gas emissions.

That's five times the amount produced by the whole of the aviation industry each year!



**Construction of floors**

**Aviation**

As a result, architects and structural engineers are under increasing pressure to significantly reduce the embodied carbon associated with building floors whilst also meeting increasingly stringent vibration performance requirements.

Historically, the favoured solution for mitigating floor vibrations has been to make the floors heavier. This significantly increases the amount of building materials used (primarily concrete and steel), which are used to stop the floors from vibrating excessively under daily use.

Roughly, **a third more materials** are regularly needed to increase mass and stiffness in the floors of a typical **high-rise**

commercial office building featuring long-span floors.

This old fashioned solution is much more expensive and harmful to the environment.



## Are long-span floors obsolete?

Humans spend an average of **90%** of their lives inside buildings. This means that there is a symbiotic relationship between humans and buildings they occupy.

As such, human behaviour and wellbeing significantly influence the performance and energy efficiency of buildings.

[A 2016 RIBA Journal article](#) stated that: There was an *“increasing appetite for longer spans and flexibility of space”* as *“clients seek to build assets rather than future white elephants”*.



The technology and creative sectors are valuing long-span column-free spaces to promote collaborative working and were easy to reconfigure and brand with their own identity.

Almost every sector using commercial offices can benefit from the greater potential for adaptation that long-spans provide. Longer floor spans reduce foundation and overall construction time and costs.

However, **long-span composite floors are invariably low-frequency**, with fundamental natural frequency below **10Hz**.

As such, those floors are prone to **excessive resonant vibrations** caused by people walking on them.

And there's the challenge - long floor spans are better for human experience and remain the preference of many modern businesses.

But, the main tactic of increasing the weight for overcoming the excessive vibration issues which they pose is hugely costly and damaging to the environment.

So, something has to change...

# 3.

# THE SOLUTION

So, is there an alternative solution?

The answer is - **yes, there is!**



It's called **CALM<sup>®</sup>FLOOR**, a world-first, commercially available, floor active mass damper (AMD) for controlling low-frequency floor vibrations.

Launched in 2022 **after 15 years of research and development.**

Designed specifically for both new build and retrofit, **CALM<sup>®</sup>FLOOR enables** medium to very long floor spans without any structural modifications.



**Disrupts** the established and rather wasteful practice of controlling long-span floor vibration by adding unnecessary steel and concrete for mass and rigidity.

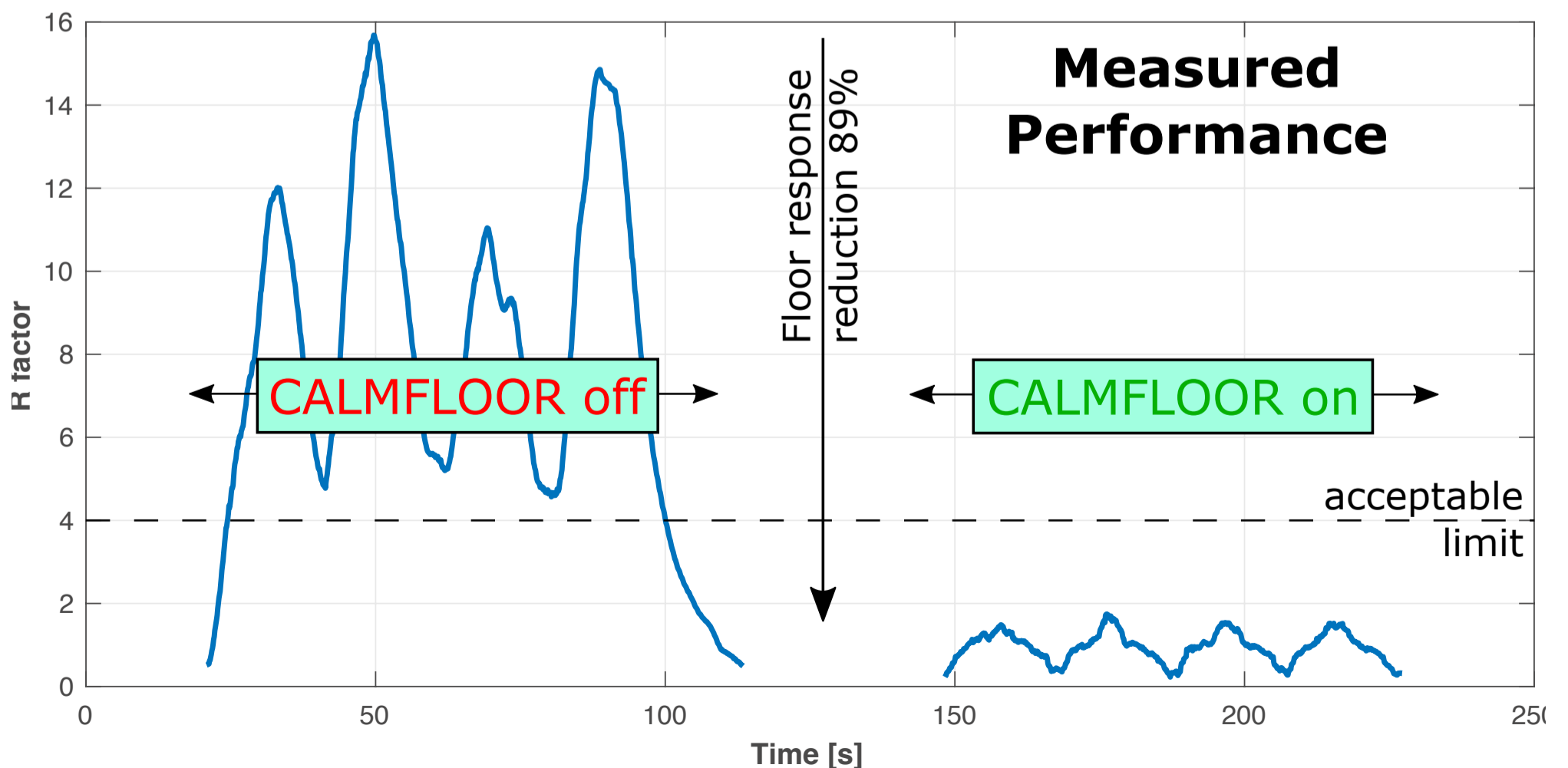
**CALM<sup>®</sup>FLOOR exploits basic principles** of physics and generates unprecedentedly large amounts of damping in the floor structure.



With **CALM<sup>®</sup>FLOOR** installed, occupants can go about their work **without any disruption** or irritation from floor vibration and the design aesthetic of the long span floor is not compromised.

1 x **CALM<sup>®</sup>FLOOR** unit = a mass of only 67kg, a height of 380mm and embodied energy of the product of only about 500kgCO<sub>2</sub>e.

It is **easily attached** to a beam of a composite floor or can also be attached directly underneath or on top of the floor deck, making it suitable for new build or retrofit.



Usable in a **variety of buildings** including offices, hospitals, municipal buildings, airports, schools and standard laboratories.

Placed only in **vibration 'hot-spot' areas** of the floor, a relatively small number of units can control large floor areas.

Based on recent projects, the strategic placing of units has achieved enviable vibration performance at a cost lower than the alternatives for floor vibration control.

This is impossible to achieve by any other reasonable and commercially viable means known today for controlling walking- or traffic-induced resonant floor vibrations.

4.

## FIND OUT MORE

Where vibration serviceability is a governing design criterion, [CALM®FLOOR](#) technology can allow for the design, versatility and comfort of long spans without any structural modifications.

Installing [CALM®FLOOR](#) avoids the need for costly and enduring building works disruption whilst outperforming alternatives such as tuned mass damper, constrained layer damper or additional steel and concrete installation to overcome long-span floor vibration issues.

Whole life costing and realistic cost-benefit studies so far indicate that the [CALM®FLOOR](#) solution is highly competitive relative to the alternatives.

So, if you would like to learn more about [CALM®FLOOR](#) technology, book a demonstration or chat through a current building project where controlling floor vibrations is a known problem we would love to hear from you.

With [CALM®FLOOR](#) active mass dampers now commercially available for worldwide distribution, please [get in touch](#) with our award-winning team.



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