

4.19 Fluid-Filled Frequency-Tunable Mass Damper

Statement: A fluids-based tunable mass damper system that allows for significant distribution of loads while also providing a simple mechanism that allows for the capability to change its frequency of mitigation with negligible impact on the damper system.

Technology description: Fluid-Filled Frequency-Tunable Mass Damper technology implements a fluid-based mitigation system where the working mass is all or a portion of the fluid mass that is contained within the geometric configuration of either a channel, pipe, tube, duct and/or similar type structure. A compressible mechanism attached at one end of the geometric configuration structure enables minor adjustments that can produce large effects on the frequency and/or response attributes of the mitigation system.

Benefits: This new technology enables structural engineers to set and change the fundamental mitigation attributes of the mass damper system with little to no modification of the fluid container.

- Offers a simple compressible mechanism for changing mitigation frequency in a damping system that does not require a modification of the fluid tank geometry.
- Enables small adjustments to frequency (+/- 10%) and large adjustments to frequency (2x - 3x) that can be done at will Minimizes size, weight, and cost in view of competing technologies.
- Can be applied to numerous applications with different requirements for fundamental mitigation attributes.
- Can utilize existing fluid filled reservoirs and or simple configurations of added reservoirs.

Comment: This technology is a part of fluid-structure coupling suite. It goes together in one package with **4.18 Fluid Structure Coupling Technology**.