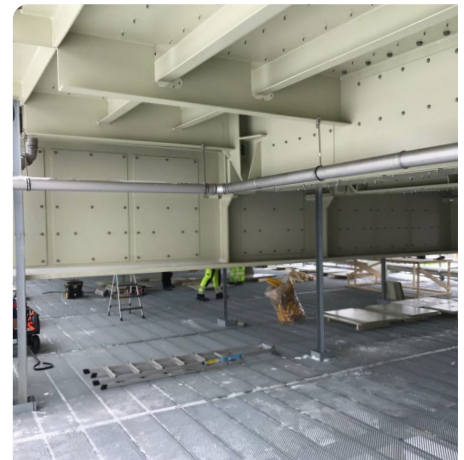


Constrained Layer Damping – Solutions



- **Railway & Road Steel Bridges**
- **Marine & Offshore**
- **Industry**
- **Wind Turbine Applications**
- **Defence Applications**

CLD Damping Tile WL44

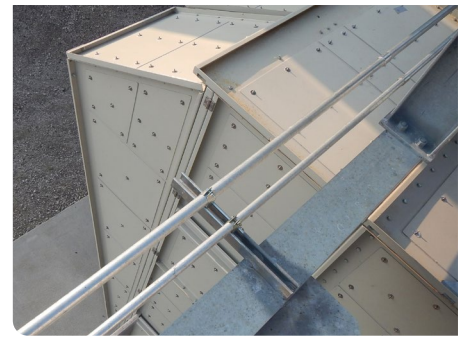
Temperature range 5° to 30°C

CLD Damping Tile WL55

Temperature range -10° to +5°C

CLD Damping Tile WL44-55 Hybrid

Temperature range -10° to +30°C



CLD-solutions for Powerstation in Kansas

At the new Rubart power station in Kansas electricity is generated by 12 Caterpillar engines. The air intake filters to the engines were originally designed for another slightly smaller engine type, so after start-up it turned out the larger air flow caused resonances in the steel plates of the filters. The vibration levels were considered to be high, not only causing noise but also risk of fatigue and cracks in the steel plates. Installing our CLD-Tiles Vibratex reduced the vibrations and met the new requirements of 6 dB IL.

Description

Constrained Layer Damping Tiles consist of a constraining sheet and a viscoelastic polymer that consists of a high performance acrylic system. The polymer is primarily characterized by its joining strength, load-dissipating properties as well as temperature and weather resistance, and has a high loss factor in the temperature range -10 -30°C, depending on the viscoelastic core type.

Due to the product's unique composition, the double-adhesive acrylic viscoelastic polymer combines very high adhesion levels with the ability to absorb and dissipate vibrational energy.

The product's viscoelastic core can compensate for thermal elongation of bonded parts.

CLD tile performs well on materials that are difficult to join, such as powder coatings or plastic materials. Even in connection with combinations of such materials, this product provides advanced security due to its innovative design.

CLD tiles are available in customized sizes and thicknesses.

Applications

- Reduction of structure borne noise radiation from steel bridges
- Reduction of structure borne noise radiation in marine & offshore applications
- Reduction of structure borne noise radiation in industrial applications, gensets, generators, wind turbine towers etc.
- Reduction of structure borne noise radiation in steel balcony applications

Engineering

Vibratex can offer a full-service incl. detailed engineering and calculation of required damping for any specific application. Note that damping requirement and needed damping by a CLD system is depending on application, required corrosion protection, fixation method and environment such as temperature, rain etc.

Laboratory measurements with test specimens and onsite Noise & vibration measurements incl. measurement of damping in the "basic structure" is often needed, prior to the design of the best possible CLD solution.

Hybrid solutions may be required for a larger temperature range, e.g. combining with viscoelastic acrylic polymer type WL55.

Along with acrylic polymer WL44 and WL55, Vibratex holds a database of many other viscoelastic materials, that enable us to design and manufacture a CLD solution, that meet customer requirement.

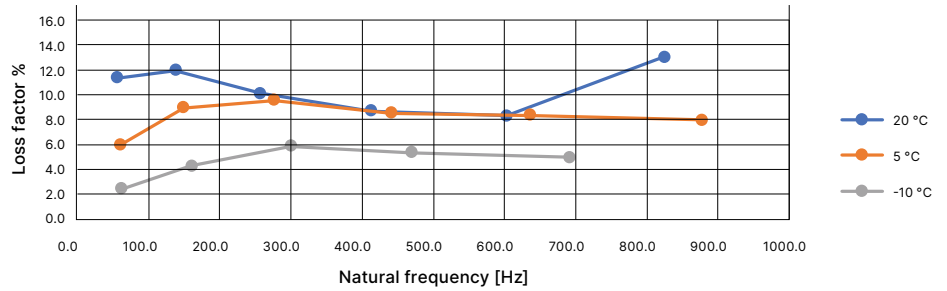
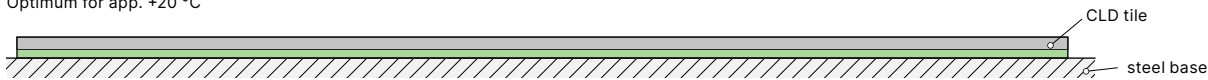


Installation

Vibratex can offer turnkey projects including installation. Contact us for more information about the options and how to start a co-operation.

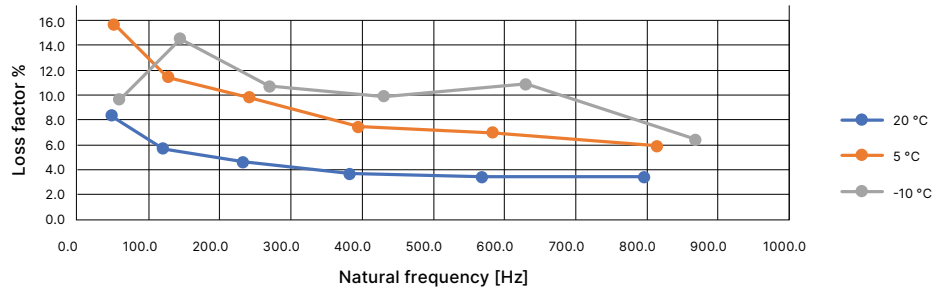
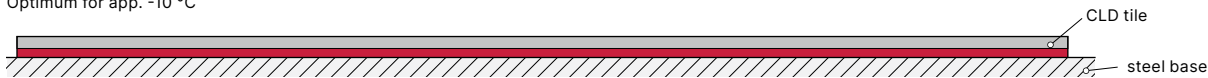
CLD Tile WL44 - Composite loss factor measurements

Optimum for app. +20 °C



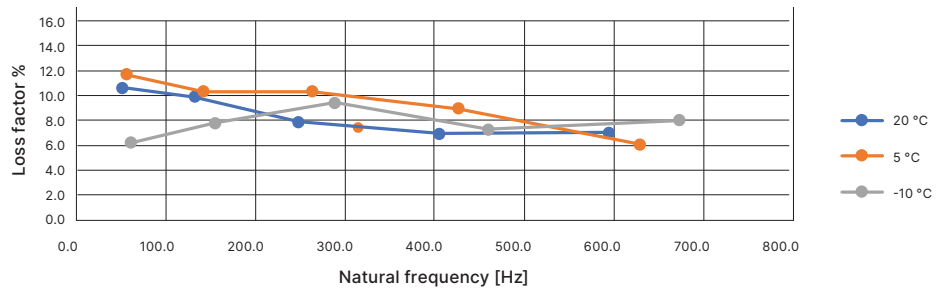
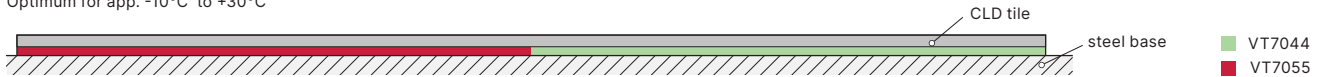
CLD Tile WL55 - Composite loss factor measurements

Optimum for app. -10 °C



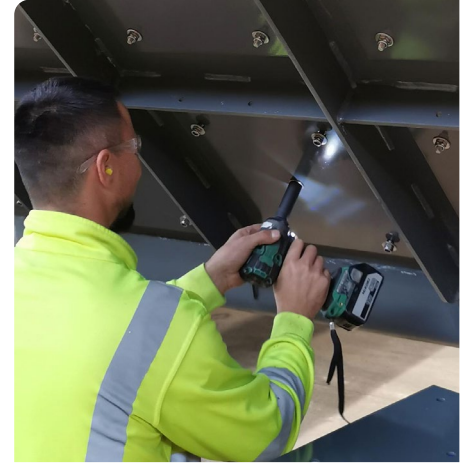
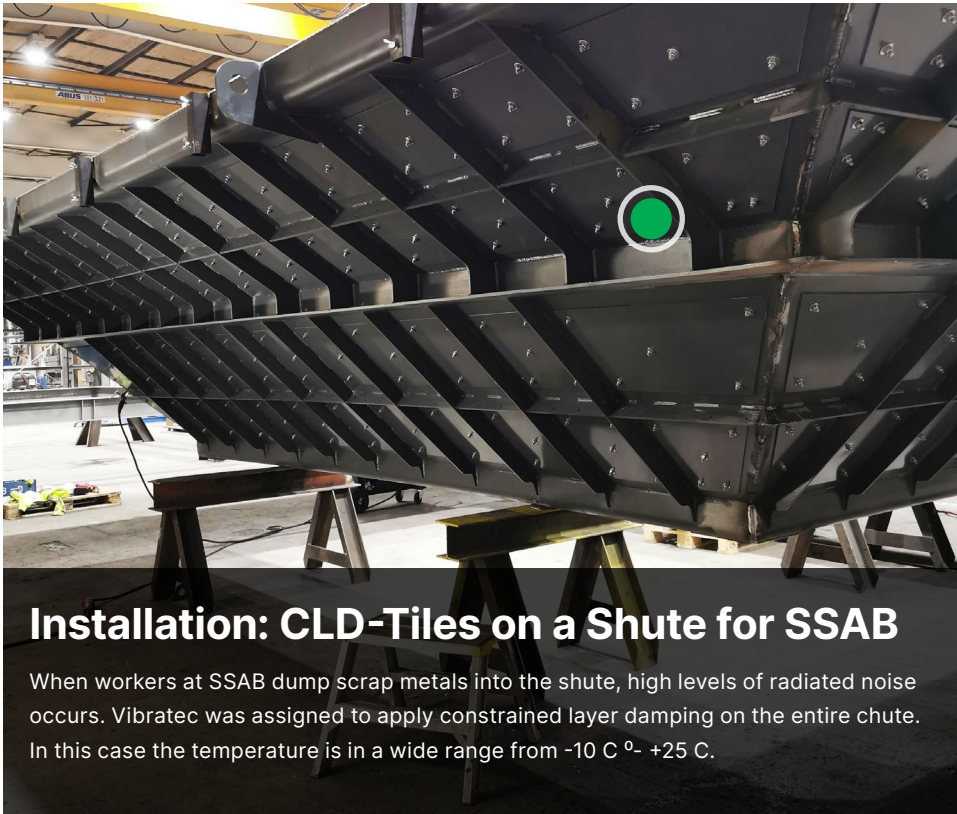
CLD Tile WL44- 55 Hybrid - Composite loss factor measurements

Optimum for app. -10°C to +30°C



Vibratec CLD Tiles	Max. Theoretical Insertion Loss I _{lp} , dB Measured on test specimens in a lab			Comments
	+20 °C	+5 °C	-10 °C	
CLD WL55	11	14	14	Good for lower temperatures
CLD WL44	14	13	11	Good for higher temperatures
CLD WL44-55-Hybrid	13	14	13	Wide range of temperature and frequency

Note: realistic insertion loss are expected to be lower due to different in-situ conditions. Expect 6-10 dB for most applications



Installation: CLD-Tiles on a Shute for SSAB

When workers at SSAB dump scrap metals into the shute, high levels of radiated noise occurs. Vibratec was assigned to apply constrained layer damping on the entire chute. In this case the temperature is in a wide range from -10 C °- +25 C.

Characteristics	WL44	WL55	WL44-55-Hybrid
Core material	Viscoelastic Acrylic Polymer	Viscoelastic Acrylic Polymer	2 Viscoelastic Acrylic Polymers
Adhesive	Acrylic	Acrylic	Acrylic
Color	Grey	Transparent	Transparent / Grey
Thickness of acrylic polymer:	app. 1 mm	app. 1 mm	app. 1 mm
Adhesive strength on steel (After 72 hours):	36 N/cm	24 N/cm	24 N/cm
Release liner:	Yes	Yes	Yes
Multiple layers:	Yes (special option for increase damping further, and widen the temperature range)	Yes (special option for increase damping further, and widen the temperature range)	Yes (special option for increase damping further, and widen the temperature range)
Constraining sheets comes in:	Galvanized steel / AISI 304 or AISI 316 Aluminum & Seawater resistant aluminum Carbon fiber & FRP panels	Galvanized steel / AISI 304 or AISI 316 Aluminum & Seawater resistant aluminum Carbon fiber & FRP panels	Galvanized steel / AISI 304 or AISI 316 Aluminum & Seawater resistant aluminum Carbon fiber & FRP panels
Size & Shape:	Customized/ Project specific	Customized/ Project specific	Customized/ Project specific
Thickness:	2-20 mm, customized	2-20 mm, customized	2-20 mm, customized