How can cork-based compressed layer damping (CLD) improve noise reduction and control vibration in transformers?

Structural attenuation of noise and vibration is a crucial aspect of the design and maintenance of transformers since it provides a means of converting mechanical energy from vibration into heat. When implemented correctly, it can significantly reduce noise levels, improve operating conditions, and extend equipment life. One effective method for achieving structural attenuation is using the cork-based compressed layer damping solutions developed by Amorim Cork Composites.

The effectiveness of a compressed layer damping solution depends on its thickness in comparison with the thickness of the wall of the tank where it is installed. To ensure optimal performance, the thickness of the damper must be comparable to that of the tank wall. If the wall is too thin, the damping effect will be minimal or even non-existent. It is, therefore, necessary to carefully consider the design specifications to ensure that the damper provides an appropriate level of damping. That is why Amorim Cork Composites has a team of technical experts available to provide advice and collaborate with clients in the development of the transformer design.

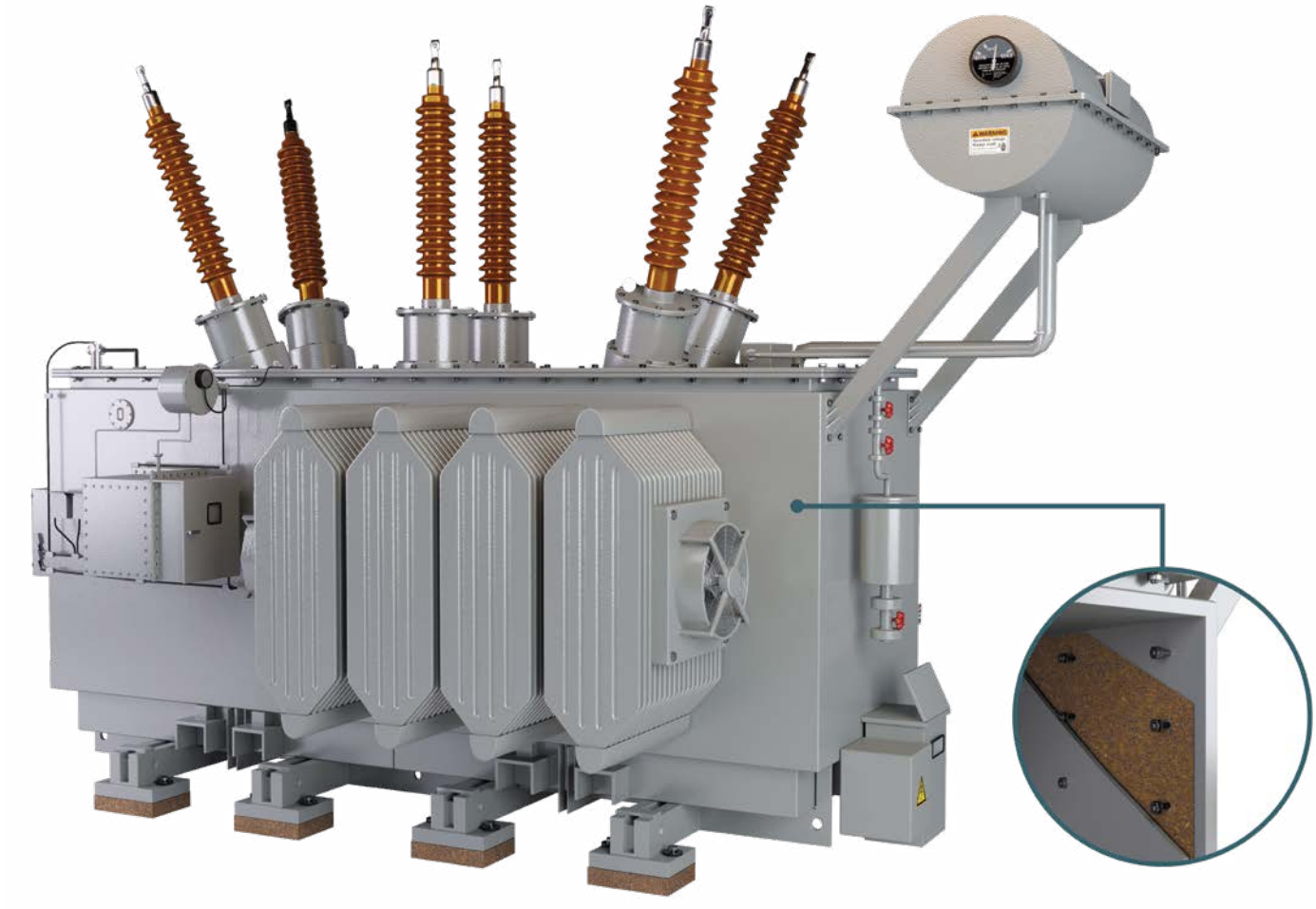
The Amorim T&D VC2100 has been developed for use as a compressed layer damping solution with excellent damping properties, suitable for industrial applications where vibration and noise reduction are essential.

By choosing cork composite solutions, we not only contribute to more environmentally friendly systems but also add the specific benefits of cork to the solution - such as **natural resilience, flexibility**, and **low lateral extrusion**. By opting for Amorim T&D solutions, manufacturers can optimize transformer designs to meet stringent noise and vibration requirements, thereby creating quieter and more reliable electrical infrastructures for various applications.

In addition to its multiple technical advantages, cork is 100% natural and one of the world's most versatile materials. Studies show that for every ton of cork produced, the cork oak forest sequesters up to 73 tons of CO_2, and no trees are felled in the process.[1]

By opting for Amorim T&D solutions, manufacturers can optimize transformer designs to meet stringent noise and vibration requirements

In equipment that includes a shunt wall, cork composites can be used as the compression element for the compressed layer damping against the tank's inner wall. This dual-function construction not only simplifies the de-



[1]https://amorimcorkcomposites.com/en-us/disclaimers/

sign but also improves the overall effectiveness of the damping solution.

Effective implementation of a compressed layer damping solution includes:

1. **Identify all areas of the tank wall that have the greatest vibration/noise amplitude:** This step is crucial in order to direct the damping efforts where they are most needed.
2. **Define the area of the constrained-layer damping solution in function of the mechanical constraints, in at least 50 % of the wall area:** This ensures that a significant area of the wall is covered, providing effective damping without undermining the tank's structural integrity.
3. **Design a clamping mechanism to compress the material nominally by 10 %:** Adequate compression of the damping material is essential to maximize its effectiveness in absorbing vibration.

Compressed layer damping is an effective and practical solution for reducing noise and vibration in industrial environments. The use of high-quality materials such as Amorim T&D VC2100 ensures that these damping solutions work effectively in demanding environments.

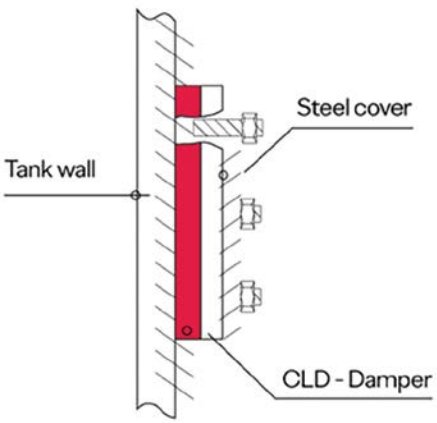
The use of high-quality materials such as Amorim T&D VC2100 ensures that these damping solutions work effectively in demanding environments

Minimize power transformers' noise and vibration with Amorim T&D solutions

Through our experience in T&D applications, Amorim Cork Composites has developed a four-step system to analyze and address issues with "noisy" equipment. This method emphasizes the importance of controlling vibrations as close to the source as possible, preventing them from reaching the tank structure. By doing so, we ensure that structural vibrations within the tank do not get amplified and converted into airborne noise by the tank walls, which could otherwise act as "loudspeakers".

Our approach begins with the recommendation for the installation of internal vibration pads beneath the active part of the transformer. Next, we focus on optimizing the connections between the active part and the tank, particularly where metal-to-metal contact occurs. In the third step, we incorporate a Compressed Layer Damper (CLD) within the tank walls. Last but not least, external vibration pads can be applied outside the transformer. This approach is flexible and can be tailored to fit the specific hardware design and constraints of the customer.

Are you looking for sustainable solutions to mitigate noise and vibration from electrical transformers? Visit Amorim Cork Composites' website, www.amorimcorkcomposites.com, to know more.



Author

Marta Reinas, Technical Product Manager

Marta Reinas completed her master's degree in chemical engineering in 2015, and in the same year, she started working at Amorim Cork Composites. She started as a developer technician in the R&D department and is currently Global Technical Manager responsible for providing all the technical support regarding Sealing and Power Industry all over the world.