



How can cork mitigate noise and control vibration in dry transformers?

Due to the increasingly rigorous regulations on the safety and sustainability of electrical transformers, an increasing number of companies in the electrical industry are striving to develop and produce dry-type transformers (i.e. oil-free). Through the elimination of oil-related hazards, these transformers offer a safer alternative for indoor installations.

However, greater vibration and noise control is required for any system intended for installation in residential areas. Amorim T&D's range of vibration control (VC) solutions can help mitigate this problem while helping reduce wear and tear on the system's parts and its environmental impact.

Cork composites as a solution for vibration and noise control

To deal with the challenges associated with noise and vibration in dry transformers, the system can be optimized in different ways - in terms of damping, acoustic insulation and increased energy dissipation. This makes it essential to choose the best materials for this purpose.

Amorim T&D cork composite solutions have been specially developed to meet such challenges. Due to its air-filled cellular structure, cork has a natural resilience, which allows it to absorb vibrations and cushion mechanical shocks. When used in transformers, cork composite solutions can mitigate vibration transmission, reduce noise levels, and minimize structural resonance.

Furthermore, cork's unique composition dampens vibrations and thereby effectively attenuates the propagation of sound waves inside transformers or their surroundings.

Allied with the high performance of Amorim T&D materials, Amorim Cork Composites has implemented a four-step approach in the analysis and treatment of noisy equipment, which focuses on the need to control vibrations prior to reaching the structure of the tank (and therefore closer to the vibration source). This approach ensures that structural vibrations in the tank are not transformed into airborne noise through amplitude vibration of its walls acting as "loudspeakers".

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NVD simulator developed by Amorim Cork Composites ensures the selection of the perfect solution

To ensure the selection of the best material and, consequently, optimal performance, it is crucial to consider various aspects of the transformer. These include operating frequency, weight/load,

available space, the placement of the material (i.e. transformers' footprint), and any potential constraints that may arise. This information is essential for accurate measurement of the pads to be used.

To facilitate this measurement, Amorim Cork Composites developed a noise and vibration control simulator, the NVD. This simulator is a unique tool

for the power industry, focused on the design and selection of Amorim T&D materials to achieve noise and vibration reduction.

Amorim T&D: the combination of performance and sustainability

The electrical industry's commitment to developing safer and more sustainable equipment delivers many benefits for people and the environment but also leads to new challenges in terms of vibration and noise control.

Cork composite solutions offer various benefits to respond to these new challenges since their natural resilience,



NVD
Noise & Vibration Design Tool

Download the NVD tool here:

Power Industry **AMORIM CORK COMPOSITES**

Noise & Vibration Design Report

Application Information

Application Mass (kg)	30000
Application Load (N)	294300
Application Frequency f ₀ (Hz)	100

Pad Design

Pad Dimensions (mm)	300 x 200
Pad Load Area (mm ²)	60000
Total Pads Area (mm ²)	360000
Applied Load per Pad (N)	49050

Material Selection

VCS400	
Compression (mm)	4.1
Compression Ratio (%)	10.2
Natural Frequency f _n (Hz)	15.1
Dynamic Stiffness (N/mm)	45275
Delta Tangent (Td)	0.164

Transmission

Select your application environment:

- ☒ Internal Contact Immersed in C
- ☐ External Contact in Ambient E
- ☐ External Contact in Enclosed A
- ☐ High Temperature Environmen

Amorim Cork Composites developed a unique tool for the power industry, focused on the design and selection of Amorim T&D materials to achieve noise and vibration reduction – the NVD simulator

flexibility, and acoustic insulation make these solutions effective for damping vibrations, reducing noise levels and improving the system's overall performance and working life. By using Amorim T&D solutions, manufacturers can optimize the designs of transformers to meet stringent noise and vibration requirements, creating quieter and more reliable electrical infrastructures for various applications. Amorim T&D solutions are also more sustainable materials (compared to 100% rubber solutions) and thereby contribute to the greater sustainability of the system.

In addition to its technical advantages, cork is one of the world's most versatile materials and is 100% natural. Studies

show that for every tonne of cork produced, the cork oak forest sequesters up to 73 tonnes of CO₂, and no trees are felled in the process.

A more sustainable future depends on everyone. To find out where to begin, visit: <https://amorimcorkcomposites.com/en/our-brands/amorim-td/>

Author



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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 at the R&D department and is currently the Global Technical Manager responsible for providing all the technical support regarding the Sealing and Power Industry all over the world.