Directory

Rolling Stock

# griwecolor GmbH

## Anti-drumming for Rail Vehicles

*Passengers can struggle to cut out noise from train wheels*

To ensure peace and quiet, our flame-retardant sound deadening solution absorbs structure-borne noise in trains.

### Solvent-Free Resin Dispersion Achieves High Acoustic Effectiveness

When we talk about travel comfort, it's not just about speed, comfortable seats and legroom, but also about the feeling of space in the train compartment or aircraft cabin. Passengers who want to work or rest undisturbed during their journey can choose quiet compartments on trains, where loud talking, mobile phone use and other noisy activities are prohibited. To reduce the structure-borne noise of the carriages themselves, and thus create the quietest-possible environment inside, many rolling stock manufacturers use sound insulation. The sheet metal used in the interior construction of the carriages – for example for cladding – is coated with sound-absorbing materials to reduce the noise generated by the sheet metal. The paint and coating experts at griwecolor GmbH have two products in their portfolio that have been developed for this application: griwephon AN2-800 and griwephon light AN2-900.

The product range has now been extended by the new griwephon AN2-750/EU, which is classified as a non-flammable product, class A2, according to DIN EN 13501-1. The product has passed the toxicological test for use in rail vehicles with flying colours. All three ready-to-use one-component solutions have also been tested for fire behaviour in accordance with the EU rail vehicle standard EN 45545-2. Griwephon AN2-800 and

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*Passengers enjoy a more comfortable journey when structure-borne noise is absorbed by griwecolor's sound-deadening solutions*

AN2-900 meet the requirement sets R1, R2, R3, R6, R7 and R17 at hazard levels HL1, HL2 and HL3. In addition, all three products have very high acoustic effectiveness according to DIN EN ISO 6721-3.

Some people find that the monotonous noise of train wheels on the tracks makes them drowsy, while others find it difficult to block out such external influences in order to sleep or work with concentration. Sound insulation and the reduction of structure-borne noise in rail vehicles to provide a more relaxing journey for passengers is therefore a major challenge for engineers. Although some components can be made from alternative materials, it is often not possible to avoid thin-walled sheet metal structures where significant vibration is unavoidable. This results in annoying background noise. *"The development of our sound-absorbing griwephon AN2-750/EU is based on the extensive experience we have gained with AN2-800 and AN2-900 as well as in the building materials sector,"* says Jörg Grieshaber, Managing Director Technology and Development at griwecolor GmbH. *"With these products, we have accumulated decades of expertise in noise reduction for rail vehicles and façade elements or windows, which we have used in further development in terms of reduced smoke density and smoke gas toxicity as well as acoustic effectiveness and flame retardancy."*

AN2-750/EU has been classified as a Class A2 non-combustible product in accordance with DIN EN 13501-1; it has also passed the toxicity and smoke density test to DB Systemtechnik specifications with flying colours. It therefore meets the R1 requirements for HL1, HL2 and HL3 for use in rail vehicles in terms of smoke development and toxicity. Like the two variants already on the market, the sound-deadening solution, based on an aqueous synthetic resin dispersion, is hydrophobic and solvent-free.

## Sound Insulation through Structure-Borne Sound Absorption

Large sheets of metal are often used in the manufacture of railway carriages. These vibrate as the train moves, producing noise. This structure-borne noise travels almost unhindered and without loss


*An application thickness in double sheet thickness of up to 5mm is possible © griwecolor GmbH*

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**Jörg Grieshaber, Managing Director Technology and Development at griwecolor GmbH**

through the metal components of the vehicle. These sound waves are then transmitted to the air, resulting in audible noise inside the carriage. To prevent this annoying noise, homogeneous layers are placed between the individual elements to provide internal damping. Thanks to its composition of inorganic components in combination with a low proportion of organic components, the griwecolor soundproofing solution achieves a very high acoustic damping effect. As the griwephon layer penetrates the material to which it is applied, it largely eliminates the material's vibrational energy by converting high-frequency vibrations into low-frequency vibrations. As a result, rail vehicle bodies emit less noise into the air inside the vehicle. *"Thanks to the special composition of our sound insulation, we achieve a very good value in terms of internal damping,"* explains Grieshaber. The loss factor according to DIN EN ISO 6271-3 is between 0.22 and 0.24, depending on the installation situation, layer thickness and material, so that a large proportion of the structure-borne sound energy is absorbed by the sound insulation. The use of a combination of mineral fillers, such as aluminium hydroxide, and the development of a special binder with high toughness, makes it possible to apply up to 5mm of double sheet thickness. The quality of the filler and the unusual layer thickness are jointly responsible for the high absorption rate. Another advantage of the mineral components is their low thermal conductivity.

## Easy to Use without Health Risks

*"As with all our products, we've made sure that griwephon AN2-750/EU, AN2-800 and AN2-900 are environmentally friendly and easy to use,"* explains Grieshaber. *"Based on an aqueous synthetic resin dispersion, we do not use any solvents to achieve the lowest-possible VOC content. Intensive development work has enabled us to achieve a value of less than 0.6g/litre. Thanks to its composition, the soundproofing solution can be applied with airless equipment at a minimum ratio of 60:1, as well as with reciprocating pump equipment using atomised air at a ratio of around 12:1, or with screw conveyors using atomised air at an inlet pressure of 3 to 4 bar. Manual application with a spatula or mortar trowel is also possible. The soundproofing solution has a high degree of stability when applied to vertical surfaces. When applied wet, a layer thickness of up to 5mm can be applied in one operation without the product slipping or cracking the surface.*

*An application thickness of up to 5mm is possible*

*After drying, the layer thickness is approximately 4 to 4.5mm. The application is therefore fast, safe, clean and poses no health risks due to the ingredients,"* concludes Grieshaber. Even in the event of a fire, griwephon AN2-750/EU does not release any toxic gases. The material has been tested to EN 45545-2 with very good results in terms of smoke density and smoke gas toxicity. Our griwephon sound insulation therefore combines fire protection with easy handling and efficient noise protection.

Further information visit **www.griwecolor**.

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