

New material for trackbeds incorporates rubber from used tyres

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Recycled tyre rubber in trackbed sub-ballast. Credit: Asociación RUVID

Researchers have developed a material for use in the subballast layer of train tracks that incorporates shredded rubber from used tyres. Combined with crushed stone, this type of mixture has already been used to good effect in asphalt mixtures and roadside embankments, but its use

in the rail sector is relatively unexplored.

The new material has already been tested along a section of the Almoraima-Algeciras ADIF line in Andalusia, where it has been assessed by UPV technicians. Not only does it allow and even promote the wholesale recycling of used tyres, a large and problematic source of waste, but it offers several other interesting advantages over traditional materials. For instance, it absorbs the vibrations from moving trains, providing insulation for urban environments with close rail traffic. The addition of tyre rubber into the mixture also increases the resistance of the crushed limestone to abrasion and fragmentation.

Pablo Martínez Fernández, researcher at the university's Institute of Transport and Territory (ITRAT), explains: "There are multiple benefits to using this material. On the one side, it contributes to mitigating the vibrations caused by moving trains. But at the same time it opens up a new market for many of our quarries, particularly limestone quarries, as well as for tyre recycling companies. It revitalises both sectors, making better use of the available limestone, not normally fit for use as a sub-ballast because of its low resistance to fragmentation, and the rubber from used tyres".

As part of this project, the team, led by Ricardo Insa, worked on the design, development and evaluation of different compositions and blends of the product, varying only the amounts of waste rubber used each time.

"From our laboratories at the Departamento de Ingeniería del Terreno (DIT) we analysed the response of the new material, with different concentrations of used tyre rubber, in order to find the best composition", says Carlos Hidalgo Signes, also of the UPV.

Another of its main characteristics is that it does not incorporate any binding [materials](#): "We simply mix the crushed stone with the waste

[rubber](#), which is what gives it its cushioning effect", adds Hidalgo Signes.

Provided by Asociacion RUVID

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