

# ECOPNEUS USING RECOVERED END-OF-LIFE TYRES TO CREATE HIGH PERFORMANCE MODIFIED ASPHALTS IN ITALY

The [Ecopneus non-profit company](#) created in 2011 in Italy, continues to manage the End-of-Life Tyres (ELTs). Created by the major tyre manufacturers operating in Italy, Ecopneus is the leading consortium managing more than 65% of the total ELTs generated yearly. It collects an average of 200,000 tonnes of ELTs every year throughout the Italian territory: from large cities and towns to the small mountain villages and the islands.



The [2023 Sustainability Report of the Company](#) shows the impact and results achieved by the system implemented to guarantee the collection and the management of the End-of-Life Tyres across the country.

The main applications of the materials derived from ELTs [are presented in the Ecopneus website](#): Asphalts (for more sustainable, high-performing and cost-effective road pavements); Sport (for synthetic turf surfaces, horse riding flooring, anti-shock floorings, athletics tracks); Building (for sound insulation, anti-vibration and water proofing); Energy (for paper mills, cement factories, thermoelectric power stations and plants for the production of lime).

In particular, [Ecopneus is working to promote new applications of rubber recycled from ELTs](#) by investing in research and innovation activities in collaboration with associated companies. In this context, one of the areas of research with significant potential for development is the use of rubber derived from the recovery of end-of-life tyres (ELT) as an additive in bituminous conglomerates to produce high-performance *modified asphalts*. Over the years, Ecopneus has played an active part [in various experiments throughout the country](#).

[As a result of these activities, by 2024 more than 680 km of roads in Italy have been surfaced with modified asphalts, with the addition of recycled rubber from end-of-life tyres.](#) Emilia Romagna, Tuscany, Piedmont and Trentino Alto Adige are the regions with the most notable experiences.

By adding rubber powder to asphalt bitumen, it is possible to obtain road pavements with superior mechanical performances compared to conventional bitumen. Moreover, these pavements can reduce the noise caused by passing vehicles. In Italy the use of this technology has become consolidated over time, also thanks to the constant commitment of Ecopneus. On the one hand with its support to new interventions and monitoring campaigns, on the other hand it has raised awareness, disseminating technical information and scientific data on this important application of recycled rubber.

The advantages of modified asphalts with recycled rubber powder are:





- *Noise reduction*, generated by the tyres in contact with the road and, in certain types of asphalt, also by vehicles in general;
- *High durability* of the pavement and exceptional resistance to aging, with international case studies showing lifetimes up to three times longer than those of traditional asphalt;
- *Greater surface resistance* to cracks leading to significant reduction in maintenance interventions, with less inconvenience caused by roadworks and lower related costs;
- *Greater safety*, thanks to the excellent grip and water drainage resulting in noticeable reduction of the splash and spray effect in case of rain, thus improving visibility. The greater resistance of modified asphalt to potholes also leads to reduced roadworks, which increases citizens' comfort and reduces accidents and noise.

In urban and suburban areas (i.e., municipal roads) the primary purpose is to reduce traffic noise; in rural areas (such as provincial, regional and state roads), characterized by higher traffic volumes, including heavy-duty vehicles, and higher speeds, the primary objective is to increase the longevity and preserve the structural characteristics over time, while still providing the additional benefit of noise reduction.

One of the main advantages of modified asphalts is, therefore, noise reduction. By appropriately designing the bitumen mixes, it is possible to obtain an asphalt that can reduce the noise generated by passing vehicles by up to 7dB. This value corresponds to halving the sound energy perceived by human ears. This is highly significant, considering that one-fifth of EU's population is exposed to excessive noise levels, according to the World Health Organisation (WHO), and Italy is currently undergoing an infringement procedure for failing to take sufficient measures to prevent and combat excessive noise levels. This highlights another reason for further promoting this effective technology, especially in urban environments.

The longer duration of modified asphalts has been confirmed by tests conducted on an important road in the city of Reggio Emilia, one of the first in Italy paved with bitumen modified with rubber powder. After six years the pavement was still perfect, despite its thickness being almost halved compared to the initial project. It showed no need for maintenance. Indeed, thanks to its greater performance due to the addition of rubber, it was possible to reduce the overall asphalt thickness from 25 to 15 cm. This allowed significant savings of materials, energy and resources. The analyses carried out to verify its condition have predicted 18 more years of useful life without major interventions. Moreover, thanks to the use of secondary raw materials, from rubber powder to asphalt millings, it was possible to avoid the emission of 40 tonnes of CO<sub>2</sub> and reduce energy consumption by 70,000 kWh, even for a distance of 3 km. This saving is equivalent to the average monthly consumption of 300 families of Reggio Emilia.

Modified asphalts allow for greater safety while driving thanks to better road holding, water drainage and improved visibility. Greater resistance to the formation of potholes and very effective drainage guarantee excellent visibility and safety for road users, increasing comfort for citizens and reducing accidents by mitigating the phenomenon of aquaplaning.

Ecopneus is also one of the partners in the [LIFE NEREIDE project](#) funded by the European Union to demonstrate the use of new porous asphalt pavements made from recycled asphalt pavements and crumb rubber from scrap tires. The other partners





in the project are the Università di Pisa, as the Project coordinator, supported by the ARPAT, the regional environmental protection agency of Tuscany; the Belgian Road Research Centre (BRRC); the Institute of Acoustics and Sensors "O.M. Corbino" of the National Research Council of Italy and Tuscany Region.

The NEREIDE project aims to demonstrate the use of new porous asphalt pavements produced using crumb rubber from scrap tires and warm mix technologies, as a valuable solution for reducing road traffic noise, increasing the use of reclaimed materials in new (and rehabilitated) pavements, reducing carbon emissions during paving operations and, at the same time, for improving road safety.

In collaboration with Universities and research centres, Ecopneus has also promoted a series of technical dossiers on modified asphalts over the years. These dossiers scientifically deal with technical aspects, case histories, experiences and characteristics of the different types of modified asphalts. The dossiers are distributed in all the events of reference; they are shipped to some selected contacts, and they can be freely downloaded from their website. Among these materials, essential for promoting these innovative methods of asphalt production, there is also the [Guide for the production of bitumen with rubber powder from PFU](#), a translation of the original text of the guide produced by Signus Ecovalor, the non-profit entity created in Spain in 2005 to support tire manufacturers and importers in fulfilling their legal obligations regarding the management of End-of-Life Tyres. Thanks to the work of SIGNUS, Spain has the European record of [1,600 kilometers of asphalt roads of the country paved with rubber dust from discarded tyres](#).

The use of recycled rubber from end of life tyres (ELT) in asphalt concretes has been invented in the 60s by Charles McDonald, who worked with the Bureau of Public Roads in Arizona (United States) and the technology, also called Asphalt Rubber, is now spreading in many countries around the world, making an important contribution to environmental sustainability.

## To know more

[Ecopneus – Modified Asphalts](#)

[Article in Ecopneus 2023](#)

[Rubberised Asphalt use in Italy in Ecopneus](#)

[Ecopneus website](#)

[Ecopneus in Facebook](#)

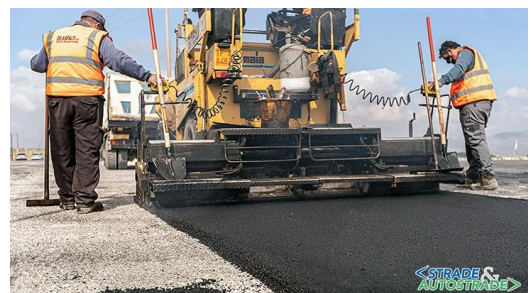
[Ecopneus Sustainability Report 2023](#)

[Ecopneus 2023 Report pdf](#)

[Asphalt Roads in Spain IDEASS article 2019](#)

[20 Years of rubberized asphalt in Spanish roads pdf](#)

[Recycled asphalt for more sustainable roads in moveglobal.com](#)



[Asphalt Rubber in Arizona in pavement.engineering.asu.edu](http://pavement.engineering.asu.edu)

[A new era for rubber asphalt concretes for the green public procurement in road construction. Article in ecopneus.it](http://ecopneus.it)

