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Porous Asphalt Mixtures: the First Barrier for Microplastic Pollution?

In recent years, much effort has been focused on microplastics as an increasing problem of environmental pollution. In the case of those generated by tyre wear on the road, they have been gaining importance as a consequence of exhaust emission reduction. The term "microplastics" comprises plastic fragments smaller than 5 mm and larger than 1 µm. Most of them settle on or around roads, with only 1 to 10% of the particles being emitted into the air. For this reason, roads are considered an intermediate step between the source and the environment. Although the use of porous asphalt mixtures in European countries does not reach 10% coverage of the road network, recent studies suggest that this type of mixture might retain a high volume of microplastics inside its pore network. This project aims to confirm this hypothesis by developing a methodology for evaluating the real capacity of porous asphalt mixtures to retain microplastics, and thus promote their use as a first barrier against further dispersion of these pollutants into the environment. For this purpose, a three-stage methodology has been designed. Firstly, an analysis at laboratory scale is conducted, where conditions and quantities are controlled. The second stage is at medium-scale, for which a circular road simulator would be used. Finally, the last part is based on a real level analysis of microplastics by collecting samples from different roads, both dense and porous.

