



Sustainable road construction material

Data and Facts

Customer References: City of Kiel, STRABAG, DEGES, & more

Cooperation Partners: Fraunhofer Institute, University of Kassel

Investors: Fraunhofer Technologie-Transfer Fonds, High-Tech-Gründerfonds

Product: Ecoflakes – Sustainable road construction materials

Founded Date: 2021

Team Size: 10

About Ecopals

Ecopals is a manufacturer of sustainable road construction materials. The first product is a high-performance asphalt additive made from recycled plastic: Ecoflakes. Ecoflakes replace virgin plastics, parts of the crude oil product bitumen, extend the lifespan of asphalt, and reduce the CO2 footprint in road construction by up to 20%.

Conventional asphalt consists of rock / gravel and the binder bitumen, a crude oil product. To enhance performance, newly produced plastics are often added to asphalt to modify and improve the bitumen. Ecoflakes contain only such plastics that modify bitumen in the same way but have already completed a life cycle and would have otherwise been incinerated. This makes the asphalt more durable while maintaining the same flexibility. Additionally, Ecoflakes keep the binder fresh longer. As a result, the asphalt lasts longer and can be easily recycled.

Management



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Our Story

Ecopals was founded in 2019 as a project of the student NGO Nidisi, which provides development aid in Nepal. Alongside projects for drinking water and education, the team sought a solution for plastic pollution and the lack of safe infrastructure. With the help of scientific project partners from Fraunhofer ICT (plastics/material sciences), the University of Kassel (asphalt & road construction), and initial construction partners in Nepal, Austria, and Germany, it quickly became clear that this technology could also have a significant impact here in Europe.



Recycled Plastics



Mixing Additives



Ecoflakes



FAQ about Ecopals

How are Ecoflakes produced?

The plastic streams from which Ecoflakes are produced are generated everywhere. Ecopals has developed a process in which recycling companies, with their technological capabilities, can produce Ecoflakes. This allows for decentralized and regional production. Ecoflakes must contain specific types of plastics that are carefully selected, sorted, and pelletized. Additives are then added to the mix to facilitate the binding of the plastics into the bitumen. The quality of the product is then regularly tested for its homogeneity and the absence of contaminants.

Why do Ecoflakes make asphalt more sustainable?

Ecoflakes extend the lifespan of asphalt by preventing rutting and cracking. The less often a road needs to be repaired, the fewer traffic jams and additional emissions occur. Additionally, we can replace about 10% of the crude oil product bitumen and newly produced plastics. Using plastics in asphalt to enhance its performance is not a new idea, but these plastics have traditionally been specifically manufactured for this purpose. Furthermore, Ecoflakes asphalt saves up to 20% in CO2 emissions during production by using plastics that would otherwise be non-recyclable.

What about microplastics?

Fundamentally, the wear of bitumen contained in asphalt is the second largest source of microplastic particles, after the wear of rubber from tires. According to the most comprehensive study on this topic to date, our type of modification can potentially reduce wear due to improved asphalt performance, for instance, by creating higher resistance to rutting.

Therefore, we do not solve this problem, but we do not worsen it either.

Do the roads look different?

Anyone driving on a road with Ecoflakes is unlikely to notice it – except perhaps for the fewer ruts.

Once installed, the asphalt looks just like traditional asphalt, as the plastics bind into the bitumen. They enhance the performance of the binder, but are no longer visually detectable.

What happens to the plastic when the roads break down?

Despite its poor environmental record so far, asphalt has a significant advantage: there are already construction projects where up to 80% of the asphalt in a newly built road consists of reclaimed asphalt. Overall, it can go through up to five life cycles over more than half a century without losing performance. Unfortunately, this is not yet standard practice.

Asphalt modified with Ecoflakes keeps the bitumen fresh and can therefore be recycled in the same way. This means that plastics can have not just one, but several new life cycles.

How expensive are Ecoflakes compared to conventional road construction materials?

Ecopals can save costs in the price-sensitive construction sector by utilizing end-of-life plastics, while achieving the technical performance of more expensive competing products.

For comparison: Ecoflakes are approximately 4 euros per ton of asphalt cheaper than non-modified asphalt.

Link to image folder:



More Info:

