

BITUMEN AND **ADDITIVES** - **AT A GLANCE**

About Bitumen

Bitumen is a sustainable construction material with inherent performance properties making it durable, flexible, and versatile providing proven solutions for supporting sustainability challenges.

The adaptability of bitumen to extreme climate conditions globally is an important property for today's environment. Also, the ability of bitumen to adapt to temperature reduction technologies can contribute to reducing CO₂ through lowering energy used in both end-product production and application stages.

Over the years a number of different approaches have been taken to modify and improve bitumen performance in its application. This publication gives an overview of the important factors that should be considered when introducing additives into bitumen.

The existing properties of bitumen already provide options for innovation. Responsible innovation is encouraged by the industry and has been seen with the many solutions already available to implement.



WHY

In order to adapt the properties of bitumen to the changing demands in applications, whether from changed climatic conditions, increasing traffic loads, objective on recycling and re-use, or with the aim to increase sustainability of end uses, bitumen is often modified.

Historically, synthetic polymers have been the most common materials used to modify bitumen. However, there has recently been increasing interest in other additives for bitumen including: bio-based materials, REOB, or secondary materials. Bio-based materials, in particular, should not compromise or compete with the food chain.

HOW

Modifications are done to produce a ready to use modified binder (wet process) or directly at the application plant (dry process).

Additives or modifiers should not negatively influence the properties of bitumen and its applications with regard to HSE, technical performance and sustainability.

WHAT

General topics to consider prior to use

- information on the production process;
- information on the products used, including used products, and their consistency;
- information on composition, including PAH content and profile of the product itself and specifically its emissions, preferably using methods used in health related literature on bitumen;
- data on assessment of potential leakage into water and soil;
- data on emissions into air during end-use, and also at workplace exposure conditions
- references for applications and technical performance of the specific product.

Technical

- Definition of the material's characteristics, which can influence performance of the final product.
- Guidance on the correct method of incorporation into bitumen, including storage stability.

HSE

No negative influence on HSE compared to standard bitumen should be accepted, unless risk assessments are conducted and controls are in place to demonstrate safe use.

Sustainability

The use of any secondary material or other additives in bituminous applications must not negatively influence the overall environmental footprint compared to standard solutions.

Modified bitumen have also been shown in some applications to allow for thinner pavements reducing need for raw materials.

Long life: Durability

Extending the service life of the end product in which bitumen is used is a critical tool for reducing the environmental impact of bitumen.

Bitumen has intrinsic and well proven technical performance properties. By adding modifiers such as polymers or other additives to bitumen an extended service life has been observed in some applications.

After first life: Re-usability

Even after its useful service life bitumen can easily be re-used over and over again – with the priority focus being to ensure the life is extended.

Additives and modifiers should not negatively impact the re-usability of bitumens.