

A new process that uses hydrated lime for preventing “bleeding” in overheating roads with a controlled impact on the environment.

Heatwaves can inflict serious damage on roads. Lhoist has developed a new process that is both curative and preventative and easy to deploy. Clim'adapt – Carnot Cerema Institute – has helped to limit the technique's environmental impact.

Supporting Innovation

Successive heatwaves damage roads by causing “bleeding” in bituminous pavement where the asphalt and the aggregate become separated. The asphalt binder forces its way to the pavement surface, creating dangerous areas with very poor grip, especially for two-wheeled vehicles. To remedy this and avoid damaging roads during extreme weather, road maintenance departments if they are unable to use hydroblasting to eliminate the outermost layer, often spread sand or gravel. This creates loose chippings and cannot really prevent damage to the road surface. Lhoist has come up with a solution that is both curative and preventative and involves spreading a special slaked lime-based formulation using machinery equipped with a tank and a spray boom. The operation may be performed at any time of the day and does not require the deployment of special fixed signalling equipment. However, if this innovative technique is to be used on a widespread basis, its environmental impact must be limited. For example, if the thin layer of lime spread on the surface is washed away during a rainstorm, it should not pose a threat to nearby natural areas. It was [Carnot Clim'adapt Institute](#) that came up with a solution to this aspect of the innovation.



The client needs

Lhoist is an international group that operates around a hundred sites in 25 countries and has, over the course of a century, become a global leader in lime, dolime and minerals. Lime in various different forms is omnipresent in construction and civil engineering. It improves the driveability and mechanical performance of road and motorway subsurfaces, is used to blend hydraulic road binders and facilitates recycling of excavation waste. Hydrated or slaked lime enhances the durability of asphalt surfaces on roads. Lhoist has developed a specific slaked lime formulation designed to prevent “bleeding”. The Asphacal® BL range may be applied in a preventive manner and immediately restores a safe driving surface. However, part of the thin film of lime left on the surface may be washed away during the heavy rains common during hot weather and safety guidelines for using hydrated lime recommend that it should not be released into the environment. Consequently, Lhoist really needed to be able to provide the local councils in charge of a large part of the road network with solutions in relation to the environmental impact of the process. Carnot Clim'adapt Institute designed and deployed a research protocol for assessing the impact of this technique on the surrounding environment, particularly on nearby wetlands. The initial findings helped to identify the areas where the product could be used without any risk and to adapt the quantity of the product to be applied to the most sensitive areas. A full-scale test conducted on a secondary road near Puy-de-Dôme in central France in 2020 made it possible to refine the conditions for using the technique.

Partnership

Cerema, Carnot Clim'adapt Institute, helps stakeholders to design and develop urban planning infrastructure. It helps them transition to a more frugal, carbon-light and environmentally friendly economy.

Lhoist was able to leverage Clim'adapt's expertise in hydraulics, infrastructure, the environment and environmental chemistry. It could also benefit of its equipment, which included a “rain generator” that can produce rainfall of controlled intensity and duration over several square metres. A three-phased experiment was conducted to assess the impact of lime leaching during a rain shower, by quantifying and evaluating the repercussions of lime flow into a watercourse near a treated surface. After some theoretical studies, the amount of lime that leached into water following different types of rainfall events was measured during the experimental phase. Physical and chemical analyses of the water collected were combined with hydrobiological tests performed on the aquatic environments of a life-size experimental site to develop findings concerning the long-term environmental impact.

The initial results were used to develop guidelines for natural areas based on how sensitive they are and they convinced a number of local councils to experiment with Asphacal® BL during the summer of 2020.

Clim'adapt provides Lhoist's innovation with the guarantees expected by local councils who get a more sustainable solution for tackling the problem of “bleeding”. The partnership has demonstrated that this highly-affordable technical innovation is a real boon for local authorities both in terms of their budgets and their social responsibility.