Asphacal®

Case Study
Asphacal® H

ASCS3 EN - 1502

Polymer-lime synergy in polymer modified asphalt concrete

Context

The client needed a Porous Asphalt (PA 0/10) with very demanding specifications due to:

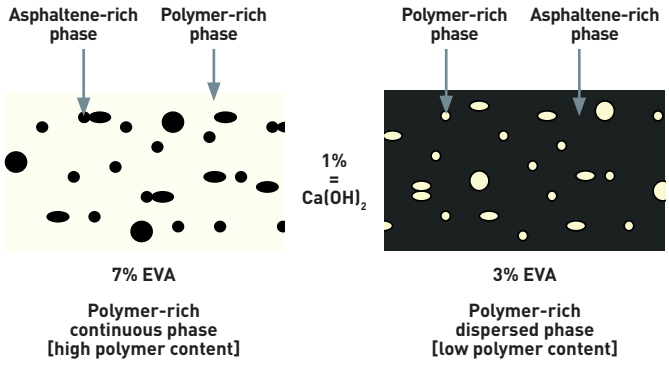
- heavy traffic (40,000 vehicles/day with 15% heavy trucks)
- severe climate (high temperatures in summer and deep frost in winter)
- high mechanical loads (shearing)

A laboratory study at the client's laboratory showed that polymer-modified binder with a high polymer content (6% to 8% polymer) allowed to obtain the needed specifications. However, the practical implementation of this composition remains tricky due to:

- risks of phase separation and settling during transportation and storage
- high viscosity of the binder, making it more difficult to handle (storage and pumping at higher temperature) and to work with (application at higher temperature).

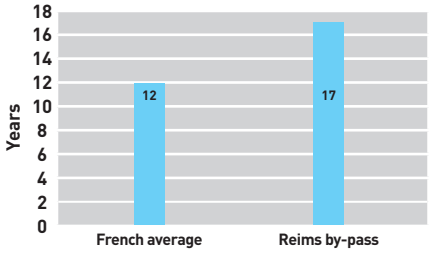
The solution: Asphacal® H

Adding 1% Asphacal® H100 (about 1 wt.% hydrated lime based on the dry aggregate) to the Porous Asphalt made it possible to reduce the polymer content (here an ethylene-vinyl acetate (EVA) copolymer) from 7% to 3% while retaining the desired mechanical properties.



This Porous Asphalt was laid over 9 km of the Reims by-pass (French A4 3-4 lane motorway). It had a thickness of 4 cm representing 14,000 tons. The service lifetime has been observed to reach 17 years, when the mean service lifetime of Porous Asphalt in France on this type of network is 12 years.

Service life of a Porous Asphalt



Source: EAPA

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Thus, the addition of 1% Asphacal® H100 has contributed in this case to:

- gain more than 30% in durability
- apply the Porous Asphalt at conventional temperatures
- obtain considerable savings due to a reduction of more than 60% of the polymer required

Asphacal® H100 has allowed ease of handling and compacting of the asphalt combined with the desired performance.

Application

Asphacal® H products are used in all types of mixing plants (continuous, batch, fixed, mobile). They are incorporated in the same manner as a conventional filler, at rates making it possible to obtain generally between 1 and 2 wt.% hydrated lime based on the asphalt. The exact proportion is defined by a formulation study according to the type of material and the desired specifications. Lhoist can advise its customers in using this product and can support them in setting up tailor-made technical solutions.

Conclusion

Asphacal® H products are hydrated limes and limestone fillers activated with hydrated lime at different percentages, designed specifically for increasing the durability of asphalt pavings. Asphacal® H can be used alone for improving regular AC or in synergy with other additives especially polymers.

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With its Asphacal® range (Asphacal® C, Asphacal® TC, Asphacal® H, Asphacal® Q and Asphacal® BK), Lhoist supports the civil engineering industry in seeking high-performing solutions for more durable roads.