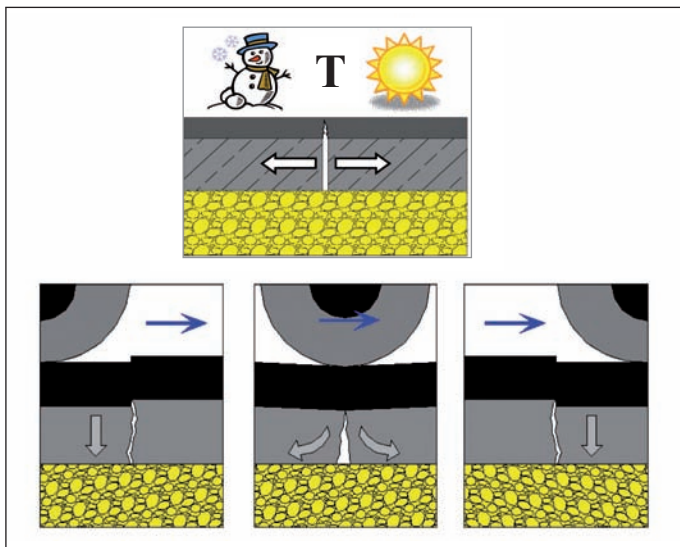


SamiGrid® - Reinforcing Composite for the rehabilitation of concrete roads

When it comes to the rehabilitation of existing concrete roads with asphalt, the development of reflective cracking is one of the biggest issues.

The traffic imposes high loads onto the carriageway, resulting in horizontal and vertical movements. The different thermal behaviour of asphalt and concrete additionally produces horizontal movements of the concrete slabs.



Loads imposed to a carriageway

Particularly at the expansion joints, these movements cause very high tensions, which cause first cracks in the asphalt that very quickly reflect through the new asphalt layers to the surface.

For technical reasons (e.g. surrounding height restrictions), it is not always possible, especially in urban areas, to integrate an asphalt regulating layer prior to installing asphalt reinforcement.

Especially for these applications, HUESKER has developed a composite called **SamiGrid®**, which can be installed directly on the concrete surface.

The use of **SamiGrid®** is also suitable for the reconstruction of ASR (alkali-silica reaction) affected pavement slabs.

SamiGrid® is a composite consisting of an asphalt reinforcement grid of high modulus polyvinyl alcohol

(PVA) fibres in combination with a nonwoven fabric. The saturation of the nonwoven material with bitumen provides a double benefit, i.e. a reinforcing effect from the grid and a sealing effect through the bitumen saturated nonwoven.

In contrast to other raw materials, PVA exhibits very good resistance to high pH-values. For this reason, it is particularly suitable for the reconstruction of concrete surfaces. The nonwoven material added to **SamiGrid®** is, like the grid, equipped with bitumen to produce an optimal interlayer bond.

Due to its high resistance against mechanical damage during installation (installation damage), **SamiGrid®** can also be directly applied to milled surfaces.

The use of **SamiGrid®** has been proven to effectively slow down the process of reflective cracking with the reconstruction of concrete roads.

SamiGrid® is produced in width of up to 5m and with a length of 100m. Other widths are available upon request. This reduces overlaps, which in turn simplifies



*Asphalt installation on **SamiGrid®***

and speeds up the installation process and guarantees very high installation quality.

Scientific investigations

Testing at the Belgian Road Research Centre (BRRC)

A series of tests of the Belgian Road Research Centre confirms that **SamiGrid®** possesses good properties that effectively slow down the reflective cracking process.

For the simulation of thermal crack propagation, the BRRC developed a test facility back in the nineties (Figure 1) with which one can test the crack-reducing effect of an asphalt layer.

In this test run, an asphalt layer 65 mm thick is installed on top of a cracked concrete base. At test start the

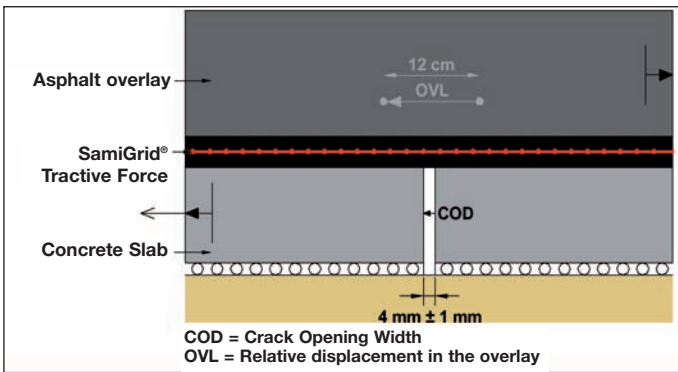


Fig. 1: BRRC test setup

width of the simulated crack is 4 mm, during each cycle the crack is widened by 1 mm and then returned to 4 mm. The 1 mm shift per cycle approximately matches the expansion volume of water, which can be found in a crack.

The BRRC test facility has been established to a point at which many products and systems available on the market today have been tested. The tested reinforcement products mainly differ in the choice of their raw material and the bituminous coating. The results are summarised in Figure 2.

The asphalt interlayers show significant differences in their effectiveness. In the nonreinforced reference sample (0), the crack penetrated through to the surface after only a few cycles.

In this test, **SamiGrid®** (6) completely prevented crack reflection, with no cracks initiated even after completion

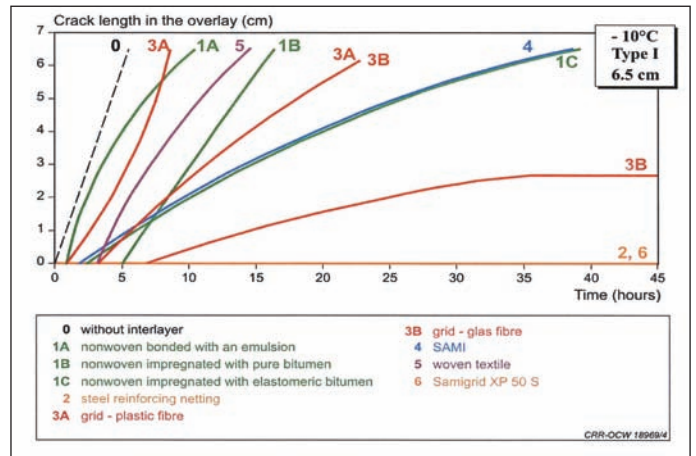


Fig. 2: Test results of different products and systems (BRRC)

of the test run. All other systems with polymeric interlayers, or with glass reinforcement, show crack initiation, with most cracks reaching the surface.

This shows that not only individual reinforcement parameters (e.g. extensional stiffness) are important, but rather the overall system behaviour of the reinforced asphalt package. Due to effective mobilisation of tractive forces and excellent system behaviour, **SamiGrid®** is highly effective with the imposed loading.



Installed **SamiGrid®**

