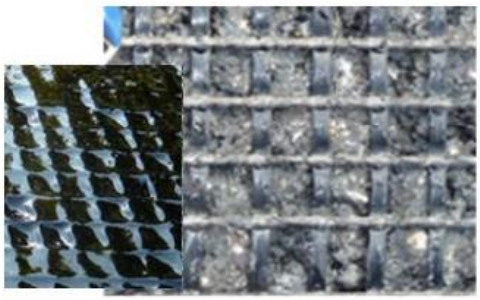
Asphalt reinforcement / „Performance“ Test

HUESKER
Ideas. Engineers. Innovations.

The effectiveness of asphalt reinforcements was investigated and compared in laboratory and in-situ tests.

At the Swiss Federal Laboratories for Materials Testing and Research (Empa), the effects of asphalt reinforcements were tested and compared [1]. The main focus was on the following topics: layer bonding strength, avoidance of reflective cracks, crack pattern and stiffness/deformation. The following 3 products/systems were tested:



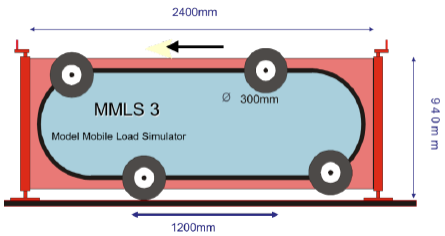
A) Glassgrid with SAMI

B) Grid out of Glass/Carbon

C) HaTelit C 40/17

Laboratory test:

In the laboratory the traffic simulator “Model Mobile Load Simulator“ MMLS3 was used. This serves the accelerated testing of road surfaces and is used to determine the mechanical properties under wheel load.

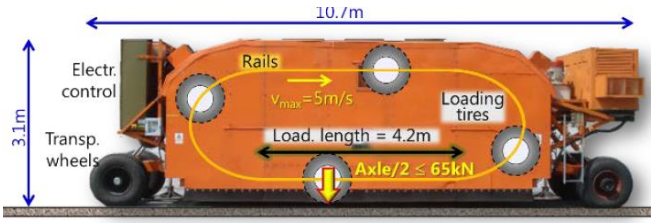


Schematic of the Model Mobile Load Simulator (MMLS3)

MMLS3 and Detail: Wheel

Test Fields:

The aim of the investigations with the traffic load simulator MLS10 was to compare the selected systems in situ, which means under most realistic conditions.



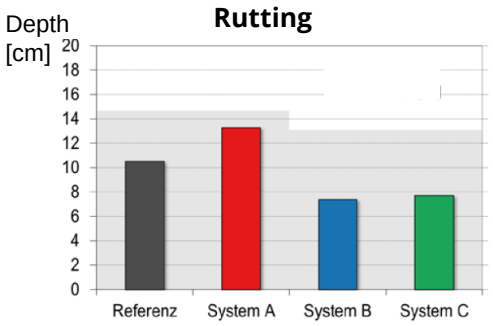
HUESKER Synthetic GmbH

Fabrikstraße 13–15, D-48712 Gescher
Tel.: + 49 (0) 25 42 / 701 - 0
Fax: + 49 (0) 25 42 / 701 - 499
E-Mail: info@HUESKER.de
Internet: www.HUESKER.de

The effectiveness of asphalt reinforcements was investigated and compared in laboratory and in-situ tests.

Findings:

A detailed description of all tests, test methods and evaluations can be found in [1]. At this point some of the findings are cited and summarized. In the laboratory tests carried out, all systems with asphalt interlayer, with the exception of the Sami system, proved to be superior to the non-reinforced system with regard to crack bridging, which leads to at least a doubling of the service life. Also in the in-situ tests, the cracks of the systems with asphalt reinforcement only became visible after twice as many load cycles. Ruts can be significantly reduced with systems B and C, whereas with one system (SAMI) the depth of the ruts increases.



Rutting of all systems and test fields by comparison (System C = HaTelit C 40/17)

„Crack initiation and development differed significantly between the reference field and the test fields with reinforcement“

Summary:

- Both laboratory and field tests show that asphalt reinforcements delay the appearance of cracks and thus extend the service life of asphalt pavements.
- It was found that with all tested products the required layer bonding strength of Fmax > 15 kN can be achieved.
- In both laboratory and field tests, asphalt reinforcement (systems B and C) without SAMI proved to be more effective than those with SAMI.
- Rutting can be reduced.
- In the assessment of crack reduction, systems B and C were both very effective and no further distinction was made between these systems. Here HaTelit with 50 kN/m and the carbon grid with 200 kN/m can be considered equivalent.

References:

[1] Empa, 2017. Research project Astra 2011/011. Application of asphalt interlayers for road pavements
[2] Raab Christiane, Arraigada Martin, Partl Manfred, 2016. Proceedings of the 8th Rilem International Conference on Mechanisms of Cracking and Debonding in Pavements.

HUESKER Synthetic GmbH
Fabrikstraße 13–15, D-48712 Gescher
Tel.: + 49 (0) 25 42 / 701 - 0
Fax: + 49 (0) 25 42 / 701 - 499
E-Mail: info@HUESKER.de
Internet: www.HUESKER.de