

## GEOSYNTHETIC MATERIALS FOR CONTROLLING THE CRACKS IN PAVEMENTS

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### A B S T R A C T

The pavements actually designed in road construction consist of materials with rather different nature and properties (coarse grained materials, bituminous materials, hydraulic mixtures etc). All these structures, under various cases of loading (thermal differences, traffic, subsoil movements), are susceptible to the creation of cracks and fissures of different nature. Designing against reflective cracking of pavements is a very complex problem, especially when considering the cost of effective rehabilitation. Indeed, cracks and fissures propagate into the new layer reappearing superficially and thus creating the reflective cracking phenomenon.

The use of geosynthetics in pavement design is already largely developed and offers the possibility of an important decrease in the cost of rehabilitation of old fissured pavements, improving as well their mechanical behaviour.

The main mechanism of the beneficial influence of geosynthetics is based on the intense anisotropy that these materials induce by the differentiation of the elasticity modulus, which allows retarding or even prevents the propagation of reflective cracking. In fact, geosynthetics employed induce a wanted anisotropy at the interface of the pavement structure according to which the ratio of horizontal stresses is larger than the ratio of vertical stresses. This fact allows for the geosynthetic to complete its function, that is to undertake large tensile stresses using its high elasticity modulus.

A first application in Greece of this method was designed and realised on October 1988 at the project of rehabilitation for the road Loutra Thermis -Vasilika in the prefecture of Thessaloniki and was totally successful. This proves that the use of geosynthetics against reflective cracking in pavement design provides both a serious cost effective solution and an important increase in the bearing capacity of pavements versus the life expectancy of the project.