

This report issued by GEOARTEC TECHNICAL SOLUTIONS S.L., a Spin-Off of University of Zaragoza, has been made by Laura de Juan Mangas (geologist).

PRODUCT TECHNICAL SHEET: AQUASHIELD FORTE – water repellent based on ceramic nanoparticles dispersed in isopropanol for porous and low porosity substrates.

Water/Stony materials high contact angle. The contact angle of treated substrates is between 138° in macroporous materials and 137° in microporous materials.

Capillary absorption coefficient or water absorption speed is reduced between 66% in microporous materials and 94-96% in macroporous materials.

Does not affect water vapour permeability in macroporous materials and in microporous materials the reduction is less than 5%.

Impact resistance of rainfall over 10 years. In the area of the Cantabrian coast rainfall would be needed 35 years to generate a 10% decrease in contact angle for macroporous rocks and 22 years in the case of microporous rocks.

Slight chromatic alterations in sandstone and limestone. Total colour variation ΔE 1,4.

After one year equivalent of ultraviolet radiation exposition, there is no perceptible chromatic variation. It maintains a reduction of the capillary absorption coefficient between 76-91% for macroporous rocks and a 43,5% for microporous rocks, the water vapour permeability has decreased 21% for macroporous rocks and 26% for microporous rocks, and the contact angle has been reduced 4% for macroporous rocks and 9% for microporous rocks.

GENERAL CONCLUSIONS:

AQUASHIELD FORTE has optimal qualities in terms of improving the contact angle, slight change in the colour of the treated material and null or slight modification in the permeability to water vapour for macroporous and microporous materials.

The minimal variation in performance and effectiveness of the product after the realization of artificial accelerated aging test of erosion by water jet effect indicates a water repellency and durability higher than 10 years for AQUASHIELD Forte against the action of rain.

The values obtained after the accelerated ageing test by exposure to ultraviolet rays regarding colour variation, capillary absorption of water, water vapour permeability and variation of the contact angle, comparable to the action of the sun for one year, indicate the resistance to their action with modifications around 7% in macroporous rocks, and between 10-25% in microporous ones.

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