



## **Salt crystallization and freeze-thaw damage of repair mortars and porous limestone; a laboratory perspective**

Balázs Szemerey-Kiss and Ákos Török

Budapest University of Technology and Economics, Engineering Geology and Geotechnics, Budapest, Hungary  
(torokakos@mail.bme.hu)

Durability of porous limestone and repair mortars were tested parallel. The specimens were subjected to salt weathering and freeze-thaw to understand the coeval behaviour and adherence of these materials. The tests were evaluated according to European Norms, salt crystallization (EN 12370) and freeze-thaw resistance (EN 12371). Three types of commercial available repair mortars and four types of laboratory mixed mortars were used for the tests. A Miocene porous limestone was also tested 40x40x40mm in size. 18 different mortars were placed next to limestone cubes in the 40x40x160mm stainless steel moulds (4 in one mould). Another 30 samples were prepared as control ones. Adhesion between the limestone and repair mortars reduced due to external stresses (freeze-thaw, salt). The results clearly show that durability of commercially available repair mortars is higher than that of the laboratory mixed mortars. Significant differences between the damage caused by freeze-thaw and salt crystallization cycles were recorded. Commercial available mortars have shown stronger adhesion during the tests. Most of the commercial samples kept the contact with the limestone interface until the end of the cyclic tests (30th cycle). At the same time, laboratory mixed mortars detached earlier (after the 8th cycle). Commercial mortars with 50m% limestone aggregate showed decreased durability, since detachment was observed after the 23rd cycle. The financial support of NKFI Fund (ref. no. K 116532) is appreciated.