Geophysical Research Abstracts, Vol. 7, 03228, 2005
SRef-ID: 1607-7962/gra/EGU05-A-03228

Correlation between rock properties and the in situ behaviour of marble used as cladding material at buildings

A. Koch (1), B. Grelk (2) and S. Siegesmund (1)

(1) Geoscience Centre of the University of Goettingen, Germany, (2) Rambøll, Copenhagen, Denmark (akoch4@gwdg.de / Fax: +49-(0)551 399700 / Phone: +49-(0)551 399713)

Marble used as cladding material often features durability problems connected with the bowing phenomenon. Two marbles different in grain size, grain boundary geometry, grain and crystallographic preferred orientation (texture) have been investigated to indicate the impact of these fabric properties on petrophysical parameters and the propagation of thermally and moistly induced microcracks. Such newly generated microcracks – indirectly detected by ultrasonic measurements - lead to a loss of grain cohesion and finally to a strength reduction in the rock that varies in intensity and anisotropy. The findings were compared with in situ observations at two buildings cladded with the same marbles types as used in the laboratory investigations. Parallels appear in the weathering potential and the directional dependence of flexural strength and ultrasonic velocity. The data obtained contribute to a better understanding of decay processes in marble slabs particularly in terms of facade assessment.