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Index

Topic 3 ......................................................................................................................................................... 31

Gypsum-based plasters and mortars in historical constructions .............................................................. 31
Stucco marble in the Portuguese architecture: first insights in mineralogical, physical and mechanical properties ............................................................................................................................................... 33
Maria Teresa Freire; António Santos Silva; Maria de Rosário Veiga
Detailed studies of gypsum renders and plasters from the Ishrat Khane Mausoleum in Samarkand, Uzbekistan ........................................................................................................................................ 34
Steffen Laue
Historic gypsum mortars from Emilia Romagna (Italy). Mineralogical and petrographic analysis ....... 35
David Sanz-Arauz; Fabio Fratini; Emma Cantisani; Gian Carlo Grillini
The use of stucco-marble to restore veined polished limestone. The case of the pavement in the major sacristy of the Cathedral of Seville .......................................................................................................................... 36
Antonio González Portillo; Maria Teresa Freire
Thermal monitoring of a traditional gypsum oven in Ribera d’Ondara (Lleida) and simulation of the calcination process ............................................................................................................................................. 37
Antonia Navarro Ezquerra; Belén González Sánchez; Manuel Julià i Macias; Ana Maria Lacasta Palacio; Marc Tous Coll; Bryan Rivas Guevara; Felipe Buil Pozuelo; Judith Ramírez Casas
Study of properties of gypsum plasters of Araripe’s pole for application in restoration mortars ........ 38
Fernanda Cavalcanti Ferreira; Jose Getulio Gomes de Sousa; Arnaldo Manoel Pereira Carneiro
Clay and gypsum mortars used during antiquity in Cyprus .............................................................................. 39
Maria Philokyprou
Physical- mechanical comparison of the traditional gypsnums from Albarracín and Pallars ......................... 40
David Osmar Batres Hernández; Antonia Navarro Ezquerra; Joan Ramon Rosell Amigó
Characterisation of Gypsum Renders in the Paris Region and Determination of the Traditional Fabrication Process ............................................................................................................................................... 41
Jean Ducasse-Lapeyrusse; Véronique Vergès-Belmin
Figural Renaissance stucco in the Czech Republic – Technological and material characterization .......... 42
R. Tišlová; L. Bartůlková; T. Köberle; Z. Kovařík; V. Krajček; D. Všianský; P. Majaroš

Topic 4 ......................................................................................................................................................... 43

Functional mortars for the conservation of historic and modern cultural heritage structures .................. 43
Hydropohized lime grouts prepared with microsilica and superplasticizers ................................................. 45
J.F. González-Sánchez; I. Navarro-Blasco; J.M. Fernández; A. Duran; R. Sirera; J.I. Alvarez
Self-cleaning of previously healed historic mortars with multi-functional coatings ............................... 46
Jonjaua Ranogajec; Maria Malesevic-Cuculis; Helena Hirsenberger; John Milan van der Bergh; Snežana Vučetić
Use of natural zeolite aggregate in restoration lime renders ................................................................. 47
Martin Vysvář; Patrik Bayer; Tomáš Žižlavský; Pavla Rovnaková
Assessment safety and durability requirements of architectural heritage by developing functional conservation mortars .................................................................................................................................................. 48
Ioannis Karatasios; Zol S. Metaxas; Stavros K. Kourkoulis; Nikolaos D. Alexopoulos; Vassilis Kilikoglou
Autogenic vs. autonomic self-healing process in conservation mortars with crystallline admixture ........ 49
Maria Amenta; Stamatooulo Papaioannou; Marios S. Katsiotis; Dimitris Gournis; Vassilis Kilikoglou; Ioannis Karatasios
Lime-based rendering mortars with photocatalytic and hydrophobic agents: assessment of the water repellency and biocide effect .................................................................................................................. 50
Jesús F. González-Sánchez; Burcu Taş; Guillermo Martínez de Tejada; José M. Fernández; Ilígo Navarro-Blasco; José I. Alvarez
Self-healing lime-based mortars using biological mechanisms and microvascular networks ............... 51
Cristina De Nardi; Magdalini Theodoridou; Philip Sim; Michael Harbottle; Anthony Jefferson
Comparative evaluation of the morphological and rheological characteristics of nanolime dispersions for the consolidation of architectural monuments ............................................................................. 52
Anastasia Michalopoulou; Elisavet Michailidi; Evangelos Favvas; Noni-Pagona Maravelaki; Vassilis Kilikoglou; Ioannis Karatasios
Photoactive Fe-TiO₂ lime Plasters for Building Protection ............................................................................ 53
Chrysi Kapraki; Nikolaos Xynidis; Nikolaos Xekoukoulotakis; Nikolaos Kallithrakas-Kontos; Noni Maravelaki
SRG composite systems for strengthening masonry structures: from laboratory to field applications .......... 54
Paolo Casadei; Paolo Girardello

VI
Hydrophobized lime grouts prepared with microsilica and superplasticizers

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Abstract

This work reports the obtaining of lime-based grouts as repairing materials. Microsilica was added as pozzolanic additive to enhance the compressive strength of the hardened grouts. Sodium oleate, as water repellent admixture, and different superplasticizers were also incorporated to reduce the water absorption and to enhance the injectability of the grouts. Polycarboxylate ether (PCE), polynaphthalene sulfonate (PNS), melamine sulfonate (MMS) and polyacrylic acid (PA) were tested as plasticizing agents. Regarding the fluidity of the grouts, PCE was seen to improve the injectability, followed by PNS, MMS and PA. However, PCE addition was also accompanied by a severe delay in the setting time. The other three superplasticizers did not provoke significant delays in the hardening of the samples. The water contact angle underwent an increase pointing to an effective hydrophobization of the surface as a consequence of the water repellent admixture. The combination with PCE was the most effective in keeping the water repellency in comparison with the control sample (lime grout + oleate). MMS yielded high compressive strengths and durability of the mortars, in the face of freezing-thawing cycles, was enhanced.

Keywords

Grout; Microsilica; Injectability; Water Repellent

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