

ABSTRACT:

An ever-open problem: the consolidation of plaster and raw earth works

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The use of raw earth and plaster as materials for art and architecture is widespread in many cultures around the world, with roots dating back thousands of years. Raw earth, used in traditional constructions such as mud bricks and wall decorations, is prevalent in regions like Africa, the Middle East, Asia, and Latin America. Plaster, on the other hand, has a broader distribution in Western art, especially in the field of sculptures and stuccoes, and has been used since ancient times in Europe and the Mediterranean area. Both materials continue to be valued for their affordability, sustainability, and aesthetic properties, being used in both historical contexts and contemporary conservation and restoration projects.

Art and architecture made of plaster and raw earth are fragile cultural assets, susceptible to degradation due to environmental factors such as humidity, extreme temperatures, pollution, and wear over time. The consolidation of these works is a challenge, as plaster and raw earth, being porous and highly hygroscopic materials, tend to deteriorate easily. The main issues involve the loss of cohesion between the material particles, cracking, thermal expansion or contraction, and demineralization. To address these problems, the use of nanoconsolidants represents an innovative and effective solution. Nanoconsolidants, composed of nanoparticles, are capable of penetrating deeply into materials, reinforcing their internal structure without altering their physical and chemical characteristics. These consolidants work by improving mechanical strength, dimensional stability, and moisture resistance, without compromising the aesthetic appearance or breathability of the materials. Research on their use in plaster and raw earth works shows promising results, opening up new possibilities for the conservation of these precious artworks.