

Second Laureate Applied Research

Scientific Committee: Architecture & Urban Planning

Research Work Title

Materials Used for the Conservation of Cultural Heritage in Dry Climates



Researcher

Parsa Pahlavan (Ph.D.)

Collaborator Organizations

Ferdowsi University of Mashhad - The Vice Presidency for Science and Technology - Research Institute of Cultural Heritage & Tourism - University of Bologna - Persepolis World Heritage Site

Abstract

Dependence on importation of the materials used for the preservation and restoration of cultural heritage had been an issue for the conservation of architectural heritage in Iran. Regardless of the economic aspects, the materials designed for restoration of the architectural heritage in Europe, in some cases, have not been suitable for restoration in the climate of Iran. Climate considerations for the materials used for the architectural heritage can develop the capacity for construction and preservation. The materials designed in this project are dependent on the available components in Iran and are considered air lime mortars using sustainable methods and fulfilling restoration requirements such as permeability and hydrophobicity. Due to the reduction of relative humidity in Iran without relying on air humidity in the laboratory, the produced materials are hard enough to be used for various restoration projects. This research design proposes that self-reliance in these consumable materials through production and development of their potential for multi-functional use creates added value and leads to the exports of the ready-to-use materials instead of the raw ones (e.g., limestone). Despite its limited application unique to a specific area, this technological product is of great value if it can meet the economic and environmental needs. The produced materials possess the required reversibility, stability and adaptability in dry climates. In this project, the fatty acid composition of the sesame oil in the materials with different saturation levels was used to increase hydrophobicity without any destructive change in the porous network of these materials to design a product with the required amount of permeability, water resistance, reliability, adaptability, carbonation speed and mechanical properties for reversible and compatible restoration operations.

