



## Desalination of Walls and Façades

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For large monumental objects like walls and façades, the common technique of applying poultices for desalination often are not effective. This practice is neither cost effective nor does it lead to the desired result of desalination. To manage the conservation and desalination of these kinds of objects, several sprinkling techniques are known and have been applied on historical objects. For example, in the wooden warship Vasa, which was excavated from the sea bottom in Stockholm/Sweden, a sprinkling method was applied in 1961 for conservation and desalination. A sprinkling method to desalinate porous mineral materials will be presented using three different case studies: the rock cut monument no. 825 in Petra/Jordan, the medieval monastary church of the former Franziscan convent in Zeitz/Germany and the baroque monastary church Santa Monica in Guadalajara/Mexico.

Before to start with practical conservation, the material- and petrophysical properties, focussed on water transport properties, like porosity, pore size distribution, water uptake and drying rate were investigated.

Diagnostic investigations on the objects included the mapping of deterioration, moister content measurements and salt accumulation determined by borehole cuts samples at depth.

In the sprinkling method water is sprayed onto the wall surface through nozzles arranged in a modular grid. Depending on the sprinkling duration, a small or a large amount of water seeps into the porous materials, whereby the depth penetration can be adjusted accordingly. The water not absorbed by the stone runs off the facade and can be collected in liter amounts and tested by electrical conductivity with respect to the dissolved substances. After the drying of the wall's surface and the accumulation of salt at the material's surface, the procedure is repeated. For each subsequent washing a lower content of salt should be brought to the surface. Step by step the salt concentration will eventually decrease to almost zero. By application of the sprinkling method several thousand grams of soluble salts can be extracted. A significant reduction of the salt content within the stone can be detected by drilling dust analyses.

The specific situation of salt-accumulation and weathering will be illustrated in each case, along with a presentation of the results and the difficulties and experiences of practical desalination.