

**Thermal Analysis of an historical bath (hammam) by quantitative IR thermography**

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**Abstract**

The study is focused on the use quantitative IR thermography (QIRT) for the examination of the hidden structure of a historical bath (hammam) using indirectly its thermal performance. The building is analyzed in terms of the thermal insulation characteristics. The differential IR images were produced from the IR sequences by taking temperature differences as a function of time. This allowed to locate thermal failures, such as heat loss, thermal bridges and air leakages, on building envelope. The study was supported by microclimatic monitoring of indoor and outdoor conditions.

A simple heat transfer model is applied to achieve reference temperature during the IRT surveys. The heat loss calculations are considered locally, trying to better understand the historical structure in a non destructive way. Another issue is the failures evaluation in relation to the recent restoring interventions.

The thermo-physical properties of the historic materials are estimated with laboratory analysis. The drawing of the building and geometric measurements are coupled with a photographic scanning to estimate the heat transfer.

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