

## EFFECT OF HYGROTHERMAL LOADS APPLIED TO THERMAL RENDER SYSTEMS

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**Abstract** *Thermal renders applied in multilayer systems are a recent trend in the building industry, besides ETICS. This type of systems aims at lowering the envelope U-Value with an upgraded thermal resistance of its components. As building rehabilitation has been increasing on a large scale, these solutions are of major interest, due to its easier application (by mechanical spraying) and enhanced hygrothermal properties. Durability assessment is a crucial issue to systematize and improve the knowledge of wall multilayer systems. Optimizing their application must take into account the actual climatic conditions. However, durability assessment procedures applied specifically to thermal render systems do not exist. The main goal of the present paper is to cover the gap in terms of durability assessment of thermal render systems defining a methodology based on accelerated ageing, taking into account the render matrix, hygrothermal and mechanical properties and also climate action. The first part of the work focus the analysis of durability assessment of existing standards, which are applied to renders and multilayer systems (EN 998-1, EN 1015 and ETAG 004). Also, some authors have worked on the calculation of acceleration factors and definition of new accelerated ageing protocols, by analysing the results of natural ageing tests and climate data. In a second part, hygrothermal simulations, using the WUFI Pro software, are performed to evaluate the thermal render systems performance, in different climates. The results were analysed to support and complement the previous knowledge and lead to the definition of a durability assessment methodology applied to thermal render systems.*