Experimental investigation on physico-mechanical properties of natural building stones exposed to fire

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1 - Context & Objectives

Main objectives:
- Identify the intrinsic parameters governing the high temperature sensitivity
- Contribution to the diagnostic of building stones after a fire

Correlate information obtained from destructive and non-destructive methods in order to assess the damage level of the material

2 - Stones of the study

Stones in this work:
- Widely used in historical monuments but also for restoration works.
- From French quarries.
- Represent a large variety in terms of intrinsic parameters: mineralogical, physical, mechanical, and microstructure.

3 - Results: damage assessment after high temperature exposure

Experimental procedure

Modification of physico-mechanical properties

Thermal deformation

Kinetics of disintegration: structural fire resistance

Microstructure alteration

Visual colour changes

4 - Conclusion