









of code standards, especially with regard to eco-compatibility.

Wood is a perfectly eco-friendly material, from its extraction, through production and processing, to the use and disposal. The construction of halls or rooms with vaulted wood roofs with this new construction technique would combine the high assembly capacity and would take advantage of the low thermal conductivity of the material, which ensures excellent thermal insulation.

The system offers many fields of application ranging from simple use for aesthetic purposes, to the use for structural purposes. It is easy to see how the system is aesthetically pleasing. Moreover, if properly introduced in certain contexts, it also enables the recovery of techniques of traditional building materials. The system is able to accommodate loads in safety, at least as regards the more favorable loading condition for this type of arch structures, or that of a uniformly distributed load; so it would not be ruled out its use even in the structural field, placing itself in competition with the laminated wood structures at least for certain applications such as large rooms, i.e. for dining or sporting activities.

The analyzes carried out have enabled us to highlight different information useful for understanding the behavior of these structures. In particular, the investigations carried out considering different levels of detail allowed to clarify the potential use of this material for structural purposes. Model validation performed on tests conducted on-site has allowed us to understand which are the critical points of the structure collapse. A more accurate modeling can be done via a non-linear analysis, possibly with mechanisms of damage of the material and considering the non-linearity resulting from the degree of ductility of the connections together with further experimental data. In fact, in this work, the damage mechanism considered provides a boundary surface defined by the parameters of tensile and compressive strength of the wood.

Globally, the knowledge gained from the present research work constitutes the beginning and the basis for analyzes to identify possible interventions of structural improvement. For more and more specific structural analyzes both in nonlinear and dynamic fields it is appropriate to conduct experimental investigations that capture the deformation capacity and strength of the joints such as to formulate reliable calculus methodologies for wood species not currently certified as structural wood.

The system has collapsed not for failure of the material, but because of its connections and the joints between the various blocks that will have to be improved and modified.

For structural uses it is necessary to observe that the arch system behaves in a less efficient way for loading conditions different from the one treated in this study, however, and covered in the code. Just think about the effects of an earthquake, but especially the effects of wind, real problem for lightweight structures.

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