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PRELIMINARY REPORT ON IGNITIBILITY OF COMBINED PRO-ECOLOGICAL WATERPROOFING AND FIRE RETARDANT COATINGS FOR PAPERBOARD IN ARCHITECTURAL APPLICATION

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Abstract
Both fire and water protection are crucial for the safety and usability of paper-based products applied as building components. The presented study investigates the possibility of combining environmentally-friendly fire retardants with oil- and wax-based waterproofing coatings on paperboard for architectural applications. The proposed impregnation technique can be used as protection for paper-based temporary and emergency structures, or as part of the protective system for building envelopes of permanent structures. The fire retardants selected for the tests were diammonium phosphate and a mixture of borax and boric acid in a 1:1 ratio. Single-flame ignitability tests were performed on the impregnated specimens to assess the fire performance of specimens with fire impregnation, waterproofing impregnation and both. A Life Cycle Assessment analysis was performed for fire-retardant paperboard. The study has shown that the application of layered fire and waterproofing treatments on paperboard components is possible and leads to a significant reduction in flammability compared to untreated and only waterproofed specimens.

Keywords: **Paper in architecture; Fire retardant; Paperboard; Ignitibility test; Life Cycle Assessment.**