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## Wood consolidation and protection using hybrid inorganic–organic nanostructured materials



The fundamental aim of this research project is to develop innovative treatments of wood for its consolidation and protection against biotic and abiotic decay and minimizing the release of undesirable chemicals in the environment. It consists in the application of inorganic–organic hybrid nanosols, in particular functionalized organic polymers containing hydrolyzable siloxane moieties, producing hybrid wood composites, which could also be subjected to thermal treatment. The realization of this plan passes through specific objectives: (i) production via sol–gel of novel composites, obtained by interpenetrating wood with hybrid siloxane materials endowed with useful physico–chemical properties; (ii) possible anchoring of borate species, metal cations and metal nanoparticles through ionic and coordinative interactions; (iii) possible modifications of the obtained composites through thermal treatments; (iv) investigations on the physico–chemical properties of the obtained wood composites (v) studies on the interactions between wood polymers and the hybrid siloxane network at a molecular level before and after thermal treatments; (vi) evaluation of the environmental impact of the proposed technology.

**Title of project:** Wood consolidation and protection using hybrid inorganic–organic nanostructured materials

**Supported by:** University of Parma

**Duration:** 3 years

**Partner:** CNR–IVALSA (FI); Biogest–Siteia, University of Modena; CPBC Catholic, University of Piacenza; Department of Materials Engineering, University of Trento; CNR–IVALSA (TN)

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