

Protection of timber constructions by using electro osmotic pulsing technology (PLEOT)

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EXTENDED ABSTRACT

Timber constructions are often built in combination with other materials such as concrete. These materials can influence the timber construction. Moist concrete can e.g. lead to development of molds which creates an unhealthy living area for people. Furthermore, moisture in wood buildings can negatively affect the wood material, which can lead to negative biological activity in timber and possible reduction of strength properties of timber constructions.

The present paper introduces a new innovative method of timber protection and describes the influence of moisture on wood and concrete.

The new environmental friendly system for protection of timber has been tested on wood destroying fungi and termites.

It can be shown that wood protection by means of electro osmotic pulsing technology (PLEOT) can preserve wood in laboratory trials. PLEOT protects Scots pine sapwood and beech samples against fungal decay when exposed to brown- and white rot. The wood moisture content of protected samples is lower compared to untreated samples. PLEOT could stop degradation of unprotected wood samples exposed to white rot when protection was installed after 4 weeks. Unprotected brown rot exposed samples had already high mass loss after 4 weeks and showed therefore no significantly different mass loss after 8 weeks.

The wood moisture content is lowered when the PLEOT protection system is installed. For termite testing, it was observed that, when moisture content was higher (control tests), the termites attack degree also increased, on the other hand, when moisture content was lower the attack degree decreased. Subterranean termites need a high moisture content of wood to perform their attack. PLEOT can play an important role in an integrated strategy to control subterranean termites attack to wood in service, since it is a low invasive method of intervention which favors the maintenance of lower wood moisture contents and therefore reduces the probability of attack by the insects.

It could be shown that humidity in pores of concrete in cellar walls is reduced using electro osmotic pulsing. The drying of concrete when combined with timber constructions can additionally help to reduce timber degradation as all protection measures that lead to a drier building are positive for fungi and subterranean termite control.

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