



Research for the Benefit of SMEs		
<p>Title: Development of a solvent-free coating process for wooden facades</p> <p>Acronym: DURAWOOD</p> <p>Grant Agreement Number: 232296</p> <div style="text-align: center;"></div>		
Deliverable 3.3	Validation of the developed PCR-systems and results of the comparative test of DURAWOOD-treated and untreated at laboratory level	
Associated WP	WP3 – Microbiological Testing	
Associated Task	Task 3.2 – Comparative test of DURAWOOD-treated and untreated wood at laboratory level	
Due Date	M15, 28 th February 2011	
Date Delivered	M17, 30 th April 2011	
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Dissemination Level	PU	

Publishable Executive Summary

This report outlines the work carried out as part of an EC funded project called DURAWOOD - Development of a solvent - free coating process for wooden facades.

Based on the results of the WP2 – *Laboratory validation of the plasma technology for improving wettability and waterproofing effects* two effects of plasma were measured: the effect of hydrophobisation of the wood surface (it was expected that the wood will be protected from absorbing moisture which is important for fungal growth) and the effect of hydrophilisation followed by a water-based wood preservative treatment (it was expected that the water-based wood preservative would be absorbed by the hydrophilic wood surface so that the wood will be better protected than the wood preservative treatment alone).

The main scope of the work performed by ttz (WP3 – *microbiological testing*) is to investigate the effect of the plasma treatment to protect wood from fungal growth and the first comparative tests of DURAWOOD treated and untreated wood are reported here. For the microbiological testing of wood treated with the DURAWOOD method, wood samples were prepared and treated with the plasma reactor developed by STUBA. These wood samples were inoculated with the wood decaying fungi *Coniophora puteana* and *Trametes versicolor*. After the incubation time, the wood test samples were analyzed with the previously developed PCR method (analyzing the growth into the wood sample) and simultaneously with the EN 113 method (mass loss).

In addition to the wood decay tests, a test method for blue stain fungi on the basis of the EN 152 was adapted to ttz's laboratory to test the DURAWOOD method against blue stain. Thus DURAWOOD treated and untreated wood samples were inoculated with two of the most frequent blue stain fungi (*Aureobasidium pullulans* and *Sclerophoma pithyophila*). After the expiration of the incubation time the wood samples were analyzed visually in respect of blue stain.

It was found out that certain fungal species grew slower into the wood test blocks treated with a combination of plasma and water-based wood preservative than into wood samples treated with wood preservative only. These results of wood decay tests suggest a possible wood protecting effect of the plasma but were not widely observed and will be verified in further tests. In addition, the effect of artificial weathering on wood samples treated by the combination of plasma and wood preservative will be determined.

The PCR method for the analysis of the growth of wood destructible fungi into wood samples developed in this project was verified and validated with results of "outgrowth" tests from the reviewed wood samples. Further investigations regarding the sterilisation effect of plasma are ongoing and will be reported in future project reports. After demonstrating the sterilizing effect of the plasma only, further experiments with a coating are envisaged.