

Reduction of Terpene Emissions from Oriented Strand Boards (OSB) by Bacterial Pre-Treatment

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Abstract : Pine wood (*Pinus sylvestris* L.) is the basic raw material for the production of Oriented Strand Boards (OSB) and the major source of volatile organic compounds, especially terpenes (like α - and β -pinene). To lower the total emission level of OSB, terpene metabolising microorganisms were therefore applied onto pine wood strands for the production of emission-reduced boards. Suitable microorganisms were identified during preliminary tests under laboratory conditions. At first, their terpene degrading potential was investigated in liquid culture, followed by laboratory tests using unsterile pine wood particles and strands. The main focus was laid on an adoptable terpene reduction in a short incubation time. An optimised bacterial mixture of *Pseudomonas putida* and *Pseudomonas fluorescens* showed the best results and was therefore used for further experiments on a larger scale. In an industry-compatible testing procedure, pine wood strands were incubated with the bacterial mixture for a period of 2 to 4 days. Incubation time was stopped by drying the strands. OSB were then manufactured from the pre-treated strands and emissions were measured by means of SPME/GC-MS analysis. Bacterial pre-treatment of strands resulted in a reduction of α -pinene- and β -pinene-emissions from OSB by 40% and 70%, respectively, even after only 2 days of incubation. The results of the investigation provide a basis for the application of microbial treatment within the industrial OSB production line, where shortest possible incubation times are required. For this purpose, the performance of the bacterial mixture will have to be further optimised.

Keywords : GC-MS, OSB, *Pseudomonas* sp., terpene degradation

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