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AIRBORNE ENDOTOXIN IN WOODWORKING (JOINERY) SHOPS

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Symptoms of shortness of breath and cough have been noted in woodworking facilities even where wood dust itself is well-controlled. Suspicion has fallen on other possible contaminants in the workplace atmosphere, including bacterial endotoxin. A few studies have indicated potentially high endotoxin exposure with exposure to fresh wood in sawmills and in the production of fiberboard and chipboard, and also when handling certain tree species where a specific bacterial infection condition called "wetwood" has developed. However, few studies have been carried out on exposure to endotoxin in dry wood work, for example in joineries. Studies carried out in Australia using Institute of Occupational Medicine (IOM) inhalable samplers have been reported, but the IOM sampler is not universally accepted for wood dust. Nevertheless, when using the same sampler, endotoxin results generally were found to be lower than in fresh woodworking facilities. In order to confirm this observation in US woodworking facilities, samples which previously had been taken to establish mass collection relationships between the IOM sampler, the closed-face 37 mm plastic cassette (CFC) sampler and the Button sampler, were re-analyzed for endotoxin content. Endotoxin was strongly correlated with total dust, but differences between the endotoxin content of fresh and dried woods in different workplaces were noticeable, and the ratio of endotoxin to total dust could be ten times higher where fresh wood was involved. No long-term time-weighted average sample (or combination of samples) exceeded the recommended limit value of 50 EU m^{-3} used in the Netherlands, although a number of the IOM samples came close (seven samples or 44% exceeded 20 EU m^{-3}) and one short-term (48 minute) sample registered the highest value of 73 EU m^{-3} . The geometric mean concentration from the IOM samples (11 EU m^{-3}) is within the range of geometric means found from Australian joineries (3.7 – 60, combined: 24 EU m^{-3}). In contrast, the corresponding values from the CFC (3.6 EU m^{-3}), and the Button sampler (2.1 EU m^{-3}) were much lower and no samples exceeded 20 EU m^{-3} . Endotoxin is likely only to be a significant problem in working most dried woods when associated with very high dust levels, where the wood dust itself is likely to be a cause for concern. The results from the few samples in this study where fresh wood was worked were similar to results from other studies involving fresh woods, such as a Canadian sawmill study where 9% of inhalable samples exceeded 50 EU m^{-3} . In the present study the range of the five fresh wood IOM samples was $8.4 - 40 \text{ EU m}^{-3}$, which included two of the seven samples that exceeded 20 EU m^{-3} . The agreement between these studies is surprising giving the difficulties of endotoxin analysis and the wide variation normally encountered between different laboratories.



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