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THE SPOROCIDAL AND SPOROSTATIC EFFECT OF SODIUM POLYBORATE AND BORON-TREATED CELLULOSE INSULATION ON COMMON INDOOR FUNGAL SPECIES

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ABSTRACT

Continuing interest in fungi and fungal-related health problems within indoor environments has spurred the building industry to develop ecologically-friendly, cost-effective, safe and useful antifungal additives for building materials. Treated cellulose insulation, made from recycled newsprint and amended with a variety of chemical compounds, has gathered attention and interest from a wide variety of sources including the building industry, environmentalists, and industrial mycologists. This study reports an assessment of antifungal properties of treated cellulose insulation (as a whole) and one of the most common principal active ingredients, sodium polyborate (CAS # 183290-63-3). Boron-treated cellulose and untreated paper homologs (controls) were challenged with a suspension containing a high concentration of fungal spores of six species of common fungi (*Alternaria alternata*, *Aspergillus niger*, *Chaetomium globosum*, *Cladosporium cladosporioides*, *Penicillium chrysogenum*, *Stachybotrys chartarum*). Results suggest that (a) paper entering processing facilities does not harbor large concentrations of fungi; (b) treated cellulose insulation is sporocidal to the six species of fungi used in this study, and possibly many other fungal species; and (c) unilateral exposure to sodium polyborate, the principal active ingredient in the samples of treated cellulose, is sufficient to preclude spore germination of these same species (actually killing spores of some).

Key words: Anti-fungal compounds, cellulose insulation, indoor air quality, mold, sick building syndrome, sodium polyborate.