

The **Forest Industry Health Research Program (FIHRP)** has completed a study to investigate and identify a number of unknown sensitization compounds present in whitewater from paper machines. A report is now available to members titled "Evaluation of Pulp and Paper Machine White Water Phase IV: Identification of Unknown Dermal Sensitization Compounds". To request a copy, phone **Agi Lee** at the Pulp and Paper Forum at (604) 777-1533, send a fax to (604) 777-1567, or e-mail alee@paperforum.com. Non-members of the Forum may be charged for the reports.

EVALUATION OF PULP AND PAPER MACHINE WHITE WATER PHASE IV: IDENTIFICATION OF UNKNOWN DERMAL SENSITIZATION COMPOUNDS

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Several aspects of worker exposures to dermal sensitization compounds in white water from paper machines were investigated in the past few years. These studies involved literature review of the health effects from chemical compounds present in white water (Phase I), followed by the determination of air borne concentrations (Phase II) and dermal exposures to three selected chemical contaminants (formaldehyde, acetic acid and formic acid) at Mill B (Phase III). In this phase of the project (Phase IV), a number of unknown compounds that were present in white water collected from Mill B (TMP mill) during Phase I and II of the project were investigated and identified.

These unknown components of whitewater were identified as 7-oxodehydroabietic acid, erucylamide and squalene using a combination of gas chromatography and mass spectrographic analysis. Studies by Smith, P.A. et. al. (1998) to assess worker exposures to oxidized resin acids in aerosol from rosin flux soldering identified 7-oxodehydroabietic acid to be the main compound causing sensitization. In addition, the Material Safety Data Sheet (MSDS) from the manufacturers of erucylamide and squalene identified these chemicals as potential dermal sensitizing compounds.

Other unknown components of white water samples from Mill B were also analyzed by GC-MS. The results showed that a number of these compounds may be multicyclic hydrocarbons and therefore they are unlikely to contribute to skin irritation or allergy.

White water samples from four other mills including a kraft mill (Mill C) and three mechanical mills (Mill D, Mill E and Mill F) were also collected and analyzed. Gas chromatographic analysis of white water samples from the mechanical mills showed that a number of potentially allergenic compounds including dehydroabietic acid, abietic acid, 7-oxodehydroabietic acid were also present in the samples collected. In the case of the kraft mill (Mill C) dehydroabietic acid was the only one of these compounds identified. Erucylamide was also detected in the white water samples collected from these four mills. Peaks comparable to squalene were also found in the white water samples from these other mills.

The concentrations of resin acid and oxidized resin acids were much more prevalent in white water from mechanical pulping mills than in white water from kraft pulping mills. The concentration of fiber in white water may also be the determining factor in controlling the concentration of resin acids and oxidized resin acids in the white water.