

TURPENTINE & delta - CARENE

FOREST INDUSTRY HEALTH RESEARCH PROGRAM

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The *Forest Industry Health Research Program (FIHRP)* has completed a study to evaluate airborne concentrations of terpenes at pulp mills. The report, which is now available to members, is titled **"Pulp Mill Workers' Exposure to Terpenes"**. 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.

Mill personnel at 12 BC pulp mills collected personal and area samples for analysis of seven terpenes, including delta-carene and alpha-pinene.

Sixty-three personal samples were analyzed. Airborne concentrations for total and individual terpenes were less than 1 ppm for 60 samples. The highest results were 2.9 ppm for total terpenes, and 0.31 ppm for delta-carene.

Thirty-six area samples were analyzed. Airborne concentrations were less than 2 ppm for 33 samples. The highest results were 3.8 ppm for total terpenes, and 1.1 ppm for delta-carene.

The results indicate that workers' exposure to terpenes under normal operating conditions does not represent a health risk. Personal exposures were well below the WCB exposure limit for turpentine of 25 ppm for an 8-hour shift, or 12.5 ppm for a 12-hour shift.

Personal samples collected during planned shutdowns and upset conditions also showed low levels of exposure, less than 1 ppm for a full shift. However, upsets are unpredictable and situations could arise that would expose workers to higher terpene concentrations.

Although the ALARA designation does not relate to a specific airborne concentration, results of this study suggest that workers' exposure to delta-carene is low or not-detectable, and would meet the requirements of "as low as reasonably achievable".

Based on the results of this study, no action needs to be taken by any of the 12 pulp mills to reduce workers' exposure to turpentine (total terpenes) or delta-carene during normal operations.