

**HUMAN HEALTH RISK ASSESSMENT OF VOLATILE ORGANIC
COMPOUND EMISSIONS FROM A TWO-PART SPRAY APPLIED
POLYURETHANE INSULATING FOAM FOR GENYK**

Submitted to:

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EXECUTIVE SUMMARY

Lalita Bharadwaj, Ph.D. undertook a Human Health Risk Assessment for a two-part spray-applied polyurethane thermal insulating foam developed by Genyk. Exova Warren Testing Facilities in Warren, Michigan performed emissions testing of a test specimen of the spray-applied foam insulation, identified here in this report as “*Genyk PU-Foam*”. Emission testing was conducted in accordance with ‘Procedure B’ of the Underwriters Laboratories of Canada, CAN/ULC-S774-09 Testing Standard. Headspace and dynamic chamber analyses were performed on a test specimen of “*Genyk PU-Foam*” and volatile organic compound (VOC) emissions were characterized by gas chromatography-mass spectroscopy.

The purpose of the risk assessment was two-fold: 1) to determine whether volatile organic compound (VOC) emissions from the two-part spray-applied polyurethane foam insulation, developed by Genyk, pose a health risk to individuals residing in homes or buildings where this product has been applied under the standards and regulations appropriate to PU-Foam insulation application and 2) to determine an acceptable residential occupancy time for the polyurethane thermal insulating foam. The health risk assessment was undertaken using guidelines, protocols and methodologies proposed and readily accepted by Health Canada and the Canadian Construction Materials Centre. These guiding principles of risk assessment were utilized to predict the human health risk associated with potential exposure to VOC emissions from the Genyk product.

Careful consideration of all relevant chemical and toxicity data was given to the assessment to determine the potential for health risk. The assessment accounted for the potential for human exposure to maximum indoor air concentrations of each VOC emission product identified through dynamic chamber analysis of the spray-applied polyurethane insulating foam. The assessment took into consideration the chemical nature and toxicity information of the VOC emissions, potential for human exposures, the magnitude, frequency and duration of human exposure to each VOC product, and their individual decay patterns over a 30-day period of dynamic chamber analysis. The

assessment also included comparisons (including stringent safety margins) between potential exposure to maximum possible levels and the toxicological profiles of the VOC products emitted.

The conclusion of this assessment is that VOC emissions from “Genyk PU-Foam” will not pose a health risk to individuals residing in homes or buildings where this product is applied under standardized regulatory guidelines.

The decay pattern of the VOC products (up to 30 days), indicate the concentration of individual airborne VOC and the total VOC (TVOC) decrease over time. Maximum airborne emission concentrations of VOC emission products measured within 1 hour of dynamic chamber analysis were found to be below airborne exposure concentrations considered safe for human exposure.

Considering that VOC emission products were classified as having a low order inhalational toxicity following short term low-level exposures and in general the maximum emission concentrations were below the safety standards applied in this risk assessment, it was concluded that airborne concentrations of VOC or TVOC emitted from “Genyk PU-Foam” would be considered safe for human exposure. Volatile organic compound emission concentrations, within 1 hour following the application of “Genyk PU-Foam” will not pose a significant human health risk to individuals residing in homes where this material is applied under the standards and guidelines associated with PU-Foam application procedures.

Overall data suggest a low risk for adverse inhalational exposures and thus a low potential for health risk. Ambient VOC concentrations at 1 hour following the application of “Genyk PU-Foam” will be within an acceptable range for human exposure. Therefore, the recommended limiting residential occupancy time for “Genyk PU-Foam” is 1 hour and applies to residents of structures insulated with this material