

**AIRBORNE CONCENTRATIONS OF BENZENE  
AND MINERAL SPIRITS (STODDARD SOLVENT)  
DURING CLEANING OF A LOCOMOTIVE GENERATOR  
AND TRACTION MOTOR**

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*Mineral spirits (also called Stoddard solvent), a petroleum distillate, is often used as a degreaser or an industrial cleaning agent. Although several studies measured airborne concentrations of mineral spirits in various occupational settings, none have characterized the airborne concentrations of benzene from use of mineral spirits. Recent case reports have suggested that benzene, as a contaminant in mineral spirits, might be responsible for adverse health effects. Because some claims of health effects in the railroad industry have been attributed to potential historical exposures to mineral spirits and little information is available regarding air concentrations in this type of occupational setting, a simulation study was conducted to quantitate historical exposures a railroad worker might have experienced while spraying mineral spirits on locomotive engine parts in the 1970s. To quantitate potential historical exposures, worker tasks were simulated under worst-case exposure conditions by spraying mineral spirits on a locomotive generator and traction motor. The results of both generator and traction motor cleaning events produced concentrations of mineral spirits ranging from 34 to 221 ppm and an average 1-h concentration of 121 ppm, whereas benzene concentrations associated with the spraying and drying tasks were less than the limit of detection (0.002-0.006 ppm). Results indicate that a railroad worker who cleaned a locomotive traction motor and generator with mineral spirits for 2 h each workday under worst-case exposure conditions would be exposed to an 8-h time-weighted average (based on lapel measurements) of 30.4 ppm airborne mineral spirits. On the basis of the conditions under which these concentrations were obtained, the results should be the reasonable maximum values that can be achieved in a modern-era (post-1970) workplace in the United States.*