

Contribution of Incidental Exposure Pathways to Total Beryllium Exposures

David C. Deubner,¹ Yvette W. Lowney,² Dennis J. Paustenbach,³
and John Warmerdam³

¹Brush Wellman Inc., Elmore, Ohio; ²Exponent, Boulder, Colorado; ³Exponent, Menlo Park, California

Beryllium manufacturing processes are associated with the immune-mediated chronic beryllium disease (CBO). Recent workplace epidemiological studies have been relatively unsuccessful in correlating disease with workplace air concentrations of beryllium, thereby failing to support the hypothesis that dose by the respiratory route determines the risk of disease. This has led to consideration of the hypotheses that dermal or oral exposures to beryllium can influence disease risk, either as a cause of sensitization or to induced tolerance to beryllium. If so, the control of dermal and/or ingestion exposure to beryllium, which has heretofore been widely disregarded in the United States, would be of practical importance. Most of the literature of the past 50 years indicates that ingestion and dermal uptake of beryllium are unimportant routes of exposures. The toxicology data generally support this position. However, research is under way to determine whether sensitization to beryllium may occur following exposure via routes other than inhalation, raising the question of whether this sensitization from other routes of exposure makes the lungs more susceptible to inflammation when inhaled doses are encountered.