

## Exposure of Infants and Children in the U.S. to the Flame Retardant Decabromodiphenyl Oxide (DBDPO)

Sean M. Hays,<sup>1,\*</sup> Colleen A. Cushing,<sup>1</sup> Hon-Wing Leung,<sup>2</sup> David W. Pyatt,<sup>3,4</sup>  
Kelley C. Holicky,<sup>1</sup> and Dennis J. Paustenbach<sup>5</sup>

<sup>1</sup>Exponent, Boulder, CO 80301; <sup>2</sup>Exponent, Danbury, CT 06811; <sup>3</sup>University of Colorado  
Health Sciences Center, Denver, CO 80262; <sup>4</sup>ChemRisk, Boulder, CO 80301;

<sup>5</sup>ChemRisk, San Francisco, CA 94105

\* Corresponding author: Sean M. Hays, 4940 Pearl East Circle, Suite 300, Boulder, CO  
80301. Phone: 303-444-7270. Fax: 303-444-7528. E-mail: shays@exponent.com

### ABSTRACT

Decabromodiphenyl oxide (DBDPO) is a widely used brominated flame retardant in the United States. It is used predominantly in hard plastic electronic consumer products and in flame-retardant backing on textiles used in furniture. Decabromodiphenyl oxide was included in the U.S. Environmental Protection Agency's (EPA's) Voluntary Children's Chemical Evaluation Program (VCCEP). A child-specific exposure assessment of DBDPO was performed following the VCCEP guidance for a Tier 1 exposure assessment (e.g., screening-level assessment using currently available data and conservative assumptions). Exposure pathways that were considered included general environmental exposures, breast milk exposures, inhalation of DBDPO particulates in air, and mouthing DBDPO-containing consumer products. For each exposure scenario, a mid-range estimate and an upper estimate of intake were calculated. Despite the uncertainties, results indicate that the aggregate exposures for children to DBDPO for each scenario evaluated were at least one order of magnitude (most being several orders of magnitude) below the National Academy of Sciences (NAS) reference dose (RfD) for DBDPO. This analysis indicates that, using the available data, current levels of DBDPO in the U.S. are not likely to represent an adverse health risk for children.

**Key Words:** brominated flame retardants, decabromodiphenyl oxide, exposure assessment, children's health, risk assessment.