

Backgrounder on Bisphenol A (BPA)

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What is bisphenol A?

The substance, phenol, 4,4'-(1-methylethylidene) bis (CAS RN 80-05-7) is also known as bisphenol A or BPA. Under Canada's Chemicals Management Plan (CMP), approximately 200 chemicals have been identified as high priority chemicals, including BPA.

Why is bisphenol A (BPA) a concern to human health and environment?

Exposure to BPA, even at low levels, may result in a wide range of reproductive and developmental effects. Expert panels established on BPA and more than 150 peer-reviewed studies have associated BPA with obesity, attention deficit hyperactivity disorder, breast cancer, prostate cancer, immune system dysfunction, early puberty in females, higher rates of miscarriage, and a wide range of developmental problems.¹

Most recently, a study published in the *Journal of the American Medical Association* linked, for the first time, 'normal' levels of BPA in a large human population in the U.S. with higher risk of heart disease and diabetes.²

Human exposure to BPA occurs mainly through dietary intake and also through environmental media (ambient air, indoor air, drinking water, soil and dust), consumer product usage and other sources. Migration of BPA has been detected from food packaging (e.g. lining of food and drink containers, canned infant formula intended for newborns and infants), baby bottles, and other BPA-containing plastics used for food and liquid storage.

Health Canada's own investigation indicates that BPA can accumulate in the womb, exposing the fetus to levels higher than those throughout other stages of their lives. In addition, BPA has been detected in breast milk at levels nearly as high as those found in infant formula.

BPA has also been detected in the environment – in surface water, sediments and groundwater. It is acutely toxic to aquatic organisms. Low-doses of BPA can have adverse effects on fish and reptiles, particularly at sensitive developmental stages. Impacts from BPA may affect future generations.

Uses and Applications

BPA has an extensive use pattern. As an ingredient in polycarbonate-based plastics, it is used for food and beverage contact containers (e.g. polycarbonate baby bottles), medical devices, and compact discs. It is utilized in the electric, electronics, and automotive industries, as well as in dental fillings, optical lenses, chain oil, and brake fluid. BPA is also a key ingredient for the production of certain epoxy and phenolic resins that are used as liners in metal cans for foods and beverages, in addition to metal lids for glass jars and bottles.

Industrial uses for BPA-based epoxy resins include protective coatings (e.g. primers, electro-coating, powder coating), structural composites, electrical laminates, adhesives, thermal paper, and paperboard packaging.

¹ Maffini MV, Rubin BS, Sonnenschein C, and Soto AM. 2006. Endocrine disruptors and reproductive health: The case of bisphenol A *Molecular and Cellular Endocrinology* 2006, 25:179-186

² vom Saal, Frederick S. and John Peterson Myers. 2008. Bisphenol A and Risk of Metabolic Disorders. *Journal of the American Medical Association*. 2008;300(11):1353-1355

What is the Canadian Government doing on BPA?

The government finalized its assessment of BPA in October 2008 and concluded that BPA is “toxic”³ under the *Canadian Environmental Protection Act* (CEPA). The government proposes to add BPA to the Toxic Substances List (Schedule 1) of CEPA, which will require the government to develop measures, regulatory or non regulatory,⁴ to address BPA within two years.

The government’s proposal to manage BPA includes a plan to “ban the importation, sale and advertising of polycarbonate baby bottles made with bisphenol A monomer” and establish “migration targets for bisphenol A in infant formula cans”. The government also plans to design a Code of Practice, a non-regulatory tool, to reduce levels of BPA in canned infant formula. For canned foods in general, the government will further investigate options for establishing BPA limits. No regulatory measures have been proposed to address other uses of BPA, according to the Proposed Risk Management Document.

Resources

Final Screening Assessment and Proposed Risk Management Approach for Bisphenol A (Canadian government): www.chemicalsubstanceschimiques.gc.ca/challenge-defi/batch-lot_2_e.html#Update

Comments to the government proposals on BPA and other chemicals under the Industry Chemical Challenge: www.cen-rce.org/NewOneRCEN/csr.html# (link to NGO responses)

³ See the Canadian Environmental Protection Act section 64. It states ““A substance is toxic if it is entering or may enter the environment in a quantity or concentration or under conditions that:

- a) have or may have an immediate or long-term harmful effect on the environment or its biological diversity;
- b) constitute or may constitute a danger to the environment on which life depends; or
- c) constitute or may constitute a danger in Canada to human life or health” ([Section 64 of CEPA](#)).

⁴ Measures may come in as regulations, guidelines or code of practice, for any part of the chemical’s life-cycle from the research and development stage through to manufacture, use, storage, transport and ultimate disposal or recycling.