



F A C T S H E E T

POLYSTYRENE FOAM INSULATION AND GREEN BUILDINGS

FLAME RETARDANT USE AND SAFETY

Polystyrene Foam and Energy/Greenhouse Gas Reduction

Polystyrene foam insulation – expanded (EPS) or extruded (XPS) – has a long history of safe use and has been highly valued for decades by architects, builders and homeowners. Used globally, this lightweight, rigid plastic foam insulation offers a unique combination of versatility, superior performance and cost-effectiveness. It is a key contributor to energy efficient homes and buildings and is widely used both above and below grade due to its durability and stability.

Building codes and standards that are designed to encourage a green building envelope continue to recognize the benefits and safety of polystyrene foam insulation products. Polystyrene foam insulation's energy efficiency minimizes the use of fossil fuels and greatly reduces greenhouse gas emissions related to the heating and cooling of buildings, thus reducing their impact on the environment. Polystyrene foam insulation continues to make important contributions to sustainable buildings through its unique benefits.

Flame Retardant Use in Polystyrene Foam

To help ensure occupant safety, the Canadian and U.S. building codes contain provisions to limit fire hazards. Flame retardants are used in many building materials to raise the ignition temperature and to reduce the rate of burning (flame spread) and smoke development, thereby allowing building occupants time to escape a life-threatening fire.

HBCD (hexabromocyclododecane) provides a high degree of flame retardancy at low concentrations in polystyrene foam insulation. Its benefits increase the foam's fire safety performance without compromising other critical physical properties such as thermal, water absorption, dimensional stability as well as air and vapor permeance performance. The fire safety properties of HBCD are maintained in the foam insulation for decades, even after extended water contact. As such, HBCD is designed to stay in the foam so that all its fire-safety performance attributes are present throughout the service life of a building. Polystyrene foam insulation with HBCD is essential for many types of building applications and for

meeting the flammability requirements of North American building codes which necessitate the use of a flame retardant.

Flame Retardant Safety in Polystyrene Foam

The safety of polystyrene foam insulation with HBCD has been researched extensively and evaluated by regulatory bodies in numerous countries. Most recently, a comprehensive risk assessment by the European Union (EU) in 2008 identified no health risk to consumers from HBCD use in polystyrene foam insulations.¹

HBCD remains in the polymer matrix throughout the insulation products' service life, so it is unlikely that the use of HBCD in polystyrene foam insulation would result in significant environmental exposure. Studies of both EPS and XPS insulation have reviewed the impact of natural light, rain run-off and other weather conditions. Many of these studies amplified real world conditions of installed polystyrene foam insulation and yet found little, if any, migration of HBCD. The studies indicated levels of HBCD in the insulation remain essentially constant, thus minimizing any emissions to the environment and preserving the insulation's flame retardancy for decades.²

Flame Retardant in Polystyrene Foam and Regulations

European Union (EU) – The European Chemicals Agency (ECHA) issued a Recommendation to list HBCD as a priority substance for Authorization under the EU Chemicals Regulation REACH in June 2009. HBCD's presence on the recommended list was based on identified risk for HBCD to the environment. No risks to consumers were identified. The final decision on the list of substances for authorization is expected in early 2011.

The polystyrene foam insulation industry is working with the EU under the REACH program to support continued responsible use of HBCD in its products. Industry intends to seek authorization for continued use in building insulation since polystyrene foam insulation meets the criteria for broad environmental benefits, lack of human health concerns, socio-economic factors, unavailability of suitable alternatives and the need for an orderly transition to potential new flame retardants once they are commercially available.

United States (U.S.) - The U.S. Environmental Protection Agency (US-EPA) recently announced its release of several new action plans for certain chemicals – including HBCD – designated in round two of its new Chemical Action Program (CAP). CAP action plans are a fast-track method to identify and evaluate chemicals that may pose a threat to human health and/or the environment.

The inclusion of HBCD in EPA's CAP announcement starts the process for rulemaking. The EPA expects to initiate or publish rulemaking by the end of 2011.

¹ Swedish Chemicals Agency (Kemi). Risk Assessment conducted under Council Regulation (EEC) No 793/93 of 23 March 1993 on the evaluation and control of the risk of existing substances. OJ L 84, 5.4. 1993, p. 1-75.

² HBCD in Polystyrene Foams: Product Safety Assessment, April 2009 HBCD Industry Working Group – Submission to European Chemicals Agency (ECHA).

Canada - Under the Government of Canada's Chemical Management Plan, a "draft" screening level risk assessment (SLRA) for HBCD was recently released, along with a very preliminary Risk Management Plan. The draft SLRA indicates that HBCD meets the criteria under Section 64 of the Canadian Environmental Protection Act for toxicity to the environment but is not a human health concern. A summary of the SLRA can be found at <http://www.gazette.gc.ca> and the complete SLRA can be found at <http://www.chemicalsubstances.gc.ca>

Product Stewardship

Although HBCD is typically the most widely-used commercially viable flame retardant in polystyrene foam insulation meeting all performance requirements, companies are continually innovating and researching new options. Substitution of HBCD with a sustainable alternative that provides equivalent flame retardancy, overall safety and does not result in a significant change to foam properties is the only alternative.

In addition to researching alternative flame retardants, HBCD producers and users are implementing a range of product stewardship programs to further minimize emissions to the environment, both at manufacturing sites and throughout the supply chain.

Polystyrene Foam – Continued Contribution to Green Buildings

Polystyrene foam insulation remains an outstanding choice for many building applications and a key contributor to green buildings. Green building professionals can continue to rely on polystyrene foam insulation's unique combination of benefits while minimizing their impacts on the environment. The polystyrene foam insulation industry will work closely with regulators and continue exploring innovative technologies to maintain the availability and benefits of its products.

For additional information, contact the Canadian Plastics Industry Association (905)678-7748; the EPS Molders Association 1-800-607-3772 or the Extruded Polystyrene Foam Association (202)207-1111. For further information on HBCD: www.bsef.com

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