Nexans

July 13, 2022

The Honourable Steven Guilbeault
Minister of the Environment
c/o Christina Paradiso
Executive Director Chemicals Management, Environmental Protection Branch
Department of the Environment
351 Saint-Joseph Boulevard, Gatineau, Quebec K1A 0H3
Email: ec.interdiction-prohibition.ec@ec.gc.ca

Re: Notice of Objection and Request for Board of Review in relation to proposed regulations prohibiting the manufacture, use, sale and import of decabromodiphenyl ethane (DBDPE, CAS Registry Number 84852-53-9) and polybrominated diphenyl ethers (PBDEs) while providing exemptions to the prohibitions, Canada Gazette, Part I, Volume 156, Number 20 – May 14, 2022: Prohibition of Certain Toxic Substances Regulations, 2022.

Dear Minister Guilbeault:

Our company/organization writes to express our formal objection to the above-referenced regulatory proposal.

Nexans Canada Inc. is an electrical wire and cable manufacturer that has operated in Canada for more than 110 years, previously under the names of Canada Wire & Cable and Alcatel Canada Wire. Nexans manufactures a wide variety of low-voltage and medium-voltage cables for residential, industrial, and utility sectors, both for use in Canada and export to USA. The proposed regulation of DBDPE would have serious, long-lasting negative impacts on our business.

One of the main processes in a cable plant is insulating – application of a thin layer of polymer over a copper or aluminum conductor. A significant amount of insulation compound used in our plant demands fire-resistant properties, which is achieved by the incorporation of DBDPE. Polyethylene compounded with DBDPE is unique in its ability to reliably meet a wide array of conflicting performance requirements: physical properties (e.g., tensile, elongation), fire resistance, and electrical performance. The insulated conductor must be approved against standard CSA C22.2 No.38 "Thermoset Insulated Conductors". Should a manufacturer wish to incorporate this conductor into a complete cable design, additional approvals are required per cable type, e.g.,

- Type TC "Tray Cable" under CSA C22.2 No.230
- Type CIC "Control and Instrumentation Cable" under CSA C22.2 No.239
- Type RPVU "Photovoltaic Cable" under CSA C22.2 No.271

The wire and cable industry (and wider electronics industry) does not oppose chemical restrictions when those restrictions are firmly grounded in scientific fact. Just in the past 20 years, compliance with RoHS has brought about several significant bans which formulators have been able to adapt to. Notable examples include: the removal of lead-based stabilizers from PVC, the removal of low molecular weight ortho-phthalates (DEHP, BBP, DBP, DIBP) from PVC, the removal of Polybrominated Diphenyl Ethers (e.g., DecaBDE) from flame retardant polyolefin systems, and the removal of heavy metals (Cd, Pb, Hg, Cr VI) notably from colour concentrate masterbatches. All of these restrictions were put in place after clearly establishing the harm their continued use would entail, and importantly, obtaining international agreement on those conclusions. Nexans finds the proposed regulation of DBDPE under Canada Gazette, Part I, Volume 156, Number 20 – May 14, 2022 does not meet either condition: there is insufficient evidence to motivate further restrictions of DBDPE, and Canada would be acting alone which will likely cause severe supply chain disruptions should this restriction come into full effect.

The five-year exemption offered for wire and cable products is inadequate for a few straightforward reasons. First, there is no guarantee that if a suitable alternative is identified it will be judged less harmful than DBDPE. Second, where data on DBDPE was lacking, data from DecaBDE was substituted. If the analogue is already banned as toxic, then how could any other conclusion be reached than to ban the material under consideration? With these two points in mind, it seems the plastics and wire & cable industry will be fully reformulating their flame-resistant polyolefin systems on a steady 10 – 15 year cycle.

As provided for by section 332(2) of CEPA 1999, our company is filing this Notice of Objection and respectfully request that a Board of Review be established, pursuant to section 333 of CEPA 1999, to “inquire into the nature and extent of danger” posed by DBDPE and PBDEs for the reasons set out below.

Proposed Risk Management Measures May Lead to Severe Risk to Public Health and Safety

DBDPE performs a valuable function by reducing the flammability of the products where it is used. Those products include not just consumer devices and appliances, but also include airplanes and motor vehicles. In the absence of alternatives, the prohibitions pose a genuine risk of increasing flammability of those products therefore creating a severe risk to public health and safety.

The unique properties of DBDPE allow for wire and cable allows manufacturers to reliably meet stringent industry standards. DBDPE is highly resistant to thermal degradation at the temperatures common for plastic extrusion lines, ensuring that the FR will behave in its intended fashion in the finished cable product every time. DBDPE is not a polar molecule and therefore does not significantly reduce insulation integrity at the loadings required to meet the most severe flame resistance tests. DBDPE is insoluble in water, which allows the cable manufacturer to achieve a 90°C wet rating through evaluation in the particularly challenging “long term insulation resistance test.” A test involving immersion of a coil of wire in 90°C water for up to 36 weeks.

A brominated flame retardant that is either soluble, or polar, or degrades at slightly lower temperatures might never be able to fully replace what manufacturers are able to achieve with DBDPE. If this ends up being the case, then CSA technical committees will have no choice but to lower the requirements on the approval of future FR polyolefin insulations, permanently reducing both fire safety and electrical safety across the country.

Proposed Risk Management Measures for DBDPE are Not Aligned with Other Regulatory Agencies or Agreements

The proposed risk management measures as set out in the proposed Prohibition of Certain Toxic Substances Regulations, 2022 (the "draft Regulation") for DBDPE are an outlier globally. No regulatory authority in the world has proposed risk management measures as sweeping as those set out in the draft Regulation. Canada is acting alone to prohibit DBDPE. By way of example, the United States Environmental Protection Agency (U.S. EPA) is not currently conducting a risk evaluation for DBDPE and is not contemplating risk management measures.

In a ruling published by the U.S EPA on 1/6/2021, DecaBDE (CAS 1163-19-5) will have its manufacturing, processing, and distribution severely curtailed under TSCA Section 6(h). This implies Canada's largest trading partner will be *switching to* DBDPE in the coming years. It is unlikely American manufacturers will be willing to carry out two reformulations; one to satisfy TSCA's move from DecaBDE to DBDPE, and a second to satisfy ECCC's move from DBDPE to a yet-to-be-identified material.

ECCC has noted that Canada is a party to the Stockholm Convention on Persistent Organic Pollutants (POP), and that the proposed risk management measures would allow Canada to meet "its international commitments implementing amendments to the Stockholm Convention." Yet, DBDPE is not listed as a POP under the Stockholm Convention. ECCC also cites meeting the goals of the Great Lakes Water Quality Agreement as a justification for its proposed risk management measures, even though DBDPE is not listed as a Chemical of Mutual Concern as part of the agreement. Accordingly, neither rationale justifies the proposed risk management measures.

Last, the Final Screening Assessment of DBDPE (the "Final Screening Assessment") published in the May 11, 2019 Canada Gazette, Part I, as well as the Proposed Order to add the substance to Schedule 1 of the Canadian Environmental Protection Act, 1999 published in the June 29, 2019 Canada Gazette, Part I Notice, and the subsequent draft Regulation are inconsistent with the U.S.-Mexico-Canada Agreement (USMCA), which requires a risk-based approach to chemical regulations.

Any risk management measures for DBDPE need to align with other national and international regulatory bodies and with international agreements to avoid potential unintended consequences that could negatively affect Canadian consumers and businesses operating in Canada.

If ECCC insists on proceeding with regulation of DBDPE, Nexans strongly suggests deferral of the current regulation and instead submitting the relevant findings to RoHS and obtaining international consensus on the restriction. In this way, all electronic device manufacturers will be operating by the same set of guidelines, and will be able to work together to identify a replacement material should RoHS agree with ECCC's conclusions and recommendations.

Proposed Risk Management Measures May Lead to Supply Chain Disruptions

Product manufacturers operate in a global regulatory environment and must take into account a broad range of product safety and design factors. This includes considerations related to product certification, performance, use and end of life, and even chemical registration. These regulatory, design, and performance requirements are addressed through a complex global supply chain for components and subcomponents.

A 2020 socioeconomic study commissioned by ECCC on DBDPE in the Canadian market noted that "at this time, effective fully tested alternatives are not currently known for many critical applications." ECCC suggests that its consultations with industry stakeholders have helped it develop permits and exemptions to address the lack of available alternatives to DBDPE. However, these permits and exemptions are insufficient in addressing the lack of available alternatives for DBDPE. ECCC notes several times during the draft Regulation that there is a lack of data and certainty regarding cost and availability of alternatives to DBDPE for some critical applications, and consequently that compliance costs have not been estimated for proposed risk management measures affecting wire and cable, automotive products, and other applications.

The engineering and certification of products is a time-consuming process that can take years, and there are considerable financial costs involved in this effort. Our company design products to meet relevant safety standards and to be safe when used as intended. Given the lack of available alternatives for DBDPE and unknown costs of compliance with the regulatory proposal, ECCC must revise its approach in regulating DBDPE to avoid disruptions to an already overburdened supply chain.

For the wire and cable industry in general, there are no Canadian manufacturers of flame-resistant polyethylene systems. The Canadian cable industry is entirely reliant on American-based polyethylene compounders, whose compounds can only function as a unified system. Below is a selection of highly flame-resistant FR XLPE systems (FT1 or equivalent) from four major suppliers.

Manufacturer	Avient	SACO	Lyondell Basell	DOW
Compound ID	S100FV	PEXIDAN V/T-2	Aquathene U4753AC	DFDA-5427
Polyethylene base	S1054A	A-3001	AQ120000	DFDA-5451
Flame Retardant / Catalyst Masterbatch	V0044G	CAT-045FR	FR420000	---
Flame Retardant	---	---	---	DFDA-5470
Catalyst	---	---	---	DFDA-5481

It should be noted the above four systems all utilize DBDPE to achieve the required flame performance. It should be further noted that given the smaller size of the Canadian wire and cable market, that even if DBDPE-free masterbatches are developed, their cost and availability would be inferior given they would be used for Canadian wire types only. As Canadian manufacturers will no longer able to import compound systems containing DBDPE, they will be forced to use a more expensive compound system when trying to compete in the export market.

Specifically in Nexans' case, we have over 20 compounds from 4 manufacturers approved which involve a DBDPE-containing masterbatch. Over the past 20 years, Nexans has carried out many approval projects to optimize current systems, modify systems in ways advantageous to the market, or simply pre-approve a back-up source. Should the proposed regulation of DBDPE come into force, all these compounds will become obsolete after the five-year exemption period. It will not be possible to return to Nexans' current state within this exemption period, not mentioning the estimated millions of dollars required in project fees and prototyping.

Final Screening Assessment for DBDPE Ignores the "Weight of the Evidence"

Section 76.1 of Canada Environmental Protection Act (CEPA) requires equal weight in the application of both the weight of evidence and the precautionary principle in conducting the evaluation of the scientific evidence relating to any particular substance. Section 76.1 does not give precedence to either of these two principles. The application of the precautionary principle is not stated or intended to govern decision-making.

The conclusion reached in the Final Screening Assessment that DBDPE has the potential to transform into lower brominated products that could pose a risk to aquatic organisms conflicts with the proper application of the weight of evidence approach and has not been substantiated. ECCC reached its conclusion regarding the potential for breakdown of DBDPE based on a theory that the DBDPE would behave in the same way as another flame retardant, decabromodiphenyl ether (decaBDE). That conclusion is inconsistent with the available evidence on DBDPE.

The approach taken by ECCC is contrary to the statutory requirement to apply the weight of evidence approach. DBDPE is very different scientifically and structurally than decaBDE. Thus, the use of decaBDE as a proxy for DBDPE in computer modelling to draw this conclusion of potential breakdown products in the absence of any supporting studies is not appropriate and based on faulty assumptions given their different molecular structures.

The Conclusions of the Final Screening Assessment upon which the Proposed Risk Management Measures for DBDPE Rely is not Supported by the State of the Science

ECCC notes for the Final Screening Assessment that "given the available information on potential human health effects, DBDPE is not a concern for human health."[1] A comprehensive list of 50 analytical, toxicological, environmental, and pharmacological studies were conducted on DBDPE to evaluate its safety and to register as appropriate in other jurisdictions. These studies were

[1] ECCC, Decabromodiphenyl Ethane (DBDPE) – Information Sheet, https://www.canada.ca/en/health-canada/services/chemical-substances/fact-sheets/chemicals-glance/decabromodiphenyl-ethane.html#a5.1.

provided to ECCC through the assessment process to assist in the evaluation of this substance. The state of the science as demonstrated by these studies does not support a conclusion that would justify the proposed risk management measures.

In addition to the studies discussed above, there is new scientific information since publication of the Final Screening Assessment in May 2019 that was not available and therefore not evaluated by ECCC or HC during the Screening Assessment. This additional scientific information provides a sufficient justification for the Minister to reconsider the conclusion reached in the Final Screening Assessment that DBDPE is "toxic" under CEPA.

First, in November 2020, an independent third-party review was provided to ECCC of the available scientific reports, as well as the draft and final screening assessments, for the purpose of providing an opinion on the validity of the approach taken and conclusions reached by ECCC with respect to DBDPE. Below are several of the conclusions from the independent review:

- DecaBDE is not a good read-across substance for the purpose of estimating the rate of potential debromination of DBDPE;
- Guidelines and recommendations for applying a read-across approach exist but were not adequately followed by ECCC in the Final Screening Assessment; and,
- The Final Screening Assessment does not include evidence to substantiate that lower-form DBDPE products enter the environment in a quantity or concentration that have or may have an immediate or long-term harmful effect.

Second, the National Academy of Sciences, Engineering, and Medicine ("NAS") published a study report[2] in May 2019 to determine if organohalogen flame retardants ("OFRs") – which includes DBDPE – could be divided into subgroups based on similar chemical structures or physicochemical properties for the purposes of further assessment. NAS recommended dividing 161 OFRs into 14 subclasses. It is noteworthy that in the study, NAS grouped DBDPE and decaBDE into separate subclasses. This finding further supports the position that it is not appropriate to use decaBDE as a surrogate for DBDPE to draw any conclusion regarding potential breakdown products in the absence of supporting studies.

Third, the results of a 2,000-hour study modelling the photodegradation of DBDPE within high impact polystyrene (HIPS) and polypropylene (PP) in the Canadian environment has been shared with ECCC. Conclusions from that study are that DBDPE has a long half-life under realistic photodegradation conditions, any formation of lower brominated products from DBDPE is negligible and are not the species of concern expressed by ECCC, and lower form brominated products can be prevented with the help of ultraviolet absorption and light stabilizers.

[2] National Academies of Sciences, Engineering, and Medicine. 2019. A Class Approach to Hazard Assessment of Organohalogen Flame Retardants. Washington, DC: The National Academies Press. doi: https://doi.org/10.17226/25412.

The 50 studies previously shared with ECCC, along with new information that has been shared with ECCC since publication of the Final Screening Assessment, does not support either the finding that DBDPE is "toxic" under CEPA or the proposed risk management measures.

Proposed Risk Management Measures for PBDEs do not Align with Global Regulations and Restrictions

As mentioned earlier for DBDPE, it is also important that risk management measures for other substances align with global agreements and regulations. That is true for PBDEs, a group of flame retardants which have largely been phased out in Canada and around the world and are no longer being produced. At present, Canada already prohibits the manufacture, use, sale, offer for sale, and import of PBDEs, including decaBDE, and all products that contain PBDEs except for manufactured items. Canada's current regulations for PBDEs are largely consistent with international regulations for PBDEs.

ECCC proposes eliminating the exemption allowing the manufacture, use, sale and import of manufactured items containing PBDEs with a few exceptions. In addition, the presence of each PBDE congener (e.g., decaBDE, octaBDE, etc.) in a substance, mixture, polymer, or resin is proposed to be incidental at a concentration less than or equal to 10 parts per million (ppm). The presence of PBDE congeners in all other products is proposed to be incidental when the total concentration of all congeners is less than or equal to 500 ppm.

In contrast, the European Union's Restriction on Hazardous Substances (RoHS) requires electrical and electronic products to contain less that 1,000 ppm or 0.1% of PBDEs. Further illustrating the complexity in finding alternatives for some substances, although five PBDEs are listed as POPs by the Stockholm Convention, all of them still have some specific exemptions on a time-limited basis. U.S. EPA is also considering additional risk management measures for decaBDE, with a proposal for a new rulemaking expected in Spring 2023.

The proposed risk management measures for PBDEs could put Canada at odds with some of its largest trading partners and consideration should be given to global regulatory alignment, circularity goals, and potential disruptions to critical sectors in the country.

Screening Assessment Criticism: Degradation of DBDPE, real world versus laboratory

In the studies referenced in the screening assessment that tested DBDPE in realistic scenarios [Kajiwara et al (2008), 2019 Albemarle Europe SPRL], it was shown that DBDPE did not degrade, and did not de-brominate beyond 0.2% nonaBDPE respectively.

The following two studies referenced in the screening assessment tested DBDPE against artificial conditions that do not model behaviour in environmental conditions. Nadjia et al (2014) found that DBDPE degrades within 180s after being dissolved in tetrahydrofuran and exposed to UV light. It is unclear what environmental scenario this test method represents. Wang et al (2012) dissolved DBDPE in an aggressive mixture of solvents (acetone-tetrahydrofuran-toluene), and then measured the degradation of DBDPE in the following media: n-hexane, tetrahydrofuran, methanol/water, humic acid/water, and silica gel while exposed to direct UV light. Again, it is unsurprising this study found the half-life of DBDPE to be on the order of minutes to hours when these conditions are not found in nature, nor are they analogous to natural environments.

While there is no supporting data, inferences made in the report by UK Environment Agency 2007, expects photolysis of DBDPE to be very limited in natural waters, soils, and biosolids. This supposition is supported by work presented in Kajiwara et al (2008) and 2019 Albemarle Europe SPRL.

The proven stability of DBDPE cannot be understated. DBDPE is proposed for restriction specifically because of the products that may form when it degrades, however DBDPE only degrades abiotically when it is forced to under the most arbitrary of laboratory conditions, and does not readily degrade at all under biotic conditions. It should be cause for serious investigation why ECCC is concerned about the degradation products of a chemical that does not degrade.

Screening Assessment Criticism: DecaBDE as a degradation analogue for DBDPE

Since it has been established that DBDPE is stable, and found in concentrations that are orders of magnitude below the toxicity level for flora and fauna, the entire restriction of DBDPE hinges on a computer model that suggests DBDPE de-brominates in a similar fashion to DecaBDE, and *those* transformation products meet the CEPA criteria for persistent & bio-accumulative toxins.

The screening assessment states there is a lack of experimental data on transformation products of DBDPE (8.2.5 Persistence of Transformation Products). To answer this question, the screening assessment used modelling methodology (Q)SAR to predict what transformation products might form. First it must be questioned that, if there is such a pivotal absence of data, why would ECCC defer to a computational model instead of commissioning an analytical study to determine what transformation products actually occur?
Second, Kajiwara et al (2008) performed a real-world assessment of DecaBDE vs DBDPE degradation. They found DecaBDE degrades rapidly even when compounded in HIPS, while after 250 days (6,000 hours) DBDPE in the equivalent compound showed effectively zero degradation. Lastly, as mentioned previously in this letter, conclusions from a 2,000 hour study conducted in the Canadian environment was shared with ECCC. It found DBDPE, again, barely degraded when compounded in HIPS and PP. And when it did degrade, the transformation products were identified to be species *other than* those predicted by the (Q)SAR model.

Therefore, it is the opinion of Nexans that, when referring to the (Q)SAR model outputs in Appendix C (Table C-1) of the screening assessment, it is wholly unscientific and imprudent to identify a transformation product of DecaBDE, simply replace the ‘ether bridge’ with an ‘ethane bridge’, and follow-up with a claim the latter material is a valid degradation product of DBDPE with zero supporting analytical evidence this molecule actually forms.

DBDPE Fits the Criteria for Continued Use

In summary, DBDPE is a material with properties that make it uniquely suited for continued use in Canada.

DBDPE is:

- Molecularly stable. While it does persist in the environment, it does not degrade in natural conditions.
- Even though it persists, it does not bioaccumulate since a) the water solubility is extremely low, and b) the lipid solubility is extremely low
- Even if it does bioaccumulate, it does so at concentrations 3 to 6 orders of magnitude below published toxicity ratings
- The vast majority of DBDPE enters the environment compounded in plastic which protects against degradation
- Any DBDPE that does degrade, will not yield the transformation products of concern outlined in the screening assessment, Appendix C

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Based upon the facts and arguments set out above we ask the Minister to appoint a Board of Review to "inquire into the nature and extent of danger" posed by DBDPE and PBDEs.

Sincerely,

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