



Australian Government

Department of Health

Australian Industrial Chemicals Introduction Scheme

Benzene, 1,1'-(1,2-ethanediyl)bis[2,3,4,5,6-pentabromo-

Assessment statement

24 June 2022



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AICIS assessment statement

Chemical in this assessment

Name	CAS registry number
Benzene, 1,1'-(1,2-ethanediyl)bis[2,3,4,5,6-pentabromo-	84852-53-9

Reason for the assessment

Proposal to cancel certificate on Executive Director's initiative under section 52 of the *Industrial Chemicals Act 2019* (the Act).

On 19 August 2021, the public report for the chemical (assessed chemical in STD/1676) was published and an assessment certificate (CERT9258) was issued under s 37 of the Act, as modified by s 13 of the *Industrial Chemicals (Consequential Amendments and Transitional Provisions) Rules 2019*, to Fibrisol Service Australia Pty Ltd, allowing them to introduce the assessed chemical into Australia. The public report of the assessment concluded that the assessed chemical could pose an unreasonable risk to the environment and recommended the following:

- The chemical is hazardous to the environment and should be prioritised for scheduling and the application of appropriate risk management measures under the *Industrial Chemicals Environmental Management (Register) Act 2021*.

The Industrial Chemicals Environmental Management Standard is not yet fully implemented.

On 20 August 2021, the Executive Director of AICIS decided to initiate an evaluation (EVA00072) of the chemical under section 69 of the Act, in order to determine whether the environment risks from any introduction of the chemical into Australia can be managed within existing risk management frameworks.

The Executive Director completed the evaluation on 18 November 2021 and the evaluation statement for the chemical was published, after a copy of the draft evaluation statement was provided to the certificate holder on 13 October 2021. A conclusion of the evaluation was that the Executive Director is not satisfied that the risks to the environment from the introduction and use of the chemical can be managed.

A recommendation of the evaluation was that the assessment certificate should be cancelled under section 52 of the Act. Following publication of the evaluation statement, the Executive Director sent written notice to the certificate holder on 29 November 2021 that cancellation was being proposed, and the reasons for cancellation. No submission was made by the certificate holder.

Following this, the Executive Director must decide whether or not to cancel the certificate, considering any submission made by the certificate holder regarding the proposed cancellation. The decision on whether or not to cancel the certificate and an assessment statement (this document) must be communicated to the certificate holder. The assessment statement must also be published on the AICIS website.

This assessment statement draws on information and conclusions from the STD/1676 public report (AICIS 2021a) and EVA00072 evaluation statement (AICIS 2021b).

Defined scope of assessment

The chemical has been assessed:

- as imported into Australia up to 120 tonnes/annum;
- as imported into Australia at up to 100% concentration and in end use products at up to 30% concentration;
- for use as a flame retardant in articles, films and coatings used in electrical, electronic, building, and automotive applications.

Summary of assessment

Summary of introduction, use and end use

Under the assessment certificate (CERT9258) issued on 19 August 2021, the chemical may be imported at 100% concentration at up to 120 tonnes/year by Fibrisol Service Australia Pty Ltd.

If introduced (imported), the chemical is intended by the certificate holder to be processed and used as a flame retardant in articles, films and coatings used in electrical, electronic, building and automotive applications.

Human health

Summary of health hazards

Studies submitted on the assessed chemical indicated that the assessed chemical is of low acute toxicity, is not irritating to skin, is slightly irritating to eyes, not a skin sensitiser and is not mutagenic or genotoxic. Some repeated dose toxicity studies (including one provided by the applicant) indicated that the assessed chemical has no adverse health effects up to 1000 mg/kg bw/day. However, effects in some other studies suggest that adverse effects after repeated exposure to the assessed chemical cannot be ruled out (AICIS, 2021a). In some studies where decabromodiphenyl ether (decaBDE) was also tested, the assessed chemical was reported to be causing similar but less severe effects than with decaBDE.

Based on the limited information available, it is uncertain if the assessed chemical may photodegrade to lower brominated congeners (breakdown products), as occurs with decaBDE.

Health hazard classification

Based on the available conflicting data and limited information, the assessed chemical is not recommended for classification according to the Globally Harmonised System of Classification and Labelling of Chemicals (GHS) (UNECE, 2017), as adopted for industrial chemicals in Australia.

Summary of health risk

Public

The assessed chemical is intended for industrial use only, however the general public may have limited contact with articles containing the assessed chemical. In addition, the assessed chemical is expected to be already imported into Australia as a component of a range of articles. Indirect human exposure is known to already occur in Australia, presumed to be due to release of dust from imported articles.

Based on the available hazard data, and noting the uncertainties in the hazard assessment, and likely widespread but low public exposure from the proposed use pattern, no risks are identified for public health through direct exposure that require specific risk management measures, if the assessed chemical is introduced and used in accordance with the terms of the assessment certificate. However, indirect exposure levels could increase over time due to persistent and bioaccumulative properties of the assessed chemical.

Workers

Workers may be exposed to the imported assessed chemical up to 100% concentration (powder form) during compounding/masterbatch production operations. Other workers may come into contact with the assessed chemical at $\leq 30\%$ concentration.

Noting the uncertainties in human health hazards with repeated exposure, and provided that control measures are in place to minimise worker exposure to the assessed chemical as recommended in the STD/1676 public report, the risk to the health of workers from use of the assessed chemical is not considered to be significant.

Environment

Summary of environmental hazard characteristics

Results from a ready biodegradability study and OECD aerobic and anaerobic transformation studies in soils and sediments demonstrate that the chemical meets the persistence criterion in Annex D of the Stockholm Convention on Persistent Organic Pollutants (the Stockholm Convention) (AICIS 2021a).

Based on the available bioaccumulation data, the chemical meets the bioaccumulation criterion of Annex D of the Stockholm Convention, including section 1(c)(iii), which is relevant when monitoring data in biota indicates the bioaccumulation potential of the chemical is sufficient to justify consideration within the scope of the Convention.

The chemical has the potential to have adverse effects on aquatic and terrestrial organisms, and therefore meets the adverse effects criterion of Annex D, specifically section 1(e)(ii) which is satisfied if there is ecotoxicity data that indicate the potential for damage to the environment.

The available evidence indicates that wet and dry deposition of particulates containing the chemical results in contamination of soils, moss, lichens, trees and surface waters long distances away from emission sources and that the chemical has reached Antarctica. Therefore, the chemical fulfils the long-range environmental transport criterion of Annex D of the Stockholm Convention, specifically section 1(d)(i) and (ii) which are satisfied if measured levels are in locations distant from the sources of its release and monitoring data exist.

Environmental hazard classification

Environmental classification under the GHS is not mandated in Australia and carries no legal status but is presented for information purposes. The chemical satisfies the criteria for classification according to the Globally Harmonised System of Classification and Labelling of Chemicals (GHS) (UNECE, 2017) for environmental hazards as follows:

Environmental Hazard	Hazard Category	Hazard Statement
Hazardous to the aquatic environment (long-term)	Aquatic Chronic. 4	H413: May cause long lasting harmful effects to aquatic life

Summary of environmental risk

The chemical meets the persistence, bioaccumulation, adverse effects and long range transport criteria of Annex D of the Stockholm Convention and has the characteristics of a persistent organic pollutant (taking into consideration the criteria in paragraph 1 of Annex D of the Convention). Therefore, on the basis of the current hazard information available, the introduction and use of the chemical could pose significant long-term risks to the environment.

Based on environmental monitoring, it is likely that articles containing the chemical are already being imported into Australia, and the chemical may be released from these articles, leading to indirect environmental exposure (AICIS 2021a). Articles containing the chemical are currently not subject to risk management.

The overall exposure and risk to the environment would be increased through introduction and use of the chemical itself under the certificate, as release to the environment would be increased.

Advice on the existing risk management framework was sought from the Department of Agriculture, Water and the Environment (DAWE). Based on the risk characteristics and the proposed uses of this chemical set out in the AICIS Public Report STD/1676, DAWE advised that the risks to the environment posed by the use of the chemical cannot be managed within the current risk management frameworks.

Australia is a Party to the Stockholm Convention. Under Article 3.3 of the Convention, Australia is bound to take measures to regulate with the aim of preventing the production and use of new industrial chemicals that exhibit the characteristics of a persistent organic pollutant.

Means for managing risk

Assessment certificate

The Executive Director of AICIS is not satisfied that the risks of the chemical to the environment from its introduction and use can be managed within existing risk management frameworks, therefore the Executive Director has decided to cancel the assessment certificate (CERT9258) for the chemical under section 52 of the Act.

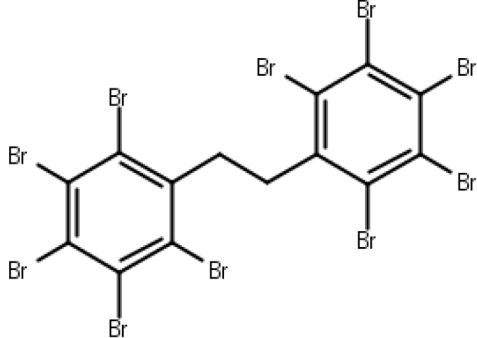
Conclusions

The conclusions of this assessment are based on the information described in this statement, as well as the public report of the STD/1676 assessment and evaluation statement on the chemical (AICIS 2021a; AICIS 2021b), which include more detailed information on hazard and risk.

Based on the characteristics of the chemical and the advice from the risk manager DAWE, the Executive Director of AICIS is not satisfied that the risks of the chemical to the environment can be managed within existing risk management frameworks.

Supporting information

Chemical identity

Synonyms	Decabromodiphenylethane; DBDPE; 1,2-Bis(pentabromophenyl)ethane
Structural formula	
Molecular formula	C ₁₄ H ₄ Br ₁₀
Molecular weight (g/mol)	971.22
SMILES	<chem>BrC=1C(Br)=C(Br)C(=C(Br)C1Br)CCC=2C(Br)=C(Br)C(Br)=C(Br)C2Br</chem>

For additional supporting information, refer to the STD/1676 public report (AICIS 2021a).

Introduction and use

Australia

The following information is taken from the STD/1676 public report.

The chemical will be imported through Sydney, Melbourne and other ports to either distributors or compounders (convertors in the plastic industry) in Australia. The chemical will be imported in 25 kg (and possibly 1000 kg) bags and transported by road or rail in Australia.

The introducer proposed that the chemical will be used as a component of articles for electrical and electronics applications, including electronic and electrical home appliances and enclosures. It will also be used for building and construction, as a component of wires, cables and plastic parts in automotive applications at 5 - 30% concentration. Use in coatings may also occur.

The chemical was proposed to be used as an additive in plastics and resins such as:

- Low-density Polyethylene (LDPE) and High-density Polyethylene (HDPE) films and sheets for building and construction
- LDPE, HDPE and Polypropylene (PP) injection moulded parts for electricity and electronics
- Acrylonitrile/Butadiene/Styrene (ABS), High Impact Polystyrene (HIPS), Polyamide (PA), Polybutylene Terephthalate (PBT) and Polyethylene Terephthalate (PET) injection moulded parts for electricity and electronics
- Unsaturated Polyester (UPE), vinyl esters, phenolic resins and epoxy resins for building and construction and electricity and electronics

References

- AICIS (2021a) [Benzene, 1,1'-\(1,2-ethanediyl\)bis\[2,3,4,5,6-pentabromo-: STD/1676 Public Report](#). Australian Industrial Chemicals Introduction Scheme, Australia.
- AICIS (2021b) [Benzene, 1,1'-\(1,2-ethanediyl\)bis\[2,3,4,5,6-pentabromo-: EVA00072 Evaluation statement](#). Australian Industrial Chemicals Introduction Scheme, Australia.
- UNECE (2017). Globally Harmonized System of Classification and Labelling of Chemicals (GHS), Seventh Revised Edition. United Nations Economic Commission for Europe (UNECE), Geneva, Switzerland. Accessed October 2021 at <https://unece.org/ghs-rev7-2017>

