

Annex 15 Report

Proposal for identification of a substance of very high concern (SVHC)

Reaction mass of triphenylthiophosphate and tertiary butylated phenyl derivatives

EC Number: 421-820-9

CAS Number: 192268-65-8

July 2026

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1. Proposal

Substance Name: Reaction mass of triphenylthiophosphate and tertiary butylated phenyl derivatives

EC Number: 421-820-9

CAS Number: 192268-65-8

The reaction mass of triphenylthiophosphate and tertiary butylated phenyl derivatives has been identified as a substance of very high concern (SVHC) in accordance with the requirements set out in Annex 15 of EU REACH (ECHA, 2024a). This is based on the substance fulfilling the persistent, bioaccumulative and toxic (PBT) criteria under Annex 13 of EU REACH.

This technical report provides an independent scientific assessment by the Agency¹ on whether the reaction mass of triphenylthiophosphate and tertiary butylated phenyl derivatives should be identified as an SVHC under UK REACH.

It is proposed to identify the reaction mass of triphenylthiophosphate and tertiary butylated phenyl derivatives as persistent, bioaccumulative and toxic (PBT) according to Article 57(d) of UK REACH.

Summary of how the substance meets the criteria set out in Article 57 of the REACH Regulation

A weight-of-evidence determination according to the provisions of Annex 13 of UK REACH was used to identify O,O,O-triphenyl phosphorothioate (also known as TPPT; EC number 209-909-9; CAS number 597-82-0) as a SVHC (HSE, 2026).

If a constituent, impurity or additive of a substance fulfils the PBT/vPvB properties a ≥ 0.1 % (w/w) threshold applies for concluding that the substance fulfils the same criteria (ECHA, 2023).

As the reaction mass of triphenylthiophosphate and tertiary butylated phenyl derivatives contains TPPT at concentrations > 0.1 % (w/w) this substance can also be identified as a PBT substance according to Article 57(d) of REACH.

¹The Health and Safety Executive (HSE) acting in its capacity as the Agency for UK REACH, and with support from the Environment Agency in accordance with Article 2B of UK REACH.

Conclusion

Based on the information available, the Agency concludes that the reaction mass of triphenylthiophosphate and tertiary butylated phenyl derivatives fulfils the PBT criteria of Annex 13 of UK REACH and can therefore be identified as an SVHC in accordance with Article 57(d) of UK REACH when containing TPPT above or equal to 0.1% (w/w).

2. Justification

2.1 Identity of the substance and physical and chemical properties

2.1.1 Name and other identifiers of the substance

Table 1: Substance identity

EC number:	421-820-9
Substance name:	Reaction mass of triphenylthiophosphate and tertiary butylated phenyl derivatives
SMILES ^a :	Not applicable (UVCB)
CAS number:	192268-65-8
IUPAC ^b name:	Reaction mass of: triphenylthiophosphate and tertiary butylated phenyl derivatives
Index number in GB Mandatory Classification and Labelling (MCL) List ^c :	607-501-00-9
Molecular formula:	Not applicable (UVCB)
Molecular weight range:	Not applicable (UVCB)
Synonyms:	Phosphorothioic acid, O,O,O-triphenyl esters, tert-Bu derivs. Triphenylthiophosphate and tertiary butylated phenyl derivatives A mixture of: triphenylthiophosphate and tertiary butylated phenyl derivatives CD 28-0132 (Irgalube 232)
Structural formula:	Not applicable (UVCB)

^a SMILES: Simplified Molecular Input Line Entry System

^b IUPAC: International Union of Pure and Applied Chemistry

^c GB MCL list in accordance with the retained Regulation (EC) No 1272/2008 as amended for Great Britain

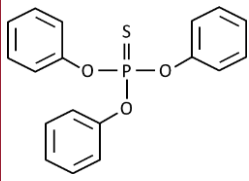
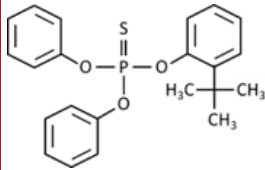
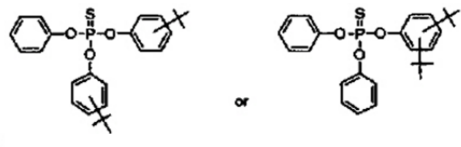
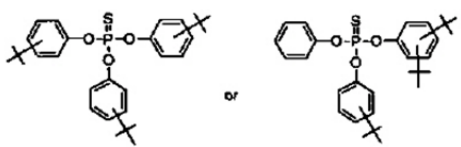
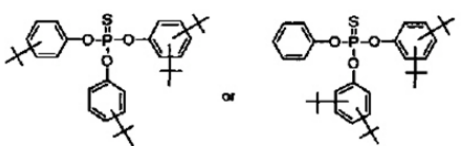
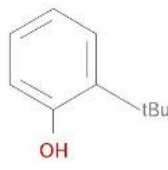
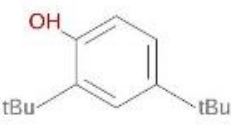
2.1.2 Composition of the substance

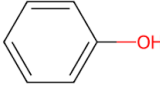
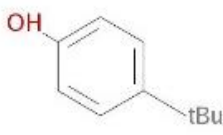
Substance type: UVCB.

The reaction mass is composed of a combination of triphenylthiophosphate and tert-butylated triphenylthiophosphate constituents (Table 2) where the position and number of tert-butyl substituents on the phenyl rings is variable.

The concentration ranges of individual components are not provided in the EU Member State Committee (MSC) support document (ECHA, 2024b). However, the document states that TPPT is the major constituent of the reaction mass of triphenylthiophosphate and tertiary butylated phenyl derivatives.

Table 2: Constituents other than impurities/additives

Constituents	Identifiers	Example chemical structure
O,O,O-triphenyl phosphorothioate (TPPT)	EC no. 209-909-9 CAS no. 597-82-0	
mono-tert-butyl O,O',O''-triphenylphosphorothioate	EC no. not available CAS no. not available	
di-tert-butyl O,O',O''-triphenylphosphorothioate	EC no. not available CAS no. not available	
tri-tert-butyl O,O',O''-triphenylphosphorothioate	EC no. not available CAS no. not available	
tetrakis-tert-butyl O,O',O''-triphenylphosphorothioate	EC no. not available CAS no. not available	
2-tert-butylphenol	EC no. 201-807-2 CAS no. 88-18-6	
2,4-di-tert-butylphenol	EC no. 202-532-0 CAS no. 96-76-4	

Constituents	Identifiers	Example chemical structure
Phenol	EC no. 203-632-7 CAS no. 108-95-2	
4-tert-butylphenol	EC no. 202-679-0 CAS no. 98-54-4	
non-specified constituents	N/A	N/A

2.1.3 Identity and composition of transformation products relevant for the SVHC assessment

No transformation products were considered in the EU MSC support document.

The Agency does not consider it necessary to consider transformation products due to the findings for TPPT.

2.1.4 Identity and composition of structurally related substances (used in grouping or read-across approach)

No structurally related substances were considered in the EU MSC support document.

The Agency does not consider it necessary to consider transformation products due to the findings for TPPT.

2.1.5 Physicochemical properties

Physicochemical property information for reaction mass of triphenylthiophosphate and tertiary butylated phenyl derivatives from the EU registration dossier are summarised in the EU MSC support document and reported in Table 3. The data are considered to be reliable or reliable with restrictions by the EU registrants, but the Agency has not been able to independently verify the reliability of this information.

Table 3: Overview of physicochemical properties of the reaction mass of triphenylthiophosphate and tertiary butylated phenyl derivatives from the EU registration dossier (ECHA, 2024b)

Property	Value
Physical state at 20°C and 101.3 kPa	Clear, yellowish liquid
Melting/freezing point (°C)	Glass transition temp. -39.0
Boiling point (°C)	432
Vapour pressure (Pa at 20°C)	7×10^{-5}
Density (kg/m ³ at 20°C)	1,167
Water solubility (µg/L at 20°C)	<100
n-Octanol–water partition coefficient (log K _{OW})	4.8 to 7.0

2.2 Mandatory classification and labelling

Table 4: Mandatory classification in the GB MCL list

Index No	International Chemical Identification	EC No	CAS No	GB MCL list Classification		Aligned with EU CLH ^a
				Hazard Class and Category Code(s)	Hazard statement code(s)	
607-501-00-9	Reaction mass of triphenylthiophosphate and tertiary butylated phenyl derivatives	421-820-9	192268-65-8	Aquatic Chronic 4	H413	Y

^a EU CLH is harmonised classification and labelling in accordance with Regulation (EC) 1272/2008

2.3 Environmental hazard assessment

The hazard assessment on which this SVHC proposal is based is reported in the Annex 15 SVHC proposal for O,O,O-triphenyl phosphorothioate (TPPT; EC no. 209-909-9; CAS no. 597-82-0) (HSE, 2026).

2.4 Conclusions on the SVHC properties

A weight-of-evidence determination according to the provisions of Annex 13 of UK REACH was used to identify TPPT) as a SVHC (HSE, 2026).

If a constituent, impurity or additive of a substance fulfils the PBT/vPvB properties, a ≥ 0.1 % (w/w) threshold applies for concluding the substance a fulfils the same criteria (ECHA, 2023).

As the reaction mass of triphenylthiophosphate and tertiary butylated phenyl derivatives contains TPPT at concentrations > 0.1 % (w/w), this substance also meets the criteria required to be identified as a PBT substance according to Article 57(d) of UK REACH.

Conclusion

Based on the information available, the Agency concludes that the reaction mass of triphenylthiophosphate and tertiary butylated phenyl derivatives fulfils the PBT criteria of Annex 13 of UK REACH and can therefore be identified as an SVHC in accordance with Article 57(d) of UK REACH when containing TPPT above or equal to 0.1% (w/w).

3. Information on use, exposure and alternatives

3.1 UK and EU REACH registration status and tonnage

The substance is not currently registered under UK REACH. However, 15 Downstream User Import Notifications (DUINs²) have been submitted.

Under EU REACH, the substance is registered with an aggregated tonnage of 100 to 1000 tpa³.

3.2 General description of uses and exposure

The EU registration dossier³ indicates that the substance is primarily used in industrial and professional applications, particularly in lubricants and greases, hydraulic fluids, and metal working fluids.

Environmental release may occur during the formulation of mixtures containing the substance and through use as a processing aid at industrial sites.

ECHA (2024c) notes that there is no information on consumer users or article service life within the available registration data.

Overall, the substance exhibits an industrial and professional use profile, with exposure and emissions largely confined to controlled workplace environments.

3.3 Alternatives

A range of alternatives are available for the substance when used as a lubricant additive ECHA (2024c). These include phosphorus-based additives (e.g. zinc dialkyldithiophosphates, tricresyl phosphate and phosphite esters), sulphur-based additives (e.g. sulphurised olefins and dithiocarbamates), boron-based additives (e.g. boron esters and boron nitride), organic additives (e.g. polyol esters and glycerol monooleate), and molybdenum-based additives (e.g. molybdenum disulphide and molybdenum dialkyldithiocarbamates).

² GB-based companies who imported substances from EU-based suppliers before UK REACH became law on 1 January 2021 had no EU REACH registration obligations as they were classed as Downstream Users (DUs). As they are now importers from outside of GB, they may have registration obligations under UK REACH. However, a transitional measure allows former DUs to suspend the registration until one of three deadlines (depending on tonnage and hazard). Where the identity of these imported substances was known, they could be included in a Downstream User Import Notification (DUIN) submitted to the Agency.

³ ECHA Chemicals database; ECHA CHEM <https://chem.echa.europa.eu/>

These alternatives have not been comprehensively assessed. There is insufficient information to determine whether they possess similar hazard profiles or whether they can be considered suitable substitutes.

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Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No 1907/2006 (Text with EEA relevance). European Commission. Available at: <http://data.europa.eu/eli/reg/2008/1272/2026-05-01>

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<https://www.legislation.gov.uk/eur/2006/1907/contents>

Glossary

Agency, the	HSE
B	Bioaccumulative
BCF	Bioconcentration factor
CAS	Chemical Abstracts Service
CLH	EU harmonised classification and labelling
DT₅₀	Time taken for 50% decline in mass or concentration. If the decline is described by first order kinetics then this is also called the half-life
DU	Downstream User
DUIN	Downstream User Import Notification
ECHA	European Chemicals Agency
EC	European Community
EU	European Union
FOCUS	Forum for the co-ordination of pesticide fate models and their use
HSE	Health and Safety Executive
IUPAC	International Union of Pure and Applied Chemistry
K_{ow}	n-Octanol–water partition coefficient
MCL	Mandatory classification and labelling
MSC	EU Member State Committee
OECD	Organisation for Economic Cooperation and Development
P	Persistent
PBT	Persistent, bioaccumulative and toxic
pK_a	Acid dissociation constant (logarithmic form)
REACH	Registration, evaluation, authorisation and restriction of chemicals
SMILES	Simplified Molecular Input Line Entry System
SVHC	Substance of very high concern
TG	Test guideline
UVCB	Unknown or variable composition, complex reaction products, or biological materials.

vB	Very bioaccumulative
vP	Very persistent
vPvB	Very persistent and very bioaccumulative

Further information

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