

GPS Safety Summary

Substance Name:

Dibenzoyl peroxide

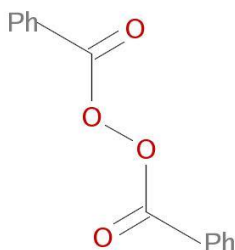
1. General Statement

Dibenzoyl Peroxide is primarily used in the manufacture of polymers, as a polymerisation initiator.

Dibenzoyl Peroxide can also be used in other applications: as an oxidant in anti-acne formulations, as a hardener/cross-linking agent (in production of unsaturated polyester resins and silicone rubbers) and as a bleaching agent.

2. Chemical Identity

Name:	Dibenzoyl peroxide, BPO
Brand names:	Luperox A75, Luperox A75FP, Luperox A75S, Luperox ANS50G
Chemical name (IUPAC):	Diphenylperoxyanhydride
CAS number(s):	94-36-0
EC number:	202-327-6
Molecular formula:	C ₁₄ H ₁₀ O ₄
Structure:	



3. Use and applications

Dibenzoyl Peroxide is primarily used as a radical initiator to induce polymerisation (free radical polymerisation process), for the manufacture of e.g. expandable polystyrene in suspension, acrylics polymers (for road marking paints).

Dibenzoyl Peroxide can also be used in other applications, in production, as an oxidant in anti-acne formulation, as a hardener of unsaturated polyester resins, as a cross-linking agent for the production of and silicone rubbers, and as a bleaching agent.

4. Physical / Chemical properties

Property	Value
Physical state	Solid at ambient temperature, low dustiness (wet powder)
Form	White powder, moist
Colour	White
Odour	Slightly benzaldehyde-like
Density	1.33 g/cm ³ at 20°C
Melting point	103-108°C at 1013 hPa
Explosive properties	The pure substance is explosive
Self-Accelerating Decomposition Temperature (SADT)	65°C
Vapour pressure	9.07.10 ⁻⁵ hPa (at 25°C) (by calculation)
Mol weight	242.23 g/mol
Water solubility	0.35 mg/L at 20°C
Octanol-water partition coefficient (LogKow)	3.2 at 20°C

5. Health Effects

Effect Assessment	Result
Acute Toxicity Oral / inhalation / dermal	Based on available data, no acute toxic effects.
Irritation / corrosion Skin / eye / respiratory tract	Severe irritant for eyes. Dermatitis possible through repeated contact.
Sensitisation	Product may cause allergic skin reaction.
Toxicity after repeated exposure Oral / inhalation / dermal	Based on the available test data, did not cause significant target organ toxicity after repeated exposure.
Genotoxicity / Mutagenicity	Based on the available test data, not expected to cause adverse genetic effects.
Carcinogenicity	Not known to be a human carcinogen.
Reproductive / Developmental Toxicology	Based on the available test data, did not cause adverse effects on reproduction.

6. Environmental Effects

Based on available data, BPO is considered to be very toxic towards aquatic organisms and is classified according to EC 1272/2008 regulation.

However, due to its properties, the risk for the aquatic compartment is low. Indeed, BPO is neither bioaccumulative nor persistent and has a rapid degradation in water by hydrolysis to benzoic acid, which is biodegradable. Therefore, it will be removed by sewage treatment plants.

Effect Assessment	Result
Aquatic Toxicity	Very toxic to aquatic life.

Fate and behaviour	Result
Biodegradation	Inherently biodegradable.
Bioaccumulation potential	Low potential for bioaccumulation.
PBT / vPvB conclusion	Not considered either as PBT (Persistent, Bioaccumulative, and Toxic chemical) nor as vPvB (Very Persistent and Very Bioaccumulative).

7. Exposure

7.1 Human health

The manufacture of BPO is a closed process that occurs behind anti-deflagration walls, which minimizes worker exposure during the production process.

However, workers can be exposed during loading/unloading operations, mixing, sampling or maintenance operations.

The primary routes of industrial/professional exposure of dibenzoyl peroxide are skin contact and inhalation.

In addition, the general population is not expected to be exposed to dibenzoyl peroxide by inhalation, dermal or oral exposure, the product does not remain in the plastic products.

Based on the risk assessment, risk is controlled when activities are carried out under conditions recommended in the extended safety data sheet (chapter 8 and exposure scenarios).

7.2 Environment

Releases of dibenzoyl peroxide into the environment are to be expected during production, processing (formulation) and industrial/professional uses mainly via wastewater and fewer amounts via emissions of vapour or powder (due to its physical state and its vapour pressure).

Potential release during production is treated by on-site and off-site risk management measures.

BPO is used for production of polymers and resins, which can occur in either dry or wet processes. In case of wet processes, releases to water have to be directed to wastewater treatment plant.

BPO has a rapid degradation in water (due to biodegradation and hydrolysis) and low potential for bioaccumulation, thus secondary poisoning and human exposure via the environment are unlikely.

Based on the risk assessment, the use of BPO is safe under conditions recommended in the extended safety data sheet (chapter 8 and exposure scenarios).

8. Risk Management recommendations

Human health measures	
Eye/Face protection	Safety glasses/goggles Half-mask during the discharge
Skin protection	Protective suit
Hand protection	Gloves: nitrile rubber, neoprene (suitable gloves tested to EN374)
Respiratory protection	Suitable respiratory equipment in case of insufficient ventilation
Organizational measures	Ensure workers are duly trained to minimize exposure
Engineering control	Provide sufficient air exchange and/or exhaust ventilation in work rooms
Environmental measures	
Can be discarded in waste water, when in compliance with local regulations. Do not spread sludge on natural soils. Eliminate the product by incineration after dilution in a suitable flammable solvent (in accordance with local and national regulations) – amount of active oxygen must be below 1%.	

9. Regulatory Information / Classification and Labelling

9.1 Regulatory Information

A dossier was generated by the Organic Peroxide Producers Association during the High Production Volume Program.





On top of that, the substance has been registered under EU Regulation EC 1907/2006 (REACH).

As organic peroxides are sensitive substances (as they are liable to exothermic decomposition), the carriage of BPO is strongly regulated, under the rules and conditions of class 5.2 of UN Recommendations on the Transport of Dangerous Goods regulation.

%	Form	UN Number	Classification	OP Category
≤75 %	as solid (wet powder)	UN 3104	OP Type C, Solid, no temperature control	Type C: the mixture possesses explosive properties but cannot detonate or deflagrate rapidly or undergo a thermal explosion when packaged.
≤50 %	as a paste	UN 3108	OP Type E, Solid, no temperature control	Type E: the mixture, in laboratory testing, neither detonates nor deflagrates at all and shows low or no effect when heated under confinement.

9.2 Classification and labelling

Under GHS substances are classified according to their physical, health, and environmental hazards. The hazards are communicated via specific labels and the eSDS. GHS attempts to standardize hazard communication so that the intended audience (workers, consumers, transport workers, and emergency responders) can better understand the hazards of the chemicals in use. Substances registered for REACH are classified according CLP (EC) 1272/2008.

Classification	
According to REGULATION (EC) no 1272/2008, the pure substance is classified:	
<ul style="list-style-type: none">– Organic peroxide; type B; Heating may cause a fire.– Skin sensitization; Category 1; May cause an allergic skin reaction.– Eye irritation; Category 2; Chronic aquatic; Causes serious eye irritation.– Acute aquatic toxicity; Category 1; Very toxic to aquatic life.	
Signal Word	
– Danger	
Pictogram	
– GHS01: Exploding bomb	
– GHS02: Flame	
– GHS07: Exclamation mark	
– GHS09: Environment	
Hazard statement	
<ul style="list-style-type: none">– H241: Heating may cause a fire or explosion.– H317: May cause an allergic skin reaction.– H319: Causes serious eye irritation.– H400: Very toxic to aquatic life.	
Additional classification according to GHS	
None.	

10. Contact Information within Company

For further information on this substance or product safety summary in general, please contact:

- arkema.peroxides-reach-uses@arkema.com
- **ICCA portal where the GPS Safety Summary is posted:**
<http://www.icca-chem.org/en/Home/ICCA-initiatives/global-product-strategy/>