

SAFETY DATA SHEET

according to the OSHA
Hazard Communication Standard

Version 6.17
Revision Date 07/14/2026
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SECTION 1. IDENTIFICATION

1.1 Product identifiers

Product name : Diisononyl phthalate

Product Number : 376663
Brand : Aldrich
CAS-No. : 28553-12-0

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

Restrictions on use : Not Available

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich Inc.
3050 SPRUCE ST
ST. LOUIS MO 63103
UNITED STATES

Telephone : +1 314 771-5765
Fax : +1 800 325-5052

1.4 Emergency telephone number

Emergency Phone # : 800-424-9300 CHEMTREC (USA) +1-703-
527-3887 CHEMTREC (International) 24
Hours/day; 7 Days/week

SECTION 2. HAZARDS IDENTIFICATION

GHS classification in accordance with the OSHA Hazard Communication Standard (29 CFR 1910.1200)

Hazards for the product as supplied

Acute toxicity (Oral) : Category 4

Reproductive toxicity : Category 1B

Long-term (chronic) : Category 4

aquatic hazard

Other hazards

None known.

GHS label elements

Hazard pictograms



Signal word

: Danger

Hazard statements

: H302 Harmful if swallowed.
H360 May damage fertility or the unborn child.
H413 May cause long lasting harmful effects to aquatic life.

Precautionary statements

Prevention:

P201 Obtain special instructions before use.
P202 Do not handle until all safety precautions have been read and understood.
P264 Wash skin thoroughly after handling.
P270 Do not eat, drink or smoke when using this product.
P273 Avoid release to the environment.
P280 Wear protective gloves, protective clothing, eye protection and face protection.

Response:

P301 + P312 + P330 IF SWALLOWED: Call a POISON CENTER/ doctor if you feel unwell. Rinse mouth.
P308 + P313 IF exposed or concerned: Get medical advice/ attention.

Storage:

P405 Store locked up.

Disposal:

P501 Dispose of contents/ container to an approved waste disposal plant.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture

: Substance

CAS-No.

: 28553-12-0

Components

Chemical name	CAS No./Unique ID	Concentration (% w/w)	Trade secret
Diisononyl phthalate	28553-12-0*	$\geq 80 - \leq 100$	TSC
Bis(2-ethylhexyl) phthalate	117-81-7*	$\geq 0.1 - \leq 1$	TSC

* Indicates that the identifier is a CAS No.

TSC- the actual concentration or concentration range is withheld as a trade secret

SECTION 4. FIRST AID MEASURES

- General advice : Show this safety data sheet to the doctor in attendance.
- If inhaled : After inhalation: fresh air.
- In case of skin contact : In case of skin contact: Take off immediately all contaminated clothing. Rinse skin with water/ shower.
- In case of eye contact : After eye contact: rinse out with plenty of water. Remove contact lenses.
- If swallowed : After swallowing: immediately make victim drink water (two glasses at most). Consult a physician.
- Most important symptoms and effects, both acute and delayed : The most important known symptoms and effects are described in the labelling (see section 2 GHS label elements) and/or in section 11
- Protection of first-aiders : For personal protection see section 8.
- Notes to physician : No data available

SECTION 5. FIREFIGHTING MEASURES

- Suitable extinguishing media : Foam
Carbon dioxide (CO₂)
Dry powder
- Unsuitable extinguishing media : For this substance/mixture no limitations of extinguishing agents are given.
- Specific hazards during fire fighting : Combustible.

Vapours are heavier than air and may spread along floors.

Forms explosive mixtures with air on intense heating.

Development of hazardous combustion gases or vapours possible in the event of fire.

Hazardous combustion products	: Carbon oxides
Specific extinguishing methods	: No data available
Further information	: Prevent fire extinguishing water from contaminating surface water or the ground water system.
Special protective equipment for fire-fighters	: In the event of fire, wear self-contained breathing apparatus.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures	: Advice for non-emergency personnel: Do not breathe vapours, aerosols. Avoid substance contact. Ensure adequate ventilation. Evacuate the danger area, observe emergency procedures, consult an expert. Advice for emergency responders: Wear appropriate personal protective equipment, as indicated in Section 8.
Environmental precautions	: Do not let product enter drains.
Methods and materials for containment and cleaning up	: Cover drains. Collect, bind, and pump off spills. Observe possible material restrictions (see sections 7 and 10). Take up with liquid-absorbent material (e.g. Chemizorb®). Dispose of properly. Clean up affected area.

SECTION 7. HANDLING AND STORAGE

For precautions see section 2 GHS label elements

Further information on storage conditions : Tightly closed.

Storage class : 10, Combustible liquids

Recommended storage temperature : Recommended storage temperature see product label.

Packaging material : Suitable material: Amber Glass Bottle/Jar

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Ingredients with workplace control parameters

Components	CAS-No.	Value type (Form of exposure)	Control parameters / Permissible concentration	Basis
Bis(2-ethylhexyl) phthalate	117-81-7	TWA	0.1 mg/m ³	ACGIH
		TWA	5 mg/m ³	NIOSH REL
		ST	10 mg/m ³	NIOSH REL
		TWA	5 mg/m ³	OSHA Z-1

Biological occupational exposure limits

Components	CAS-No.	Control parameters	Biological specimen	Sampling time	Permissible concentration	Basis
Bis(2-ethylhexyl) phthalate	117-81-7	Mono(2-ethylhexyl)phthalate	Urine	End of shift	5 µg/g creatinine	ACGIH BEI
		Mono(2-ethyl-5-hydroxyhexyl)phthalate	Urine	End of shift	20 µg/g creatinine	ACGIH BEI
		Mono(2-ethyl-5-oxohexyl)phthalate	Urine	End of shift	15 µg/g creatinine	ACGIH BEI
		Mono(2-ethyl-5-carboxypentyl)phthalate	Urine	End of shift	25 µg/g creatinine	ACGIH BEI

Engineering measures : No data available

Personal protective equipment

Respiratory protection : required when vapours/aerosols are generated.

Our recommendations on filtering respiratory protection are based on the following standards: DIN EN 143, DIN 14387 and other accompanying standards relating to the used respiratory protection system.

Recommended Filter type: : Filter type ABEK

The entrepreneur has to ensure that maintenance, cleaning and testing of respiratory protective devices are carried out according to the instructions of the producer. These measures have to be properly documented.

Hand protection

Remarks : required

Eye protection : Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).
Safety glasses

Skin and body protection : protective clothing

Hygiene measures : Change contaminated clothing. Preventive skin protection recommended. Wash hands after working with substance.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance : liquid (68 °F / 20 °C, 1,013 hPa)

Colour : colourless, clear

Odour : slight

Odour Threshold : No data available

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pH	: No data available
Melting point/ range	: -54 °F / -48 °C
Boiling point/boiling range	: 628 °F / 331 °C (964.70 hPa) Method: OECD Test Guideline 103
Flash point	: 457 °F / 236 °C (1017.0 hPa) Method: ASTM D 93, closed cup
Evaporation rate	: No data available
Flammability (solid, gas)	: No data available
Flammability (liquids)	: No data available
Burning rate	: No data available
Upper explosion limit / Upper flammability limit	: No data available
Lower explosion limit / Lower flammability limit	: 0.3 %(V) (424 °F / 218 °C)
Vapour pressure	: No data available
Relative vapour density	: No data available
Relative density	: 0.97 (68 °F / 20 °C) Method: OECD Test Guideline 109
Density	: 0.972 g/mL (77 °F / 25 °C) Method: lit.
Solubility(ies)	
Water solubility	: 0.0014 g/l slightly soluble (68 °F / 20 °C) pH: 4.6 Method: OECD Test Guideline 105
Solubility in other solvents	: Solvent: Methanol Solvent: Benzene Solvent: Acetone Solvent: Ether
Partition coefficient: n- octanol/water	: log Pow: 8.8 - 9.7 (77 °F / 25 °C)

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Autoignition temperature	: ca. 752 °F / 400 °C
Decomposition temperature	: Heating can release hazardous gases. Decomposes on heating. To avoid thermal decomposition, do not overheat.
Viscosity	
Viscosity, dynamic	: 72 - 82 mPa.s (68 °F / 20 °C)
Viscosity, kinematic	: 77.6 mm ² /s (68 °F / 20 °C)
Flow time	: No data available
Explosive properties	: Not classified as explosive.
Oxidizing properties	: none
Molecular weight	: 418.61 g/mol
Particle characteristics	
Particle size	: No data available

SECTION 10. STABILITY AND REACTIVITY

Reactivity	: Forms explosive mixtures with air on intense heating. A range from approx. 15 Kelvin below the flash point is to be rated as critical.
Chemical stability	: The product is chemically stable under standard ambient conditions (room temperature) .
Possibility of hazardous reactions	: No data available
Conditions to avoid	: Strong heating.
Incompatible materials	: Reducing agents
Hazardous decomposition products	: In the event of fire: see section 5

SECTION 11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity

Acute toxicity estimate Oral - 500.1 mg/kg

(Calculation method)

Acute toxicity estimate Oral - 500.1 mg/kg

(Expert judgement)

Remarks: The value / statement given is based on a (Q)SAR approach

LC50 Inhalation - Rat - 4 h - > 4.4 mg/l

LD50 Dermal - Rabbit - > 3,160 mg/kg

Skin corrosion/irritation

Skin - Rabbit

Result: No skin irritation - 4 h

(OECD Test Guideline 404)

Serious eye damage/eye irritation

Eyes - Rabbit

Result: No eye irritation

(OECD Test Guideline 405)

Respiratory or skin sensitization

Buehler Test - Guinea pig

Result: Does not cause skin sensitisation.

(OECD Test Guideline 406)

Germ cell mutagenicity

Test Type: Ames test

Test system: *S. typhimurium*

Metabolic activation: with and without metabolic activation

Method: OECD Test Guideline 471

Result: negative

Carcinogenicity

IARC: 2B - Group 2B: Possibly carcinogenic to humans (Bis(2-ethylhexyl) phthalate)

NTP: RAHC - Reasonably anticipated to be a human carcinogen (Bis(2-ethylhexyl) phthalate)

OSHA: No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

Reproductive toxicity

No data available

No data available

Specific target organ toxicity - single exposure

No data available

Specific target organ toxicity - repeated exposure

No data available

Aspiration hazard

No data available

11.2 Additional Information

To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

SECTION 12. ECOLOGICAL INFORMATION

Ecotoxicity

Components:

Diisononyl phthalate:

- Toxicity to fish : LC50 (Danio rerio (zebra fish)): > 102 mg/l
Exposure time: 96 h
Test Type: semi-static test
Method: Directive 67/548/EEC, Annex V, C.1.
- Toxicity to daphnia and other aquatic invertebrates : (Daphnia magna (Water flea)): > 74 mg/l
Exposure time: 48 h
Test Type: Growth inhibition
Method: Directive 67/548/EEC, Annex V, C.2.
- Toxicity to algae/aquatic plants : EC50 (Desmodesmus subspicatus (green algae)): > 88 mg/l
Exposure time: 72 h
Test Type: static test
Method: Directive 67/548/EEC, Annex V, C.3.
- Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : NOEC (Daphnia magna (Water flea)): > 101 mg/l
Exposure time: 21 d

Ecotoxicology Assessment

- Acute aquatic toxicity : This product has no known ecotoxicological effects.
Remarks: The value / statement given is based on a (Q)SAR approach
- Chronic aquatic toxicity : May cause long lasting harmful effects to aquatic life.
Remarks: The value / statement given is based on a (Q)SAR approach

Bis(2-ethylhexyl) phthalate:

- Toxicity to fish : LC50 (Pimephales promelas (fathead minnow)): > 0.67 mg/l
End point: mortality
Exposure time: 96 h
Test Type: flow-through test
Analytical monitoring: yes

Method: OECD Test Guideline 203

GLP: yes

Remarks: (above the solubility limit in the test medium)

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): > 0.16 mg/l
End point: Immobilization
Exposure time: 48 h
Remarks: (ECOTOX Database)

Toxicity to algae/aquatic plants : EC50 (Pseudokirchneriella subcapitata): > 0.003 mg/l
Exposure time: 72 h
Analytical monitoring: yes
Method: OECD Test Guideline 201

Toxicity to fish (Chronic toxicity) : NOEC (Pimephales promelas (fathead minnow)): 23.8 mg/l
Exposure time: 32 d
Test Type: flow-through test
Remarks: (above the solubility limit in the test medium)
(ECOTOX Database)

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : NOEC (Daphnia magna (Water flea)): 0.158 mg/l
End point: mortality
Exposure time: 21 d
Test Type: flow-through test
Analytical monitoring: yes
Method: OECD Test Guideline 211
Remarks: (above the solubility limit in the test medium)

Toxicity to microorganisms : NOEC (activated sludge): 1,000 mg/l
End point: Growth rate
Exposure time: 3 h
Test Type: static test
Method: OECD Test Guideline 209
GLP: yes

Ecotoxicology Assessment

Acute aquatic toxicity : This product has no known ecotoxicological effects.

Chronic aquatic toxicity : This product has no known ecotoxicological effects.

Persistence and degradability

Components:

Diisononyl phthalate:

Biodegradability : aerobic
Inoculum: activated sludge

Concentration: 20.1 mg/l
Result: Readily biodegradable.
Biodegradation: 81 %
Exposure time: 28 d
Method: Directive 67/548/EEC Annex V, C.4.C.

Bis(2-ethylhexyl) phthalate:

Biodegradability : aerobic
Inoculum: activated sludge, non-adapted
Concentration: 20.3 mg/l
Result: Readily biodegradable.
Biodegradation: ca. 82 %
Exposure time: 29 d
Method: OECD Test Guideline 301B
GLP: yes

Bioaccumulative potential

Components:

Diisononyl phthalate:

Bioaccumulation : Species: Oncorhynchus mykiss (rainbow trout)
Bioconcentration factor (BCF): < 3
Remarks: Bioaccumulation is unlikely.

Partition coefficient: n-octanol/water : log Pow: 8.8 - 9.7 (77 °F / 25 °C)

Bis(2-ethylhexyl) phthalate:

Bioaccumulation : Species: Oncorhynchus mykiss (rainbow trout)
Bioconcentration factor (BCF): 113
Exposure time: 100 d
Concentration: 0.014 mg/l
Remarks: Does not bioaccumulate.

Mobility in soil

Components:

Diisononyl phthalate:

Stability in soil : Remarks: Adsorbs on soil.

Other adverse effects

Product:

Ozone-Depletion Potential : Regulation: 40 CFR Protection of Environment; Part 82 Protection of Stratospheric Ozone - CAA Section 602 Class I Substances
Remarks: This product neither contains, nor was manufactured with a Class I or Class II ODS as defined by the U.S. Clean Air Act Section 602 (40 CFR

Endocrine disrupting properties

No data available

SECTION 13. DISPOSAL CONSIDERATIONS

Disposal methods

Waste from residues : Waste material must be disposed of in accordance with the national and local regulations. Leave chemicals in original containers. No mixing with other waste. Handle uncleaned containers like the product itself.

SECTION 14. TRANSPORT INFORMATION

International Regulations

IATA-DGR

Not regulated as a dangerous good

IMDG-Code

Not regulated as a dangerous good

Transport in bulk according to IMO instruments

Not applicable for product as supplied.

National Regulations

49 CFR

Not regulated as a dangerous good

Poison Inhalation Hazard : No

Special precautions for user

Remarks : Not classified as dangerous in the meaning of transport regulations.

SECTION 15. REGULATORY INFORMATION

CERCLA Reportable Quantity

Listed substances in the product are at low enough levels to not be expected to exceed the RQ

SARA 304 Extremely Hazardous Substances Reportable Quantity

This material does not contain any components with a section 304 EHS RQ.

SARA 302 Extremely Hazardous Substances Threshold Planning Quantity

This material does not contain any components with a section 302 EHS TPQ.

SARA 311/312 Hazards : Chronic Health Hazard

SARA 313

: The following components are subject to reporting levels established by SARA Title III, Section 313:

Diisononyl phthalate	28553-12-0	>= 90 - <= 100 %
Bis(2-ethylhexyl) phthalate	117-81-7	>= 0.1 - < 1 %

Clean Air Act

This product neither contains, nor was manufactured with a Class I or Class II ODS as defined by the U.S. Clean Air Act Section 602 (40 CFR 82, Subpt. A, App.A + B). This product does not contain any hazardous air pollutants (HAP), as defined by the U.S. Clean Air Act Section 112 (40 CFR 61).

This product does not contain any chemicals listed under the U.S. Clean Air Act Section 112(r) for Accidental Release Prevention (40 CFR 68.130, Subpart F).

This product does not contain any chemicals listed under the U.S. Clean Air Act Section 111 SOCM I Intermediate or Final VOC's (40 CFR 60.489).

Clean Water Act

This product does not contain any Hazardous Substances listed under the U.S. CleanWater Act, Section 311, Table 116.4A.

This product does not contain any Hazardous Chemicals listed under the U.S. CleanWater Act, Section 311, Table 117.3.

This product contains the following toxic pollutants listed under the U.S. Clean Water Act Section 307

Diisononyl phthalate	28553-12-0	>= 90 - <= 100 %
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This product does not contain any priority pollutants related to the U.S. Clean Water Act

US State Regulations**Massachusetts Right To Know**

Bis(2-ethylhexyl) phthalate	117-81-7
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Pennsylvania Right To Know

Diisononyl phthalate	28553-12-0
Bis(2-ethylhexyl) phthalate	117-81-7

Maine Chemicals of High Concern

Product does not contain any listed chemicals

Vermont Chemicals of High Concern

Diisononyl phthalate	28553-12-0
Bis(2-ethylhexyl) phthalate	117-81-7

Washington Chemicals of High Concern

Diisononyl phthalate	28553-12-0
Bis(2-ethylhexyl) phthalate	117-81-7

California Prop. 65

WARNING: This product can expose you to chemicals including Diisononyl phthalate, Bis(2-ethylhexyl) phthalate, which is/are known to the State of California to cause cancer, and Bis(2-ethylhexyl) phthalate, which is/are known to the State of California to cause birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov.

The components of this product are reported in the following inventories:

US TSCA : All substances listed as active on the TSCA inventory

TSCA list

No substances are subject to a Significant New Use Rule.

No substances are subject to TSCA 12(b) export notification requirements.

SECTION 16. OTHER INFORMATION

Full text of other abbreviations

ACGIH	: USA. ACGIH Threshold Limit Values (TLV)
ACGIH BEI	: ACGIH - Biological Exposure Indices (BEI)
NIOSH REL	: USA. NIOSH Recommended Exposure Limits
OSHA Z-1	: USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
ACGIH / TWA	: 8-hour, time-weighted average
NIOSH REL / TWA	: Time-weighted average concentration for up to a 10-hour workday during a 40-hour workweek
NIOSH REL / ST	: STEL - 15-minute TWA exposure that should not be exceeded at any time during a workday
OSHA Z-1 / TWA	: 8-hour time weighted average

AIIC - Australian Inventory of Industrial Chemicals; ASTM - American Society for the Testing of Materials; bw - Body weight; CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DOT - Department of Transportation; DSL - Domestic Substances List (Canada); ECx - Concentration associated with x% response; EHS - Extremely Hazardous Substance; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; ERG - Emergency Response Guide; GHS - Globally Harmonised System; GLP - Good Laboratory Practice; HMIS - Hazardous Materials Identification System; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organisation; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardisation; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; MSHA - Mine Safety and Health Administration; n.o.s. - Not Otherwise Specified; NFPA - National Fire Protection Association; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No

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Observable Effect Loading Rate; NTP - National Toxicology Program; NZIoC - New Zealand Inventory of Chemicals; OECD - Organisation for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; RCRA - Resource Conservation and Recovery Act; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; RQ - Reportable Quantity; SADT - Self-Accelerating Decomposition Temperature; SARA - Superfund Amendments and Reauthorization Act; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance Inventory; TECI - Thailand Existing Chemicals Inventory; TSCA - Toxic Substances Control Act (United States); UN - United Nations; UNRTDG - United Nations Recommendations on the Transport of Dangerous Goods; vPvB - Very Persistent and Very Bioaccumulative

The information is believed to be correct but is not exhaustive and will be used solely as a guideline, which is based on current knowledge of the chemical substance or mixture and is applicable to appropriate safety precautions for the product. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

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