

## 1,4-diazabicyclooctane

Version number: GHS 3.0  
Replaces version of: 2019-09-12 (GHS 2)

Revision: 2023-02-06

### SECTION 1: Identification of the substance/mixture and of the company/undertaking

#### 1.1 Product identifier

Identification of the substance	<b>1,4-diazabicyclooctane</b>
CAS number	280-57-9
Alternative name(s)	1-cyclooctyl-1,4-diazocane
Article number	A0006677

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

Relevant identified uses	General use
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#### 1.3 Details of the supplier of the safety data sheet

Chemos GmbH & Co. KG  
Sonnenring 7  
84032 Altdorf  
Germany

Telephone: +49 871-966346-0  
Telefax: +49 871-966346-13  
e-mail: chemos@chemos.de  
Website: <http://www.chemos.de/>

e-mail (competent person)	chemos@chemos.de
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#### 1.4 Emergency telephone number

Emergency information service	+49 89 1 92 40
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Poison centre				
Country	Name	Postal code/ city	Telephone	Telefax
United Kingdom	National Poison Information Centre Medical Toxicology Unit	SE14 5ER Lon- don	+44 171 635 91 91	

### SECTION 2: Hazards identification

#### 2.1 Classification of the substance or mixture

Classification acc. to GHS

Section	Hazard class	Category	Hazard class and cat- egory	Hazard state- ment
2.7	flammable solid	1	Flam. Sol. 1	H228
3.10	acute toxicity (oral)	4	Acute Tox. 4	H302
3.2	skin corrosion/irritation	2	Skin Irrit. 2	H315
3.3	serious eye damage/eye irritation	2	Eye Irrit. 2	H319
3.8R	specific target organ toxicity - single exposure (respiratory tract irritation)	3	STOT SE 3	H335
4.1C	hazardous to the aquatic environment - chronic hazard	3	Aquatic Chronic 3	H412

For full text of abbreviations: see SECTION 16.

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The most important adverse physicochemical, human health and environmental effects  
Spillage and fire water can cause pollution of watercourses.

### 2.2 Label elements

Labelling

- Signal word danger

- Pictograms

GHS02, GHS07



- Hazard statements

H228 Flammable solid.  
H302 Harmful if swallowed.  
H315 Causes skin irritation.  
H319 Causes serious eye irritation.  
H335 May cause respiratory irritation.  
H412 Harmful to aquatic life with long lasting effects.

- Precautionary statements

P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.  
P261 Avoid breathing dust/fume/gas/mist/vapours/spray.  
P273 Avoid release to the environment.  
P280 Wear protective gloves/protective clothing/eye protection/face protection.  
P312 Call a POISON CENTRE/doctor if you feel unwell.  
P370+P378 In case of fire: Use sand, carbon dioxide or powder extinguisher to extinguish.  
P403+P233 Store in a well-ventilated place. Keep container tightly closed.  
P501 Dispose of contents/container to industrial combustion plant.

### 2.3 Other hazards

This material is combustible, but will not ignite readily.

Results of PBT and vPvB assessment

According to the results of its assessment, this substance is not a PBT or a vPvB.

## SECTION 3: Composition/information on ingredients

### 3.1 Substances

Name of substance 1,4-diazabicyclooctane

Identifiers

CAS No 280-57-9

EC No 205-999-9

Specific Conc. Limits	M-Factors	ATE	Exposure route
-	-	700 mg/kg	oral

Molecular formula C<sub>6</sub>H<sub>12</sub>N<sub>2</sub>

Molar mass 112.2 g/mol

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**SECTION 4: First aid measures****4.1 Description of first aid measures****General notes**

Do not leave affected person unattended. Remove victim out of the danger area. Keep affected person warm, still and covered. Take off immediately all contaminated clothing. In all cases of doubt, or when symptoms persist, seek medical advice. In case of unconsciousness place person in the recovery position. Never give anything by mouth.

**Following inhalation**

If breathing is irregular or stopped, immediately seek medical assistance and start first aid actions. In case of respiratory tract irritation, consult a physician. Provide fresh air.

**Following skin contact**

Rinse skin with water/shower.

**Following eye contact**

Remove contact lenses, if present and easy to do. Continue rinsing. Irrigate copiously with clean, fresh water for at least 10 minutes, holding the eyelids apart.

**Following ingestion**

Rinse mouth with water (only if the person is conscious). Do NOT induce vomiting.

**4.2 Most important symptoms and effects, both acute and delayed**

Symptoms and effects are not known to date.

**4.3 Indication of any immediate medical attention and special treatment needed**

none

**SECTION 5: Firefighting measures****5.1 Extinguishing media****Suitable extinguishing media**

Water, Foam, Alcohol resistant foam, ABC-powder

**Unsuitable extinguishing media**

Water jet

**5.2 Special hazards arising from the substance or mixture**

Deposited combustible dust has considerable explosion potential.

**Hazardous combustion products**

Nitrogen oxides (NO<sub>x</sub>), Carbon monoxide (CO), Carbon dioxide (CO<sub>2</sub>)

**5.3 Advice for firefighters**

In case of fire and/or explosion do not breathe fumes. Co-ordinate firefighting measures to the fire surroundings. Do not allow firefighting water to enter drains or water courses. Collect contaminated firefighting water separately. Fight fire with normal precautions from a reasonable distance.

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### SECTION 6: Accidental release measures

#### 6.1 Personal precautions, protective equipment and emergency procedures

For non-emergency personnel

Remove persons to safety.

For emergency responders

Wear breathing apparatus if exposed to vapours/dust/spray/gases.

#### 6.2 Environmental precautions

Keep away from drains, surface and ground water. Retain contaminated washing water and dispose of it.

#### 6.3 Methods and material for containment and cleaning up

Advice on how to contain a spill

Covering of drains, Take up mechanically

Advice on how to clean up a spill

Take up mechanically.

Other information relating to spills and releases

Place in appropriate containers for disposal. Ventilate affected area.

#### 6.4 Reference to other sections

Hazardous combustion products: see section 5. Personal protective equipment: see section 8. Incompatible materials: see section 10. Disposal considerations: see section 13.

### SECTION 7: Handling and storage

#### 7.1 Precautions for safe handling

Recommendations

- Measures to prevent fire as well as aerosol and dust generation

Use local and general ventilation. Take precautionary measures against static discharge. Use only in well-ventilated areas. Ground/bond container and receiving equipment.

- Specific notes/details

Dust deposits may accumulate on all deposition surfaces in a technical room. The product in the delivered form is not dust explosion capable; the enrichment of fine dust however leads to the danger of dust explosion.

Advice on general occupational hygiene

Wash hands after use. Do not eat, drink and smoke in work areas. Remove contaminated clothing and protective equipment before entering eating areas. Never keep food or drink in the vicinity of chemicals. Never place chemicals in containers that are normally used for food or drink. Keep away from food, drink and animal feedingstuffs.

#### 7.2 Conditions for safe storage, including any incompatibilities

Managing of associated risks

- Explosive atmospheres

Removal of dust deposits.

- Flammability hazards

Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

- Ventilation requirements

Use local and general ventilation.

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- Packaging compatibilities
- Only packagings which are approved (e.g. acc. to ADR) may be used.

## 7.3 Specific end use(s)

See section 16 for a general overview.

## SECTION 8: Exposure controls/personal protection

### 8.1 Control parameters

Occupational exposure limit values (Workplace Exposure Limits)											
Country	Name of agent	CAS No	Identifier	TWA [ppm]	TWA [mg/m <sup>3</sup> ]	STEL [ppm]	STEL [mg/m <sup>3</sup> ]	Ceiling-C [ppm]	Ceiling-C [mg/m <sup>3</sup> ]	Notation	Source
GB	dust		WEL		10					i	EH40/2005
GB	dust		WEL		4					r	EH40/2005

#### Notation

Ceiling-C

ceiling value is a limit value above which exposure should not occur

i

inhalable fraction

r

respirable fraction

STEL

short-term exposure limit: a limit value above which exposure should not occur and which is related to a 15-minute period (unless otherwise specified)

TWA

time-weighted average (long-term exposure limit): measured or calculated in relation to a reference period of 8 hours  
time-weighted average (unless otherwise specified)

### Human health values

Relevant DNELs and other threshold levels				
Endpoint	Threshold level	Protection goal, route of exposure	Used in	Exposure time
DNEL	1.2 mg/m <sup>3</sup>	human, inhalatory	worker (industry)	chronic - systemic effects
DNEL	3.6 mg/m <sup>3</sup>	human, inhalatory	worker (industry)	acute - systemic effects

### Environmental values

Relevant PNECs and other threshold levels				
Endpoint	Threshold level	Organism	Environmental compartment	Exposure time
PNEC	0.1 mg/l	aquatic organisms	freshwater	short-term (single instance)
PNEC	0.01 mg/l	aquatic organisms	marine water	short-term (single instance)
PNEC	200 mg/l	aquatic organisms	sewage treatment plant (STP)	short-term (single instance)
PNEC	1.3 mg/kg	aquatic organisms	freshwater sediment	short-term (single instance)
PNEC	0.13 mg/kg	aquatic organisms	marine sediment	short-term (single instance)
PNEC	0.19 mg/kg	terrestrial organisms	soil	short-term (single instance)

### 8.2 Exposure controls

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Appropriate engineering controls

General ventilation.

Individual protection measures (personal protective equipment)

Eye/face protection

Wear eye/face protection.

Skin protection

- Hand protection

In the case of wanting to use the gloves again, clean them before taking off and air them well.

- Other protection measures

Take recovery periods for skin regeneration. Preventive skin protection (barrier creams/ointments) is recommended. Wash hands thoroughly after handling.

Respiratory protection

Particulate filter device (EN 143).

Environmental exposure controls

Use appropriate container to avoid environmental contamination. Keep away from drains, surface and ground water.

### SECTION 9: Physical and chemical properties

#### 9.1 Information on basic physical and chemical properties

Physical state	solid
Colour	white
Odour	characteristic
Melting point/freezing point	not determined
Boiling point or initial boiling point and boiling range	173.4 °C at 1 bar
Flammability	flammable solid in accordance with GHS criteria
Lower and upper explosion limit	not determined
Flash point	62.2 °C at 101.3 kPa
Auto-ignition temperature	not determined
Decomposition temperature	>234 °C at 1 bar (ECHA)
pH (value)	not applicable
Kinematic viscosity	not relevant

Solubility(ies)

Water solubility	610 g/l at 25 °C
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### Partition coefficient

Partition coefficient n-octanol/water (log value)	-0.49 (pH value: 7, 20 °C) (ECHA)
Soil organic carbon/water (log KOC)	1.955 (ECHA)

Vapour pressure	0.43 hPa at 23 °C
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### Density and/or relative density

Density	not determined
Relative vapour density	information on this property is not available

### Particle characteristics

Particle size	>100 µm
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## 9.2 Other information

Information with regard to physical hazard classes	there is no additional information
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### Other safety characteristics

Solid content	100 %
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## SECTION 10: Stability and reactivity

### 10.1 Reactivity

Concerning incompatibility: see below "Conditions to avoid" and "Incompatible materials". It's a reactive substance. The mixture contains reactive substance(s). Risk of ignition.

If heated:

Risk of ignition

### 10.2 Chemical stability

See below "Conditions to avoid".

### 10.3 Possibility of hazardous reactions

No known hazardous reactions.

### 10.4 Conditions to avoid

Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

Hints to prevent fire or explosion

The product in the delivered form is not dust explosion capable; the enrichment of fine dust however leads to the danger of dust explosion.

### 10.5 Incompatible materials

Oxidisers

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### 10.6 Hazardous decomposition products

Reasonably anticipated hazardous decomposition products produced as a result of use, storage, spill and heating are not known. Hazardous combustion products: see section 5.

## SECTION 11: Toxicological information

### 11.1 Information on toxicological effects

#### Classification acc. to GHS

Acute toxicity

Harmful if swallowed.

GHS of the United Nations, annex 4: May be harmful in contact with skin.

- Acute toxicity estimate (ATE)

Oral 700 mg/kg

Skin corrosion/irritation

Causes skin irritation.

Serious eye damage/eye irritation

Causes serious eye irritation.

Respiratory or skin sensitisation

Shall not be classified as a respiratory or skin sensitiser.

Germ cell mutagenicity

Shall not be classified as germ cell mutagenic.

Carcinogenicity

Shall not be classified as carcinogenic.

Reproductive toxicity

Shall not be classified as a reproductive toxicant.

Specific target organ toxicity - single exposure

May cause respiratory irritation.

Specific target organ toxicity - repeated exposure

Shall not be classified as a specific target organ toxicant (repeated exposure).

Aspiration hazard

Shall not be classified as presenting an aspiration hazard.

### 11.2 Information on other hazards

There is no additional information.

## SECTION 12: Ecological information

### 12.1 Toxicity

Harmful to aquatic life with long lasting effects.

Aquatic toxicity (chronic)			
Endpoint	Value	Species	Exposure time
EC50	355.6 mg/l	microorganisms	17 h

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### 12.2 Persistence and degradability

Biodegradation

Not readily biodegradable.

Process of degradability		
Process	Degradation rate	Time
carbon dioxide generation	7 %	28 d

### 12.3 Bioaccumulative potential

Data are not available.

n-octanol/water (log KOW)	-0.49 (pH value: 7, 20 °C) (ECHA)
BCF	<13 (ECHA)

### 12.4 Mobility in soil

The Organic Carbon normalised adsorption coefficient	1.955 (ECHA)
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### 12.5 Results of PBT and vPvB assessment

According to the results of its assessment, this substance is not a PBT or a vPvB.

### 12.6 Endocrine disrupting properties

Information on this property is not available.

### 12.7 Other adverse effects

Data are not available.

## SECTION 13: Disposal considerations

### 13.1 Waste treatment methods

Sewage disposal-relevant information

Do not empty into drains. Avoid release to the environment. Refer to special instructions/safety data sheets.

Waste treatment of containers/packagings

It is a dangerous waste; only packagings which are approved (e.g. acc. to ADR) may be used. Completely emptied packages can be recycled. Handle contaminated packages in the same way as the substance itself.

#### Remarks

Please consider the relevant national or regional provisions. Waste shall be separated into the categories that can be handled separately by the local or national waste management facilities.

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### SECTION 14: Transport information

#### 14.1 UN number or ID number

ADR/RID	UN 1325
IMDG-Code	UN 1325
ICAO-TI	UN 1325

#### 14.2 UN proper shipping name

ADR/RID	FLAMMABLE SOLID, ORGANIC, N.O.S.
IMDG-Code	FLAMMABLE SOLID, ORGANIC, N.O.S.
ICAO-TI	Flammable solid, organic, n.o.s.
Technical name	1,4-diazabicyclooctane

#### 14.3 Transport hazard class(es)

ADR/RID	4.1
IMDG-Code	4.1
ICAO-TI	4.1

#### 14.4 Packing group

ADR/RID	II
IMDG-Code	II
ICAO-TI	II

#### 14.5 Environmental hazards

non-environmentally hazardous acc. to the dangerous goods regulations

#### 14.6 Special precautions for user

Provisions for dangerous goods (ADR) should be complied within the premises.

#### 14.7 Maritime transport in bulk according to IMO instruments

The cargo is not intended to be carried in bulk.

#### Information for each of the UN Model Regulations

##### Agreement concerning the International Carriage of Dangerous Goods by Road (ADR) - Additional information

Classification code	F1
Danger label(s)	4.1






Special provisions (SP)	274
Excepted quantities (EQ)	E2
Limited quantities (LQ)	1 kg
Transport category (TC)	2
Tunnel restriction code (TRC)	E
Hazard identification No	40

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Emergency Action Code	1Z
<b>Regulations concerning the International Carriage of Dangerous Goods by Rail (RID) - Additional information</b>	
Classification code	F1
Danger label(s)	4.1
	
Special provisions (SP)	274
Excepted quantities (EQ)	E2
Limited quantities (LQ)	1 kg
Transport category (TC)	2
Hazard identification No	40
<b>International Maritime Dangerous Goods Code (IMDG) - Additional information</b>	
Marine pollutant	-
Danger label(s)	4.1
	
Special provisions (SP)	274
Excepted quantities (EQ)	E2
Limited quantities (LQ)	1 kg
EmS	F-A, S-G
Stowage category	B
<b>International Civil Aviation Organization (ICAO-IATA/DGR) - Additional information</b>	
Danger label(s)	4.1
	
Special provisions (SP)	A3
Excepted quantities (EQ)	E2
Limited quantities (LQ)	5 kg

### SECTION 15: Regulatory information

#### 15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture Relevant provisions of the European Union (EU)

##### Deco-Paint Directive

VOC content	100 %
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##### Industrial Emissions Directive (IED)

VOC content	100 %
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### 15.2 Chemical Safety Assessment

No Chemical Safety Assessment has been carried out for this substance.

### SECTION 16: Other information

#### Indication of changes (revised safety data sheet)

Section	Former entry (text/value)	Actual entry (text/value)	Safety-relevant
1.1	Registration number (REACH): this information is not available		yes
3.1		EC No: change in the listing (table)	yes
9.1	Appearance		yes
9.1	Other safety parameters		yes
9.1		Lower and upper explosion limit: not determined	yes
9.1	Evaporation rate: not determined		yes
9.1	Explosion limits of dust clouds: not determined		yes
9.1		Kinematic viscosity: not relevant	yes
9.1		Density and/or relative density	yes
9.1	Vapour density: this information is not available		yes
9.1	Viscosity: not relevant (solid matter)		yes
9.1	Explosive properties: none		yes
9.1	Oxidising properties: none		yes
9.1		Particle characteristics	yes
9.2		Information with regard to physical hazard classes: there is no additional information	yes
9.2		Other safety characteristics	yes
11.2		Information on other hazards: There is no additional information.	yes
12.5	Results of PBT and vPvB assessment: Data are not available.	Results of PBT and vPvB assessment: According to the results of its assessment, this substance is not a PBT or a vPvB.	yes
12.6	Other adverse effects: Data are not available.	Endocrine disrupting properties: Information on this property is not available.	yes
14.1	UN number: 1325	UN number or ID number	yes
14.1		ADR/RID: UN 1325	yes

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Section	Former entry (text/value)	Actual entry (text/value)	Safety-relevant
14.1		IMDG-Code: UN 1325	yes
14.1		ICAO-TI: UN 1325	yes
14.2	UN proper shipping name: FLAMMABLE SOLID, ORGANIC, N.O.S.	UN proper shipping name	yes
14.2		ADR/RID: FLAMMABLE SOLID, ORGANIC, N.O.S.	yes
14.2		IMDG-Code: FLAMMABLE SOLID, ORGANIC, N.O.S.	yes
14.2		ICAO-TI: Flammable solid, organic, n.o.s.	yes
14.3	Class: 4.1 (flammable solids)		yes
14.3		ADR/RID: 4.1	yes
14.3		IMDG-Code: 4.1	yes
14.3		ICAO-TI: 4.1	yes
14.4	Packing group: II (substance presenting medium danger)	Packing group	yes
14.4		ADR/RID: II	yes
14.4		IMDG-Code: II	yes
14.4		ICAO-TI: II	yes
14.7	UN number: 1325		yes
14.7	Proper shipping name: FLAMMABLE SOLID, ORGANIC, N.O.S.		yes
14.7	Class: 4.1		yes
14.7	Packing group: II		yes
14.7		Regulations concerning the International Carriage of Dangerous Goods by Rail (RID) - Additional information	yes
14.7		Classification code: F1	yes
14.7		Danger label(s): 4.1	yes
14.7		Danger label(s): change in the listing (table)	yes

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Section	Former entry (text/value)	Actual entry (text/value)	Safety-rel- evant
14.7		Special provisions (SP): 274	yes
14.7		Excepted quantities (EQ): E2	yes
14.7		Limited quantities (LQ): 1 kg	yes
14.7		Transport category (TC): 2	yes
14.7		Hazard identification No: 40	yes
14.7	UN number: 1325		yes
14.7	Proper shipping name: FLAMMABLE SOLID, ORGANIC, N.O.S.		yes
14.7	Class: 4.1		yes
14.7	Packing group: II		yes
14.7	UN number: 1325		yes
14.7	Proper shipping name: Flammable solid, organic, n.o.s.		yes
14.7	Class: 4.1		yes
14.7	Packing group: II		yes
16		Abbreviations and acronyms: change in the listing (table)	yes
16	Key literature references and sources for data: Regulation (EC) No 1272/2008 on classification, labelling and packaging of substances and mixtures. Regulation (EC) No. 1907/2006 (REACH), amended by 2015/830/EU. Transport of dangerous goods by road, rail and inland waterway (ADR/RID/ADN). International Maritime Dangerous Goods Code (IMDG). Dangerous Goods Regulations (DGR) for the air transport (IATA).	Key literature references and sources for data: Agreement concerning the International Carriage of Dangerous Goods by Road (ADR). Regulations concerning the International Carriage of Dangerous Goods by Rail (RID). International Maritime Dangerous Goods Code (IMDG). Dangerous Goods Regulations (DGR) for the air transport (IATA).	yes

## Abbreviations and acronyms

Abbr.	Descriptions of used abbreviations
ADR	Accord relatif au transport international des marchandises dangereuses par route (Agreement concerning the International Carriage of Dangerous Goods by Road)
ATE	Acute Toxicity Estimate
BCF	Bioconcentration factor
CAS	Chemical Abstracts Service (service that maintains the most comprehensive list of chemical substances)
Ceiling-C	Ceiling value

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Abbr.	Descriptions of used abbreviations
DGR	Dangerous Goods Regulations (see IATA/DGR)
DNEL	Derived No-Effect Level
EC50	Effective Concentration 50 %. The EC50 corresponds to the concentration of a tested substance causing 50 % changes in response (e.g. on growth) during a specified time interval
EC No	The EC Inventory (EINECS, ELINCS and the NLP-list) is the source for the seven-digit EC number, an identifier of substances commercially available within the EU (European Union)
EH40/2005	EH40/2005 Workplace exposure limits ( <a href="http://www.nationalarchives.gov.uk/doc/open-government-licence/">http://www.nationalarchives.gov.uk/doc/open-government-licence/</a> )
EINECS	European Inventory of Existing Commercial Chemical Substances
ELINCS	European List of Notified Chemical Substances
EmS	Emergency Schedule
GHS	"Globally Harmonized System of Classification and Labelling of Chemicals" developed by the United Nations
IATA	International Air Transport Association
IATA/DGR	Dangerous Goods Regulations (DGR) for the air transport (IATA)
ICAO	International Civil Aviation Organization
ICAO-TI	Technical instructions for the safe transport of dangerous goods by air
IMDG	International Maritime Dangerous Goods Code
IMDG-Code	International Maritime Dangerous Goods Code
NLP	No-Longer Polymer
PBT	Persistent, Bioaccumulative and Toxic
PNEC	Predicted No-Effect Concentration
ppm	Parts per million
REACH	Registration, Evaluation, Authorisation and Restriction of Chemicals
RID	Règlement concernant le transport International ferroviaire des marchandises Dangereuses (Regulations concerning the International carriage of Dangerous goods by Rail)
STEL	Short-term exposure limit
TWA	Time-weighted average
VOC	Volatile Organic Compounds
vPvB	Very Persistent and very Bioaccumulative
WEL	Workplace exposure limit

### Key literature references and sources for data

Agreement concerning the International Carriage of Dangerous Goods by Road (ADR). Regulations concerning the International Carriage of Dangerous Goods by Rail (RID). International Maritime Dangerous Goods Code (IMDG). Dangerous Goods Regulations (DGR) for the air transport (IATA).

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**List of relevant phrases (code and full text as stated in section 2 and 3)**

Code	Text
H228	Flammable solid.
H302	Harmful if swallowed.
H315	Causes skin irritation.
H319	Causes serious eye irritation.
H335	May cause respiratory irritation.
H412	Harmful to aquatic life with long lasting effects.

**Disclaimer**

This information is based upon the present state of our knowledge. This SDS has been compiled and is solely intended for this product.