

Safety data sheet

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BASF Safety data sheet according to Regulation (EC) No. 1907/2006 as amended from time to time.

Date / Revised: 00.00.0000

Version: 0.0

Date previous version: 19.06.2019

Previous version: 1.0

Product: **Ultrafuse 316L**

(ID no. 961249/SDS_GEN_EU/EN)

Date of print 24.06.2019

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

1.1. Product identifier

Ultrafuse 316L

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

Recommended use: 3D Printing

1.3. Details of the supplier of the safety data sheet

Company:

BASF SE

67056 Ludwigshafen

GERMANY

Telephone: +49 621 60-0

E-mail address: global.info@basf.com

1.4. Emergency telephone number

International emergency number:

Telephone: +49 180 2273-112

SECTION 2: Hazards Identification

2.1. Classification of the substance or mixture

For the classification of the mixture the following methods have been applied: extrapolation on the concentration levels of the hazardous substances, on basis of test results and after evaluation of experts. The methodologies used are mentioned at the respective test results.

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According to Regulation (EC) No 1272/2008 [CLP]

No need for classification according to GHS criteria for this product.

2.2. Label elements

Globally Harmonized System, EU (GHS)

The product does not require a hazard warning label in accordance with GHS criteria. The dangerous ingredients are fixed in a polymer matrix.

Labeling of special preparations (GHS):

Product contains the following components and may cause an allergic skin reaction: nickel, cobalt

2.3. Other hazards

According to Regulation (EC) No 1272/2008 [CLP]

If applicable information is provided in this section on other hazards which do not result in classification but which may contribute to the overall hazards of the substance or mixture. Upon mechanical treatment like e.g. cutting, grinding and/or polishing the product can release hazardous substances. Upon thermal and/or chemical treatment the product can release hazardous substances.

SECTION 3: Composition/Information on Ingredients

3.1. Substances

Not applicable

3.2. Mixtures

Chemical nature

polymer blend based on: Alloy, metal powder
encapsulated, in a polymer matrix

Hazardous ingredients (GHS)

according to Regulation (EC) No. 1272/2008

Chromium

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Content (W/W): $\geq 0\%$ - $< 25\%$ Aquatic Chronic 4
 CAS Number: 7440-47-3 H413
 EC-Number: 231-157-5
 REACH registration number: 01-2119485652-31

cobalt

Content (W/W): $\geq 0\%$ - $< 1\%$ Acute Tox. 4 (oral)
 CAS Number: 7440-48-4 Resp. Sens. 1
 EC-Number: 231-158-0 Skin Sens. 1
 REACH registration number: 01-2119517392-44 Carc. 1B (by inhalation)
 Repr. 2 (fertility)
 Aquatic Chronic 4
 H302, H334, H317, H350i, H361f, H413

Differing classification according to current knowledge and the criteria given in Annex I of Regulation (EC) No. 1272/2008

Acute Tox. 4 (oral)
 Resp. Sens. 1B
 Skin Sens. 1A
 Carc. 1B (by inhalation)
 Repr. 2 (fertility)
 Aquatic Chronic 4

nickel powder; [particle diameter $< 1\text{mm}$]

Content (W/W): $\geq 0\%$ - $< 20\%$ Skin Sens. 1
 CAS Number: 7440-02-0 Carc. 2
 EC-Number: 231-111-4 STOT RE 1
 REACH registration number: 01-2119438727-29 Aquatic Chronic 3
 H317, H351, H372, H351, H372, H412

For the classifications not written out in full in this section, including the hazard classes and the hazard statements, the full text is listed in section 16.

SECTION 4: First-Aid Measures

4.1. Description of first aid measures

Remove affected person from danger area.

If inhaled:

If formaldehyde vapour is inhaled, remove person to fresh air and keep warm, if necessary summon physician.

On skin contact:

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Wash thoroughly with soap and water.

On contact with eyes:

Wash affected eyes for at least 15 minutes under running water with eyelids held open.

On ingestion:

Rinse mouth and then drink 200-300 ml of water.

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

Symptoms: (Further) symptoms and / or effects are not known so far

Hazards: No hazard is expected under intended use and appropriate handling.

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

Treatment: Treat according to symptoms (decontamination, vital functions), no known specific antidote.

SECTION 5: Fire-Fighting Measures

5.1. Extinguishing media

Suitable extinguishing media:

dry powder, water spray, foam, carbon dioxide

Additional information:

Water spray for suppression (heat dissipation) of incipient fires as long as the product has not yet ignited.

5.2. Special hazards arising from the substance or mixture

At temperatures of > 200 °C can be emitted: formaldehyde ...%, harmful vapours

5.3. Advice for fire-fighters

Special protective equipment:

Wear a self-contained breathing apparatus.

Further information:

The degree of risk is governed by the burning substance and the fire conditions. Dispose of fire debris and contaminated extinguishing water in accordance with official regulations.

SECTION 6: Accidental Release Measures

6.1. Personal precautions, protective equipment and emergency procedures

Avoid dust formation.

6.2. Environmental precautions

Suppress gases/vapours/mists with water spray jet. Wet down dust with water spray jet.

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6.3. Methods and material for containment and cleaning up

For small amounts: Pick up with suitable appliance and dispose of.

For residues: Pick up with suitable appliance and dispose of.

Nonsparking tools should be used.

6.4. Reference to other sections

Information regarding exposure controls/personal protection and disposal considerations can be found in section 8 and 13.

SECTION 7: Handling and Storage

7.1. Precautions for safe handling

Avoid dust formation. Ensure adequate ventilation.

Upon mechanical load the product can release sensitizing substances.

Protection against fire and explosion:

Accumulation of fine dust may entail the risk of a dust explosion in the presence of air.

7.2. Conditions for safe storage, including any incompatibilities

Further information on storage conditions: Keep container dry.

The packed product is not damaged by low temperatures or by frost.

Protect from temperatures above: 165 °C

Changes in the properties of the product may occur if substance/product is stored above indicated temperature for extended periods of time.

7.3. Specific end use(s)

For the relevant identified use(s) listed in Section 1 the advice mentioned in this section 7 is to be observed.

SECTION 8: Exposure Controls/Personal Protection

8.1. Control parameters

Components with occupational exposure limits

7439-89-6: Iron

7440-02-0: nickel

7440-47-3: Chromium

TWA value 2 mg/m³ (OEL (EU))
indicative

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7440-48-4: cobalt

7440-02-0: nickel powder; [particle diameter < 1mm]

Components with PNEC

7439-89-6: Iron

A PNEC could not be derived as no studies have been performed. The product is a naturally occurring substance, whose molecular structure is not supposed to have harmful effects.

7440-02-0: nickel

freshwater: 0.0036 mg/l

freshwater: 0.0071 mg/l

marine water: 0.0086 mg/l

STP: 0.33 mg/l

sediment (marine water): 109 mg/kg

sediment (freshwater): 109 mg/kg

oral (secondary poisoning): 5.0 mg/kg

soil: 29.9 mg/kg

7440-48-4: cobalt

freshwater: 0.0006 mg/l

marine water: 0.00236 mg/l

sediment (freshwater): 9.5 mg/kg

sediment (marine water): 9.5 mg/kg

soil: 10.9 mg/kg

STP: 0.37 mg/l

7439-96-5: Manganese

freshwater: 0.034 mg/l

marine water: 0.0034 mg/l

sediment (freshwater): 3.3 mg/kg

sediment (marine water): 0.34 mg/kg

soil: 3.4 mg/kg

STP: 100 mg/l

intermittent release: 0.028 mg/l

7440-47-3: Chromium

sediment (freshwater): 205.7 mg/kg

freshwater: 0.0065 mg/l

soil: 21.1 mg/kg

Components with DNEL

7439-89-6: Iron

worker: Long-term exposure - local effects, Inhalation: 3 mg/m³

consumer: Long-term exposure- systemic effects, oral: 0.71 mg/kg

consumer: Long-term exposure - local effects, Inhalation: 1.5 mg/m³

7440-02-0: nickel

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worker: Long-term exposure - systemic and local effects, Inhalation: 0.05 mg/m³

worker: Short-term exposure - local effects, Inhalation: 11.9 mg/m³

worker: Long-term exposure - local effects, dermal: 0.035 mg/cm²

consumer: Short-term exposure - systemic effects, oral: 0.012 mg/kg

consumer: Short-term exposure - local effects, Inhalation: 0.8 mg/m³

consumer: Long-term exposure - systemic and local effects, Inhalation: 0.00006 mg/m³

consumer: Long-term exposure- systemic effects, oral: 0.02 mg/kg

7440-48-4: cobalt

worker: Long-term exposure - local effects, Inhalation: 0.04 mg/m³

consumer: Long-term exposure- systemic effects, oral: 0.0095 mg/kg

consumer: Long-term exposure - local effects, Inhalation: 0.0063 mg/m³

7439-96-5: Manganese

worker: Long-term exposure- systemic effects, Inhalation: 0.2 mg/m³

worker: Long-term exposure- systemic effects, dermal: 0.00414 mg/kg

consumer: Long-term exposure- systemic effects, Inhalation: 0.041 mg/m³

consumer: Long-term exposure- systemic effects, dermal: 0.0021 mg/kg

7440-47-3: Chromium

worker: Long-term exposure - local effects, Inhalation: 0.5 mg/m³

consumer: Long-term exposure - local effects, Inhalation: 0.027 mg/m³

8.2. Exposure controls

Personal protective equipment

Respiratory protection:

Breathing protection if gases/vapours are formed. Gas filter for gases/vapours of inorganic compounds (e.g. EN 14387 Type B) Breathing protection if dusts are formed. Particle filter with medium efficiency for solid and liquid particles (e.g. EN 143 or 149, Type P2 or FFP2)

Hand protection:

Wear chemical resistant protective gloves.

Manufacturer's directions for use should be observed because of great diversity of types.

Eye protection:

Safety glasses with side-shields (frame goggles) (e.g. EN 166)

Body protection:

Body protection must be chosen depending on activity and possible exposure, e.g. apron, protecting boots, chemical-protection suit (according to EN 14605 in case of splashes or EN ISO 13982 in case of dust).

General safety and hygiene measures

Wearing of closed work clothing is recommended. No eating, drinking, smoking or tobacco use at the place of work. Handle in accordance with good industrial hygiene and safety practice.

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SECTION 9: Physical and Chemical Properties

9.1. Information on basic physical and chemical properties

Form:	fibers, extrudates, pressed	
Colour:	grey	
Odour:	odourless	
Odour threshold:	No data available.	
pH value:	not applicable, not soluble	
Melting point:	165 °C	
Boiling point:	The product is a non-volatile solid.	
Flash point:	not applicable, the product is a solid	
Evaporation rate:	not applicable	
Flammability:	not highly flammable	
Lower explosion limit:	For solids not relevant for classification and labelling.	
Upper explosion limit:	For solids not relevant for classification and labelling.	
Ignition temperature:	440 °C	(VDI 2263, sheet 1, 2.6)
Vapour pressure:	negligible, not applicable	
Density:	5.4 - 5.8 g/cm ³ (20 °C)	
Solubility in water:	insoluble	
Partitioning coefficient n-octanol/water (log Kow):	not applicable for mixtures	
Self ignition:	not self-igniting	
Thermal decomposition:	> 200 °C	
Viscosity, dynamic:	Thermal decomposition above the indicated temperature is possible.	
Viscosity, kinematic:	not applicable, the product is a solid	
Explosion hazard:	not explosive	
Fire promoting properties:	Product is not explosive, however a dust explosion could result from an air / dust mixture.	
Fire promoting properties:	not fire-propagating	

9.2. Other information

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Self heating ability: It is not a substance capable of spontaneous heating.

Radioactivity:

not radioactive for transport purposes

Bulk density: 5 - 6 kg/m³

Hygroscopy: Non-hygroscopic

Solids content: > 90 %

Other Information:

If necessary, information on other physical and chemical parameters is indicated in this section.

SECTION 10: Stability and Reactivity

10.1. Reactivity

No hazardous reactions if stored and handled as prescribed/indicated.

Corrosion to metals: Corrosive effects to metal are not anticipated.

Reactions with water/air: Reaction with: air

Flammable gases: no

Toxic gases: no

Corrosive gases: no

Smoke or fog: no

Peroxides: no

Reaction with: water

Flammable gases: no

Toxic gases: no

Corrosive gases: no

Smoke or fog: no

Peroxides: no

Formation of flammable gases: Remarks: Forms no flammable gases in the presence of water.

10.2. Chemical stability

The product is stable if stored and handled as prescribed/indicated. depolymerizes at elevated temperatures

10.3. Possibility of hazardous reactions

Strong exothermic reaction with acids. May decompose violently.

The product is stable if stored and handled as prescribed/indicated.

10.4. Conditions to avoid

Avoid all sources of ignition: heat, sparks, open flame. Avoid prolonged exposure to extreme heat.

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10.5. Incompatible materials

Substances to avoid:

inorganic acids, plastics containing halogenated flame retardants

10.6. Hazardous decomposition products

Hazardous decomposition products:

formaldehyde ...%

At prolonged and/or strong thermal stressing above the decomposition temperature dangerous decomposition products can be formed.

SECTION 11: Toxicological Information

11.1. Information on toxicological effects

Acute toxicity

Assessment of acute toxicity:

Virtually nontoxic after a single ingestion.

Information on: Iron

Assessment of acute toxicity:

Virtually nontoxic after a single ingestion. Virtually nontoxic by inhalation. The product has not been fully tested. The statements have been derived in parts from products of a similar structure or composition.

Irritation

Assessment of irritating effects:

May cause mechanical irritation.

Information on: Iron

Assessment of irritating effects:

Not irritating to the skin. Not irritating to the eyes. The product has not been tested. The statement has been derived from substances/products of a similar structure or composition.

Respiratory/Skin sensitization

Assessment of sensitization:

Study not necessary due to exposure considerations.

Information on: nickel

Assessment of sensitization:

Sensitization after skin contact possible.

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Information on: cobalt

Assessment of sensitization:

May cause sensitization by inhalation. May cause sensitization by skin contact.

Germ cell mutagenicity

Assessment of mutagenicity:

Based on available Data, the classification criteria are not met.

Information on: Iron

Assessment of mutagenicity:

Most of the results from the available studies show no evidence of a mutagenic effect.

Carcinogenicity

Assessment of carcinogenicity:

Based on available Data, the classification criteria are not met.

Information on: nickel

Assessment of carcinogenicity:

The results of various animal studies gave no indication of a carcinogenic effect. IARC (International Agency for Research on Cancer) has classified this substance as group 2B (The agent is possibly carcinogenic to humans).

Information on: cobalt

Assessment of carcinogenicity:

In long-term studies in rats and mice in which the substance was given by inhalation, a carcinogenic effect was observed. IARC (International Agency for Research on Cancer) has classified this substance as group 2B (The agent is possibly carcinogenic to humans).

Reproductive toxicity

Assessment of reproduction toxicity:

No reliable data are available concerning reproduction toxicity.

Information on: cobalt

Assessment of reproduction toxicity:

The results of animal studies suggest a fertility impairing effect.

Developmental toxicity

Assessment of teratogenicity:

No reliable data was available concerning teratogenicity.

Information on: cobalt

Assessment of teratogenicity:

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Tests underway; results are still not available.

Specific target organ toxicity (single exposure)

Remarks: Based on available Data, the classification criteria are not met.

Repeated dose toxicity and Specific target organ toxicity (repeated exposure)

Assessment of repeated dose toxicity:

Based on our experience and the information available, no adverse health effects are expected if handled as recommended with suitable precautions for designated uses.

Information on: nickel

Assessment of repeated dose toxicity:

The substance may cause damage to the lung after repeated inhalation.

Information on: Manganese

Assessment of repeated dose toxicity:

The substance may cause damage to the central nervous system after repeated inhalation of high doses.

Information on: cobalt

Assessment of repeated dose toxicity:

The substance may cause increase in lung mass and lung tissue changes after repeated inhalation.

Aspiration hazard

Not relevant.

Other relevant toxicity information

The product has not been tested. The statement has been derived from the properties of the individual components. The product has been assessed on the basis of the components' available data. To some extent data gaps exist for individual components. According to our present knowledge and experience dangers which are not covered by the current labeling are not to be expected.

Based on our experience and the information available, no adverse health effects are expected if handled as recommended with suitable precautions for designated uses.

SECTION 12: Ecological Information

12.1. Toxicity

Assessment of aquatic toxicity:

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There is a high probability that the product is not acutely harmful to aquatic organisms. The product has not been tested. The statement has been derived from substances/products of a similar structure or composition.

Information on: Chromium

Assessment of aquatic toxicity:

There is a high probability that the product is not acutely harmful to aquatic organisms.

No toxic effects occur within the range of solubility.

12.2. Persistence and degradability

Assessment biodegradation and elimination (H₂O):

The product is not very soluble in water and can thus be removed from water mechanically in suitable effluent treatment plants.

Information on: Chromium

Assessment biodegradation and elimination (H₂O):

Not applicable for inorganic substances.

12.3. Bioaccumulative potential

Bioaccumulation potential:

The product has not been tested. Because of the product's consistency and low water solubility, bioavailability is improbable.

Information on: Chromium

Assessment bioaccumulation potential:

May be accumulated in organisms.

12.4. Mobility in soil

Assessment transport between environmental compartments:

Adsorption in soil: Adsorption to solid soil phase is possible.

12.5. Results of PBT and vPvB assessment

According to Annex XIII of Regulation (EC) No.1907/2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH): The product does not contain a substance fulfilling the PBT (persistent/bioaccumulative/toxic) criteria or the vPvB (very persistent/very bioaccumulative) criteria.

12.6. Other adverse effects

The product does not contain substances that are listed in Regulation (EC) 1005/2009 on substances that deplete the ozone layer.

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12.7. Additional information

The product contains:

The product contains the heavy metals listed in Section 3 and/or Section 8, which are fixed in a polymer matrix.

Add. remarks environm. fate & pathway:

The product has not been tested. The statements on environmental fate and pathway have been derived from the properties of the individual components.

Other ecotoxicological advice:

The product has not been tested. The statements on ecotoxicology have been derived from the properties of the individual components.

The product has been assessed on the basis of the components' available data. To some extent data gaps exist for individual components. According to our present knowledge and experience dangers which are not covered by the current labeling are not to be expected.

SECTION 13: Disposal Considerations

13.1. Waste treatment methods

Check for possible recycling.

Must be disposed of by special means, e.g. suitable dumping after chemical/physical pretreatment (consolidation).

The local regulations on waste-water treatment must be followed.

A waste code in accordance with the European waste catalog (EWC) cannot be specified, due to dependence on the usage.

Contaminated packaging:

Contaminated packaging should be emptied as far as possible; then it can be passed on for recycling after being thoroughly cleaned.

Uncleaned empties should be disposed of in the same manner as the contents.

SECTION 14: Transport Information

Land transport

ADR

Not classified as a dangerous good under transport regulations

UN number: Not applicable

UN proper shipping name: Not applicable

Transport hazard class(es): Not applicable

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Packing group: Not applicable
Environmental hazards: Not applicable
Special precautions for user: None known

RID

Not classified as a dangerous good under transport regulations
UN number: Not applicable
UN proper shipping name: Not applicable
Transport hazard class(es): Not applicable
Packing group: Not applicable
Environmental hazards: Not applicable
Special precautions for user: None known

Inland waterway transport

ADN

Not classified as a dangerous good under transport regulations
UN number: Not applicable
UN proper shipping name: Not applicable
Transport hazard class(es): Not applicable
Packing group: Not applicable
Environmental hazards: Not applicable
Special precautions for user: None known

Transport in inland waterway vessel

Not evaluated

Sea transport

IMDG

Not classified as a dangerous good under transport regulations
UN number: Not applicable
UN proper shipping name: Not applicable
Transport hazard class(es): Not applicable
Packing group: Not applicable
Environmental hazards: Not applicable
Special precautions for user: None known

Air transport

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IATA/ICAO

	Not classified as a dangerous good under transport regulations
UN number:	Not applicable
UN proper shipping name:	Not applicable
Transport hazard class(es):	Not applicable
Packing group:	Not applicable
Environmental hazards:	Not applicable
Special precautions for user	None known

14.1. UN number

See corresponding entries for "UN number" for the respective regulations in the tables above.

14.2. UN proper shipping name

See corresponding entries for "UN proper shipping name" for the respective regulations in the tables above.

14.3. Transport hazard class(es)

See corresponding entries for "Transport hazard class(es)" for the respective regulations in the tables above.

14.4. Packing group

See corresponding entries for "Packing group" for the respective regulations in the tables above.

14.5. Environmental hazards

See corresponding entries for "Environmental hazards" for the respective regulations in the tables above.

14.6. Special precautions for user

See corresponding entries for "Special precautions for user" for the respective regulations in the tables above.

14.7. Transport in bulk according to Annex II of MARPOL and the IBC Code

Regulation:	Not evaluated
Shipment approved:	Not evaluated
Pollution name:	Not evaluated
Pollution category:	Not evaluated
Ship Type:	Not evaluated

SECTION 15: Regulatory Information**15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture**Prohibitions, Restrictions and Authorizations

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Annex XVII of Regulation (EC) No 1907/2006: Number on List: 27, 40

15.2. Chemical Safety Assessment

Advice on product handling can be found in sections 7 and 8 of this safety data sheet.

SECTION 16: Other Information

Full text of the classifications, including the hazard classes and the hazard statements, if mentioned in section 2 or 3:

Aquatic Chronic	Hazardous to the aquatic environment - chronic
Acute Tox.	Acute toxicity
Resp. Sens.	Respiratory sensitization
Skin Sens.	Skin sensitization
Carc.	Carcinogenicity
Repr.	Reproductive toxicity
STOT RE	Specific target organ toxicity — repeated exposure
H413	May cause long lasting harmful effects to aquatic life.
H302	Harmful if swallowed.
H334	May cause allergy or asthma symptoms or breathing difficulties if inhaled.
H317	May cause an allergic skin reaction.
H350i	May cause cancer by inhalation.
H361f	Suspected of damaging fertility.
H351	Suspected of causing cancer.
H372	Causes damage to organs through prolonged or repeated exposure.
H351	Suspected of causing cancer by inhalation.
H372	Causes damage to organs (Lung) through prolonged or repeated exposure (inhalation).
H412	Harmful to aquatic life with long lasting effects.

Abbreviations

ADR = The Regulation concerning the International Carriage of Dangerous Goods by Road. **ADN** = The Regulation concerning the International Carriage of Dangerous Goods by inland waterways. **ATE** = Acute Toxicity Estimates. **CAO** = Cargo Aircraft Only. **CAS** = Chemical Abstract Service. **CLP** = Label Classification, Labelling and Packaging Regulation. **DIN** = German national organization for standardization. **DNEL** = Derived No Effect Level. **EC50** = Effective concentration median for 50% of the population. **EC** = European Community. **EN** = European Norm. **IARC** = International Agency for Research on Cancer. **IATA** = International Air Transport Association. **IBC-Code** = Intermediate Bulk Container code. **IMDG** = International Maritime Dangerous Goods Code. **ISO** = International Organization for Standardization. **STE** = Short time exposure. **LC50** = Lethal concentration median for 50% of the population. **LD50** = Lethal dose median for 50% of the population. **MAK** = Maximum acceptable concentration. **MARPOL** = The International Convention for the Prevention of Pollution from Ships. **NEN** = Dutch Norm. **NOEC** = No Observed Effect Concentration. **OEL** = Occupational Exposure Limit. **OECD** = Organization for Economic Cooperation and Development. **PBT** = Persistent, Bioaccumulative and Toxic. **PNEC** = Predicted No Effect Level. **ppm** = parts per million. **RID** = The Regulation concerning the International Carriage of Dangerous Goods by Rail. **TWA** = Time weight average. **UN-number** = UN number at transport. **vPvB** = very Persistent and very Bioaccumulative.

BASF Safety data sheet according to Regulation (EC) No. 1907/2006 as amended from time to time.

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Vertical lines in the left hand margin indicate an amendment from the previous version.