

# ROAD BITUMEN (160/220)(200/300)(250/330)

Preparation date: 16.12.2014

Revision date: 01.01.2023

Revision: 6

## INFORMATION SHEET

Prepared in accordance with Article 32 REACH.

The product is not unclassified as hazardous, does not contain PBT or vPvB components in the amount of >0.1% by weight, or substances for which the Community maximum allowable concentrations in the working environment have been established. Therefore, based on Article 31(5) REACH, a safety data sheet is not required to be submitted, but only information for the substance on its own or as a component of mixtures prepared in accordance with Article 32 REACH.

### SECTION 1: IDENTIFICATION OF SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

#### 1.1. Product identifier

Trade name: **ROAD BITUMEN (160/220) (200/300) (250/330)**

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

Identified use: The product is used to perform bituminous layers of road pavements, for the production of bitumen mineral mixtures, roofing felt, bitumen compounds.

Use advised against: Any other than listed above.

#### 1.3. Details of the safety data sheet supplier

Manufacturer: Polski Koncern Naftowy ORLEN S.A.

Address: 09-411 Płock, ul. Chemików 7

Phone/Fax: Head office: telephone (24) 365 00 00; fax: (24) 365 40 40

E-Mail: reach@orlen.pl (e-mail of the person responsible for the sheet)

#### 1.4. Emergency telephone number

Plant Fire Service

National Centre for Assistance in Transport of Dangerous Materials – SPOT: (24) 365 70 32 and (24) 365 70 33 (24/7)

### SECTION 2: IDENTIFICATION OF RISKS

#### 2.1. Classification of substance or mixture

Hazards	Classification	in accordance with Regulation (EC) 1272/2008 (CLP):
resulting from physical and chemical properties:		Not classified
for humans:		Not classified
for environment		Not classified

#### 2.2. Signage elements

Pictogram: Not applicable

Signal word: Not applicable

Hazard statements: Not applicable

Precautionary statements: Not applicable

#### 2.3. Other hazards

The components of the mixture do not meet the PBT or vPvB criteria according to Annex XIII REACH.

In normal usage conditions the product is hot. It can cause burns and exude vapors. When working with hot bitumen you should avoid any contact with vapors. With prolonged storage in closed tanks, hydrogen sulfide (H<sub>2</sub>S) can be released from the bitumen, the concentration of which can reach dangerous levels.

During construction and insulation work, heating of the product is required, resulting in the release of vapors and their emission into the atmosphere.

### SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

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## 3.1. Substances

Not applicable.

## 3.2 Mixtures

Substance name	% by weight	CAS No	EC No	Index No	CLP classification	Registration No
Bitumen	160/220: 50-100 200/300, 250/330: 60-100	8052-42-4	232-490-9	Not applicable	Not applicable	01-2119480172-44-0080
Oxidized bitumen	160/220: 0-50 200/300, 250/330: 0-40	64742-93-4	265-196-4	Not applicable	Not applicable	01-2119498270-36-0067

Bitumen: A very complex mixture of organic compounds of high molecular weight containing a relatively large amount of hydrocarbons with a number of carbon atoms mostly greater than C25 with amounts of various metals such as nickel, iron or vanadium; it is obtained as a non-volatile residue from the distillation of crude oil or by separation as a raffinate from oil residues in the deasphalting or decarbonization process.

Oxidized bitumen: A complex solid obtained by blowing air over a heated residue or raffinate from a deasphalting process, either in the presence or absence of a catalyst. The process is basically an oxidative condensation process that leads to an increase in molecular weight.

The product does not contain substances hazardous to health or the environment above the concentrations established in the regulations.

## SECTION 4: FIRST AID MEASURES

### 4.1. Description of first aid measures

#### Inhalation:

Immediately remove the injured person to fresh air, position the person in a lying position, loosen the clothes; if the injured person is not breathing, give artificial respiration; if no heartbeat is detected, apply cardiac massage combined with artificial respiration using a respirator, cover the injured person, ensure a calm atmosphere; do not administer any fluids to unconscious persons and persons with disturbance of consciousness. If possible give oxygen. Transport the injured person in a recovery position.

#### Skin contact:

Cool the burn area as quickly as possible to reduce further heat-related injuries. Cool the burn area with cold running water for at least 10 minutes. Avoid excessive cooling of the body. Do not use ice. **Do not attempt to remove bitumen from the burn area.** Upon cooling down, bitumen forms a waterproof, sterile layer on the burn surface, protecting it from drying. Polluted clothing may be taken off, provided that it has not stuck to the skin. Consult a doctor. Never use gasoline, kerosene or other solvents to wash contaminated skin.

#### Eye contact:

Flush thoroughly with a slow stream of potable running water for at least 15 minutes with eyelids retracted, remove contact lenses, do not wipe the eyes, place a sterile, loose dressing. Consult a doctor immediately.

#### Ingestion:

Do not induce vomiting – the product may get into the respiratory tract.  
Do not administer any oral medication. If no improvement is observed, seek medical assistance.

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

Inhalation: inhalation of resulting vapors or mists may cause respiratory irritation.

Skin contact: contact with hot/melted product may cause severe thermal burns.

Eye contact: redness, irritation, contact with hot/melted product can cause severe thermal burns.

Ingestion: no or weak symptoms of nausea.

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

In case of an accidental contact of hot bitumen with skin, do not attempt to remove the bitumen. In each of the cases listed above, if the symptoms persist, seek medical attention immediately or take the injured person to hospital, showing the product's packaging or label. If vapors are suspected to contain H<sub>2</sub>S, responders should use personal protective equipment, including breathing apparatus, among other things.

## SECTION 5: FIRE-FIGHTING MEASURES

### 5.1. Extinguishing agents

**Suitable extinguishing agents:** Carbon dioxide, extinguishing powder, inert gases, sand, earth; for qualified personnel, additionally: firefighting foam, water mist.

**Unsuitable extinguishing agents:** Do not use dense water streams on the surface of molten bitumen

**due to the hazard of violent splatter of hot bitumen.** Water may be used only to cool down hot surfaces. Do not apply water and foam to the same surface at the same time because water destroys the foam.

## 5.2. Special hazards arising from the substance or mixture

**Sticking of hot bitumen to the body and clothes.** Foaming and splatter occur when the hot product has contact with water. During fire, released gases and vapors are heavier than air and can collect in depressions, spread just above the ground within a certain distance from the source of fire and present a new combustion hazard.

As a result of fire the following compounds are formed: carbon monoxide, a compound mixture of bitumen millings, and – depending on composition – small amounts of sulfur oxides, nitric oxides, metallic oxide vapors.

## 5.3. Advice for firefighters

**Small fire** should be extinguished with sand, a dry powder extinguisher or carbon dioxide extinguisher; large fire should be extinguished with expandable foam and diffused water currents.

Persons participating in fire extinguishing activities should be trained, **wear a full set of anti-static protective clothing and equipment that isolates the respiratory tract.**

Notify the surroundings of the fire; provide a clear escape route; remove from the danger area all persons not involved in extinguishing the fire.

# SECTION 6: ACCIDENTAL RELEASE MEASURES

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

Use personal protective equipment tailored to the specific hazard – see section 8 of the information sheet. Avoid direct contact with the released material due to the risk of thermal burns. Avoid inhaling vapors. Stay on the windward side.

Immediately secure the source of discharge: cut off the fluid feed; protect against contact with water or other fluids; eliminate all possible sources of ignition – extinguish open fire, declare no-smoking zone; restrict personnel access to the discharge area and the directly adjacent area; Provide a clear escape route; Evacuate all persons who do not participate in the firefighting activities from the endangered area; In case of larger spillages call the chemical rescue service and secure the spillage, preventing it from spreading by digging a ditch or building a barrier of sand, earth or other material.

## 6.2. Environmental precautions

Prevent release of the product to storm drains and water bodies. Solidified product can clog drains and sewers. If released to water bodies, notify relevant authorities.

## 6.3. Methods and materials for containment and cleaning up

On land: If necessary, sprinkle with earth, sand or other non-flammable material. Wait until bitumen cools down and hardens. Ensure adequate ventilation. Collect using available equipment and place in a marked, tight container. Dispose of in compliance with applicable regulations.

Water: the product will immediately cool and solidify and sink to the bottom of the tank. If possible collect mechanically and dispose of in accordance with applicable regulations.

Attention! Materials like rags, paper, etc. which are soaked with the product, present a fire hazard. Prevent accumulation of those materials and dispose of them safely.

## 6.4. Reference to other sections

Also refer to sections 8 and 13 of the information sheet.

# SECTION 7: HANDLING AND STORAGE OF SUBSTANCES AND MIXTURES

## 7.1. Precautions for safe handling

Reduce fire hazard by using machines and devices in such a way as to:

- Avoid spilling and splattering the product onto hot or energized machine parts.
- Prevent formation of vapors.
- Avoid skin contact (burns) and vapor inhalation (irritation of the respiratory tract)
- In case of skin contact, clean using paraffin oil, grease, and finally water with soap.
- Do not inhale vapor or mist.
- Prevent any contact of the product with strong oxidizing agents.
- Avoid contact of hot product with water – risk of splashing.
- When handling, do not eat, drink or smoke.
- Use only containers, connections and equipment resistant to hydrocarbons.

**Poison prevention:** Use in a place with adequate ventilation. Always have the equipment available in case of

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fire or spillage. Remember about the possibility of hydrogen sulfide collecting in the container, especially during long-term storage in the heat-up state. Use personal protection equipment in compliance with information published in section 8 of the information sheet.

Observe basic occupational health and safety rules: do not eat and drink at the work place, wash hands using hot water and soap upon finishing work, do not allow clothing to be contaminated, and – if this does happen – immediately take off the polluted clothing.

**Fire and explosion prevention:** Perform all handling in temperatures of min. 30° below the flash point. Recommended application and storage temperature below 200°C. Avoid overheating the product to minimize vapor formation. Do not use steam to purge pipelines. Do not use solvents to clean pipelines. Ground the equipment.

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

The product should be stored in closed and insulated steel containers, equipped with a heating coil. Do not exceed 190°C due to the possibility of polymer degradation. Recommended storage temperature: 140-160°C. Avoid contact with oxidizing materials. Prevent any access of water to the stored product. Remember about the possibility of deposits collecting on container walls and tops, with pyrolytic (self-igniting) properties. Use steel or stainless steel packaging. Unsuitable packaging: made of synthetic materials.

## 7.3. Specific end use(s)

See section 1.2. For more information, contact your supplier.

## SECTION 8: EXPOSURE CONTROL / PERSONAL PROTECTION

### 8.1. Control parameters

Polycyclic aromatic hydrocarbons (PAHs) – as the sum of the products of concentrations and carcinogenicity factors of 9 carcinogenic PAHs NDS: 0.002 mg/m<sup>3</sup>, TLV: –, STEL: –, skin  
Benzo(a)pyrene NDS: 0.002 mg/m<sup>3</sup>, TLV: –, STEL: –, skin

Petroleum bitumen – inhalable fraction:

Poland	NDS: 5 mg/m <sup>3</sup> , NDSCh: 10 mg/m <sup>3</sup> , NDSP: -
Belgium	TWA: 5 mg/m <sup>3</sup> 8h (2014)
Spain	VLA-ED: 0.5 mg/m <sup>3</sup> (2014)
Ireland	OELV: 0.5 mg/m <sup>3</sup> 8h, OELV:10 mg/m <sup>3</sup> 15 min. (2011)
Norway	TWA: 5 mg/m <sup>3</sup> 8h (2013)
Slovenia	TWA: 10 ppm 8h (2011)
Switzerland	MAK: 10 mg/m <sup>3</sup> 8h (SUVA 2014)
United Kingdom	TWA: 5 mg/m <sup>3</sup> , STEL: 10 mg/m <sup>3</sup> (2011)

*Regulation of the Minister of Family, Labour and Social Policy of 12 June 2018 on the maximum permissible concentration and intensity of factors harmful to health in the working environment (Journal of Laws of 2018 item 1286, Journal of Laws of 2020, item 61, Journal of Laws of 2021, item 325)*

Bitumen/Oxidized bitumen:

DNEL <sub>worker</sub> (inhalation, prolonged exposure, local)	2.9 mg/m <sup>3</sup> /8h
DNEL <sub>consumer</sub> (inhalation, prolonged exposure, local)	0.6 mg/m <sup>3</sup> /24h
PNEC	Not applicable (the substance poses no threat to the environment)

### 8.2. Exposure control

#### Relevant technical control measures:

The employer should make sure that the personal protective equipment, clothing and footwear used have appropriate protective and functional properties, and ensure proper cleaning, maintenance, repair and disinfection thereof.

#### Eye or face protection:

Goggles, protective masks or face and neck covers in case splatter risk exists.

#### Skin protection:

Wear protective impervious gloves, resistant to oils (e.g. perbutan thickness > 0.1 mm, resistance to puncturing > 480 min., viton thickness > 0.1 mm, resistance to puncturing > 480 min., butyl rubber thickness > 0.1 mm, resistance to puncturing > 480 min.).

Material of gloves must be selected taking into consideration recommendations of the gloves' manufacturer within the scope of the piercing time, penetration rate and degradation time. It is advisable to change gloves regularly and replace them immediately if there are any signs of wear, damage (tears, holes) or changes in appearance (color, elasticity, shape).

Wear a safety apron or other protective clothes of coated fabrics, resistant to the product; protective oil-resistant

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and anti-slip footwear.

## Respiratory protection:

Avoid contact with vapor and mist of heated product – exposure by inhalation is likely in this case.

## Thermal hazards:

In normal usage conditions the product is hot. It can cause burns and exude vapors. Provide the above-mentioned appropriate control measures to protect against burns and inhalation of vapors.

## Environmental exposure control:

Permissible content of oil-based hydrocarbons in wastewater introduced to surface water or the ground is 5 mg/l (in refinery wastewater) or 15 mg/l in other industries' wastewater. The Employer should meet the requirements imposed by the environmental protection law.

## SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

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

Physical and chemical properties	CSR values for the Bitumen category	Actual values for fractions – analyzed at the manufacturer's site
(a) State of aggregation (20°C, 1013 hPa)	Solid substance	
(b) Color	black or dark brown.	
(c) Fragrance	No data available	
(d) Melting/freezing point	30-128°C (ASTM D36)	
(e) Boiling point or initial boiling point and boiling range	>320°C	
(f) Flammability of materials	Bitumens do not meet EU flammability criteria. Based on the very low vapor pressure, bitumens are not expected to be flammable except at very high temperatures.	
(g) Lower and upper explosive limits	No data available.	not applicable, the substance is not flammable
(h) Flash point	>180 °C	min. 220°C
(i) Self-ignition temperature	>400°C	
(j) Decomposition temperature	No data available	
(k) pH	Not applicable	
(l) Kinematic viscosity	1000 – 16000 mm <sup>2</sup> /s at 60°C (EN12595); 4.5 – 10000 Pa.s at 60°C (EN12596) 1189 – 8650 mPa.s at 100°C (EN13302); 80 – 3210 mm <sup>2</sup> /s at 135°C (EN12595).	
(m) Solubility	Not applicable	
(n) Partition coefficient n-octanol/water (log ratio value)	No data available	
(o) Vapor pressure	<<0.1 kPa at 20°C	
(p) Density or relative density	relative density 0.925-1.07 g/cm <sup>3</sup> at 15°C	
(q) Relative vapor density	No data available	
(r) Characterization of molecules	Not applicable	

### 9.2. Other information

Softening point : 30 – 43°C

## SECTION 10: STABILITY AND REACTIVITY

### 10.1. Reactivity

The mixture is not reactive.

### 10.2. Chemical stability

The mixture is stable under normal ambient conditions, and also at a predicted temperature and under predicted pressure during storage and handling.

### 10.3. Possibility of hazardous reactions

Unknown.

### 10.4. Conditions to avoid

Do not store in temperatures above 220°C! Protect from fire source or sparks.

### 10.5. Incompatible materials

Avoid contact with strong oxidizers and mineral acids. Foaming and/or splatter occur when the hot product has contact with water.

**10.6. Hazardous decomposition products**

Unknown. For hazardous combustion products, see section 5 of the information sheet.

**SECTION 11: TOXICOLOGICAL INFORMATION****11.1. Information on hazard classes as defined in Regulation (EC) No. 1272/2008****Acute toxicity:**

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

Bitumen/Oxidized bitumen:

LD50: >5000 mg/kg (oral, rat)

LC50: >94.4 mg/m<sup>3</sup> (inhalation, rat)

LD50: >2000 mg/kg (skin, rabbit)

**Skin corrosion/irritation:**

Based on available data, the classification criteria are not met. Substance is not irritant (OECD 404 test).

Prolonged exposure to bitumen can cause acne-like skin changes, excessive skin keratosis and black chromatosis.

In high temperatures, it can cause thermal burns and irritation of the respiratory tract.

**Serious eye damage/eye irritation:**

Based on available data, the classification criteria are not met. The mixture is not irritating. May cause eye irritation in high temperatures.

**Respiratory or skin sensitization:**

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

**Mutagenic effects on germ cells:**

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

**Carcinogenic effects:**

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

**Reproductive toxicity:**

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

**Specific target organ toxicity – single exposure:**

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

**Specific target organ toxicity – repeated exposure:**

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

**Aspiration hazard:**

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

**11.2. Information on other risks**

The substances contained in the product do not have endocrine disrupting properties.

**SECTION 12: ECOLOGICAL INFORMATION****12.1. Toxicity****Aquatic environment:**

Bitumen/Oxidized bitumen:

LL50: >1000 mg/l – acute toxicity test on freshwater invertebrates; *Daphnia magna*, 48h

NOEL: ≥1000 mg/l – chronic toxicity test on invertebrates; *Daphnia magna*, 21 days

EL50: >1000 mg/l – acute toxicity test for freshwater algae; *Selenastrum capricornutum*, 72h

LL50: >1000 mg/l – acute toxicity test on freshwater fish; *Oncorhynchus mykiss*, 96h

NOEL: ≥1000 mg/l – chronic toxicity test on freshwater fish; *Oncorhynchus mykiss*, 28 days

**Sediment:**

Toxicity test on sediment organisms: none (scientifically unsubstantiated test)

**Terrestrial environment:**

Toxicity test on invertebrates: no data (scientifically unsubstantiated test)

Toxicity test on plants: none (scientifically unsubstantiated test)

Toxicity test on earthworms: none (scientifically unsubstantiated test)

**12.2. Persistence and degradability****Biotic:**

Biodegradability: not applicable – UVCB substance  
 Simulation test of activated deposits: not applicable - UVCB substance

**Abiotic:**

Hydrolysis as pH function: does not occur  
 Photolysis/phototransformation: does not occur

**12.3. Bioaccumulative potential**

Not applicable – UVCB substance

**12.4. Mobility in soil**

Adsorption/desorption test – not applicable – UVCB substance

**12.5. Results of PBT and vPvB assessment**

The components of the mixture do not meet the PBT or vPvB criteria according to Annex XIII REACH.

**12.6. Endocrine disrupting properties**

The substances contained in the product do not have endocrine disrupting properties.

**12.7. Other adverse effects**

Unknown.

**SECTION 13: WASTE HANDLING****13.1. Waste treatment methods**

Waste code: 17 03 02 Bitumen other than those mentioned in 17 03 01, or  
 05 01 17 Bitumen

Do not dispose of in the sewage system. Do not allow contamination of surface water and groundwater. Do not store in waste dumpsites. Consider reuse. Recovery or treatment of the waste product should be performed in compliance with the applicable provisions. Recommended treatment method: thermal treatment.

Recovery (recycling) or treatment of the packaging waste must be performed in compliance with the applicable provisions. Reusable packaging should be reused after cleaning.

The product which has lost its functional properties, and also waste polluted with the product as a result of e.g. a spillage, should be stored in selected places only. It should be disposed of in compliance with the local legislation. Disposal by thermal treatment is permitted.

Attention! The codes listed above are just a guideline. The waste producer is responsible for its proper classification. Waste codes should be determined in cooperation with the disposal company.

*Act of 14 December 2012 on Waste (Journal of Laws of 2013, No 0, item 21, as amended).*

*Act of 13 June 2013 on Packaging and Packaging Waste Management (Journal of Laws of 2013, No 0, item 888, as amended).*

*Regulation of the Minister of Climate of 2 January 2020 on the waste catalogue (Journal of Laws of 2020, item 10)*

**SECTION 14: TRANSPORT INFORMATION**

The product is subject to transport regulations on the transport of dangerous materials only in case of transport of the hot product. The substance is subject to regulations on the transport of dangerous goods included in ADR (road transport), RID (rail transport), IMDG (marine transport) and ICAO/IATA (air transport).

Guidelines for correct preparation of transport should be prepared each and every time by a sender based on: knowledge about the product, necessary analyses and after appropriate RID / ADR classification.

Transport by sea, air or by inland waterways - is not carried out.

**14.1. UN number or ID number**

UN 3257

**14.2. UN proper shipping name**

ELEVATED TEMPERATURE LIQUID, N.O.S.

**14.3. Transport hazard class(es)**

9 / M9

**14.4. Packaging group**

III

**14.5. Environmental hazards**

No

**14.6. Special precautions for users**

No

**14.7. Maritime transport in bulk in accordance with IMO instruments**

No data available

**SECTION 15: REGULATORY INFORMATION****15.1. Legal regulations concerning safety, health and environment protection specific for the substance or the mixture**

See also section 13 of the safety data sheet.

Act of 25 February 2011 on Chemical Substances and Mixtures Thereof (Journal of Laws of 2011, No 63, item 322; Journal of Laws of 2015 No. 0 item 675, Journal of Laws of 2020 item 1337)

Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) and establishing a European Chemicals Agency, amending Directive 1999/45/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC (corrigendum OJ L 136, 29.5.2007, as amended)

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 (OJ EU L No 353, 31.12.2008, as amended)

Regulation (EU) 2016/425 of the European Parliament and of the Council of 9 March 2016 on personal protective equipment and repealing Council Directive 89/686/EEC.

REACH Annex XIV (authorizations)/ SVHC candidate list: not applicable

REACH Annex XVII (restrictions): not applicable

## 15.2. Chemical safety assessment

The manufacturer has performed the chemical safety assessment – results of the assessment are included in the substance chemical safety report.

## SECTION 16: OTHER INFORMATION

Information sheet prepared on the basis of data contained in the Chemical Safety Report and current regulations.

Scope of revision: Section 3, 8.1, 13, 15, 16. Revision 2: Section 2, 8. Revision 3: Section 15. Revision 4: Section 9.

Revision 5: sections 1.2, 4, 5, 6, 7, 8.1, 13, 15. Revision 6: sections 9, 11, 12, 14, 15.

All data presented in this Sheet is to be taken only as help in safe handling during transport, distribution, use and storage. This is not a certification of product quality.

Information in the Safety Data Sheet relates to the above-mentioned product only and cannot be up-to-date or sufficient for this product used in combination with other materials or in diverse uses.

The user is obliged to comply with all binding standards and provisions as well as bears liability for the improper use of the information included in the Data Sheet, or for the misapplication of the product.

### Additional information important for protection of health and the environment

The employer is required to comply with the provisions set forth in the regulations set forth in Section 15 of the information sheet (if applicable to a specific case):

- training of staff members within the scope of the risk for health, hygiene requirements, use of personal protection equipment, measures preventing accidents, rescue proceedings etc.,
- monitoring of staff members' health state,
- control of the working environment, in particular application of methods for early detection of exposure,
- keeping a register of works and a register of staff members,
- taking up measures and actions reducing exposure.

### List of applicable hazard identification statements not specified in whole in sections 2 - 15 of the Sheet:

Not applicable.

### Explanation of abbreviations and acronyms used in the data sheet

TLV	Threshold Limit Value
TLV-STEL	Threshold Limit Value, Short Term Exposure Limit
TLV-CL	Threshold Limit Value-Ceiling Level
TWA	Time-Weighted Average concentration value measured over 8 h
STEL	Short Term Exposure Limit for 15 minutes (STEL)
vPvB	(Substance) Very persistent and very bioaccumulative
PBT	(Substance) Persistent, bioaccumulative and toxic
PNEC	Predicted no-effect concentration
DN(M)EL	Derived No Effect Level
LD50	Dose that will kill 50% of the test animals
LC50	Concentration that will kill 50% of test animals
EC <sub>x</sub>	Concentration at which X % inhibition of growth or growth rate is observed
OECD	Organization for Economic Co-operation and Development
LL50	Lethal level for 50% of the exposed population
EL50	Level causing adverse effect in 50% of exposed population
NOEL	Level at which no harmful changes are observed
RID	Regulations for the international carriage of dangerous goods by rail
ADR	European Agreement concerning the International Carriage of Dangerous Goods by Road
IMDG	International Maritime Dangerous Goods Code



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IATA	International Air Transport Association
UVCB	Substances of Unknown or Variable composition, Complex reaction products or Biological materials
STOT	Specific Target Organ Toxicity

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