

## High-severity oxidized asphalt

REVISION H 23/01/2023

REPLACES REV. G 31/03/2022

DEVELOPED BY: ICARO SRL

ON BEHALF OF: ALMA PETROLI S.p.A.

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

#### 1.1 Product identifier

Substance name: High-severity oxidized asphalt (PI > 2)  
This material is a totally oxidized bitumen with a Penetration Index > 2.0

Synonyms: Bitume for waterproofing

CAS Number: 64742-93-4

EC Number: 265-196-4

IndexNumber: Not applicable

Registration Number: 01-2119498270-36-0039

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

**Relevant identified uses:** Road pavement, membranes, sheaths, protective, waterproofing, sealing

Uses identified in the chemical safety report: generic list of applications for the non-classified substance; totally oxidized bitumen (PI>2):

**Life Cycle:**

*Manufacture:* Production of the substance

*Formulation or repackaging:* Formulation and (re)packaging of substances and mixtures

*Use at industrial sites:* Use of the substance as an intermediate, use in coatings, use in fuels. Use in the manufacture of articles, production and processing of rubber,

*Generalized use by professional operators:* use in coatings, use in construction applications, use in agrochemicals

*Consumer Use:* Use in Coatings

*Service life:* Use in Construction Applications: Professional

**Uses advised against:** The relevant uses are listed above. No other uses are recommended.

**Reasons for uses advised against:** Uses other than those identified as relevant are not recommended unless an assessment has been carried out prior to the start of such use indicating that the risks associated with such use are safe.

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

Company name ALMA PETROLI S.p.A.

Address Via di Roma 67 - Via Baiona 195

City / Country Ravenna - Italy

Phone0 039054434317-00390544696411

Competent technician E-mail info@almapetroli.com

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### 1.4 Emergency telephone number

For Appropriate National Emergency Information Services see the following link:

<https://echa.europa.eu/support/helpdesks>

Other useful numbers

Alma Petroli - Sciascia Antonino (Employer) - Mob. 3461305790 (24 hours)

## SECTION 2. HAZARDS IDENTIFICATION

### 2.1 Classification of the substance or mixture

The substance is not classified as hazardous under Regulation (EC) No 1272/2008 (CLP).

### 2.2 Label elements

None.

### 2.3 Other hazards

**Please note: The product is used and/or handled at temperatures between 180 and 260 °C**

Given the hot use of the product, the greatest danger for users is the possibility of burns from contact with the molten product or its fumes. Heated asphalt emits fumes. Although it is assumed that such fumes do not present significant dangers to health, normal caution advises to limit exposure as much as possible, using correct working procedures and ensuring good ventilation of the working environments. Prolonged inhalation of the fumes of the hot product can cause irritation of the respiratory tract. Hydrogen sulfide (toxic and flammable gas) may be present in the fumes, which can accumulate until dangerous concentrations are reached in storage tanks.

The product does not meet the PBT or vPvB classification criteria set out in Annex XIII to REACH.

The substance is not included in the list established in accordance with Article 59( of REACH for the possession of endocrine disrupting properties, or is not identified as having endocrine disrupting properties according to the criteria established by Commission Delegated Regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605.

## SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

### 3.1 Substances

Complex black solid substance obtained by blowing air through a heated residue or through a refined one coming from a deasphaltation process, with or without catalyst. The process is mainly based on oxidative condensation that causes the increase in molecular weight.

Denomination	EC	CAS	n.Index	Registration number
Oxidized asphalt	265-196-4	64742-93-4	Not applicable	01-2119498270-36-0039

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**SECTION 4. FIRST AID MEASURES**

**4.1 Description of first aid measures**

**Please note: Each rescue scenario is aggravated by the very high temperature of the product (above 180 °C) when it is moved melted.**

Warning before

intervention: Contact with the hot product can cause severe thermal burns. Hydrogen sulfide (H<sub>2</sub>S) can accumulate in the headspace of storage tanks and reach potentially dangerous concentrations.

Eye contact: Exposure to hot fumes can cause severe irritation of the eyes and mucous membranes. Remove contact lenses. Irrigate the eyes with 0.9% saline solution if available or water for at least 15 minutes. Irrigate before and after removing the lenses to avoid dragging substances into the shielded area of the lenses. Continue to rinse. do not make any attempt to remove the asphalt. See a doctor immediately in case irritation, blurred vision or swelling develop and persist .

Immediately cool the part with running water for at least five minutes; do not make any attempt to remove the asphalt. Urgently transport the affected person to the hospital.

Skin contact: In case the hot product accidentally comes into contact with the skin, do not remove contaminated clothing adhered to the skin or the hot product on the scene. Deave in cold water for 10-15 minutes and then rinse the skin with 10% dioctyl sulfosuccinate (DS), if available. Transport the injured person to the clinic or emergency room. If necessary, the asphalt can be softened and then removed with pads soaked in vegetable oil and petroleum jelly oil. After cooling do not attempt to remove the asphalt layer from the skin as it constitutes a sterile protection of the burned part. The layer spontaneously removes at the mimento of skin healing after some time. In case of circumferential burns with asphalt adhesion, engrave the material to prevent a "tourniquet" effect during cooling. Seek immediate medical attention.

For minor thermal burns, cool the injured part. Keep the burned part under cold running water for at least five minutes, or until the pain disappears. Avoid general hypothermia. Do not apply ice on the burn. DO NOT attempt to remove the portions of clothing attached to the burnt skin but cut its contours. First aid workers should never use gasoline, kerosene or other solvent to clean contaminated skin. Consult a doctor in all cases of severe burns.

Ingestion/aspiration: Route of exposure unlikely.

Inhalation: In case of irritation due to exposure to high concentrations of fumes, transport the affected person into an unpolluted atmosphere. Consult a doctor. Immediately transfer the injured person to the hospital. In case of discomfort due to exposure to hydrogen sulfide immediately take to the fresh air using the appropriate safety measures for rescuers and urgently request medical assistance. Start artificial respiration immediately if breathing has stopped. Administer oxygen if necessary. Keep your breathing and heartbeat under control. If the injured person is unconscious and does not breathe, keep him in a safe lateral position. Administer oxygen if necessary.

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

No symptoms in case of contact with the product at room temperature. Slight irritation to the eyes. Contact with the hot product can cause severe thermal burns. Inhalation: Exposure to hot fumes can cause: eye irritation, nose irritation, throat irritation, irritation of the respiratory tract, headache, nausea, nervousness.

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

Consult a doctor in all cases of severe burns.

## SECTION 5. FIREFIGHTING MEASURES

### 5.1 Extinguishing media

*Suitable extinguishing media:* Small fires: earth or sand, carbon dioxide, foam, dry chemical powder. Large fires: foam, water mist, Note: The use of fractional jet water (spray water) is reserved for specially trained personnel. Other inert gases (as permitted by law).

*NOT suitable extinguishing means:* Do not use direct water jets on the burning product, they can cause splashes and spread the fire. Avoid using foam and water simultaneously on the same surface as water destroys the foam.

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

The contact of the hot product with water generates a violent expansion since the water turns into steam, this can generate splashes of hot product, or damage or complete loss of the roof of the tank. Breathing problems or nausea caused by excessive exposure of the fumes generated by the hot product.

Incomplete combustion could generate a complex mixture of airborne solid and liquid particles and gases, including carbon monoxide, H<sub>2</sub>S (hydrogen sulfide), SO<sub>x</sub> (sulfur oxides), H<sub>2</sub>SO<sub>4</sub> (sulfuric acid), and other unidentified organic and inorganic compounds.

### 5.3 Advice for firefighters

In the event of a large fire or in confined or poorly ventilated spaces, wear a garment complete with fireproof protection and a stand-alone respirator equipped with a complete mask working under positive pressure.

## SECTION 6. ACCIDENTAL RELEASE MEASURES

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

#### 6.1.1 For non-emergency personnel

If safety conditions permit, stop or contain the leak at source. Avoid direct contact with the released material. Stay windward. In the event of large spills, warn residents of leeward areas. Remove uninvolved personnel from the spill area. Warn emergency teams. Except in the case of small payments, the feasibility of the interventions must always be evaluated and approved, if possible, by qualified and competent personnel in charge of managing the emergency. Eliminate all sources of ignition if safety conditions allow (e.g. electricity, sparks, fires, torches).

When the presence of dangerous amounts of H<sub>2</sub>S in the spilled/spilled product is suspected or ascertained, additional or special actions may be indicated, such as the limitation of access, the use of special personal protective equipment, the adoption of specific procedures and the training of personnel. If required, communicate the event to the competent authorities in accordance with the applicable legislation, especially in the case of prolonged storage. This situation is particularly relevant for operations involving direct exposure to vapors in the tank.

The spillage of a limited quantity of product, particularly in the open air where the vapours disperse faster, is a dynamic situation that is likely to limit exposure to dangerous concentrations. Since H<sub>2</sub>S has a higher density than ambient air, a possible exception may be the accumulation of dangerous concentrations in specific places such as ditches, depressions or enclosed spaces. In all these circumstances, however, the assessment of the correct intervention to be taken must be carried out on a case-by-case basis.

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### 6.1.2 For emergency personnel

Large spills: total protection garment resistant to chemical agents and made of antistatic material. If necessary, heat-resistant and heat insulated. Work gloves (preferably half-arm gloves) that provide adequate resistance to chemical agents. Gloves made of PVA (polyvinyl alcohol) are not water resistant and are not suitable for emergency use. If contact with the hot product is possible or foreseeable, the gloves must be heat resistant and thermally insulated. Protective helmet. Antistatic and non-slip safety shoes or boots. Resistant to chemical agents. Goggles or face protection equipment if splashes or contact with eyes are possible or foreseeable. Respiratory protection: A half-mask or a whole mask equipped with an organic vapour filter(s) (and H<sub>2</sub>S, where applicable) or a stand-alone respirator may be used depending on the extent of the spillage and the foreseeable level of exposure. In the event that the situation cannot be fully assessed or if there is a risk of oxygen starvation, use only an autonomous respirator. When the presence of dangerous amounts of H<sub>2</sub>S in the spilled/spilled product is suspected or ascertained, additional or special actions may be indicated, such as the limitation of access, the use of special personal protective equipment, the adoption of specific procedures and the training of personnel. If required, communicate the event to the competent authorities in accordance with the applicable legislation, especially in the case of prolonged storage. This situation is particularly relevant for operations involving direct exposure to vapors in the tank. The spillage of a limited quantity of product, particularly in the open air where the vapours disperse faster, is a dynamic situation that is likely to limit exposure to dangerous concentrations. Since H<sub>2</sub>S has a higher density than ambient air, a possible exception may be the accumulation of dangerous concentrations in specific places such as ditches, depressions or enclosed spaces. In all these circumstances, however, the assessment of the correct intervention to be taken must be carried out on a case-by-case basis.

### 6.2 Environmental precautions

Prevent the product from ending up in sewers, rivers or other bodies of water.

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

Leaks and spills are formed from hot liquefied material, with the risk of severe burns; Solidified product can clog manholes and sewers.

Spreading on the ground: If necessary, stem the product with dry earth, sand or other non-flammable material. Let the hot product cool naturally. If necessary, use nebulized water with caution to help cooling. Do not direct jets of foam or water on the spill of molten product to avoid splashing. Inside buildings or enclosed spaces, ensure appropriate ventilation. Collect the solidified product by appropriate means (e.g. shovels).

Collect the recovered product and other materials in appropriate tanks or containers, for recycling or safe disposal. Transfer the product and other contaminated materials collected into appropriate tanks or containers for recycling or safe disposal.

Spreading in water: the product cools quickly, becoming solid. The product in the solid state is denser than water, sinks slowly and lies on the bottom, making any type of intervention normally impractical. If possible, contain the product. Contain the contaminated product and materials using mechanical means.

The recommended measures are based on the most likely spill scenarios for this product. Local conditions (wind, air temperature, direction and speed of waves and currents) can, however, significantly influence the choice of action to be taken. Consult, therefore, local experts if necessary.

### 6.4 Reference to other sections

For more information about personal protective equipment, please refer to the section 8 "Exposure control and personal protection".

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### SECTION 7. HANDLING AND STORAGE

#### 7.1 Precautions for safe handling

Ensure that all provisions regarding product management and storage facilities are properly complied with. Avoid contact of the hot product with water: risk of splashes generated by the hot material.

The product may release H<sub>2</sub>S (hydrogen sulfide): carry out a specific assessment of the inhalation risks arising from the presence of hydrogen sulfide in the free spaces of tanks, in confined spaces, in product residues and surpluses, in tank waste and waste water, and in all situations of unintentional release, to determine the best means of control according to local conditions.

Ensure the grounding of the container and receiving equipment. Do not breathe the fumes generated by the hot product. Use appropriate personal protective equipment if necessary. Do not use compressed air during filling, unloading or handling operations. Prevent the risk of slipping.

Make sure that adequate cleaning measures are taken (housekeeping). Contaminated material must not accumulate in the workplace and should never be stored in your pocket. Keep away from food and drink. Do not eat, drink or smoke while using the product. Wash your hands thoroughly after handling. Do not reuse contaminated clothing. Do not use solvents or other products with a degreasing effect on the skin.

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

The structure of the storage area, the characteristics of the tanks, the equipment and the operating procedures must comply with the relevant legislation at European, national or local level. Storage facilities must be equipped with appropriate systems to prevent contamination of soil and water in the event of leaks or spills. The activities of cleaning, inspection and maintenance of the internal structure of the storage tanks must be carried out by qualified and properly equipped personnel, as established by national, local, or company regulations, after reclamation of the tank. Before accessing the storage tanks and starting any type of intervention in a confined space, check the atmosphere and check the oxygen content, and the degree of flammability. Store separately from oxidizing agents. Store in a well-ventilated place.

Recommended materials: mild steel or stainless steel for containers and coatings. Some synthetic materials may not be suitable for containers or coatings based on the characteristics of the material and the intended uses. Check the compatibility of the materials with the manufacturer in relation to the conditions of use.

If the product is supplied in containers, store only in the original containers or in a container suitable for the type of product.

Store containers carefully closed and properly labeled. Protect from sunlight.

Light hydrocarbon vapors can accumulate at the top of the containers. This can cause danger of fire or explosion. Empty containers may contain combustible product residues. Do not weld, braze, drill, cut or incinerate empty containers unless they have been properly reclaimed.

#### 7.3 Specific end use(s)

Road pavement, membranes, sheaths, protective, waterproofing, sealing

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### SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

#### 8.1 Control parameters

##### Exposure limit values Asphalt (Bitumen fumes):

ACGIH 2023

TLV-TWA<sup>®</sup>: 0.5 mg/m<sup>3</sup>

BEI (Refer to PAH BEI): 1-Hydroxypyrene-(1-HP) in urine (end of shift working weekend): 2.5 g/l $\mu$ ; 3-Hydroxybenzo(a)pyrene in urine (end of shift working weekend): non-quantitative.

##### Limit values for hydrogen sulphide exposure:

ACGIH 2023:

TLV-TWA<sup>®</sup>: 1 ppm

TLV-STEL<sup>®</sup>: 5 ppm

Monitoring procedures: refer to national regulations or good industrial hygiene practices.

#### DNEL (Derived No-Effect Level)

*Workers*

DNEL long-term inhalation (local effects): 2.88 mg/m<sup>3</sup>/8h (repeated dose toxicity)

*General population*

DNEL long-term inhalation (local effects): 0.61 mg/m<sup>3</sup>/24h (repeated dose toxicity)

#### 8.2 Exposure controls

##### 8.2.1 Appropriate engineering controls

Minimize exposure to mists/vapours/aerosols. When handling the hot product in confined spaces, ensure effective ventilation. Before entering the storage tanks and starting any type of intervention in a confined space, check the atmosphere and check the oxygen content, the presence of hydrogen sulfide (H<sub>2</sub>S) and the degree of flammability.

##### 8.2.2 Individual protection measures, such as personal protective equipment

###### a) Eye/face protection:

Protective screens are advisable for operations that provoke splashes. Helmet with nape protection. Wear goggles (UNI EN 166).

###### b) Skin protection:

###### (i) Hand protection

In the absence of containment systems and in case of possibility of contact with the skin, use gloves with high cuffs resistant to hydrocarbons, internally plush and thermally insulated if necessary. Materials presumably suitable: nitrile, PVC or PVA (polyvinyl alcohol) with a chemical protection index of at least 5 (permeation time > of 240 minutes). Use gloves in accordance with the conditions and limits set by the manufacturer. In the case, refer to the UNI EN 374 standard. Gloves must be periodically inspected and replaced in case of wear, perforation or contamination.

###### (ii) Other

Wear protective clothing during operations involving hot material, heat-resistant clothing (with trousers over boots and sleeves over the cuff of gloves), heat-resistant and non-slip heavy boots (e.g., leather) (EN 943-13034-14605) based on chemical agents. In case of counting of clothing, replace and clean them immediately.

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### c) Respiratory protection:

If the exposure of workers is, or may be, higher than the exposure levels established for the working position, wear respirator in accordance with UNI EN14387: 2021 with filter type A/P2 or higher.

In places where hydrogen sulfide can accumulate, use approved respiratory protection devices: whole masks equipped with a type B filter cartridge (gray for inorganic vapors, H<sub>2</sub>S included), or autonomous respirators (UNI EN 11719: 2018). If it is not possible to determine or estimate exposure levels with good certainty or if it is possible that oxygen deficiency may occur, use only a stand-alone respirator.

### d) Thermal hazards: see point b above.



### 8.2.3 Environmental exposure controls

Do not release into the environment. Storage facilities must be equipped with appropriate systems to prevent contamination of soil and water in the event of leaks or spills.

## SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

### 9.1 Information on basic physical and chemical properties

(a) physical state	Solid
b) color	blackish
c) odour	characteristic hot, cold odorless
(d) melting point/freezing point	38 - 130 °C (ASTM D36 (CONCAWE 1992a, Shell 2003)).
(e) boiling point or boiling starting point and boiling range	271.2°C 271.2°C-750°C ASTMD2007 Test Report N°: GE10-0109.001
(f) Flammability	Non-flammable
(g) lower and upper explosive limit	Data not available
(h) flash point	>250 °C approx. 101,325 kPa ISO No., other: EN 2592 CONCAWE(2010a) >200°C ASTM D92/EN ISO 2592
(i) auto-ignition temperature	>400 °C (TOTAL, 1979; Shell 2003).
(j) decomposition temperature	Data not available
(k) pH	Data not available
(l) kinematic viscosity	> 1000 mm <sup>2</sup> /s at 60°C EN 12595
(m) solubility	2.69E-12 – 1.99 mg/l (calculated range-QSAR)
(n) partition coefficient n-octanol/water (logarithmic value):	5.4-18.02 (calculated range-QSAR)
(o) vapour pressure	<< 0.1 kPa at 20°C
(p) density and/or relative density	1.02 to 1.07 to 15°C EN ISO 12185/EN ISO 3838/ EN 15326 CONCAWE(2010a)
(q) relative vapour density	Data not available
(r) particle characteristics	Not applicable



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### 9.2 Other information

#### 9.2.1. Information with regard to physical hazard classes

Penetration Index (PI)  $2.5 < PI < 7$

No chemical group associated with the molecules contained with oxidizing properties. On the basis of the chemical structure, the substance is not able to react exothermically with combustible materials.

#### 9.2.2. Other safety characteristics

The product does not possess dangerous properties that require mention.

## SECTION 10. STABILITY AND REACTIVITY

### 10.1 Reactivity

The substance has no additional reactivity hazards than those listed in the following subtitles

### 10.2 Chemical stability

The asphalt is normally stored and manipulated at temperatures above 180 ° C, and contact with water causes a violent expansion with the danger of splashing and boiling.

### 10.3 Possibility of hazardous reactions

A mixture with nitrates or other strong oxidants (such as chlorates, perchlorates and liquid oxygen) can generate an explosive mass. Sensitivity to heat, friction and shock cannot be assessed in advance.

### 10.4 Conditions to avoid

Excessive heating to a temperature above the recommended temperature causes alterations of the product and the development of flammable fumes. Do not use above the maximum recommended temperatures (230 °C).

### 10.5 Incompatible materials

Avoid contact of the molten product with water or other liquids. Avoid contact with oxidizing substances. Avoid contact of hot asphalt with water. Avoid oil and asphalt contamination of thermal insulation materials and the accumulation of oily residues or similar material near hot surfaces and replace the thermal insulation coating, where necessary, with a non-absorbent insulator. The phenomenon of self-heating and subsequent self-ignition of surfaces of porous or fibrous material impregnated with oil or asphalt, can also occur at a temperature of only 100 ° C.

### 10.6 Hazardous decomposition products

Confined spaces: Since hydrogen sulfide (H<sub>2</sub>S) has a higher density than ambient air, a possible exception may be the accumulation of dangerous concentrations in specific places such as ditches, depressions or enclosed spaces.

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### SECTION 11. TOXICOLOGICAL INFORMATION

Complex substances such as asphalt do not lend themselves to kinetic toxic analysis. However, the toxicokinetics of some individual components, such as polycyclic aromatic hydrocarbons (PAHs) have been studied in detail. For humans, the main routes of exposure to asphalt are inhalation and the skin route. The main potential absorption sites of PAHs from asphalt in humans are the lungs and respiratory system, after exposure by inhalation to asphalt fumes, and the skin, due to contact with pure asphalt or fumes condensed from asphalt. In general, the individual constituents of asphalt and fumes from asphalt undergo oxidative metabolism, which can lead to bioactivation. The distribution of PAHs throughout the body has been studied in rodents. These studies have shown that a low level of PAHs can be found in internal organs, especially in adipose tissue. In general, PAHs are eliminated by urine or biliary route.

#### 11.1. Information on hazard classes as defined in Regulation (EC) No 1272/2008

##### a) Acute toxicity

###### *Oral*

Acute oral toxicity of asphalt has been evaluated in some rat studies. These studies have shown an acute oral LD50 of more than 5 g/kg which does not result in any classification under hazardous substances regulations.

Below is a summary of the most representative studies of the Registration Dossier.

Method	Result	Comments	Source
RAT M/F Administration: gavage OECD Guideline 401	LD50:>5000 mg/kg (M/F)	Key study Read across CAS 64741-56-6	American Petroleum Institute (API) 1982a

###### *Inhalation*

Rat studies are available to assess acute inhalation toxicity of asphalt.

These studies revealed a high acute inhaled LC50 that does not involve any classification under hazardous substances regulations.

Below is a summary of the most representative studies of the Registration Dossier.

Method	Result	Comments	Source
RAT M/F Aerosol (nose only) OECD Guideline 403	CL50: > 94.4 mg/m <sup>3</sup> (M/F)	Key study Read-across Aerosols of condensed fumes of oxidized asphalt	Fraunhofer Institute of Toxicology and Aerosol Research (2000)

###### *Dermal*

Acute cutaneous toxicity of asphalt has been evaluated in studies in rabbits. These studies revealed an acute cutaneous LD50 of more than 2 g/kg which does not involve any classification under the regulations on dangerous substances.

Below is a summary of the most representative studies of the Registration Dossier.

Method	Result	Comments	Source
RABBIT (male/female) Occlusive bandage OECD Guideline 402 (Acute Dermal Toxicity)	LD50 > 2000 mg/kg (male/female)	Key study Read across CAS 64741-56-6	Study by American Petroleum Institute API (1982a)

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### b) Skin corrosion/irritation

The potential of asphalt skin irritation has been tested in some studies conducted on the rabbit. The conclusions of these studies indicate the absence of skin irritation.

These results do not lead to any classification under the legislation on dangerous substances.

Below is a summary of the most representative studies of the Registration Dossier.

Method	Result	Comments	Source
RABBIT Occlusive bandage OECD Guideline 404	Non-irritating Average Erythema score: 0.1 of max. 4 (intact skin) Edema Index: 0.1 of max. 4 (intact skin)	Support study Read across CAS 64741-56-6	American Petroleum Institute (API) 1982a

### c) Serious eye damage/irritation

The potential for eye irritation of asphalt has been tested in some studies conducted on rabbits.

All studies have shown no eye irritation, so no classification of the substance is necessary.

Below is a summary of the most representative studies of the Registration Dossier

Method	Result	Comments	Source
RABBIT OECD Guideline 405	Non-irritating	Support study Read across CAS 64741-56-6	American Petroleum Institute (API) 1982a

### d) Respiratory or skin sensitisation

#### *Respiratory sensitization*

This endpoint is not a REACH requirement and no data is available for this endpoint.

#### *Skin sensitization*

Some studies are available to test the sensitization potential of asphalt. The results obtained from these studies indicate the absence of skin sensitisation potential, therefore no classification of the substance is necessary.

A summary of the most representative studies of the Registration Dossier is reported below

Method	Result	Comments	Source
GUINEA PIG OECD Guideline 406	Non-sensitizing	Key study Read across CAS 64741-56-6	American Petroleum Institute (API) 1983a

### e) Germ cell mutagenicity

Several in vitro and in vivo genotoxicity studies are available for oxidized bitumen samples. Although the results show weak activity in some in vitro studies, this is not supported by the results of an in vivo study. In the key in vivo study animals exposed by inhalation for 28 days showed no evidence of micronucleus formation in the bone marrow.

In addition, several supporting in vitro and in vivo studies are available for paving bitumen samples (or Straight-run bitumen CAS No. 8052-42-4; EINECS No. 232-490-9. The read-across from the bitumen studies straight run is justified by all studies based on the weight of evidence and by the fact that the oxidation process increases the molecular weight. Furthermore, the fumes of partially oxidized bitumen are very similar in terms of composition and physical properties to the fumes of bitumen for pavements Most of the read-across studies with bitumen for pavements show no evidence of genotoxic activity.

In conclusion, the results of a series of in vivo genotoxicity studies do not show convincing evidence that exposure to oxidized asphalt presents a genotoxic risk, therefore no classification under the legislation on dangerous substances is foreseen.

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### f) Carcinogenicity

Some carcinogenicity studies are available for the inhalation and skin exposure pathways. For the inhalation route, the available study did not detect any carcinogenic effects. For skin exposure, some animal studies report weak activity. It should be noted that the presence of solvents used in the administration of asphalt clearly increases bioavailability and / or dermal absorption. In two epidemiological studies on workers exposed to asphalt, it was not possible to find a causal link between exposure to asphalt fumes and the risk of lung cancer. On the basis of an overall assessment of the results of the key and supporting animal studies, and of the two key epidemiological studies, it was concluded that there is no evidence to support that asphalt presents a carcinogenic risk under normal conditions of use by skin or inhalation.

Below is a summary of the most representative animal studies in the Registration Dossier

Method	Result	Comments	Source
RAT - (M/F) Inhalation (nose only) Exposure: 104 weeks (6 hours a day for 5 days a week) Servings: 0, 4, 20, or 100 mg/m <sup>3</sup> OECD Guideline 451	NOAEC (carcinogenicity): 103.9 mg/m <sup>3</sup> air (analytical) (adjusted value for neoplastic histopathologists: 172.5 mg/m <sup>3</sup> ) Neoplastic effects: no effect	Key study Read-across With condensates of oxidized asphalt fumes	Fraunhofer (2006). Fuhst et al. (2007)"
MOUSE - (M) dermal route (acetone vehicle) Doses 1 drop Exposure: 2 times a week for two years	LOAEL: 50 mg/week: Skin tumours LOAEL: 50 mg/week: mortality, body weight, skin irritation	Key study Fume condensate from oxidized asphalt EC265-196-4	Reference Clark, C. R. et al 2011

### g) Reproductive toxicity

To date, there is no 2-generation reproductive toxicity study available for oxidized asphalt.

A PNDR study conducted in accordance with OECD Guideline 414 and a screening study on reproductive/developmental toxicity on condensed oxidized asphalt fumes conducted in accordance with OECD Guideline 422 show no effect on reproduction and development.

Since the available studies do not comply with Annex X of the REACH Regulation, a study proposal is underway. However, the currently available data are of no concern regarding the classification of oxidized asphalt as toxic to reproduction or development under the CLP Regulation. Therefore the substance is not classified as hazardous under European regulations.

The following table summarizes the above studies available in the Registration Dossier.

Method	Result	Comments	Source
RAT - M/F Repeated toxicity study combined with reproductive/developmental toxicity Doses: 30, 100, or 300 mg/m <sup>3</sup> Inhaled administration (nose only) Exhibition: males: 28 days females: 50 days 6 hours a day for 7 days a week OECD Guideline 422 (Combined Repeated Dose)	NOAEC (P): 30 mg/m <sup>3</sup> air (weight of organs) (NOAEC (P): 300 mg/m <sup>3</sup> air (specific parameters of reproduction) NOAEC (F1): 300 mg/m <sup>3</sup> air (nominal) (all effects)	Key study Read-across With asphalt fume condensates (CAS 64742-93-4)	Fraunhofer (2009)

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Method	Result	Comments	Source
Toxicity Study with the Reproduction / Developmental Toxicity Screening Test)			
RAT Prenatal Developmental Toxicity Study. Doses: 0, 50, 150, 500 mg/ m <sup>3</sup> Administration by inhalation (nose only. Rats were exposed to a mixture of aerosols and vapors of oxidized asphalt fumes) Exhibition: 6 hours a day OECD Guideline 414 (Prenatal Developmental Toxicity Study)	Maternal animals: NOAEL: 50 mg/kg body weight/day Fetuses: NOAEL: 500 mg/kg body weight/day (nominal)	Key study With mixture of aerosols and fume vapors condensed by oxidized asphalt	Fraunhofer Institute for Toxicology and Experimental Medicine (2018)

### h) STOT-single exposure

No information is available on specific toxic effects for particular target organs following single exposure.

Numerous occupational exposure studies have evaluated acute and chronic lung irritation and function in correlation with exposure to bitumen fumes (EC 232-490-9).

Effects on acute and (sub)chronic respiratory inflammation and lung function in bitumen workers were conducted by Hansen, 1991; Norseth 1991; Bergdahl 2004; Randem 2004; Tepper 2006; Ulvestad 2007; Ulvestad 2017, but due to co-exposure to a variety of other chemicals (e.g. benzene, coal tar, tobacco) the symptoms cannot be directly attributed to bitumen fumes. Furthermore, a consistent association between acute and chronic clinical effects on lung or respiratory function and irritation following exposure to bitumen fumes was not observed in additional human studies conducted by Gamble 1999; Watkins 2002; Burstyn 2003; Randem 2003; Breuer 2011; Marczynski 2011; Fishing 2011; Raulf-Heimsoth 2001a, 2011b, 2011c; Rihs 2011; Spickenheuer 2011; Welge 2011). The qualitative evaluation of these epidemiological studies confirms that the substance does not meet the criteria for CLP classification.

### i) STOT-repeated exposure

Studies of repeated oral toxicity on asphalt are not appropriate as the main routes of exposure for humans are inhalation and skin. In all inhaled and dermal studies, there were no adverse systemic effects even at the higher doses administered, so asphalt is not classified as hazardous for this end-point under hazardous substances regulations.

### j) Aspiration hazard:

Taking into account the estimated or measured viscosity value for asphalt, the substance is not classified for the danger of aspiration into the lungs.

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### 11.2 Information on other hazards

#### 11.2.1. Endocrine disrupting properties

The substance is not included in the list established in accordance with Article 59(1) of REACH for the possession of endocrine disrupting properties, or is not identified as having endocrine disrupting properties according to the criteria established by Commission Delegated Regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605.

#### 11.2.2. Other information

Not available.

## SECTION 12. ECOLOGICAL INFORMATION

Based on the ecological information below and according to the criteria indicated by the regulations on dangerous substances, asphalt is NOT classified as dangerous for the environment.

### 12.1 Toxicity

Below is a summary of the most representative studies of the Registration Dossier.

Endpoint	Result	Comments
<b>Aquatic toxicity</b>		
Invertebrates Daphnia magna Short term	LL50 48/hour > 1000 mg/l	Key study Redman Et al (2010b) QSAR
Invertebrates Daphnia magna Long term	NOAEL 21/day: ≥ 1000 mg/l	Key study Redman Et al (2010b) QSAR
Algae Selenastrum capricornutum	EL50 72/hours: ≥ 1000 mg/l	Key study Redman Et al (2010b) QSAR
Fish Short term Oncorhynchus mykiss	LL50 96/hour: > 1000 mg/l	Key study Redman Et al (2010b) QSAR
Fish Long term Oncorhynchus mykiss	LL50 28 /day: > 1000 mg/l NOEL 28/day ≥ 1000 mg/l	Key study Redman Et al (2010b) QSAR

### 12.2 Persistence and degradability

#### Abiotic degradability

Hydrolysis:

Asphalt components are resistant to hydrolysis due to the lack of a functional group that is hydrolytically reactive. Therefore, this process will not contribute to a measurable loss of degradation of the substance in the environment.

Photolysis in air, water and soil:

This substance contains hydrocarbon molecules that absorb UV light below 290 nm, a range of UV light that does not reach the Earth's surface. Therefore, this substance does not have the potential to undergo photolysis in water and soil, and this fate process will not contribute to a measurable degradation loss of this substance from the environment.

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### Biotic degradability

Standard tests for this endpoint are not applicable to UVCB substances.

The following Biodegradation values were calculated by QSAR for the constituents of the UVCB.

Water: range of 1.74-165496 days.

Soil: range of 1.74-165496 days

### 12.3 Bioaccumulative potential

Standard tests for this endpoint are not applicable to UVCB substances.

Two ranges of BCF for aquatic-fish species are calculated by QSAR for the constituents of the UVCB: 0.4-2472 l/kg and 3.16 – 13300 l/kg.

### 12.4 Mobility in soil

Koc absorption: Standard tests for this endpoint are not applicable to UVCB substances.

A Log Koc of 4.47-14.70 was calculated by QSAR for the constituents of the UVCB.

### 12.5 Results of PBT and vPvB assessment

*Comparison with the criteria of Annex XIII of the REACH Regulation*

The UVCB substance does not contain any PBT / vPvB constituents included in the SVHC Candidate List at concentrations above 0.1%. No other representative hydrocarbon structures were found to meet the PBT / vPvB (Evaluation of PBT for Petroleum Hydrocarbons criteria. "Concawe 2019". In conclusion, the substance does not meet the PBT or vPvB classification criteria set out in Annex XIII of REACH.

### 12.6. Endocrine disrupting properties

The substance does not contain components with known endocrine disrupting properties with effects on the environment.

### 12.7 Other adverse effects

Not known.

## SECTION 13. DISPOSAL CONSIDERATIONS

### 13.1 Waste treatment methods

Do not dump on the ground or in sewers, tunnels or waterways.

For the disposal of waste deriving from the product, including empty containers not reclaimed, compliant with the national regulation. European Waste Catalogue Code: 05 01 17, the code indicated is only a general indication, based on the original composition of the product and the intended uses. The user (producer of the waste) is responsible for choosing the most appropriate code based on the actual use of the product, any alterations and contaminations. The product as such does not contain halogenated compounds. Disposal of containers: Do not disperse containers in the environment. Dispose of according to local regulations. Do not drill, cut, grind, weld, braz, burn or incinerate unreclaimed empty containers or drums.

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### SECTION 14. TRANSPORT INFORMATION

#### 14.1 UN number or ID number

3257

**Note:** the product is classified as dangerous goods, transported melted at a temperature  $\geq 100^{\circ}\text{C}$  (and below the flash point) Transported asphalt cold, solid, is not classified.

#### 14.2 UN proper shipping name

ELEVATED TEMPERATURE LIQUID, N.O.S., (molten oxidized asphalt)

#### 14.3 Transport hazard class(es)

##### Road/rail transport (ADR/RID)

Class 9, M9

Tunnel Restriction Code (ADR): D

##### Maritime Transport (IMDG)

Class 9

##### Air transport (IATA)

Class 9

Carriage is prohibited on both cargo and passenger flights

#### 14.4 Packing group

III; Label 9 + indication "High temperature"

#### 14.5 Environmental hazards

Substance NOT hazardous to the environment within the meaning of the ADR, RID, ADN and IMDG codes

#### 14.6 Special precautions for user

Wear chemical protective gloves (compliant with the EN374 standard), along with a basic training course.

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

Not applicable.

### SECTION 15. REGULATORY INFORMATION

#### 15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

- Title VII Authorization pursuant to reach Regulation (EC Reg. no. 1907/2006): not subject to authorization
- Title VIII Restrictions pursuant to reach Regulation (EC Reg. no. 1907/200.): not subject to restriction

##### Other EU legislation and national transpositions:

- Category Seveso ((Dir. 2012/18/UE): not applicable



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- Dir. 98/24/EC: Hazardous chemical agent
- Dir. 97/42/EC and 99/38/EC: not applicable as it is not carcinogenic

### 15.2 Chemical safety assessment

A chemical safety assessment was carried out.

As the product is not classified as hazardous to health and the environment, no exposure assessment or risk characterisation is required. Therefore, there is no need to process exposure scenarios.

## SECTION 16. OTHER INFORMATION

### List of relevant hazard statements and notes :

Not present.

### Advice on any training appropriate for workers:

Adequate training of workers potentially exposed to this substance on the basis of the contents of this safety data sheet.

### Main bibliographic references and data sources

Registration Dossier

CSR 2021, CSR 2022

### Legend of abbreviations and acronyms:

ACGIH = American Conference of Governmental Industrial Hygienists

CSR = Chemical Safety Report

EC50 = Median effective concentration

IC50 = Inhibition concentration, 50%

Klimisch=Evaluation criterion for reliability of the method used.

LC50 = Lethal concentration, 50%

LD50 = Mean Lethal Dose

PBT = Persistent, Bioaccumulative and Toxic Substance

CNS=Central nervous system

STOT = Specific target organ toxicity

(STOT) RE = Repeated exposure

(STOT) SE = Single exposure

Key Study=Study of greater relevance

TLVTWA®= Threshold limit value – time-weighted average

TLVSTEL®= Threshold limit value – limit for short exposure time

UVCB=substances of Unknown or Variable composition

vPvB = very Persistent and very Bioaccumulative

Compilation date 29/11/2010

Revision date 01/12/2010

Reason for Rev00 of 01/12/2010:

Update pursuant to Annex I of EU Regulation 453/2010

Revision date 04/05/2015

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Reason for the Rev.A of 04/05/2015:	Update of emergency telephone numbers. Upgrade to the 5th ATP
Revision date 21/12/2015	
Reason for Rev.B of 21/12/2015:	Update of the following sections: 2, 8, 11, 14, 15, 16 and insertion Complete list of uses and usage identifiers
Revision date 04/07/2016	
Reason for Rev.C of 04/07/2016:	Update of the following section: 14
Revision date 27/09/2018	
Reason for Rev. D of 27/09/2018:	Update of the following sections: 1. Update of the complete list of uses and use identifiers
Revision date 20/12/2019	
Reason for Rev. E of 20/12/2019:	Update of the following sections: 1 (name change from Bitumen to Asphalt), 8 (changes to DNELs), 9 (inserted values calculated for solubility and Log-Pow), 10, (10.4), 11 (Update information on reproductive toxicity), 12 (inserted calculated values for biodegradation, bioaccumulation and mobility in the soil)
Revision date 08/10/2020	
Reason for Rev. F of 08/10/2020:	Update of the format of the safety data sheet (all sections. Update of section 8 (replacement of pictograms in accordance with UNI EN 7010 Safety Signs 2019). Update section 14 (deletion of UN No. 3256) Update of the following sections: 1. Update of the complete list of uses and use identifiers (also in the Annex).
Revision date 31/03/2022	
Reason for Rev. G of 31/03/2022:	Translation of the SDS in English; Update of the SDS model according to Reg. (EU) 2020/878. Updating the content of Sections 1, 2, 4, 8, 12, 16 and the Annex.
Revision date 23/01/2023	
Reason for Rev.H of 23/01/2023:	Update of the SDS in according to Chemical Safety Report 2022 sections 1, 8, 11, 12, 16

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### ANNEX

#### Complete list of uses and use identifiers

## High-severity oxidized asphalt

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Identified use name	Life Cycle	Field of use (SU)	Category of chemicals (PC)	Article category (AC)	Process Category (PROC)	Environmental Release Category (ERC)
01 – Production of the substance (not classified; severely oxidized asphalt (PI>2))	Production				1, 2, 3, 4, 8a, 8b, 9, 15, 28	1
02 - Formulation and (re)packaging of substances and mixtures (not classified; severely oxidized asphalt (PI>2))	Formulation				1, 2, 3, 4, 5, 8a, 8b, 9, 14, 15, 28	2
01b - Use of the substance as an intermediate (not classified; severely oxidized asphalt (PI>2))	Use at industrial sites	8, 9			1, 2, 3, 4, 8a, 8b, 9, 15, 28	6th
03a - use in coatings: Industrial - only cold applications, without emissions (severely oxidized asphalt (PI>2))	Use at industrial sites				1, 2, 3, 4, 5, 7, 8a, 8b, 9, 10, 13, 14, 15, 28	4
12a – use in fuels: Industrial (not classified; severely oxidized asphalt (PI>2))	Use at industrial sites				1, 2, 8a, 8b, 16, 28	7
Use in the manufacture of articles: Industrial (not classified; severely oxidized asphalt (PI>2))	Use at industrial sites				1, 2, 3, 4, 5, 8a, 8b, 9, 10, 13, 14, 15, 28	4, 6d
19 - Production and processing of rubber: Industrial (not classified; severely oxidized asphalt (PI>2))	Use at industrial sites	11			1, 2, 3, 4, 5, 6, 7, 8a, 8b, 9, 13, 14, 15, 28	4, 6d
03b - Uses in Coatings: Professional - only cold applications, without emissions (not classified; severely oxidized asphalt (PI>2))	Widespread use by professional operators				1, 2, 3, 4, 5, 8a, 8b, 10, 11, 13, 15, 19, 28	8a, 8d
Use in construction applications: Professional (not classified; severely oxidized asphalt (PI>2))	Widespread use by professional operators				1, 2, 5, 8a, 8b, 9, 10, 13	8d, 8f
11a - Use in agrochemicals: Professional (not classified; severely oxidized asphalt (PI>2))	Widespread use by professional operators	26			1,2,4,8a, 8b, 11, 28	8a, 8d
03c - Use in coatings: Consumers - only cold applications, without emissions (not classified; severely oxidized asphalt (PI>2))	Consumer Use		1, 9a, 9b, 9c, 15, 18, 23, 24		n.a.	8a, 8d

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Identified use name	Life Cycle	Field of use (SU)	Category of chemicals (PC)	Article category (AC)	Process Category (PROC)	Environmental Release Category (ERC)
Use in construction applications: service life (Professional) (not classified; severely oxidized asphalt (PI>2))	Service life			4a		10a