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Reason for revision: changes at §1.3 (references) and §1.4 (Poison centres)

1 Identification of the Product and the Company

1.1 Identification of the product

Name of substance: BITUMEN (all types)
CAS Number: 8052-42-4
Registration Number: 01-2119480172-44-0043

1.2 Identified relevant use of the substance or mixture and use not recommended

COMMON USES: road paving, membranes, sheathing, protective layers, waterproofing, sealers, fuels.
USES NOT RECOMMENDED: the relevant uses are listed above. Other uses are not recommended unless an evaluation has been carried out, before the beginning of the said use, indicating that said use will be controlled. The single registrars are responsible for any additional evaluation.

1.3 Identification of the Safety Data Sheet supplier:

IPLOM S.p.A.
via C. Navone, n. 3/b
16012 BUSALLA - (GE) - Italy

Competent person responsible for the MSDS (EC Reg. No. 1907/2006): dott.ssa Repetto Chiara
E-mail: laboratorio@iplom.com
call telephone number: 010 9623-1 (with dial-through function)

1.4 Emergency telephone number:

Poison Centre

Az. Osp. Univ. Foggia	Foggia	0881-732326
CAV Policlinico "Umberto I"	Roma	06-4450618
CAV Policlinico "A. Gemelli"	Roma	06-3054343
Az. Osp. "Careggi" U.O. Tossicologia Medica	Firenze	055-7947819
CAV Centro Nazionale di Informazione Tossicologica	Pavia	0382-24444
Osp. Niguarda Ca' Granda	Milano	02-66101029
Osp. Riuniti di Bergamo	Bergamo	800883300

2 Hazard Identification

General information:

Bitumen is not classified as hazardous by criteria defined by the EU.

Physical-chemical hazards

Bitumen is normally stored and handled at a temperature in excess of 100°C; therefore, contact with water causes violent expansion with the danger of "boil over" and boiling splashes. Though it is not classified as flammable, it is a hydrocarbon and, as such, can only burn if heated to a temperature that exceeds its flash point.

Health hazards

At ambient temperature and in the solid state, bitumen presents no significant hazards for human health.

	<p>Since the product is used hot, the greatest hazard for users includes burns resulting from contact with the molten product or its fumes.</p> <p>Since the product is handled at high temperatures (150-160°C), a potential risk is associated with the generation of fumes, whose quantity is temperature-dependent. Though these fumes presumably represent no significant health hazard, exposure should be limited as a precautionary measure by adopting correct operating procedures and ensuring good ventilation in work environments.</p> <p>Hence the need to reduce usage temperature and exposure of staff to fumes by adopting the correct work practices.</p> <p>Prolonged inhalation of fumes produced by the hot product can cause irritation in the airways.</p> <p>Considering the organoleptic features of the product, ingestion shall be deemed as most unlikely. For the toxicological characteristics of the product, see section 11.</p>
Environmental hazards	<p>Bitumens are solid and/or semi-solid at ambient temperature, and their environmental mobility is unimportant.</p> <p>Their solubility in water is so low that it can be considered as unimportant; in fact, it can be said that they present neither acute nor chronic toxicity nor bioaccumulation events in aquatic species.</p>
Other hazards	<p>Vapour that develops during hot handling and in high temperature storage conditions may contain small quantities of hydrogen sulphide (toxic flammable gas), which can build up in empty spaces of tanks, even reaching dangerous concentrations.</p> <p>These compounds are not deliberately added.</p>
2.1 Classification of the substance or mixture	n.a.
2.2 Label elements	n.a.

3 Composition / Information about the ingredients

3.1 Substances

Asphalt (**CAS 8052-42-4 / EINECS 232-490-9**): Highly complex combination of high molecular weight organic hydrocarbons containing a relatively high quantity of hydrocarbons with high carbon-hydrogen ratios and whose number of carbon atoms is prevalently higher than C25. It also contains small quantities of metals, such as nickel, iron or vanadium. It is obtained as a non-volatile residual substance of crude oil distillation, or as a refined product of separation from a residual oil, through a 0-100% deasphalting or decarbonisation process

and/or

as vacuum residue (petroleum) of thermal cracking (CAS 92062-05-0 / EINECS 295-518-9): complex combination of hydrocarbons obtained from distillation of the products of a thermal cracking process. It prevalently includes hydrocarbons with a number of carbon atoms that is usually higher than C34, and boiling point higher than about 495°C.

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3.2 Mixtures

n.a.

4 First aid measures

4.1 Description of first aid measures

Liquid or high temperature product

Skin contact	<p>Cool the area with cold running water for at least ten minutes, paying attention not to trigger a condition of general hypothermia.</p> <p>After cooling, do not attempt to remove the bitumen layer from the skin because it ensures sterile protection for the burnt area.</p> <p>The layer will spontaneously detach when the skin heals after some time. If necessary, bitumen can be softened and then removed with buffers soaked in vegetal oil or paraffin oil.</p> <p>In case of burns, immediately seek medical advice or accompany the subject to hospital.</p> <p>Cooled bitumen undergoes contraction. If a limb is completely surrounded by cooled bitumen, the pressure can block blood circulation (constriction). In this case, the bitumen shall be either softened or cut to ensure free blood circulation.</p>
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Contact with eyes	<p>Cool the area with abundant water for at least five minutes. Make no attempt to remove the bitumen. Urgently accompany the injured person to hospital.</p>
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Inhalation	<p>In case of irritation due to exposure to high concentrations of vapour, accompany the injured person to an area where the atmosphere is unpolluted. If necessary, request medical assistance or urgently accompany the injured person to hospital.</p> <p>In case of sickness due to exposure to hydrogen sulphide (H₂S), immediately accompany the injured person outdoors, using the appropriate safety measures for rescuers, and urgently request medical assistance. If the injured person is unconscious, keep him/her in the recovery position.</p> <p>Monitor both pulse and respiration.</p> <p>While awaiting the doctor's arrival, if respiration is irregular or has stopped, apply artificial respiration, preferably with the mouth-to-mouth method and, in case of cardiac arrest, administer a cardiac massage.</p>
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In case of contact with the solid product at ambient temperature, no particular measures are required except for normal hygiene. In case of ingestion, seek medical advice.

Contact with eyes: wash the eyes with abundant water, keeping the eyelids wide open. In case of persistent irritation, seek medical advice.

4.2 Principal symptoms and effects, both acute and delayed

Contact with the hot product can cause severe thermal burns.

4.3 Indications for the need, if any, to seek immediate medical advice and special treatments.

Consult a doctor in all cases of severe burns.

5 Fire-fighting measures

5.1 Fire-fighting devices

Powder, carbon dioxide, foam (only trained staff), atomised water (only trained staff).

Unsuitable fire-fighting devices: do not use water jets directly on the burning product as they may cause the molten bitumen to bubble.

5.2 Special hazards deriving from the substance or mixture

Combustion could generate the following hazardous products: CO_x, SO_x, HC

5.3 Recommendations for fire-fighters

The use of water fog streams is reserved for specially trained staff.

Use water jets only to cool surfaces that are exposed to fire, preventing water from entering the tanks.

Fire-fighters shall be equipped with special devices: self-contained breathing apparatuses and individual protection devices (i.e. gloves, shoes, goggles).

6 Measures in case of accidental release

6.1 Personal precautions, protection devices and procedures in case of an emergency

If the safety conditions allow action, stop or contain the leak at the source. Avoid direct contact with the released material. Send staff away from the leak area, if not involved. Call the emergency teams. Save for small-scale leaks, the feasibility of an intervention shall always be evaluated and approved, if possible, by qualified and competent staff in charge of managing emergencies.

When requested, inform the authorities of the event, in compliance with the applicable law.

Small-scale leaks: conventional antistatic work clothes are usually appropriate.

Large-scale leaks: conventional antistatic work clothes are usually appropriate. When necessary, they should be heat resistant and heat-insulated. Work gloves that provide adequate resistance to heat and thermal insulation. Protective helmet. Anti-static and anti-skid safety shoes or boots. Protective goggles or face protection devices in case of potential or predictable splashes or contact with eyes.

6.2 Environmental precautions

Do not dispose of the product into sewers, rivers or other waterways.

6.3 Containment and clean up methods and materials

Spills on the ground: surround the product with dry soil, sand or any other absorbent material and leave to cool. Collect the spilt product with appropriate devices (906). Collect the recovered product and other materials in appropriate tanks or containers for recycling or safe disposal (908). Send for recovery or disposal as established by the law.

Spills in water: remove the spilt product with mechanical devices. Collect in suitable containers. Inform the competent authorities in compliance with the current law. Do not use solvents or dispersing agents. If possible, collect the product and contaminated material with mechanical devices and store/dispose of in compliance with the applicable law.

7 Handling and storage

7.0 General information

- Recommended storage, loading/unloading temperature: about 160°C
- In any case, do not exceed 200°C.

7.1 Precaution for safe handling

7.1.1 Protective measures and precautions for unloading bitumen from the tank

Bitumen is stored and handled molten at high temperatures.

Avoid contact with the skin (burn hazard) and inhalation of product fumes (irritation in the airways).

Use clean dry tubes made of heat-resistant material, without bottlenecks or bends.

Do not use steam to empty tubes or connections.

Do not use solvents to eliminate any obstructions in tubes. Only use heating.

Work in well ventilated places.

When emptying a tank of bitumen, take the appropriate precautions to avoid risks of a fire or an explosion.

Bitumen tanks can be heated with diathermic oil, steam, electricity or direct heating. When a bitumen tank fitted with a tube heater is emptied, ensure that the level of bitumen does not drop below at least 150 mm above the tube heater, unless heating is switched off in advance for appropriate cooling. The mean temperature of bitumen should be kept as low as possible, compatibly with operating requirements, and shall never exceed the maximum handling temperature established.

The arrival tank shall have sufficient free space, taking load expansion into account.

7.1.2 Indications regarding hygiene at work

Do not inhale mist/vapour. Avoid contact with skin. Do not eat, drink or smoke while handling the product. Do not reutilise contaminated clothing. Work in well ventilated places.

7.2 Safe storage conditions, including incompatibilities, if any

Prevent water from entering the tanks.

In case of prolonged storage, the product can build up on tank walls and ceiling. This build up, namely carbonaceous compounds and iron sulphides, may possess pyrophoric properties and spontaneously catch fire in contact with air (when the tank is opened).

In case of prolonged storage at high temperatures, hydrogen sulphide can build up in tanks.

Use clean dry tubes made of heat-resistant material, without bottlenecks or bends.

Do not use steam to empty tubes or connections.

Do not use solvents to eliminate any obstructions in tubes. Only use heating.

Work in well ventilated places.

7.3 Specific final uses

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8 Exposure control and personal protection

Bitumen has low volatility, and the production of vapour is limited in normal conditions. Anyhow, limit exposure to fumes. For operations conducted in closed environments, ensure adequate ventilation.

8.1 Control parameters – threshold value

The most significant exposure limits:

TLV – TWA (A.C.G.I.H. 2007): 0.5 mg/m³ (bitumen vapour, inhalable particulate fraction soluble in benzene).

TLV – TWA (A.C.G.I.H. 2007): 10 ppm (hydrogen sulphide)

TLV – STEL (A.C.G.I.H. 2007): 15 ppm (hydrogen sulphide)

TLW-TWA mean pondered concentration per working day of 8 hours and 40 hours a week (chronic exposure).

TLW-STEL maximum concentration for a brief period (peak).

If necessary, refer to the limits listed in Leg. Decree 81/08, in employment contracts or in A.C.G.I.H. documentation.

Monitoring procedures: see Leg. Decree 81/2008 and good industrial hygiene practices.

8.2 Exposure control

8.2.1 Suitable technical control

Minimise exposure to mists/vapour/aerosols. When the hot product is handled in closed spaces, ensure efficient ventilation.

8.2.2 Measures for individual protection

If the concentration of the product in air exceeds the aforementioned limits of exposure, and if plants, operating modes and other means of reducing the exposure of workers are inappropriate for the purpose, use individual protection devices.

(a) Eyes/face protection:

If product handling entails potential direct contact, use a helmet with protection for the nape, facial screen. In case of need, refer to the UNI EN 465-466-467 regulations (clothing), UNI-EN 166 (eye protection devices) or UNI-EN 374 (gloves).

(b) Skin protection:

i) Hand protection

If product handling entails potential direct contact, use heat-resistant clothing with long sleeves and long insulation gloves. In case of need, refer to the UNI EN 465-466-467 regulations (clothing), or UNI-EN 374 (gloves).

ii) Further information

Wear protective clothing during operations that involve hot material, heat resistant clothing (with trousers over boots and sleeves over glove cuffs), anti-skid shoes.

(c) Protection for airways:

In ventilated environments or outdoors: none.

In confined environments that are not appropriately ventilated: breathing equipment. For characteristics, refer to Ministerial Decree dated 02.05.2001.

However, extractor fans are recommended in case of formation of vapour, and protective screens for operations that cause splashing.

Thermal hazards: see previous letter (b)

For further information regarding personal protection devices and operative conditions, see the section “Exposure scenarios.”



8.2.3 Environmental exposure control

Do not release into the environment.

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Physical-chemical properties

a) Aspect	solid
b) Colour	black or dark brown
c) Odour	typical
d) Density (solid) at 25°C kg/m ³ :	990 – 1100
d) Density (solid) at 200.00°C kg/m ³ :	850 – 1000
f) Solubility in water	Not soluble
g) pH	Not applicable
h) Oxidising properties	Not applicable
i) Evaporation rate	Not applicable
l) Vapour pressure	Negligible
m) Melting or change of status temperature (°C):	35 - 55
n) Boiling point (°C):	> 250
o) Relative density of vapour (air=1):	> 1
p) Flash point (°C):	> 230
q) Spontaneous ignition temperature (°C)	> 300
r) Solubility in organic solvents	soluble or partly soluble
s) Log P _o /w	> 6

9.2 Further information

Not available

10 Stability and reactivity

The product is stable in the intended conditions for use.

Conditions to be avoided: over-heating to a temperature above the recommended one causes alterations in the product and development of flammable fumes.

Incompatible materials:

Avoid contact between the molten product and water or other liquids.

Avoid contact with oxidising substances.

Avoid contamination of thermal insulators with oil or bitumen. If necessary, replace the insulator with a non porous one. A fibrous or porous material impregnated with bitumen or condensate fumes can undergo self-heating and spontaneous ignition even at temperatures under 100°C.

Hazardous decomposition products

Hydrogen sulphide (toxic gas) can build up in closed spaces.

11 Toxicological information

11.1 Toxicokinetics, metabolism and distribution

There is no experimental data available about absorption, distribution, metabolism and elimination of substances contained in bitumen.

11.2 Toxicological information

a) Acute toxicity:

LD ₅₀ oral	over 5 g/kg (*)
LD ₅₀ cutaneous	over 5 g/kg (*)
LC ₅₀ respiratory	Not applicable

(*) extrapolated from data on petroleum products of the same type

Not irritant for skin or eyes.

The vapour of the heated product can cause slight irritation in the airways and eyes.

Sensitisation: bitumen is not classified as a sensitising agent.

b) Chronic toxicity

The information available does not indicate that exposure to bitumen as is or to its vapour may have hazardous effects in time. Consider that the product does not present any hazards of chronic toxicity.

In any case, in normal conditions of application, direct contact with bitumen is presumably very limited, given the high handling temperatures. Therefore, normal safety measures limit chronic risks, if any.

Bitumen is not classified as hazardous by criteria defined by the EU.

Bitumen contains very small quantities of aromatic polycyclic hydrocarbons (APH) with 4-6 condensate rings, namely in the range of a few mg/kg for each chemical agent; however, APH shall not be considered as bioavailable in bitumen as is. This may not apply to cases in which bitumen is used in a mixture with other substances such as, for instance, solvents.

12 Ecological information

General	Bitumen is not soluble in water. It is not evidently attacked by microorganisms and does not determine a high biological demand for oxygen. The product has no hazardous effects on the aquatic environment or on plants. It has very low mobility in soil. It typically sinks into aquatic sediment, even if this might not occur in certain circumstances.
Bioaccumulation	Even if the constituents of bitumen have a value of Log Kow >6 and are, therefore, potentially bioaccumulative, they also have very low solubility and a high molecular weight. Therefore, they shall not be considered as bioavailable and they have a low bioaccumulation potential.
Use in compliance with good working practice, avoiding dispersion of the product in the environment.	

13 Comments on disposal

13.1 Waste treatment methods

Do not dispose of the product on ground or in sewers, tunnels or streams.

For the disposal of refuse deriving from the product, including uncleaned empty containers, comply with Leg. Decree 152/2006 and subsequent amendments and related regulations.

European Waste Catalogue (EWC): 05 01 17 (Ref.: EC Regulation No. 2001/118 and Directive of the Ministry for the Environment 9/04/2002). The Catalogue mentioned only provides general indications based on the original composition of the product and its intended use. The user holds the final responsibility of choosing the most adequate code based on the actual use of the product, possible alterations and contaminations.

Do not drill, cut, sand, weld, braze, burn or incinerate empty containers or drums that have not been cleaned out.

14 Transport information

The product is classified as hazardous merchandise only if it is transported molten at a temperature >100°C (but below the flash point). If the transport temperature is below 100°C (and the flash point), the product is not classified in any of the hazard classes ADR, IATA, IMDG.

In the first case:

UNO number	3257
Name and description of ADR	HOT TRANSPORTED LIQUID, N.O.S. (MOLTEN BITUMEN)
R.I.D. / A.D.R	class 9, Kemler No. 89, Pack. Gr. III
I.M.D.G.	class 9 Pack. Gr. III EmS F-A. S-P
I.A.T.A.	TRANSPORT IS FORBIDDEN

15 Information on regulations

Leg. Decree 65 of 14 March 2003 and Decree of the Ministry of Health dated 14 June 2002 and related regulations on classification, packaging and labelling of hazardous substances and preparations: NOT APPLICABLE.



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Presidential Decree 336/94	“Table of professional diseases in the industry”
Leg. Decree 81/2008	“Implementation of Art. 1 of Law No. 123 of 3 August 2007 on the protection of safety and health in workplaces”

16 Further information

Do not use the product for purposes other than those indicated. In this case the user can be exposed to unpredictable hazards.

Text of risk phrases quoted in other sections of the Safety Data Sheet: none.

The Safety Data Sheet complies with EC Regulation No. 1907/2006 (REACH).

The information contained herein refers only to the product indicated and may not apply if the product is used in combination with others or during processing. This information is the best in our possession in **November 2008**.