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1. Identification of the substance/mixture and of the company / undertaking

Trade name	KRS 70 (Cationic Rapid Set)	
Synonyms	Cationic Bitumen emulsion, Petroleum residue, Road binder, Petroleum pitch.	
Use	Constructing seals, chip and spray.	
Company	Tosas (PTY) Limited 12 Commercial Road Wadeville Germiston, 1422 Republic of South Africa	
Information (Product safety)	Telephone: +27 11 323 2000 E-mail address: Info@tosas.co.za	Fax: +27 11 902 2755
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2. Hazards identification

The product does not need to be labeled in accordance with EC directives or respective national laws.

Identification of the risks

The product does not need to be labeled in accordance with EC directives or respective national laws.

To man

Hot emulsion will adhere to the skin. Prolonged exposure to emulsion fumes above the recommended occupational exposure standard may cause irritation to the skin, eyes and upper respiratory tract.

To Environment

Emulsions are not classified as dangerous under current S.A. and EC criteria. Fouling of shorelines and environment. Although emulsions are biodegradable they can act as a waste pollutant. Emulsions have a high solubility in water thus they should be kept away from natural sources, e.g. dams, streams, etc.

Safety Hazards

Not classified as flammable but will burn once the water phase has evaporated off. Contact of hot bitumen with emulsion leads to violent expansion and high potential for boil over.



3. Composition/information on ingredients

Proprietary information Content: Secured		Bitumen Content: 65-73%W/W	
CAS-No. 7647-01-0	Index-No. 017-002-01-X, EC-No.231-595-7	CAS-No. 8052-42-4	Index-No. EC-No 232-490-9
Symbol(s) T, C	R-phrases(s) –R23 –R35 R34 –R37	Symbol(s)	R-phrases(s)
Illuminating Paraffin (petroleum) Contents: 0-5%		Water Content: 27-30 % W/W	
CAS-No. 8042-47-5	Index-No. EC-No 2229/2004 ²	CAS-No. 7732-18-5	Index-No. EC-No. 231-791-2
Symbol(s)	R-phrases(s) R45	Symbol(s)	R-phrases(s) none

Chemical nature

Mixture of heavy hydrocarbons, high molecular weight organic compounds which are obtained from processing residue streams from the refining of Petroleum crude oils.

Other information

Emulsions are prepared by mixing or milling bitumen, water and emulsifier chemicals to ensure that performance criteria are met. This process does not affect the classification or handling information given elsewhere in the Material Data Sheet.

For the full text of the R-phrases mentioned in this Section, see Section 16.

4. First aid measures

Symptom and effects:

Inhalation :	Vapors cause slight irritation of respiratory system if present in high concentrations.
Eye :	Symptoms may include pain, tears, swelling, redness and blurred vision.
Ingestion :	Grade 1 : LD50 = 5 - 15 g/kg
Skin :	Slight burns may result from contact with hot emulsion. Cold emulsion may cause skin irritation which could cause dermatitis.
Product inhalation :	Remove to fresh air. If breathing has stopped, apply respiration and seek immediate medical assistance. If breathing, but unconscious, place in the recovery position and seek immediate medical assistance. If heartbeat is absent, give external cardiac compression and seek immediate medical assistance. This is applicable to manufacturing and transport environment.
Product in eye :	Rinse eye immediately with large amounts of cold water for at least ten (10) minutes. Keep eye closed. Patient should not to rub eye. If irritation persist, seek medical advice.
Product ingestion :	Vomiting should not be induced. If the patient is conscious let the patient drink 1 - 2 glasses of water or milk. Protect the airway if vomiting begins. If rapid recovery does not occur, immediately obtain medical assistance.
Product on skin :	The affected areas should be immediately immersed in or flushed with large amounts of cold water. Speed is crucial, because if the emulsion has not been broken; it may be washed off. Prompt medical advice should be sought. No organic solvents should or must be used to remove bitumen. Olive oil, butter, baby oil is found to remove dried or broken emulsion from the skin effectively.

ADVICE TO PHYSICIANS:

Eyes:	Under medical supervision the eye may be rinsed with weak bicarbonate solution.
Skin:	Under doctors supervision the bitumen may be removed from the skin by swabbing with medicinally approved vegetable oil or liberal amounts of warm medicinal paraffin. This should be followed by washing with soap and water and the application of the medically-approved re-fattening agent.



5. Firefighting measures

Extinguishing Media

Small fire Emulsions contain approximately 30-50% of water, thus fires are unlikely. In the event that all the water has evaporated off and the residual bitumen caught alight, then sand or earth can be used to extinguish small fires. Large fires can be extinguished with dry chemical powder, carbon dioxide (CO₂). Water may be used to cool down surrounding area, exposed surfaces and to protect personnel.

Hazards Emulsions contain approximately 30-50% of water, thus fires are unlikely. In the event that all the water has evaporated off and the residual bitumen caught alight. Combustion is likely to give rise to a potentially dangerous complex mixture of gases and airborne particulars, including carbon monoxide, oxides of sulfur and unidentified organic and inorganic compounds. Vapors may travel to ignition sources and flash back.

Protective equipment Emulsions contain approximately 30-50% of water, thus fires are unlikely. In the event that all the water has evaporated off and the residual bitumen caught alight. Proper protective equipment including self-contained breathing apparatus and eye protection must be worn when dealing with fires, especially fires in confined spaces.

6. Accidental release measures

Personal protection: See section 8: Personal protective equipment.

Small spillages: Use sand, fire retardant-treated saw dust, diatomaceous earth, etc. to absorb or contain the spill. Contaminated material should be collected and placed in suitable, clearly marked containers for disposal or reclamation in accordance with local laws and regulations.

Large spillages: Prevent the spill from spreading by construction trenches or barriers, with sand, earth or other containment material.

Environmental: Precautions: Prevent from spreading or entering into drains, ditches or rivers by using the methods detailed under spillage. Prevent further leakage or spillage if safe to do so.

7. Handling and storage

Handling: Avoid skin contact with heated and ambient emulsion. When handling products in drums, safety footwear should be worn and proper handling equipment. Do not eat, drink or smoke while product is being handled or used. Emulsions are preferably handled at ambient temperature.

Handling temperature: Emulsions will normally be handled at 10-30°C. Short term handling Maximum temperature 70°C. Spraying temperature max 80°C. Maximum holding time at this temperature 6 hours.

Storage Emulsions are stored at ambient temperatures. Precautions must be taken to prevent the ingress of water and / or dirt into the product. Different types and grades may not be mixed. Emulsions stored for excessive periods must be thoroughly circulated and drums well rolled prior to application. In the event that the emulsion has been diluted with water then this material must be sprayed out the same day. This product was not formulated to be diluted.



8. Exposure controls/personal protection

Components with workplace control parameters

Occupational exposure standards

COMPONENT	LIMIT	TYPE	REFERENCE
Bitumen fume	5 mg/m ³	TWA*	ACGIH*
H ₂ S	14 mg/m ³	TWA*	ACGIH*
H ₂ S	21 mg/m ³	STEL*	ACGIH*

ACGIH* Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices, American Conference of Industrial Hygienists, Cincinnati, Ohio current edition.

TWA* Time Weighted Average.

The time weighed average concentration for a normal 8 hour working day and 40 hour work week.

STEL* Short-term exposure levels. The concentration to which workers can be exposed continuously for a short period of time without suffering from 1) irritation; 2) chronic or irreversible tissue damage; and 3) narcosis of sufficient degree to increase the likelihood of accidental injury; impair damage, narcosis of sufficient degree to increase the likelihood of accidental injury; impair self-rescue or materially reduce work efficiency and provided that the daily TWA is not exceeded.

Engineering control measures

Use engineering controls to keep airborne concentrations below the exposure limits. Locate emergency equipment at well-marked and clearly identified stations in case emergency escape is necessary.

Personal protective equipment

Respiratory protection

In case of insufficient ventilation, wear suitable respiratory equipment.

Hand protection

Gloves suitable for permanent contact:

Material: butyl-rubber

Break through time: 4 h

Material thickness: 0.5 mm

Eye protection

Safety glasses.

Hygiene measures

Wash overalls and undergarments regularly. Dispose of soiled gloves. Do not eat, drink or smoke while product is being handled.

Protective measures

Skin

Protective clothing comprising of safety shoes or boots, cotton acid resistant overalls, close fitting at neck and wrist.

9. Physical and chemical properties

State of matter	Liquid; at 20 °C; 1,013 kPa
Color	Brown
Odor	Amine
pH	2.00 - 5.00 @ 25°C
Softening point	42 - 51 °C; ASTM D36
Boiling point/boiling range	100 °C depend on elevation above sea level.
Flash point	Not applicable.
Density	1.0 g/cm ³ @ 25°C



10. Stability and reactivity

Materials to avoid	Oxidizing agents, Strong acids, Alkali metals, Halogens. Anionic emulsions are not compatible with cationic emulsions and polar acidic solutions. Emulsions are incompatible with tar products.
Hazardous decomposition products	No expected under normal operating conditions.
Thermal decomposition	Stable under recommended storage conditions.

11. Toxicological information

Further information

Respiratory

Slight irritation of respiratory system in high concentrations. The effect is temporary.

Carcinogenicity

There is no evidence that bitumen emulsions are carcinogenic to humans. Repeated and prolonged exposure to bitumen emulsions can result in skin and eye irritations and allergic responses in some individuals.

Mutagenicity

No history or data to support mutagenicity.

Reproductive hazards

No data available.

12. Ecological information

Eco toxicity effects	Soluble in water. Practically non-toxic, LC/EC50 > 100 mg/l to aquatic organisms.
Biodegradation	None inherently biodegradable.
Bioaccumulation	Emulsions do not bio-accumulate.
Mobility	Emulsions are liquid at ambient temperatures, thus must be considered mobile. Once the water has evaporated off, they become a solid reverting to the bitumen state.
Further information	This product has no known eco-toxicological effects.

13. Disposal considerations

Product	Dispose of in accordance with local regulations. Can be recycled.
Contaminated packaging	Store containers and offer for recycling of material when in accordance with the local regulations. Do not remove the label.

14. Transport information

Further information	Not classified as dangerous in the meaning of transport regulations.
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15. Regulatory information

Labeling

The product does not need to be labeled in accordance with EC directives or respective national laws.

R-phrase(s)

R36/37/38: Irritating to eyes, respiratory system and skin.

S-phrase(s)

S53: Avoid exposure - obtain special instructions before use.

S26: In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

S35: This material and its container must be disposed of in a safe way.

S36/37: Wear suitable protective clothing and gloves.

Special labeling of certain mixtures

Restricted to professional users.

Hazardous components which must be listed on the label

Proprietary

16. Other information

Full text of R-phrases referred to under sections 2 and 3

R37

Irritating to respiratory system.

R65

Harmful: may cause lung damage if swallowed.

All reasonable efforts were exercised to compile this SDS. The SDS provides information regarding the health, safety and environmental hazards, at the date of issue, to facilitate the safe receipt, use and handling of the product in the workplace. Since TOSAS and its subsidiaries cannot anticipate or control all conditions under which the product may be handled, used and received in the workplace, it remains the obligation of each user, receiver or handler to, prior to usage, review this SDS in the context within which the product will be received, handled or used in the workplace. The user, handler or receiver must ensure that the necessary mitigating measures are in place as regards health and safety. This does not substitute the need or requirement for any relevant risk assessments to be conducted. It further remains the responsibility of the receiver, handler or user to communicate such information to all relevant parties that may be involved in the receipt, use or handling of the product. Although all reasonable efforts were exercised in the compilation of this SDS, TOSAS does not expressly warrant the accuracy or assume any liability for the incompleteness of the information contained herein or any advice given. The product is sold and risk passes in accordance with the specific terms and conditions of sale.

Useful references include the following:

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|-------|--------------------------|---|-------|--|
| (i) | Concave Report | : | 85/57 | Review of bitumen carcinogenicity |
| | | : | 7/82 | Health aspects of bitumen |
| | | : | 6/84 | Review of bitumen fume exposure and measurement |
| (ii) | SABITA | : | | HSE Guidelines for bitumen and coal tar products |
| (iii) | IARC working groups | : | | IARC monographs – 103 |
| (iv) | SANS 4001 BT – 4 (2022) | : | | Cationic road emulsions “similar guidelines” |
| (v) | ASTM | : | | D36 |
| (vi) | CAS registration numbers | : | | cas.ChemNet.com |

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