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

Trade name	Tosas EDC
Synonyms	Tosas Stabilising Emulsion, Nonionic Bitumen Emulsion Grade, Dust suppressant
Use	Raw material for soil stabilisation, dust control, dust palliative
Company	Tosas (PTY) Limited 12 Commercial Road Wadeville Germiston, 1422 Republic of South Africa
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S.A Worcester	+27 (23) 342-0609
S.A. Gauteng Spartan	+27 (11) 974-1971

2. Hazards identification

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

To man
Prolonged exposure to emulsion fumes above the recommended occupational exposure standard may cause irritation to the skin, eyes and upper respiratory tract. This application of bitumen emulsions does not require heat and will not result in the above.

To Environment
Emulsions are not classified as dangerous under current S.A. and EC criteria. Fouling of shorelines and environment. Emulsions have a high solubility in water thus they should be kept away from natural sources, e.g. dams, streams, etc. This Emulsion is not dangerous or harmfull to mining environments as the bitumenous residue occurs naturaly in the form of rock asphalt or lake asphalt in other parts of the world. At a low dosage rate used in the dust sepresion on mines the gradual build up of bitumenous residue will result in an *in situ* "asphalt" surfacing construction. This will eventually appear like a surfaced road under the mining trafic.

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. However this is highly unlikely in a mining environment and applies to road constuction and road binder transport in general.

3. Composition / information on ingredients

Bitumen 70/100 Contents: 50 - 65 %W/W CAS-No. 8052-42-4 Index-No. EC-No. 232-490-9

Water Contents: 35 - 50 %W/W CAS-No. 7732-18-5 Index-No. EC-No. 231-791-2

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

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, resembling naturally occurring asphalt. No volatile organic components are present which may contribute to volatile organic compounds (VOC's).

Other information

Emulsions are prepared by mixing or milling bitumen, water and **biodegradable** emulsifier chemicals to ensure that performance criteria are met. This process does not affect the classification or handling information given elsewhere in the Safety Data Sheet. During the application the dilution levels reduces the net binder content significantly, in order to be effective as a dust controlling agent.

4. First aid measures

Synptom 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. Hot emulsions applicable to manufacturing environment only.

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 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. If the emulsion has broken on the skin ,prompt medical advice should be sought. No organic solvents 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 :
Anionic emulsion : Weak acetic acid 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-fatting agent.

5. Firefighting measures

Extinguishing media

Small and large fire	Emulsions contain approximately 35-55% 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 (CO_2). Water may be used to cool down surrounding area, exposed surfaces and to protect personnel. This is applicable to manufacturing and transportation only.
Hazards	Combustion is likely to give rise to a potentially dangerous complex mixture of gases and airborne particulars, including carbon monoxide, oxides of sulphur and unidentified organic and inorganic compounds. Vapors may travel to ignition sources and flash back. This is highly unlikely in the dust suppression application.
Protective equipment	Proper protective equipment including self-contained breathing apparatus and eye protection must be worn when dealing with fires, especially fires in confined spaces which is unlikely to occur in an open mining environment.

6. Accidental release measures

Personal protection:	If possible, wait until product has cooled down. Evacuate the area of all non-essential personnel. Remove ignition sources if possible. Shut off leaks if possible, without personal risk. Protective clothing should be worn when removing accidentally released emulsions.
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 product in drums, safety footwear should be worn and proper handling equipment. Dot not eat, drink or smoke while product is being handled or used.
Handling temperature	Emulsions are preferably handled at ambient temperature.
Advice on protection against fire and explosion	Keep away from heat and sources of ignition.
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.

8. Exposure controls / personal protection

Components with workplace control parameters

Occupational exposure standards

Component	Limit	Type	Reference
Bitumen fume	5 mg/m³	TWA*	ACGIH*
H_2S	14 mg/m³	TWA*	ACGIH*
H_2S	21 mg/m³	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 Weighed 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
Color	Brown
Odor	Woody
pH	11.00 – 12.5 @ 25 °C
Softening point	42 - 51 °C; ASTM D36
Boiling point/boiling range	100 °C dependent on elevation above sea level.
Flash point	Not applicable
Density	1.0 g/cm³ @ 25°C

10. Stability and reactivity

Materials and conditions to avoid	Oxidizing agents, Strong acids, Alkali metals, Halogens. Nonionic emulsions are not compatible with cationic emulsions and polar acidic solutions. Emulsions are incompatible with tar products.
Hazardous decomposition products	None expected under normal use 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

Ecotoxicity effects	Soluble in water Practically non-toxic, LC/EC50 > 100 mg/ℓ to aquatic organisms
Biodegradation	None inherently, biodegradable
Bioaccumulation effects	Emulsions do not bio-accumulate
Mobility effects	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. Ref. Sabita bitumen protocol – land and / or adjacent water environments.

14. Transport information

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

15. Regulatory information

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

16. Other information

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

R43 May cause sensitization by skin contact.

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:

(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 1985, 1987
(iii)	IARC working groups	:	IARC monographs – 103
(iv)	SANS 4001 – BT3 2014	:	Anionic bitumen road emulsions "similar guidelines"

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