

SAFETY DATA SHEET

I.E.T.S. (In-situ Engineering Technology Solutions with Nano polymer)

Version 03.00

Revision date: 01/06/2018



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1. Identification of the substance/mixture and of the company / undertaking Trade name Synonyms

I.E.T.S In situ Engineering Technology Solutions with Nano polymer

Tosas Stabilizing Emulsion, Nonionic Bitumen Emulsion Grade, Dust suppressant

Use

Raw material for soil stabilization, dust control, dust palliative

Company

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Information (Product safety)

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2. Hazards identification: Identification of the risks

The product does not need to be labelled 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 harmful to mining environments as the bituminous residue occurs naturally in the form of rock asphalt or lake asphalt in other parts of the world. At a low dosage rate used in the dust suppression on mines the gradual build-up of bituminous residue will result in an *in situ* "asphalt" surfacing construction. This will eventually appear like a surfaced road under the mining traffic.

Safety Hazards

Not classified as flammable.



3. Composition / information on ingredients

	Contents	W/W CAS-No.	Index-No.
Bitumen 70/100	50 - 65%	8052-42-4	EC-No. 232-490-9
Water Contents	35 - 50%	7732-18-5	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

Symptom and effects

Inhalation:

Vapours 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.

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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 persists, 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 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. Fire fighting measures

Extinguishing media

Small and large fire Emulsions contain approximately 35-55% of water, thus fires are unlikely to occur.

Hazards Emulsions contain approximately 35-55% of water, thus fires are unlikely to occur.

Protective equipment Emulsions contain approximately 35-55% of water, thus fires are unlikely to occur.



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 product 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

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/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.

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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

Colour: Brown

Odour: Woody

pH: 7.00– 12.00 @ 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: g/cm³ @ 25°C



10. Stability and reactivity

Materials and conditions to avoid

Oxidizing agents, Alkali metals, Halogens. Nonionic emulsions are not compatible with cationic emulsions and polar acidic solutions. Emulsions are incompatible with tar products.

Hazardous decomposition products

No decomposition 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

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. Residual bitumen 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 labelled 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.

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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”
- The MSDS was created by : Lambert, Johannes (J)
- The MSDS was approved by : Muller, Johan (J)