

**Table of content**

	Page no
1.) Identification of the substance / mixture and of the company / undertaking	2/8
2.) Hazard identification	2/8
3.) Composition / information on ingredients	3/8
4.) First aid measures	3/8
5.) Firefighting measures	4/8
6.) Accidental release measures	4/8
7.) Handling and storage	4/8
8.) Exposure controls / personal protection	5/8
9.) Physical and chemical properties	5/8
10.) Stability and reactivity	6/8
11.) Toxicological information	6/8
12.) Ecological information	6/8
13.) Disposal considerations	6/8
14.) Transport information	7/8
15.) Regulatory information	7/8
16.) Other information	8/8



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

Trade name	Arm R shield (SR-1)	
Synonyms	Bitumen rubber, Arm-R-Shield	
Use	Chip & Spray applications	
Company	Tosas (PTY) Limited 12 Commercial Road Wadeville Germiston, 1422 Republic of South Africa	
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2. Hazards identification

Identification of the risks

UN 3257

To man

Elevated temperature will cause serious skin burns.

Prolonged exposure to bitumen rubber fumes may cause irritation to the skin, eyes and upper respiratory tract

To Environment

Bitumen rubber is classified as dangerous under current SA and EC criteria. Fouling of shorelines and environment. Bitumen rubber is not biodegradable and is as such a waste pollutant. Bitumen rubber is not soluble in water, thus it should be kept away from natural sources, e.g. dams, streams, etc.

Safety Hazards

Bitumen rubber is classified as flammable. Contact of hot bitumen rubber with water or other substances leads to violent expansion and a high potential for boil over



3. Composition/information on ingredients

Bitumen Content: 76-82%W/W CAS-No. 8052-42-4 Index-No. EC-No 232-490-9 Symbo(s) R-phrased(s)	Proprietary information (Aromatic oil) Content: 0-4 % W/W CAS-No. 64742-04-7 Index-No. EC-No. not established Symbol(s) S53,S45,S36/37,S61 R-phrased(s) R45, R63, R48/21, R53
Rubber crumb Content: 18-22%W/W CAS-No:Not available Index-No. EC-No:Not available Symbo(s) none R-phrased(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

S-R1 are prepared by mixing bitumen, rubber and extender oils to ensure that performance criteria are met. This process does not affect the classification or handling information given elsewhere in the Safety Data Sheet

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

4. First aid measures

Syptom 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 :	Ingestion may cause gastro intestinal disturbances including irritation, nausea, vomiting, abdominal pain as well as headaches, respiratory difficulties and mild convulsions
Skin :	Contact with skin can result in severe irritation and thermal burns
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. Symptoms may include blindness, pain, tears, swelling, redness and blurred vision
Product ingestion :	LD50 = 5 to 15 g/kg
Product on skin :	The affected areas should be immediately immersed in or flushed with large amounts of cold water. Do not remove the bitumen rubber from the skin. The bitumen rubber forms a sterile protective layer that usually detatches after a few days. If bitumen rubber has to be removed, No organic solvents should or must be used to remove bitumen the area should be swabbed, using cod liver oil, olive oil, butter, baby oil vegetable oil or warm medicinal paraffin. Prompt medical advice should be sought.
Advice to physicians:	Where severe burns have occurred, the patient must immediately be transferred to a burn unit and under no circumstances must the bitumen rubber be removed



5. Firefighting measures

Extinguishing Media

Fire	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
Hazards	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	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. Evacuate the area of all non-essential personnel and public. Prevent hot material coming into contact with water and other liquids. Shut off leaks and remove ignition sources. Full protective clothing should be worn when dealing with spills.
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:	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 or molten product. Avoid breathing fumes or vapors from heated bitumen rubber. Do not eat, drink or smoke when product is being handled
Handling temperature:	Bitumen rubber is applied at 190°C - 210°C
Storage	Tanks should be provided with a heating facility. Precautions must be taken to ensure that heating oils are always well covered with product (minimum 15 cm) - Tanks should be lagged to prevent heat loss Precautions must be taken to prevent ingress of water Carbonaceous deposits, which can be pyrophoric, occur on the roofs and walls of heated bitumen tanks and should be removed The lowest practicable storage temperatures should be used and through-draughts of air avoided to minimise risk of generating flammable conditions in the tank space The bulk storage tanks should be surrounded by bund walls The product should be stored in well-ventilated areas Sparks, flames and other sources of ignition near the product must be avoided



8. Exposure controls/personal protection

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:
Heat resistant PVC, rubber or leather gloves
Material: butyl-rubber
Break through time: 4 h
Material thickness: 0.5 mm

Eye protection

Safety visor, face shield or safety goggles

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, 100% cotton full length overalls. Only cotton undergarments are to be worn when working with bitumen rubber. Suitable balaclava for face and neck.

9. Physical and chemical properties

State of matter	Liquid; at 20 °C; 1,013 kPa
Color	Black
Softening point	55 - 65 °C; ASTM D36
Flash point	>230°C
Density	1.06 g/cm ³ @ 25°C
Solubility – water	Nil
Solubility – solvent	Soluble in specific solvents
Viscosity	2500-4000 CPs; MB 13
Relative molecular mass	Base bitumen 2000 AMU



10. Stability and reactivity

Conditions to avoid	Temperatures above 230°C - Contact with water or polar substances
Incompatible materials	Not compatible with water or polar substances
Hazardous decomposition products	Non-expected under normal use conditions.

11. Toxicological information

Acute toxicity	
Oral	Toxicological information has not been determined for bitumen rubber
Dermal inhalation	Not considered to be an inhalation hazard under normal conditions of use
Chronic toxicity	No effects and data found that supports the long-term toxicity of bitumen rubber
Skin	LD50 expected to be above 2000 mg/kg. Condensed vapors to be slightly irritating to the skin. Not expected to be a skin sensitiser
Eyes	Vapors from bitumen rubber will cause moderate to severe irritation
Respiratory	Exposure particularly in confined areas to bitumen rubber fumes may cause upper-respiratory tract irritation
Carcinogenicity	Occupational exposures to straight-run bitumen's and their emissions during road paving are 'possibly carcinogenic to humans' (Group 2B). Occupational exposures to hard bitumen's and their emissions during mastic asphalt work are 'possibly carcinogenic to humans' (Group 2B);

12. Ecological information

Eco toxicity effects	Eco toxicological information has not been determined especially for bitumen rubber
Biodegradation	None inherently biodegradable
Bioaccumulation	Information not available
Mobility	Semi-solid under most environmental conditions



13. Disposal considerations

Disposal method	Waste product should not be allowed to contaminate soil or water. Waste arising from spillage or tank cleaning operations should be disposed of in accordance with prevailing regulations (Section 20(i) of the Environment Conservation Act) preferably by a recognised collector or contractor. The competence of the collector or contractor should be established beforehand
Disposal of packaging	Bulk operation
Classification	Group 2 Chemical – Hazardous

14. Transport information

IMDG	UN number: 3257; Class: 9; EmS: F-A, S-P; Packaging group: II; Description of the goods: ELEVATED TEMPERATURE LIQUID, N.O.S.
ICAO/IATA	UN number: 3257; Class: 9; Description of the goods: Elevated temperature liquid, n.o.s

15. Regulatory information

Labelling



Regulatory base	UN 3257
R-phrases(s)	R45: May cause cancer. R43: May cause sensitization to skin R63/48/21/53
S-phrases(s)	S53: Avoid exposure - obtain special instructions before use. S35: This material and its container must be disposed of in a safe way S36/37: Wear suitable protective clothing and gloves.

Special labelling of certain mixtures

Restricted to professional users.

Hazardous components which must be listed on the label

Aromatic oil



16. Other information

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

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) | Health: A Case-Control Study of Lung Cancer Nested in a Cohort of European Asphalt Workers | : | http://ehp03.niehs.nih.gov/article/info:doi/10.1289/ehp.0901800 | |
| (i) | SABITA | : | Guidelines for the safe and responsible handling of bituminous Products- Manual 8. October 2021 | |
| | | : | Code of Practice: Transportation, off-loading and storage of bitumen, bituminous products and asphalt in transit. Manual 25. May 2020 | |
| (ii) | IARC working groups | : | IARC monographs – 103 | |
| | | : | IARC 2011 WHO/International Agency for Research on Cancer's Monographs program | |
| (iii) | ASTM | : | D-36 | |
| (iv) | CAS registration numbers | : | cas.ChemNet.com | |
| (v) | TG -1 | : | MB – 13 | |
| | The SDS was revised by | : | Gramni, Larusha (L) | |
| | The SDS was approved by | : | Lambert, Johannes (J) | |