MATERIAL SAFETY DATA SHEET

1. Product and Company Identification

Material name	**Asphalt - Oxidized Roofing**
Version #	03
Issue date	04-27-2011
Revision date	01-10-2013
Supersedes date	11-13-2012
MSDS Number	208OxR
Product use	Asphalt products are to be used as road and highway paving applications; waterproofing and sealing applications; coatings; or other engineering applications. Use in other applications may result in higher exposures and require additional engineering controls and personal protective equipment.
Synonym(s)	Oxidized Petroleum Asphalt; Built Up Roofing Asphalt (BURA) - Type I, II, III, & IV; ASTM D-312 Roofing Asphalt - Type I, II, III, & IV; Coating Asphalt; Damp Roofing ASTM D 449-89 - Type I, II, III, & IV
Manufacturer/Supplier	Valero Marketing & Supply Company and Affiliates P.O. Box 696000 San Antonio, TX 78269-6000
General Assistance	210-345-4593
Emergency	24 Hour Emergency 866-565-5220 1-800-424-9300 (CHEMTREC USA)

2. Hazards Identification

Physical state	Liquid.
Appearance	Dark brown to black liquid at normal use temperatures above 300F. Semi-solid at 70F.
Emergency overview	WARNING Contact with product at elevated temperatures can result in thermal burns. Harmful if inhaled or swallowed. May be harmful if absorbed through skin. Aspiration may cause lung damage. Irritating to eyes, respiratory system and skin. In high concentrations, vapors and spray mists are narcotic and may cause headache, fatigue, dizziness and nausea. Suspect cancer hazard - may cause cancer. Prolonged exposure may cause chronic effects. Contains polycyclic aromatic hydrocarbons (PAHs). Some PAHs are recognized carinogens and may cause skin, lung and bladder cancer. Hydrogen sulfide, a highly toxic gas, may be present or released. Signs and symptoms of overexposure to hydrogen sulfide include respiratory and eye irritation, dizziness, nausea, coughing, a sensation of dryness and pain in the nose, and loss of consciousness. Odor does not provide a reliable indicator of the presence of hazardous levels in the atmosphere.
OSHA regulatory status	This product is considered hazardous under 29 CFR 1910.1200 (Hazard Communication).
Potential health effects	
Routes of exposure	Inhalation. Ingestion. Skin contact. Eye contact.
Eyes	This product is normally stored, shipped or used hot (300 to 400 F). Hot, molten material can cause thermal burns. Contact may irritate or burn eyes. Eye contact may result in corneal injury.
Skin	This product is normally stored, shipped or used hot (300 to 400 F). Contact with hot product may cause severe burns. May be harmful if absorbed through skin. Contains a substance which has been shown to cause cancer in laboratory animals. Irritating to skin. High pressure skin injections are SERIOUS MEDICAL EMERGENCIES. Injuries may not appear serious at first. Within a few hours, tissues will become swollen, discolored and extremely painful.
Inhalation	Harmful if inhaled. Irritating to respiratory system. In high concentrations, vapors and spray mists are narcotic and may cause headache, fatigue, dizziness and nausea. May cause breathing disorders and lung damage. Prolonged inhalation may be harmful.
Ingestion	Harmful if swallowed. Ingestion may result in vomiting; aspiration (breathing) of vomitus into lungs must be avoided as even small quantities may result in aspiration pneumonitis. Irritating to mouth, throat, and stomach.
Target organs	Eyes. Respiratory system. Skin. Central nervous system. Lungs.

Chronic effects Suspect cancer hazard - may cause cancer. May cause central nervous system disorder (e.g., narcosis involving a loss of coordination, weakness, fatigue, mental confusion and blurred vision) and/or damage. Frequent or prolonged contact may defat and dry the skin, leading to discomfort and dermatitis.

Signs and symptoms Irritation of nose and throat. Irritation of eyes and mucous membranes. Skin irritation. Unconsciousness. Corneal damage. Narcosis. Decrease in motor functions. Behavioral changes. Edema. Conjunctivitis. Proteinuria. Defatting of the skin. Rash.

Potential environmental effects The product is not expected to be hazardous to the environment.

3. Composition / Information on Ingredients

Components	CAS #	Percent
Asphalt	8052-42-4	0 - 100
Asphalt, oxidized	64742-93-4	0 - 100
Vaccum Tower Bottoms	64741-56-6	0 - 100
Distillates, petroleum residues, vaccum	68955-27-1	0 - 15
Hydrogen sulfide	7783-06-4	<0.1
Polycyclic Aromatic Hydrocarbons	130498-29-2	<0.1

Composition comments Dangerous amounts of hydrogen sulfide, a highly toxic gas, may be present, especially in the headspace of containers.

4. First Aid Measures

First aid procedures

Eye contact Immediately flush eyes with plenty of water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical attention.

Skin contact In case of contact with hot or molten product, cool rapidly with water and seek immediate medical attention. Do not attempt to remove molten product from skin because skin will tear easily. Remove contaminated clothing and shoes. Get medical attention if irritation develops or persists. Wash clothing separately before reuse. Destroy or thoroughly clean contaminated shoes. If high pressure injection under the skin occurs, always seek medical attention.

Inhalation Move to fresh air. If breathing is difficult, give oxygen. If not breathing, give artificial respiration. Get medical attention.

Ingestion Rinse mouth thoroughly. Do not induce vomiting without advice from poison control center. Do not give mouth-to-mouth resuscitation. If vomiting occurs, keep head low so that stomach content does not get into the lungs. Get medical attention immediately.

Notes to physician In case of shortness of breath, give oxygen. Keep victim warm. Keep victim under observation. Symptoms may be delayed.

General advice If exposed or concerned: get medical attention/advice. Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves. Show this safety data sheet to the doctor in attendance. Wash contaminated clothing before re-use.

5. Fire Fighting Measures

Flammable properties Not flammable by OSHA or DOT criteria.

Extinguishing media

Suitable extinguishing media Water spray. Water fog. Dry chemical powder. Carbon dioxide (CO2).

Unsuitable extinguishing media Do not use water jet.

Protection of firefighters

Protective equipment and precautions for firefighters Wear full protective clothing, including helmet, self-contained positive pressure or pressure demand breathing apparatus, protective clothing and face mask.

Fire fighting equipment/instructions Wear full protective clothing, including helmet, self-contained positive pressure or pressure demand breathing apparatus, protective clothing and face mask. Withdraw immediately in case of rising sound from venting safety devices or any discoloration of tanks due to fire. Fight fire from maximum distance or use unmanned hose holders or monitor nozzles. Move containers from fire area if you can do it without risk. In the event of fire, cool tanks with water spray. Cool containers exposed to flames with water until well after the fire is out. For massive fire, use unmanned hose holders or monitor nozzles; if this is impossible, withdraw from area and let fire burn. Water runoff can cause environmental damage. Use compatible foam to minimize vapor generation as needed.

Specific methods	In the event of fire and/or explosion do not breathe fumes.
Hazardous combustion products	Carbon monoxide. Carbon Dioxide. Sulfur oxides. Nitrogen oxides (NOx). Hydrocarbons. Hydrogen sulfide.

6. Accidental Release Measures

Personal precautions	Keep unnecessary personnel away. Local authorities should be advised if significant spills cannot be contained. Keep upwind. Keep out of low areas. Ventilate closed spaces before entering. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. See Section 8 of the MSDS for Personal Protective Equipment.
Environmental precautions	If facility or operation has an "oil or hazardous substance contingency plan", activate its procedures. Stay upwind and away from spill. Wear appropriate protective equipment including respiratory protection as conditions warrant. Do not enter or stay in area unless monitoring indicates that it is safe to do so. Isolate hazard area and restrict entry to emergency crew. Review Firefighting Measures, Section 5, before proceeding with clean up. Keep all sources of ignition (flames, smoking, flares, etc.) and hot surfaces away from release. Contain spill in smallest possible area. Recover as much product as possible (e.g. by vacuuming). Stop leak if it can be done without risk. Use water spray to disperse vapors. Use compatible foam to minimize vapor generation as needed. Spilled material may be absorbed by an appropriate absorbent, and then handled in accordance with environmental regulations. Prevent spilled material from entering sewers, storm drains, other unauthorized treatment or drainage systems and natural waterways. Contact fire authorities and appropriate federal, state and local agencies. If spill of any amount is made into or upon navigable waters, the contiguous zone, or adjoining shorelines, contact the National Response Center at 1-800-424-8802. For highway or railways spills, contact Chemtrec at 1-800-424-9300.
Methods for containment	Eliminate all ignition sources (no smoking, flares, sparks, or flames in immediate area). Local authorities should be advised if significant spillages cannot be contained. Stop leak if you can do so without risk. Dike the spilled material, where this is possible. Prevent entry into waterways, sewers, basements or confined areas.
Methods for cleaning up	Use only non-sparking tools. Large Spills: Prevent product from entering drains.
Other information	Clean up in accordance with all applicable regulations.

7. Handling and Storage

Handling	Wear personal protective equipment. Avoid breathing mist or vapor from heated material. Avoid contact with eyes, skin, and clothing. Avoid prolonged exposure. Use only with adequate ventilation. Wash thoroughly after handling. Do not handle, store or open near an open flame or sources of ignition. Protect material from direct sunlight. Take precautionary measures against static discharges. All equipment used when handling the product must be grounded. Use only non-sparking tools. When using, do not eat, drink or smoke. Avoid release to the environment.
Storage	Material is normally stored in closed tanks at 250 to 375F. Do not handle, store or open near an open flame or sources of ignition. Protect material from direct sunlight. This material can accumulate static charge which may cause spark and become an ignition source. The pressure in sealed containers can increase under the influence of heat. Keep container tightly closed in a cool, well-ventilated place. Keep away from food, drink and animal feedingstuffs. Keep out of the reach of children.

8. Exposure Controls / Personal Protection

Occupational exposure limits

US. ACGIH Threshold Limit Values

Components	Type	Value	Form
Asphalt (CAS 8052-42-4)	TWA	0.5 mg/m3	Inhalable fraction.
Hydrogen sulfide (CAS 7783-06-4)	STEL	5 ppm	
	TWA	1 ppm	
Vaccum Tower Bottoms (CAS 64741-56-6)	TWA	0.5 mg/m3	Inhalable fraction.

US. OSHA Table Z-2 (29 CFR 1910.1000)

Components	Type	Value
Hydrogen sulfide (CAS 7783-06-4)	Ceiling	20 ppm

Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2)

Components	Type	Value	Form
Asphalt (CAS 8052-42-4)	TWA	5 mg/m3	Fume.
Hydrogen sulfide (CAS 7783-06-4)	Ceiling	21 mg/m3	
		15 ppm	
	TWA	14 mg/m3	
		10 ppm	
Vaccum Tower Bottoms (CAS 64741-56-6)	TWA	5 mg/m3	Fume.

Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended)

Components	Type	Value	Form
Asphalt (CAS 8052-42-4)	TWA	0.5 mg/m3	Aerosol, inhalable.
Hydrogen sulfide (CAS 7783-06-4)	Ceiling	10 ppm	
Vaccum Tower Bottoms (CAS 64741-56-6)	TWA	0.5 mg/m3	Aerosol, inhalable.

Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents)

Components	Type	Value	Form
Asphalt (CAS 8052-42-4)	TWA	0.5 mg/m3	Inhalable fraction.
Hydrogen sulfide (CAS 7783-06-4)	STEL	15 ppm	
	TWA	10 ppm	
Vaccum Tower Bottoms (CAS 64741-56-6)	TWA	0.5 mg/m3	Inhalable fraction.

Canada. Quebec OELs. (Ministry of Labor - Regulation Respecting the Quality of the Work Environment)

Components	Type	Value	Form
Asphalt (CAS 8052-42-4)	TWA	5 mg/m3	Fume.
Hydrogen sulfide (CAS 7783-06-4)	STEL	21 mg/m3	
		15 ppm	
	TWA	14 mg/m3	
		10 ppm	
Vaccum Tower Bottoms (CAS 64741-56-6)	TWA	5 mg/m3	Fume.

Mexico. Occupational Exposure Limit Values

Components	Type	Value	Form
Asphalt (CAS 8052-42-4)	STEL	10 mg/m3	Fume.
	TWA	5 mg/m3	Fume.
Hydrogen sulfide (CAS 7783-06-4)	STEL	21 mg/m3	
		15 ppm	
	TWA	14 mg/m3	
		10 ppm	
Vaccum Tower Bottoms (CAS 64741-56-6)	STEL	10 mg/m3	Fume.
	TWA	5 mg/m3	Fume.

Engineering controls Provide adequate general and local exhaust ventilation. Use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below recommended exposure limits.

Personal protective equipment

Eye / face protection Wear safety glasses. If splash potential exists, wear full face shield or chemical goggles.

Skin protection Wear chemical-resistant, impervious gloves. Flame retardant protective clothing is recommended.

Respiratory protection Wear a NIOSH-approved (or equivalent) respirator as needed.

General hygiene considerations	Consult supervisor for special handling instructions. Avoid contact with eyes. Avoid contact with skin. Keep away from food and drink. Wash hands before breaks and immediately after handling the product. Provide eyewash station and safety shower. Handle in accordance with good industrial hygiene and safety practice.

9. Physical & Chemical Properties

Appearance	Dark brown to black liquid at normal use temperatures above 300F. Semi-solid at 70F.
Physical state	Liquid.
Form	Semi-Solid at 70F
Color	Brown/black.
Odor	Strong petroleum.
Odor threshold	Not available.
pH	Not available.
Vapor pressure	< 0.01 kPa @ 20 °C
Vapor density	> 1.6 (Air = 1)
Boiling point	700 - 1100.1 °F (371.1 - 593.4 °C)
Melting point/Freezing point	150 - 250 °F (65.6 - 121.1 °C) (Softening point)
Solubility (water)	Not available.
Specific gravity	1 - 1.2 (Water=1)
Flash point	> 350.1 °F (> 176.7 °C) Closed Cup
Flammability limits in air, upper, % by volume	< 7
Flammability limits in air, lower, % by volume	> 0.9
Auto-ignition temperature	> 600.1 °F (> 315.61 °C)
Other data	
Flash point class	Combustible IIIB

10. Chemical Stability & Reactivity Information

Chemical stability	Stable under normal temperature conditions and recommended use.
Conditions to avoid	Flames and sparks. Ignition sources. Contact with incompatible materials. Do not pressurize, cut, weld, braze, solder, drill, grind or expose empty containers to heat, flame, sparks, static electricity, or other sources of ignition; they may explode and cause injury or death.
Incompatible materials	Strong oxidizing agents.
Hazardous decomposition products	Carbon oxides. Sulfur oxides. Nitrogen oxides (NOx). Hydrocarbons. Hydrogen sulfide.
Possibility of hazardous reactions	Hazardous polymerization does not occur.

11. Toxicological Information

Toxicological data

Components	Species	Test Results
Hydrogen sulfide (CAS 7783-06-4)		
Acute		
Inhalation		
LC50	Monkey	0.7 mg/l, 35 Minutes
	Mouse	> 0.024 mg/l, 960 Minutes
	Rat	> 0.38 mg/l, 960 Minutes

Sensitization	This substance may have a potential for sensitization which may provoke an allergic reaction among sensitive individuals.

Acute effects Harmful if inhaled, absorbed through skin, or swallowed. Harmful: may cause lung damage if swallowed. Irritating to eyes, respiratory system and skin. In high concentrations, vapors and spray mists are narcotic and may cause headache, fatigue, dizziness and nausea. Hydrogen sulfide, a highly toxic gas, may be present. Signs and symptoms of overexposure to hydrogen sulfide include respiratory and eye irritation, dizziness, nausea, coughing, a sensation of dryness and pain in the nose, and loss of consciousness. Odor does not provide a reliable indicator of the presence of hazardous levels in the atmosphere.

Subchronic effects Liver and kidney damage may occur after prolonged and repeated exposure.

Carcinogenicity Contains polycyclic aromatic compounds (PACs). Prolonged and/or repeated skin contact with certain PACs has been shown to cause skin cancer. Prolonged and/or repeated exposures by inhalation of certain PACs may also cause cancer of the lung and of other sites of the body. The Working Group has classified occupational exposures to oxidized bitumens/asphalts and their emissions during roofing as “probably carcinogenic to humans” (Group 2A) and the classification of occupational exposures to straight-run bitumens/asphalts and their fume condensates during road paving as “possibly carcinogenic to humans” (Group 2B).

ACGIH Carcinogens

Asphalt (CAS 8052-42-4)	A4 Not classifiable as a human carcinogen.
Vaccum Tower Bottoms (CAS 64741-56-6)	A4 Not classifiable as a human carcinogen.

IARC Monographs. Overall Evaluation of Carcinogenicity

Asphalt (CAS 8052-42-4)	2B Possibly carcinogenic to humans.
Asphalt, oxidized (CAS 64742-93-4)	2A Probably carcinogenic to humans.

Epidemiology Pre-existing skin conditions including dermatitis might be aggravated by exposure to this product.

Mutagenicity No component of this product present at levels greater than or equal to 0.1% is identified as a mutagen by OSHA.

Reproductive effects This product is not expected to cause reproductive or developmental effects.

Teratogenicity The components of this product are not reported to cause teratogenic effects in humans. Based on best current information, there is no known teratogenicity associated with this product.

Further information Symptoms may be delayed.

12. Ecological Information

Ecotoxicological data

Components		Species	Test Results
Hydrogen sulfide (CAS 7783-06-4)			
Aquatic			
Fish	LC50	Lake whitefish (Coregonus clupeaformis)	0.002 mg/l, 96 hours

Ecotoxicity Not expected to be harmful to aquatic organisms.

Persistence and degradability Not available.

Bioaccumulation / Accumulation Not available.

13. Disposal Considerations

Disposal instructions Dispose in accordance with all applicable regulations.

14. Transport Information

DOT

Basic shipping requirements:

UN number	UN3257
Proper shipping name	Elevated temperature liquid, n.o.s.
Hazard class	9
Packing group	III
Special precautions	Not regulated by DOT if at room temperature and in containers of 119 gallons or less.

Additional information:

Special provisions	IB1, T3, TP3, TP29
Packaging exceptions	None
Packaging non bulk	None
Packaging bulk	247

IATA

UN number	UN3257
UN proper shipping name	Elevated temperature liquid, n.o.s.

Transport hazard class(es)	9
ERG code	9L

IMDG

UN number	UN3257
UN proper shipping name	Elevated temperature liquid, n.o.s.
Transport hazard class(es)	9
Packing group	III
Environmental hazards	
Marine pollutant	No.
EmS	F-A, S-P*

TDG

Proper shipping name	ELEVATED TEMPERATURE LIQUID, N.O.S., at or above 100 °C and below its flash point including molten metals, molten salts, etc.
Hazard class	9
UN number	UN3257
Packing group	III

15. Regulatory Information

US federal regulations

TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)

Not regulated.

Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List

Polycyclic Aromatic Hydrocarbons (CAS 130498-29-2)

US EPCRA (SARA Title III) Section 302 - Extremely Hazardous Spill: Reportable quantity

Hydrogen sulfide (CAS 7783-06-4)	100 LBS

US EPCRA (SARA Title III) Section 302 - Extremely Hazardous Substance: Threshold Planning Quantity

Hydrogen sulfide (CAS 7783-06-4)	500 LBS

US EPCRA (SARA Title III) Section 313 - Toxic Chemical: De minimis concentration

Polycyclic Aromatic Hydrocarbons (CAS 130498-29-2)	0.1 % N590 Substance is not eligible for the de minimis exemption except for the purposes of supplier notification requirements.

US EPCRA (SARA Title III) Section 313 - Toxic Chemical: Reportable threshold

Polycyclic Aromatic Hydrocarbons (CAS 130498-29-2)	100 LBS N590

US EPCRA (SARA Title III) Section 313 - Toxic Chemical: Listed substance

Polycyclic Aromatic Hydrocarbons (CAS 130498-29-2)	N590 Listed.

CERCLA (Superfund) reportable quantity (lbs) (40 CFR 302.4)

Asphalt: 100
Hydrogen sulfide: 100

Superfund Amendments and Reauthorization Act of 1986 (SARA)

Hazard categories	Immediate Hazard - Yes Delayed Hazard - Yes Fire Hazard - No Pressure Hazard - No Reactivity Hazard - No
Section 302 extremely hazardous substance (40 CFR 355, Appendix A)	No
Section 311/312 (40 CFR 370)	No
Drug Enforcement Administration (DEA) (21 CFR 1308.11-15)	Not controlled
WHMIS status	Controlled
WHMIS classification	D2B - Other Toxic Effects-TOXIC

WHMIS labeling

Inventory status

Country(s) or region	Inventory name	On inventory (yes/no)*
Australia	Australian Inventory of Chemical Substances (AICS)	Yes
Canada	Domestic Substances List (DSL)	Yes
Canada	Non-Domestic Substances List (NDSL)	No
China	Inventory of Existing Chemical Substances in China (IECSC)	Yes
Europe	European Inventory of Existing Commercial Chemical Substances (EINECS)	Yes
Europe	European List of Notified Chemical Substances (ELINCS)	No
Japan	Inventory of Existing and New Chemical Substances (ENCS)	No
Korea	Existing Chemicals List (ECL)	Yes
New Zealand	New Zealand Inventory	No
Philippines	Philippine Inventory of Chemicals and Chemical Substances (PICCS)	No
United States & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	Yes

*A "Yes" indicates this product complies with the inventory requirements administered by the governing country(s)

State regulations

US - California Hazardous Substances (Director's): Listed substance

Asphalt (CAS 8052-42-4)	Listed.
Hydrogen sulfide (CAS 7783-06-4)	Listed.
Polycyclic Aromatic Hydrocarbons (CAS 130498-29-2)	Listed.
Vaccum Tower Bottoms (CAS 64741-56-6)	Listed.

US - California Proposition 65 - Carcinogens & Reproductive Toxicity (CRT): Listed substance

Asphalt (CAS 8052-42-4)	Listed.
Vaccum Tower Bottoms (CAS 64741-56-6)	Listed.

US - California Proposition 65 - CRT: Listed date/Carcinogenic substance

Asphalt (CAS 8052-42-4)	Listed: January 1, 1990 Carcinogenic.
Vaccum Tower Bottoms (CAS 64741-56-6)	Listed: January 1, 1990 Carcinogenic.

US - New Jersey RTK - Substances: Listed substance

Asphalt (CAS 8052-42-4)	Listed.
Asphalt, oxidized (CAS 64742-93-4)	Listed.
Hydrogen sulfide (CAS 7783-06-4)	Listed.
Polycyclic Aromatic Hydrocarbons (CAS 130498-29-2)	Listed.
Vaccum Tower Bottoms (CAS 64741-56-6)	Listed.

US - Pennsylvania RTK - Hazardous Substances: Special hazard

Asphalt (CAS 8052-42-4)	Special hazard.
Vaccum Tower Bottoms (CAS 64741-56-6)	Special hazard.

US. Massachusetts RTK - Substance List

Asphalt (CAS 8052-42-4)	Listed.
Hydrogen sulfide (CAS 7783-06-4)	Listed.
Vaccum Tower Bottoms (CAS 64741-56-6)	Listed.

US. New Jersey Worker and Community Right-to-Know Act

Hydrogen sulfide (CAS 7783-06-4)	500 LBS
Polycyclic Aromatic Hydrocarbons (CAS 130498-29-2)	500 LBS

US. Pennsylvania RTK - Hazardous Substances

Asphalt (CAS 8052-42-4)	Listed.
Hydrogen sulfide (CAS 7783-06-4)	Listed.
Polycyclic Aromatic Hydrocarbons (CAS 130498-29-2)	Listed.
Vaccum Tower Bottoms (CAS 64741-56-6)	Listed.

16. Other Information

Other information	Note: This Material Safety Data Sheet applies to the listed products and synonym descriptions for Hazard Communication purposes only. Technical Specifications vary greatly depending on the products and are not reflected in this document. Consult specification sheets for technical information.
HMIS® ratings	Health: 2* Flammability: 1 Physical hazard: 0
NFPA ratings	Health: 2 Flammability: 1 Instability: 0