



**CITGO Asphalt Refining Company
620 West Germantown Pike, Suite 470
Plymouth Meeting, PA 19462**

Material Safety Data Sheet

Trade Name: **Cutback Asphalt,
Medium Cure, All Grades** Date: November 21, 2001

CAS No.: Mixture (Refer to Section 1) Commodity Code: APHMC

Synonyms: Petroleum Asphalt Cut-back;
Cutback Asphalt; Road Asphalt;
Road Tar, Liquid; MC-30; MC-70;
MC-250; MC-400; MC-800

CITGO Index No.: 5444

Technical Contact: (856) 224-7409
Medical Emergency: (918) 495-4700
CHEMTREC Emergency: (800) 424-9300

MATERIAL HAZARD EVALUATION

(Per OSHA Hazard Communication Standard [29 CFR 1910.1200])

Health Precautions: **DANGER:** This material can cause skin irritation. Hot cutback asphalt may release fumes that are irritating to the respiratory tract. Hot liquid causes burns. This mixture may release Hydrogen Sulfide (H₂S). At elevated concentrations, H₂S acts as a systemic poison and causes unconsciousness and death by respiratory paralysis. If burned by hot product, cool affected area immediately with cool water. Do not remove asphalt from skin. Seek medical attention immediately.

Safety Precautions: **Combustible Liquid.** Keep away from heat, open flame and other ignition sources.

HMIS Rating¹: Health: 1* Flammability: 2 Reactivity: 0

1.0 GENERIC COMPOSITION / COMPONENTS

Components	CAS No.	%	Hazard Data
Asphalt	8052-42-4	45 - 90	Oral LD ₅₀ (rat) 5 - 15 g/kg Skin TD (mouse): 69 g/kg/43W-I Skin TDLo (mouse): 130 g/kg/81W-I
Hydrodesulfurized Kerosene; (consisting of hydrocarbons having carbon numbers primarily in the range of C ₉ through C ₁₆ .)	64742-81-0	10 - 55	Dermal Toxicity, 28 D, (rabbit): Irritant Dermal Toxicity, acute, (rabbit): No deaths (2.0 g/kg) Inhalation Toxicity, acute (rat): No deaths (5.2 mg/L) Carcinogenesis, Chronic (mouse): Positive (dermal) Dermal Sensitization (guinea pig): Nonsensitizing Primary Dermal Irritation: Irritant Primary Eye Irritation: Mild Irritant

¹Hazard Rating: least-0; slight-1; moderate-2; high-3; extreme-4.

CITGO assigned these values based upon an evaluation conducted pursuant to NPCA guidelines. Use of an asterisk (*) indicates that the material may present chronic health effects.

1.0 GENERIC COMPOSITION / COMPONENTS (continued)

Components	CAS No.	%	Hazard Data
Hydrogen Sulfide	7783-06-4	trace	Eye irritation (human): 4 to 100 ppm Respiratory irritation (human): 50 to 500 ppm (potential pulmonary edema) Bronchitis (human): 250 ppm Severely toxic (human): 200 ppm Coma and death (human): 500 to 1000 ppm Inhalation LC ₅₀ (rat): 444 ppm. Inhalation LC ₅₀ (mouse): 673 ppm/1 H

2.0 PHYSICAL DATA

PHYSICAL HAZARD CLASSIFICATION (Per 29 CFR 1910.1200):

Combustible:	Yes	Flammable:	No	Pyrophoric:	No
Compressed Gas:	No	Organic Peroxide:	No	Reactivity:	No
Explosive:	No	Oxidizer:	No	Stable:	Yes

Initial Boiling Point, 760 mm Hg, °C (°F):	120 (249)
Specific Gravity (H ₂ O = 1):	0.90 - 0.98
Vapor Density (Air = 1):	> 1
% Volatiles by Volume:	10 to 55
Melting Point, °C (°F):	ND
Vapor Pressure, mm Hg (25°C):	ND
Solubility in Water:	No
Evaporation Rate (n-butyl acetate = 1):	< 1
pH of Undiluted Product:	NA
Appearance and Odor:	Black semi-solid or viscous liquid; tar-like or heavy hydrocarbon odor.

3.0 FIRE AND EXPLOSION DATA

Flash Point, OC, °C (°F):	38 - 74 (100 - 165)
Autoignition Temperature °C (°F):	229 (444)
NFPA Rating ² :	Health: <u>0</u> Flammability: <u>2</u> Reactivity: <u>0</u>
Flammable Limits ³ (% by volume in air):	Lower: <u>0.7</u> Upper: <u>5.0</u>
Extinguishing Media:	CO ₂ , dry chemical.
Special Fire Fighting Procedure:	Wear self-contained breathing apparatus when in confined area. Avoid inhaling fumes or vapor. Water or fire fighting foam may cause frothing. Use caution when using water on asphalt at temperatures above 100° C (212° F) as product may expand with explosive force.

²Hazard Rating: least - 0; slight - 1; moderate - 2; high - 3; extreme - 4.

The Company assigned these values based upon an evaluation conducted pursuant to NFPA guidelines.

³Based on vapors of kerosene components.

3.0 FIRE AND EXPLOSION DATA (continued)

Unusual Fire or Explosion Hazard: When heated, this material has volatile components that can travel along the ground to a remote ignition source and flash back. Under some conditions, sulfur compounds in hot asphalt may evolve H₂S or SO₂. At low concentrations, the odor of H₂S resembles decaying eggs. At higher concentrations, odor fatigue may occur, resulting in life-threatening inhalation hazard conditions.

4.0 REACTIVITY DATA

Stability: Stable.
Conditions Contributing to Instability: Extreme heat.
Incompatibility: Strong oxidants
Hazardous Decomposition Products: CO, CO₂, H₂S, Hydrocarbons, Smoke, and SO₂.
(thermal, unless otherwise specified)
Hazardous Polymerization: Hazardous polymerization is not expected to occur.

5.0 SPILL, LEAK AND DISPOSAL PROCEDURES

Procedure if Material is Spilled:

- Remove all potential ignition sources such as flares or flames.
- Isolate the hazard area and restrict access.
- Ventilate area of release to disperse mists or fumes, as necessary.
- **Small spills:** Take up with sand or other non-combustible absorbent material and place into containers for later disposal.
- **Large spills:** Evacuate area in the event of significant spills. Evaluate exposure potential. Use protective clothing and respiratory protection as needed. Contain spill in temporary dikes to avoid product migration and to assist in recovery. Mechanical containment may be required for liquid spills. Do not allow material to escape into sewers, ground water, drainage ditches or surface waters.
- Administer first aid as needed.
- OSHA HAZWOPER regulations may require establishing a regulated area with site control.
- Report spills as required to appropriate federal, state and local authorities.

Waste Disposal:

- It is the responsibility of the user to determine if any residues are regulated as hazardous waste at the time of disposal.
- State and/or local regulation may be more restrictive than federal regulations.
- Contact the RCRA/Superfund Hotline (800) 424-9346 or your regional U.S. EPA office for guidance concerning case specific disposal issues.

Protective Measures During Repair and Maintenance of Contaminated Equipment:

- Avoid skin contact with hot asphalt. Refer to Section 7.0.
- Check vapor space of storage tanks and process equipment for presence of toxic gases, vapors or asphalt fumes. Ventilate space as necessary to maintain airborne concentrations applicable workplace exposure levels.

5.0 SPILL, LEAK AND DISPOSAL PROCEDURES (continued)

- Eliminate ignition sources.
- Avoid skin contact.
- Remove contaminated clothing and launder before reuse.
- Wash exposed skin thoroughly.

6.0 HEALTH HAZARD DATA

Health Hazard Classification (Per 29 CFR 1910.1200):

Highly Toxic	No	Sensitizer (possibly phototoxic)	Yes
Toxic	Yes	Reproductive Effects	No
Corrosive	No	Mutagen	No
Irritant (fumes)	Yes	Target Organ (Skin, Respiratory System)	Yes

Carcinogen:

Product/Component	CAS No.	Conc. (%)	NTP	IARC	OSHA	Other
Cutback Asphalt, Medium Cure, All Grades	Mixture	100	No	Yes*	No	No
Asphalt	8052-42-4	45 - 90	No	Yes*	No	No
Hydrodesulfurized Kerosene	64742-81-0	10 - 55	No	No	No	No

*The International Agency for Research on Cancer (IARC) has determined that there is sufficient evidence for the carcinogenicity of extracts of steam-refined bitumens, air refined bitumens and pooled mixtures of steam- and air-refined bitumens in experimental animals. Further, IARC has determined that there is limited evidence for the carcinogenicity of undiluted steam-refined bitumens in experimental animals. Also, IARC determined that there is inadequate evidence that bitumens alone are carcinogenic to humans.

Toxicity Summary:

Laboratory evaluations have concluded that one or more components of this material have been associated with skin cancer in experimental animals. These effects were observed after repeated and prolonged skin contact. This material is a skin irritant and is moderately toxic to animals by ingestion.

This material may contain hydrogen sulfide (H₂S). At elevated concentrations, H₂S acts as a systemic poison and causes unconsciousness and death by respiratory paralysis.

Major Route of Entry: Inhalation of incidental mists or vapors, skin contact.

Acute Exposure Symptoms:

Inhalation: Asphalt fumes may cause irritation to respiratory system.

Inhalation of low concentrations of vapors, mists or aerosols of the component kerosene can cause transient euphoria similar to alcohol intoxication. Also, a burning sensation in the chest, weakness, poor coordination, and confusion may be present. At high concentrations, inhalation of this material may cause headaches, drowsiness, rapid breathing rate and coma. Upon inhalation, vapor of the component kerosene can irritate the lungs and can induce asthma.

6.0 HEALTH HAZARD DATA (continued)

Hydrogen Sulfide causes respiratory irritation at concentrations of four to 100 ppm. At low concentrations, H₂S has an odor of rotten eggs. At elevated concentrations, H₂S acts as a systemic poison, causing unconsciousness and death by respiratory paralysis. The National Institute for Occupational Safety and Health has determined that atmospheres containing 100 ppm or more of H₂S are immediately dangerous to life and health.

- Dermal:** This material may produce skin irritation. Hot asphalt will cause burns to the skin.
- Eye:** Contact with hot product will cause eye burns. Asphalt fumes are an irritant to eyes. Exposure to hydrogen sulfide at concentrations above four ppm may cause eye irritation. In addition, swelling of the eye (conjunctivitis) may occur from over exposure to the component kerosene.
- Ingestion:** Gastric masses (Bezoars) and stomach (pyloric) obstructions have been reported in individuals who have chewed and swallowed asphalt.
If ingested, the component kerosene can cause somnolence, hallucinations, distorted perceptions and fever. Swallowing causes gagging, coughing or strangling, followed by gastrointestinal tract irritation with nausea, vomiting and diarrhea. Bright red lips are an indication of kerosene ingestion.
- Injection:** Injection under the skin, in muscle or into the blood stream may cause skin irritation, inflammation, swelling, small clustered bruises or severe tissue damage. Most damage occurs during the first few hours.

Chronic Exposure Symptoms:

- Inhalation:** Asphalt fumes may cause irritation to respiratory system.
The International Agency for Research on Cancer (IARC) has determined that there is sufficient evidence for the carcinogenicity of extracts of steam-refined bitumens, air refined bitumens and pooled mixtures of steam- and air-refined bitumens in experimental animals. Further, IARC has determined that there is limited evidence for the carcinogenicity of undiluted steam-refined bitumens in experimental animals. Also, IARC determined that there is inadequate evidence that bitumens alone are carcinogenic to humans.
The effects of over exposure to component kerosene from chronic inhalation in laboratory animals include kidney damage, bronchioconstriction in rabbits, inflammatory of the lungs in guinea pigs. Symptoms of chronic inhalation exposure to kerosene above applicable workplace exposure levels include headache, inflammation of nerves, nerve pain, memory loss, lowered blood counts and respiratory problems.
- Dermal:** Studies have indicated that prolonged dermal exposures to the component kerosene have been associated with skin cancer to laboratory animals. Also, repeated and prolonged exposure may cause defatting that results in dry and cracked skin.
Repeated or prolonged contact at ambient temperatures may cause skin redness, blistering, dryness and/or scaly dermatitis. Long term exposure can cause dermatitis, acne, photosensitization and, more rarely, pigmentation of the skin.
- Ingestion:** Gastric masses (Bezoars) and stomach (pyloric) obstructions have been reported in individuals who have chewed and swallowed asphalt.

6.0 HEALTH HAZARD DATA (continued)

Other Special Effects:

Data published for the product generally refers to dermal contact at ambient conditions for potential chronic effects. Good personal hygiene is expected to reduce or eliminate long-term effects. Acute hazards are recognized at the elevated temperature of use. Fumes from hot product can cause respiratory discomfort and irritation.

Sulfur compounds in hot asphalt can form hydrogen sulfide (H₂S) gas. H₂S is a colorless toxic gas. Odor cannot be relied upon as a means of detection because the sense of smell rapidly becomes insensitive to H₂S. Also, the H₂S odor may be masked by the odor of hot asphalt. Because H₂S and kerosene vapors may accumulate in tanks and bulk transport compartments, personnel should stand up-wind and avoid breathing fumes or vapors when opening hatches or dome covers.

Medical Conditions Aggravated by Exposure:

Dermatoses and other skin conditions, pulmonary and cardiovascular conditions may be aggravated by over exposure to this material.

First Aid and Emergency Procedures for Acute Effects:

Inhalation: Move victim to fresh air. If victim is not breathing, immediately begin cardiopulmonary resuscitation (CPR). If breathing is difficult, 100 percent humidified oxygen should be administered by a qualified individual. Seek medical attention immediately.

Dermal: If burned by hot product, cool skin by quenching with cold water. Do not attempt to remove hot product. The burn area should be covered with a sterile dressing. Seek medical attention immediately. For contact with product at ambient temperatures, remove contaminated clothing and wash with soap and water. Launder clothing before use. Seek medical attention if tissue appears damaged or if irritation persists.

Eyes: Flush eyes with cool water while occasionally lifting and lowering eyelids. Seek medical attention if excessive tearing, irritation or pain persists. If hot product is splashed into eyes, flush with cool water. Seek medical attention immediately.

Ingestion: Do not induce vomiting unless directed to by a physician. Never give anything by mouth to a person who is not fully conscious. Seek medical attention immediately.

Injection: Injection under the skin, in muscle or into the blood stream is a medical emergency. Seek medical attention immediately.

Notes to Physician:

Hot asphalt may cause eye and skin burns. Immerse asphalt-covered skin in cool water to limit tissue damage. Cooling should be continued only until asphalt is hardened or reaches ambient temperature to avoid hypothermia. Anticipate blistered tissue. Hardened asphalt may be removed from unblistered tissue by applying liberal amounts of Polysorbate 80 over the affected area and covering the affected area with wet sterile dressings for six hours. Resultant emulsified asphalt may be removed with sterile water or saline solution.

6.0 HEALTH HAZARD DATA (continued)

Asphalt fumes, hydrogen sulfide gas and kerosene vapors are respiratory system, skin and eye irritants. Also, toxic effects are produced by inhalation of hydrogen sulfide, a potential component of this material. Monitor for respiratory distress. If cough or difficulty in breathing develops, evaluate for respiratory tract irritation, bronchitis or pneumonitis. Administer 100 percent humidified supplemental oxygen with assisted ventilation, as required.

7.0 SPECIAL PROTECTION INFORMATION

Ventilation Requirements:

When handling product in confined areas or when hot, use mechanical ventilation to maintain airborne concentrations below applicable work place exposure levels as evaluated by designated and properly trained individuals.

Applicable Workplace Exposure Levels:

Chemical Component	ACGIH TLV TWA ppm (mg/M ³)	ACGIH TLV STEL/ Ceiling (C) ppm (mg/M ³)	ACGIH TLVs Skin notation?	OSHA PEL TWA ppm (mg/M ³)	OSHA PEL STEL/ Ceiling (C) ppm (mg/M ³)	OSHA PEL Skin notation?
Asphalt Petroleum Fumes	(0.5) (as benzene-soluble aerosol (or equivalent method))	NE	No	NE	NE	No
Hydrogen Sulfide	10 (14)	15 (21)	No	NE	20 (50)(C) 10 min Peak/8 H	No
Sulfur Dioxide	2 (5)	5 (13)	No	5 (13)	NE	No
Kerosene ^{4,5}	NE	NE	No	500	2,000	No

Specific Personal Protective Equipment:

Personal protective equipment should be selected based upon the conditions under which this material is used. A hazard assessment of the work area for PPE requirements should be conducted by a qualified professional pursuant to OSHA regulations.

Respirator: Air concentrations of fumes or vapors determine the level of protection needed. Use only NIOSH-approved respiratory equipment. Use only supplied air respiratory equipment when H₂S concentrations are anticipated to exceed applicable workplace exposure levels. Air supplied respirators are recommended for confined space entry.

Eyes: Use splash proof goggles with face shield when handling hot asphalt.

Dermal: Protect against hot liquid. Use heat and chemical resistant gloves. Avoid direct skin contact.

Clothing or Equipment: For potential contact with hot asphalt, use whole body protection. Discard contaminated clothing including shoes. Wash skin thoroughly with soap and water after handling.

⁴The National Institute for Occupational Safety and Health has established a Recommended Exposure Limit (Eight Hour Time Weighted Average) of 100 ppm for Kerosene. CITGO suggests that this workplace exposure level is applicable for this material.

⁵The OSHA PELs listed for Kerosene are the standards for Petroleum Distillates.

8.0 TRANSPORTATION AND SPECIAL PRECAUTIONS

Storage: Store in a well ventilated area. Do not use or store this product near heat, flame or other potential ignition sources. Do not store with oxidizers. Do not store this product in unlabeled containers. Keep container closed.

Danger: **Flammable Liquid.** Use only in a well ventilated area. Empty containers may contain product residues which can ignite with explosive force. Consult appropriate federal, state and local authorities before reusing, reconditioning, reclaiming, recycling or disposing of empty containers and/or waste residues of this product.

DOT Information:

Proper Shipping Name:	Elevated temperature liquid, flammable, n.o.s. (Medium Cure Cutback Asphalt)
Hazard Class:	3
Hazard Identification No.:	UN 3256
Packaging Group	III
DOT Placard:	Flammable Liquid
Bulk Shipments at elevated temperatures:	“HOT”

9.0 ENVIRONMENTAL DATA

Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA)

Section 313 - Toxic Chemicals:

This product is not known to contain components in concentrations above *de minimis* levels that are listed as toxic chemicals in 40 CFR Part 372 pursuant to the requirements of Section 313 of SARA

Section 311/312 - Hazard Categories:

This product may meet one or more of the criteria for the hazard categories defined in 40 CFR Part 370 as established by Sections 311 and 312 of SARA as indicated below:

Immediate (Acute) Health Hazard:	<u>Yes</u>	Sudden Release of Pressure Hazard:	<u>No</u>
Delayed (Chronic) Health Hazard:	<u>Yes</u>	Reactive Hazard:	<u>No</u>
Fire Hazard:	<u>Yes</u>		

Section 302 - Extremely Hazardous Substances:

This product is not known to contain any components in concentrations greater than one percent that are listed as Extremely Hazardous Substances in 40 CFR Part 355 pursuant to the requirements of Section 302(a) of SARA.

Clean Water Act (CWA):

Under the CWA, discharges of crude oil and petroleum products to surface water without proper Federal and State permits must be reported immediately to the National Response Center at (800) 424-8802.

9.0 ENVIRONMENTAL DATA (continued)

Comprehensive Environmental Response, Compensation & Liability Act (CERCLA) Section 102 Hazardous Substances:

As defined in CERCLA, the term "hazardous substance" does not include petroleum, including crude oil or any fraction thereof which is not otherwise specifically listed or designated as a hazardous substance.

California Proposition 65 (The Safe Drinking Water and Toxics Enforcement Act):

WARNING: This product contains chemicals known to the State of California to cause cancer, birth defects or other reproductive harm.

Toxic Substances Control Act (TSCA):

Reported in TSCA Inventory as:	Product	Components
Cutback Asphalt, Medium Cure, All Grades		X

10.0 LABELING

DANGER:

Poisonous - may release H₂S.
Combustible Liquid
Hot liquid may cause burns to eyes and skin.
Fumes may cause respiratory tract irritation.
Target Organ(s): Skin, Respiratory System.

HANDLING:

Keep away from heat and flame.
Avoid breathing vapor.
Avoid contact with skin and clothing.
Use only with adequate ventilation.

FIRST AID:

Inhalation: If not breathing provide CPR. If breathing is difficult, give oxygen.
Skin: Upon contact with hot product, cool affected area with cool water. Seek medical attention immediately.
Eye: Flush with cool water. Seek medical attention immediately.

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