



MATERIAL SAFETY DATA SHEET

1 CHEMICAL PRODUCT & COMPANY IDENTIFICATION

TRADE NAME(S) **GRADE 54 EXPANDABLE POLYSTYRENE (NORTH AMERICA - ENGLISH)**

CAS NUMBER Mixture

MSDS NUMBER 21503

PRODUCT CODE(S) GRADE 54

SYNONYM(S) APPLICABLE TO ALL GRADE 54 PRODUCT TYPES

MANUFACTURER / SUPPLIER Flint Hills Resources, LP
501 Brunner Street
Peru, IL
61354 USA

TELEPHONE NUMBERS - 24 HOUR EMERGENCY ASSISTANCE

CHEMTREC (US)	800-424-9300
CHEMTREC	703-527-3887
CARECHEM24 (Asia)	65 633 44 177
CARECHEM24 (Europe)	44 208 762 8322 (UK)
CARECHEM24 (No. & So. America)	44 208 762 8322 (UK)
Flint Hills Resources, LP	815-224-5223

TELEPHONE NUMBERS - GENERAL ASSISTANCE

8-5 (M-F, CST)	815-224-5257
8-5 (M-F, CST) MSDS Assistance	316-828-7988
Email: msdsrequest@fhr.com	

2 HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

WARNING!

HEALTH HAZARDS

DUST MAY CAUSE SKIN, EYE AND RESPIRATORY TRACT IRRITATION
FUMES FROM HOT PRODUCT CAN CAUSE IRRITATION TO THE EYES, SKIN AND RESPIRATORY SYSTEM
HEATED MATERIAL MAY CAUSE THERMAL BURNS

SEE "TOXICOLOGICAL INFORMATION" (SECTION 11) FOR MORE INFORMATION

FLAMMABILITY HAZARDS

SOLID WITH EXTREMELY FLAMMABLE SOLVENT AND VAPORS
EXTREMELY FLAMMABLE GASES MAY EVOLVE FROM THIS MATERIAL

REACTIVITY HAZARDS

STABLE

POTENTIAL HEALTH EFFECTS, SKIN

Dusts may cause irritation due to abrasion. Repeated or prolonged skin contact may cause reddening, itching and inflammation.

Contains a component(s) that may cause allergic skin reactions in some individuals.

POTENTIAL HEALTH EFFECTS, EYE

Dusts may cause mechanical irritation including pain, lacrimation and redness. Effects may become more serious with repeated or prolonged contact.

POTENTIAL HEALTH EFFECTS, INHALATION

Dusts may cause irritation to the nose, throat and lungs by mechanical abrasion.

Fumes or vapors from the heated material may be irritating to the respiratory tract.

Overexposure to this material may cause systemic damage including target organ effects listed under "Toxicological Information" (Section 11).

POTENTIAL HEALTH EFFECTS, INGESTION

Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhea.

3 COMPOSITION / INFORMATION ON INGREDIENTS

Ingredient Name	CAS Number	Concentration*	Exposure Limits / Health Hazards
POLYSTYRENE	9003-53-6	92.3 - 97 %	No Data
PENTANES	Mixture	3 - 7.5 %	1000 ppm 8-Hour TWA (OSHA) 600 ppm 8-Hour TWA (ACGIH)
MODIFIERS - ADDITIVES	Mixture	0.005 - 3 %	No Data

*Values do not reflect absolute minimums and maximums; these values are typical which may vary from time to time.

COMPOSITION COMMENTS

This Material Safety Data Sheet is intended to communicate potential health hazards and potential physical hazards associated with the product(s) covered by this sheet, and is not intended to communicate product specification information. For product specification information, contact your Flint Hills Resources, LP representative.

4 FIRST AID MEASURES

SKIN

Immediately wash skin with plenty of soap and water after removing contaminated clothing and shoes. Get medical attention if irritation develops or persists.

EYE

Flush immediately with large amounts of water for at least 15 minutes. Eyelids should be held away from the eyeball to ensure thorough rinsing. Get medical attention if irritation persists.

INHALATION

Remove to fresh air. If not breathing, institute rescue breathing. If breathing is difficult, ensure airway is clear and give oxygen. If heart has stopped, immediately begin cardiopulmonary resuscitation (CPR).

Keep affected person warm and at rest. GET IMMEDIATE MEDICAL ATTENTION.

INGESTION

If spontaneous vomiting occurs, keep head below hips to prevent aspiration and monitor for breathing difficulty.

Never give anything by mouth to an unconscious person.

Keep affected person warm and at rest. GET IMMEDIATE MEDICAL ATTENTION.

NOTES TO PHYSICIAN

INHALATION: This material (or a component) sensitizes the myocardium to the effects of sympathomimetic amines. Epinephrine and other sympathomimetic drugs may initiate cardiac arrhythmias in individuals exposed to this material. Administration of sympathomimetic drugs should be avoided.

5 FIRE FIGHTING MEASURES

HAZARDOUS COMBUSTION PRODUCTS

A variety of decomposition products may occur including simple hydrocarbons to toxic and irritating gases such as carbon, carbon monoxide, carbon dioxide, styrene, acids, ketones, and aldehydes.

EXTINGUISHING MEDIA

Use water spray, dry chemical, carbon dioxide or fire-fighting foam for Class B fires to extinguish fire.

BASIC FIRE FIGHTING PROCEDURES

Material is a solid containing an extremely flammable liquid and vapor. Material will burn on contact with flame or exposure to high temperature.

Evacuate area and fight fire from a safe distance.

If spilled material has not ignited, ventilate area and use water spray to disperse gas or vapor and to protect personnel. Use water spray to cool adjacent structures.

Containers can build up pressure if exposed to heat (fire). Stay away from storage container ends. Withdraw immediately in case of rising sound from venting safety device or any discoloration of storage container due to fire.

Be aware that a BLEVE (Boiling Liquid Expanding Vapor Explosion) may occur unless surfaces are kept cool with water.

Firefighters must wear NIOSH approved positive pressure breathing apparatus (SCBA) with full face mask and full protective equipment.

UNUSUAL FIRE & EXPLOSION HAZARDS

Extremely flammable vapors form flammable or explosive mixtures with air at room temperature. Vapor or gas may spread to distant ignition sources and flash back. Eliminate ignition sources (including static spark) and prevent vapor accumulation.

Explosion hazard if exposed to extreme heat.

Hazardous melting and dripping may occur at elevated temperatures. May burn at or above flash point, and airborne dust may explode if ignited.

Flash Point	-60 °F (-51.1 °C) (As Pentanes) (Estimated)
Autoignition Temperature	500 °F (260.0 °C) (As Pentanes) (Estimated)
Flammability Limits in Air, Lower, % by Volume	1.4 % (As Pentanes)
Flammability Limits in Air, Upper, % by Volume	8.3 % (As Pentanes)

6 ACCIDENTAL RELEASE MEASURES

EMERGENCY ACTION

Eliminate and/or shut off ignition sources and keep ignition sources out of the area. Keep unnecessary people away; isolate hazard area and deny entry. Stay upwind. Isolate for 800 meters (1/2 mile) in all directions if tank, rail car or tank truck is involved in fire. Evacuate area endangered by release as required. (See Exposure Controls/Personal Protection, Section 8.)

ENVIRONMENTAL PRECAUTIONS

Avoid excessive generation of dust. If dust is generated, appropriate respiratory, eye and skin protection should be used to protect personnel during clean-up.

If material is released to the environment, take immediate steps to stop and contain release. Notify local, provincial and/or federal authorities, if required.

SPILL OR LEAK PROCEDURE

Avoid generation of static spark during clean up. Avoid the generation of dusts during clean-up. Sweep up or gather material and place in appropriate container for disposal. Avoid cleanup procedures that may result in water pollution.

See Exposure Controls/Personal Protection (Section 8).

7 HANDLING & STORAGE

HANDLING

Minimize vapor accumulation in confined spaces with positive ventilation. Minimize dust generation during handling and contact.

Dusts may become explosive when dispersed in a confined space such as a building or vessel and in the presence of oxygen and heat (spark). Risk of dust-air explosion is increased if flammable vapors are present.

Ground and bond equipment used to reduce the possibility of static spark-initiated fire or explosion. Use non-sparking tools. Do not cut, grind, drill, weld or reuse containers unless adequate precautions are taken against these hazards.

Avoid accumulation of dust on surfaces. Clean up dust using approved methods.

Avoid inhaling dust and contact with skin and eyes.

Do not eat, drink or smoke in areas of use or storage.

STORAGE

Store in tightly closed containers in a cool, dry, isolated, well-ventilated area away from heat, sources of ignition and incompatibles.

Empty containers may contain material residue. Do not reuse without adequate precautions.

Do not eat, drink or smoke in areas of use or storage.

8 EXPOSURE CONTROLS / PERSONAL PROTECTION

ENGINEERING CONTROLS

General or local exhaust ventilation and other forms of engineering controls are the preferred means for controlling exposures.

EYE PROTECTION: PERSONAL PROTECTION EQUIPMENT (PPE)

Keep away from eyes. Eye contact can be avoided by using chemical safety glasses, goggles, and/or face shield. Have eye washing facilities readily available where eye contact can occur.

SKIN PROTECTION: PERSONAL PROTECTION EQUIPMENT (PPE)

Avoid skin contact with this material. Use appropriate chemical protective gloves when handling. Additional protective clothing may be necessary, such as antistatic clothing and conductive footwear.

Good personal hygiene practices such as properly handling contaminated clothing, using wash facilities before entering public areas and restricting eating, drinking and smoking to designated areas are essential for preventing personal chemical contamination.

RESPIRATORY PROTECTION: PERSONAL PROTECTION EQUIPMENT (PPE)

A NIOSH approved dust respirator may be appropriate under certain circumstances where airborne concentrations are expected to exceed exposure limits. Protection provided by air purifying respirators is limited. Use a positive pressure air supplied respirator if there is any potential for an uncontrolled release, exposure levels are not known, or any other circumstances where air purifying respirators may not provide adequate protection.

9 PHYSICAL & CHEMICAL PROPERTIES

ODOR AND APPEARANCE

WHITE SOLID WITH HYDROCARBON ODOR

Flash Point	-60 °F (-51.1 °C) (As Pentanes) (Estimated)
Boiling Point	Not Applicable - Solid
Specific Gravity	Not Applicable
Melting Point	Softens & Expands @ 60-101.7 °C (140-215 °F) (EPS Beads Containing Pentanes)
Percent Volatile	7.5 Maximum (As Pentanes)
Vapor Pressure	< 100 mmHg @ 25°C
Evaporation Rate	No Data
Vapor Density	Not Applicable
Viscosity	No Data
Solubility in Water	Negligible (<1%)
Octanol/Water Partn	No Data
Freezing Point	No Data
Density	1.020 @25 °C, g/ml
Molecular Formula	Not Applicable
Molecular Weight	Not Applicable
Chemical Family	Polystyrene Thermoplastic Polymer
Odor Threshold	No Data

10 STABILITY & REACTIVITY

STABILITY/INCOMPATIBILITY

Avoid contact with strong oxidizers.

Avoid high temperatures, open flames, sparks and the use of ungrounded electrical equipment.

See precautions under Handling & Storage (Section 7).

HAZARDOUS REACTIONS/DECOMPOSITION PRODUCTS

Combustion may produce hazardous combustion products and other decomposition products in the case of incomplete combustion.

HAZARDOUS POLYMERIZATION

Will not occur.

11 TOXICOLOGICAL INFORMATION

ROUTES OF EXPOSURE

Inhalation, ingestion, skin and eye contact.

TOXICOLOGICAL DATA

PENTANES: Studies of pentane isomers in laboratory animals indicate exposure to extremely high levels (roughly 10 vol.%) may induce cardiac arrhythmias (irregular heartbeats) which may be serious or fatal.

POLYSTYRENE: Dust may be irritating to the respiratory system. Prolonged and repeated inhalation of dust may cause impaired lung function and lung changes. Vapors and fumes from thermal processing may be irritating to the eyes and respiratory system.

DIBENZOYL PEROXIDE: Contact allergic dermatitis has been reported in workers and in persons using dermal lotions and anti-acne medicinal preparations containing dibenzoyl peroxide. Evidence of dermal tumor promotion effects were observed in studies in laboratory rodents receiving repeated dermal applications. Evidence of damage to DNA (strand breaks) has been observed in some types of skin cells following exposure to dibenzoyl peroxide. Increased embryonic mortality and malformations were observed in chicken embryos incubated while exposed to dibenzoyl peroxide. The International Agency on Research in Cancer (IARC) has classified dibenzoyl peroxide as having limited evidence of carcinogenicity in experimental animals and inadequate evidence in humans. The overall evaluation is not classifiable as to its carcinogenicity to humans (Group 3).

DICUMYL PEROXIDE: Reduced pulmonary function, dermatitis, contact (allergic) dermatitis and changes in the vasculature of nasal mucosal membranes were reported in a study of workers exposed to this material. Anemia was observed in repeat-dose feeding studies in laboratory animals. Malformations were observed in chick embryos exposed to solutions of this material during incubation. Histopathological changes were observed in the nasal mucosal membranes of laboratory animals in repeat-dose inhalation studies.

HEXABROMOCYCLODODECANE: Findings from a dermal sensitization study in laboratory animals was positive. Reports of sensitization in humans are uncertain, but suggest this material is a weak allergic sensitizer. Evidence of adverse effects of the liver, prostate and disruption of thyroid function and homeostasis were observed in repeat-dose studies in laboratory animals receiving this material by the oral route of exposure. Findings from an oral reproduction study in laboratory animals included reduced pup viability and some evidence of abnormal neurobehavioral development.

STYRENE: Neurological effects including learning and memory impairment, increased reaction time and altered nerve conduction have been observed in studies of workers exposed to styrene but there does not appear to be evidence of permanent effects. Some studies indicate occupational exposure to styrene may be related to hearing loss but other studies do not. Studies in laboratory rats have demonstrated evidence of hearing loss at an exposure level of 600-700 ppm for 4 weeks. Chromosomal damage has been observed in lymphocytes of peripheral blood of workers exposed to styrene. Studies in laboratory animals include positive in vivo micronuclei findings, chromosome breaks in cells from the kidney, liver, lung, testes, brain, and circulating blood cells. An increased incidence of leukemia was observed in a study of workers exposed to styrene and butadiene. Another study did not show a significant increase in leukemia in workers exposed to styrene. The International Agency for Research in Cancer (IARC) has classified styrene as 2B - 'possibly carcinogenic'; inadequate evidence in humans. Adverse effects on the testicles and sperm formation were observed in laboratory animals exposed to high levels of styrene by the oral route of exposure. Some studies suggest a slightly increased rate of spontaneous abortion in workers exposed to styrene and others do not. Increased serum liver enzyme levels and increased NAG (an early marker of renal toxicity) have been observed in workers exposed to styrene. Increased erythrocyte Heinz body formation has been observed in laboratory animals exposed to styrene.

Exposure to this material may cause adverse effects or damage to the following organs or organ systems: central nervous system, skin, eyes, respiratory tract, immune system, heart, thyroid, prostate, liver, and blood.

12 ECOLOGICAL INFORMATION

ECOTOXICOLOGICAL INFORMATION

ECOTOXICITY:

Not classified as harmful to aquatic organisms.

PERSISTENCE/BIODEGRADATION:

Not readily biodegradable.

BIOACCUMULATION:

Not classified in terms of bioaccumulation in aquatic organisms.

MOBILITY IN ENVIRONMENT:

Not classified in terms of mobility in air, soil and water.

13 DISPOSAL CONSIDERATIONS

WASTE DISPOSAL

Under RCRA, it is the responsibility of the user of the material to determine, at the time of disposal, whether the material meets RCRA criteria for hazardous waste.

In Canada, wastes should be disposed of according to federal, state, provincial and local regulations.

14 TRANSPORT INFORMATION

BILL OF LADING - BULK (U. S. DOT)

UN2211, Polymeric Beads, Expandable, 9, PGIII

BILL OF LADING - NON-BULK (U. S. DOT)

UN2211, Polymeric Beads, Expandable, 9, PGIII

BILL OF LADING (CTDG)

UN2211, Polymeric Beads, Expandable, 9, PGIII

COMMENTS

See Bill of Lading for proper shipping description.

15 REGULATORY INFORMATION

FEDERAL REGULATIONS

All ingredients are on the TSCA inventory, or are not required to be listed on the TSCA inventory.

This material, as supplied, contains no hazardous substances regulated under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302), or any extremely hazardous substances regulated under the Emergency Planning and Community Right to Know Act (EPCRA) (40 CFR 355), and thus a release of this material as supplied has no reporting requirements under these regulations.

This material does not contain toxic chemicals (in excess of the applicable de minimis concentration) that are subject to the annual toxic chemical release reporting requirements of the Superfund Amendments and Reauthorization Act (SARA) Section 313 (40 CFR 372).

This material contains substances subject to accident prevention regulations when present above the applicable threshold quantities (Section 112(r) of the Clean Air Act).

Check local, regional or state/provincial regulations for any additional requirements as these may be more restrictive than federal laws and regulations. Failure to report may result in substantial civil and criminal penalties.

STATE REGULATIONS

Based on available information this product does not contain any components or chemicals currently known to the State of California to cause cancer, birth defects or reproductive harm at levels which would be subject to Proposition 65. Reformulation, use or processing of this material may affect its composition and require re-evaluation.

This product, as sold, meets the requirements of the Model Toxics Legislation of the Coalition of Northeastern Governors (CONEG). Any alteration of this product may affect its compliance with this law.

CANADIAN REGULATIONS

All known major components of this material are listed on the Canadian Environmental Protection Act (CEPA) DSL or are exempt.

WHMIS STATUS

Controlled

WHMIS CLASSIFICATION

B4 - Flammable/Combustible

WHMIS LABELING



INTERNATIONAL REGULATIONS

All ingredients are on the following chemical inventories or are not required to be listed:

US INVENTORY (TSCA)

EU INVENTORY (EINECS/ELINCS)

CANADA INVENTORY (DSL)

SARA 311/312 HAZARD CATEGORIES

Immediate Hazard: X Delayed Hazard: X Fire Hazard: X Pressure Hazard:

Reactivity Hazard:

NFPA RATINGS

Health 1 Flammability 3 Instability 0 Special Hazards

HMIS RATINGS

Health 1* Flammability 3 Physical Hazard 0

16 OTHER INFORMATION**DISCLAIMER**

NOTICE: The information presented herein is based on data considered to be accurate as of the date of preparation of this Material Safety Data Sheet. Adequate training and instruction should be given by you to your employees and affected personnel. Appropriate warnings and safe handling procedures should be provided by you to handlers and users. Additionally, the user should review this information, satisfy itself as to its suitability and completeness, and pass on the information to its employees or customers in accordance with the applicable federal, state, provincial or local hazard communication requirements. This MSDS may not be used as a commercial specification sheet of manufacturer or seller, and no warranty or representation, expressed or implied, is made as to the accuracy or comprehensiveness of the foregoing data and safety information, nor is any authorization given or implied to practice any patented invention without a license. In addition, vendor neither assumes nor retains any responsibility for any damage or injury resulting from abnormal use, from any failure to adhere to appropriate practices, or from any hazards inherent in the nature of the material.

SECTIONS / SUBSECTIONS CHANGED

CHEMICAL PRODUCT & COMPANY IDENTIFICATION: Product & Company Identification

Completed By Flint Hills Resources, LP - Operations EH&S