SAFETY DATA SHEET

1. Identification

Product identifier	**ORTHOXYLENE**
Other means of identification	
SDS number	5027
Synonyms	1,2-DIMETHYLBENZENE * O-DIMETHYLBENZENE * O-XYLENE * O-METHYLTOLUENE * 1,2-XYLENE * O-XYLOL
Recommended use	Used to make plasticizer, vitamins, dyes and insecticides.
Recommended restrictions	Other uses are not recommended unless an assessment is completed, prior to commencement of that use, which demonstrates that the use will be controlled.

Manufacturer/Importer/Supplier/Distributor information

Flint Hills Resources Corpus Christi, LLC
2825 Suntide Road
Corpus Christi, TX
78409
United States

Supplier

Flint Hills Resources, LP
P.O. Box 2917
Wichita, KS
67201-2917
United States

Telephone numbers – 24 hour emergency assistance	
Chemtrec	800-424-9300 (CCN:8586)
Carechem24 (US/Canada)	866-928-0789
Carechem24 (Mexico)	52 555 004 8763
Carechem24 (Brazil)	55 11 3197 5891
Carechem24 (UK)	+44 (0) 1235 239 670
Flint Hills Resources Corpus Christi, LLC	361-242-8596
24 Hour Emergency Telephone	800-835-1121
Telephone numbers – general assistance	
8-5 (M-F, CST) Customer Service	800-835-1121
8-5 (M-F, CST) SDS Assistance	316-828-7988
Email:	msdsrequest@fhr.com

2. Hazard(s) identification

Physical hazards	Flammable liquids	Category 3
Health hazards	Acute toxicity, inhalation	Category 4
	Skin corrosion/irritation	Category 2
	Serious eye damage/eye irritation	Category 2A
	Specific target organ toxicity, single exposure	Category 3 respiratory tract irritation
	Specific target organ toxicity, single exposure	Category 3 narcotic effects
	Aspiration hazard	Category 1

Environmental hazards Hazardous to the aquatic environment, acute hazard Category 2

OSHA defined hazards Not classified.

Label elements

Signal word Danger

Hazard statement Flammable liquid and vapor. Harmful if inhaled. Causes skin irritation. Causes serious eye irritation. May cause respiratory irritation. May cause drowsiness or dizziness. May be fatal if swallowed and enters airways. Toxic to aquatic life.

Precautionary statement

Prevention Keep away from heat/sparks/open flames/hot surfaces. - No smoking. Keep container tightly closed. Ground/bond container and receiving equipment. Use explosion-proof electrical/ventilating/lighting equipment. Use only non-sparking tools. Take precautionary measures against static discharge.

Avoid breathing mist or vapor. Wash thoroughly after handling. Use only outdoors or in a well-ventilated area. Avoid release to the environment. Wear protective gloves/protective clothing/eye protection/face protection.

Response If swallowed: Immediately call a poison center/doctor. Do NOT induce vomiting.

If skin irritation occurs: Get medical advice/attention.

If inhaled: Remove person to fresh air and keep comfortable for breathing. Call a poison center/ doctor if you feel unwell.

If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice/attention.

In case of fire: Use water spray, dry chemical, carbon dioxide or fire-fighting foam to extinguish. Specific treatment (see first aid instructions on this label). Wash contaminated clothing before reuse.

Storage Keep container tightly closed. Keep cool. Store in a well-ventilated place. Store locked up.

Disposal Dispose of contents/container in accordance with local/regional/national/international regulations.

Hazard(s) not otherwise classified (HNOC) Static accumulating flammable liquid can become electrostatically charged even in bonded and grounded equipment.

Supplemental information Sparks may ignite liquid and vapor. May cause flash fire or explosion. Keep away from heat/sparks/open flames/hot surfaces. – No smoking. Ground/bond container and receiving equipment. These alone may be insufficient to remove static electricity. Eliminate all ignition sources if safe to do so.

3. Composition/information on ingredients

Mixtures

Chemical name	Common name and synonyms	CAS number	%
ORTHOXYLENE		95-47-6	95 - 100

Additional components

Chemical name	Common name and synonyms	CAS number	%
METAXYLENE		108-38-3	≤ 1
CUMENE		98-82-8	≤ 0.3
PARAXYLENE		106-42-3	≤ 0.3
ETHYLBENZENE		100-41-4	≤ 0.1
TOLUENE		108-88-3	≤ 0.1
BENZENE		71-43-2	< 0.1
1,3,5-TRIMETHYLBENZENE	MESITYLENE	108-67-8	< 0.1

Additional components

Chemical name	Common name and synonyms	CAS number	%
STYRENE		100-42-5	< 0.1

Composition comments

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

This 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

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.

Skin contact

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

Place contaminated clothing in closed container for storage until laundered or discarded. If clothing is to be laundered, inform person performing operation of contaminant's hazardous properties. Discard contaminated leather goods.

Eye contact

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 IMMEDIATE MEDICAL ATTENTION.

Ingestion

Do not induce vomiting because of danger of aspirating liquid into lungs, causing serious damage and chemical pneumonitis. 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.

Most important symptoms/effects, acute and delayed

INHALATION:
Breathing high concentrations may be harmful. Breathing of the mists, vapors or fumes may irritate the nose, throat and lungs. May cause central nervous system depression or effects. Symptoms may include headache, excitation, euphoria, dizziness, incoordination, drowsiness, light-headedness, blurred vision, fatigue, tremors, convulsions, loss of consciousness, coma, respiratory arrest and death, depending on the concentration and duration of exposure.

Breathing high concentrations of this material, for example, in a confined space or by intentional abuse, can cause irregular heartbeats which can cause death. Breathing of the mists, vapors or fumes may irritate the nose, throat and lungs.

SKIN:
Contact may cause reddening, itching and inflammation. Skin contact may cause harmful effects in other parts of the body. Prolonged skin contact may defat the skin and cause drying, cracking and/or dermatitis.

EYES:
May cause severe eye irritation with pain, tearing, burning feeling, sensitivity to light, swelling and possible corneal damage. Effects may become more serious with repeated or prolonged contact.

INGESTION:
May cause irritation of the mouth, throat and gastrointestinal tract. Symptoms may include salivation, pain, nausea, vomiting and diarrhea.

Aspiration into lungs may cause chemical pneumonia and lung damage.

Exposure may also cause central nervous system symptoms similar to those listed under "Inhalation" (see Inhalation section).

Indication of immediate medical attention and special treatment needed

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.

INGESTION: If ingested this material represents a significant aspiration and chemical pneumonitis hazard. Induction of emesis is not recommended.

5. Fire-fighting measures

Suitable extinguishing media	Use water spray, dry chemical, carbon dioxide or fire-fighting foam for Class B fires to extinguish fire.
Unsuitable extinguishing media	Do not use a solid water stream as it may scatter and spread fire.
Specific hazards arising from the chemical	Combustion may produce COx, reactive hydrocarbons, irritating vapors, and other decomposition products in the case of incomplete combustion. Material will burn in a fire. Vapors may form explosive mixtures with air. Vapors can travel to a source of ignition and flash back. Static accumulator (nonconductive) flammable or combustible material may form ignitable vapor-air mixtures in storage tanks and other confined spaces. Bonding and grounding may be insufficient to eliminate the hazard from static accumulation. Explosion hazard if exposed to extreme heat.
Special protective equipment and precautions for firefighters	Shut off source of flow, if possible. Evacuate area and fight fire from a safe distance. If leak or spill has not ignited, ventilate area and use water spray to disperse gas or vapor, cool adjacent structures, and to protect personnel attempting to stop a leak. Containers can build up pressure if exposed to heat (fire). Stay away from storage tank ends. Withdraw immediately in case of rising sound from venting safety device or any discoloration of storage tank due to fire. Always stay away from tanks engulfed in flame. Firefighters must wear NIOSH approved positive pressure breathing apparatus (SCBA) with full face mask and full protective equipment.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures	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. For spills in confined areas, ensure adequate ventilation. For spills outdoors, stay upwind. IF TANK, RAILCAR OR TANK TRUCK IS INVOLVED IN A FIRE, isolate for 800 meters (1/2 mile) in all directions. Evacuate area endangered by release as required. Wear appropriate personal protective equipment. See Exposure Controls/Personal Protection (Section 8).
Methods and materials for containment and cleaning up	Keep unnecessary people away. Isolate area for at least 50 meters (164 feet) in all directions to preserve public safety. For large spills, if downwind consider initial evacuation for at least 300 meters (1000 feet). Keep ignition sources out of area and shut off all ignition sources. Use non-sparking tools and grounded equipment for clean-up. Small Spills: Absorb spill with inert material (e.g., dry sand or earth), then place in a chemical waste container. Large Spills: Dike far ahead of liquid spill for later disposal. Avoid clean up procedures that may result in water pollution. Use vapor reducing foam to reduce vapors. Avoid clean up procedures that may result in water pollution. Do not touch or walk through spilled material. Stop leak when safe to do so. See Exposure Controls/Personal Protection (Section 8).
Environmental precautions	Prevent entry into water ways, sewers, basements or confined areas. Notify local authorities and National Response Center, if required.

7. Handling and storage

Precautions for safe handling

Electrostatic charge may accumulate and create a hazardous condition when handling this material.

Static accumulator (nonconductive) flammable or combustible material may form ignitable vapor-air mixtures in storage tanks. Bond and ground lines and equipment (tank, transfer lines, pump, floats, etc.) used during transfer to reduce the possibility of static spark-initiated fire or explosion.

Review all operations which have the potential of generating and accumulating an electrostatic charge and/or a flammable atmosphere (such as tank and container filling, splash filling, tank cleaning, sampling, gauging, switch loading, filtering, mixing, agitation, and vacuum truck operations) and use appropriate procedures to mitigate the hazard.

Bonding and grounding may be insufficient to eliminate the hazard from static accumulation. Additional precautions should be considered consistent with the current NFPA 77, Recommended Practice on Static Electricity, the current API Recommended Practice 2003, Protection Against Ignitions Arising Out of Static, Lightning, and Stray Currents and OSHA Standard 29 CFR 1910.106, Flammable and Combustible Liquids.

Avoid contact with strong oxidizing agents and strong reducing agents. Prevent small spills to minimize slip hazard or release to the environment. Use non-sparking tools. Do not use electronic devices while handling, unless the device is certified as intrinsically safe as they could present ignition sources. Do not cut, grind, drill, weld or reuse empty containers unless adequate precautions are taken.

Avoid personal contact with this material. Always observe good personal hygiene measures, such as removing contaminated clothing and protective equipment, washing after handling the material and before entering public areas. Restrict eating, drinking and smoking to designated areas to prevent personal chemical contamination. Routinely wash work clothing and protective equipment to remove contaminants. Do not breathe mist or vapor.

See Section 8 of the SDS for Personal Protective Equipment.

Conditions for safe storage, including any incompatibilities

Store in tightly closed containers in a cool, dry, isolated, well-ventilated area away from heat, sources of ignition and incompatibles. Avoid contact with strong oxidizing agents and strong reducing agents. Empty containers may contain material residue. Do not reuse without adequate precautions.

8. Exposure controls/personal protection

Occupational exposure limits

The following constituents are the only constituents of the product which have a PEL, TLV or other recommended exposure limit. At this time, the other constituents have no known exposure limits.

US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)

Additional components	Type	Value
BENZENE (CAS 71-43-2)	STEL	5 ppm
	TWA	1 ppm

US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000)

Components	Type	Value
ORTHOXYLENE (CAS 95-47-6)	TWA	100 ppm

Additional components	Type	Value
METAXYLENE (CAS 108-38-3)	TWA	100 ppm
CUMENE (CAS 98-82-8)	TWA	50 ppm
PARAXYLENE (CAS 106-42-3)	TWA	100 ppm
ETHYLBENZENE (CAS 100-41-4)	PEL	100 ppm

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

Additional components	Type	Value
TOLUENE (CAS 108-88-3)	Ceiling	300 ppm

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

Additional components	Type	Value
	TWA	200 ppm
BENZENE (CAS 71-43-2)	TWA	10 ppm
STYRENE (CAS 100-42-5)	Ceiling	200 ppm
	TWA	100 ppm

US. ACGIH Threshold Limit Values

Components	Type	Value
ORTHOXYLENE (CAS 95-47-6)	STEL	150 ppm
	TWA	100 ppm

Additional components	Type	Value	Form
METAXYLENE (CAS 108-38-3)	STEL	150 ppm	
	TWA	100 ppm	
CUMENE (CAS 98-82-8)	TWA	50 ppm	
PARAXYLENE (CAS 106-42-3)	STEL	150 ppm	
	TWA	100 ppm	
ETHYLBENZENE (CAS 100-41-4)	TWA	20 ppm	
TOLUENE (CAS 108-88-3)	TWA	20 ppm	
BENZENE (CAS 71-43-2)	STEL	2.5 ppm	Skin
	TWA	0.5 ppm	Skin
1,3,5-TRIMETHYLBENZENE (CAS 108-67-8)	TWA	25 ppm	
STYRENE (CAS 100-42-5)	STEL	40 ppm	
	TWA	20 ppm	

US. NIOSH: Pocket Guide to Chemical Hazards

Components	Type	Value
ORTHOXYLENE (CAS 95-47-6)	STEL	150 ppm
	TWA	100 ppm

Additional components	Type	Value
METAXYLENE (CAS 108-38-3)	STEL	150 ppm
	TWA	100 ppm
CUMENE (CAS 98-82-8)	TWA	50 ppm
PARAXYLENE (CAS 106-42-3)	STEL	150 ppm
	TWA	100 ppm
ETHYLBENZENE (CAS 100-41-4)	STEL	125 ppm
	TWA	100 ppm
TOLUENE (CAS 108-88-3)	STEL	150 ppm
	TWA	100 ppm
BENZENE (CAS 71-43-2)	STEL	1 ppm
	TWA	0.1 ppm
1,3,5-TRIMETHYLBENZENE (CAS 108-67-8)	TWA	25 ppm
STYRENE (CAS 100-42-5)	STEL	100 ppm
	TWA	50 ppm

Biological limit values

ACGIH Biological Exposure Indices

Components	Value	Determinant	Specimen	Sampling Time
ORTHOXYLENE (CAS 95-47-6)	1.5 g/g	Methylhippuric acids	Creatinine in urine	*

Additional components	Value	Determinant	Specimen	Sampling Time
METAXYLENE (CAS 108-38-3)	1.5 g/g	Methylhippuric acids	Creatinine in urine	*
PARAXYLENE (CAS 106-42-3)	1.5 g/g	Methylhippuric acids	Creatinine in urine	*
ETHYLBENZENE (CAS 100-41-4)	0.15 g/g	Sum of mandelic acid and phenylglyoxylic acid	Creatinine in urine	*
TOLUENE (CAS 108-88-3)	0.3 mg/g	o-Cresol, with hydrolysis	Creatinine in urine	*
	0.03 mg/l	Toluene	Urine	*
	0.02 mg/l	Toluene	Blood	*
BENZENE (CAS 71-43-2)	25 µg/g	S-Phenylmercapturic acid	Creatinine in urine	*
STYRENE (CAS 100-42-5)	40 µg/l	Styrene	Urine	*
	400 mg/g	Mandelic acid plus phenylglyoxylic acid	Creatinine in urine	*

* - For sampling details, please see the source document.

Exposure guidelines *The listed exposure limits for benzene may not apply in all circumstances. Please see 29 CFR 1910.1028 for specific exemptions.

US - California OELs: Skin designation

BENZENE (CAS 71-43-2)	Can be absorbed through the skin.
CUMENE (CAS 98-82-8)	Can be absorbed through the skin.
STYRENE (CAS 100-42-5)	Can be absorbed through the skin.
TOLUENE (CAS 108-88-3)	Can be absorbed through the skin.

US - Minnesota Haz Subs: Skin designation applies

CUMENE (CAS 98-82-8)	Skin designation applies.
STYRENE (CAS 100-42-5)	Skin designation applies.
TOLUENE (CAS 108-88-3)	Skin designation applies.

US - Tennessee OELs: Skin designation

CUMENE (CAS 98-82-8)	Can be absorbed through the skin.

US ACGIH Threshold Limit Values: Skin designation

BENZENE (CAS 71-43-2)	Can be absorbed through the skin.

US NIOSH Pocket Guide to Chemical Hazards: Skin designation

CUMENE (CAS 98-82-8)	Can be absorbed through the skin.

US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000)

CUMENE (CAS 98-82-8)	Can be absorbed through the skin.

Appropriate engineering controls Consider the following when employing engineering controls and selecting personal protective equipment: potential hazards of the material, applicable exposure limits, job activities, and other substances in the work place. Explosion-proof ventilation and other forms of engineering controls are the preferred means for controlling exposures below occupational exposure limits and guidelines.

Individual protection measures, such as personal protective equipment

Eye/face protection Keep away from eyes and face. 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

Hand protection Avoid skin contact with this material. Use chemical resistant gloves when handling this material. Contact the glove manufacturer for specific advice on glove selection regarding permeability and breakthrough times for your use conditions. Gloves should be discarded and replaced if there is any indication of degradation or chemical breakthrough.

Other	Dermal exposure to this chemical may add to the overall exposure. Avoid skin contact with this material. Additional protective clothing may be necessary.
Respiratory protection	A NIOSH approved air purifying respirator with an appropriate cartridge or canister, such as an organic vapor cartridge, may be used in circumstances where airborne organic vapor concentrations may 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. See OSHA 29 CFR 1910.134 for more information regarding respiratory protection and Assigned Protection Factors (APFs).
Thermal hazards	No special precautions required.

9. Physical and chemical properties

Appearance	
Physical state	Liquid.
Form	Not applicable
Color	Clear, colorless
Odor	Moderate aromatic
Odor threshold	Not available.
pH	Essentially neutral
Melting point/freezing point	-12 °F (-24.44 °C)
Initial boiling point and boiling range	292 °F (144.4 °C)
Flash point	85 °F (29.44 °C) Tag Closed Cup
Evaporation rate	Slow rate
Flammability (solid, gas)	Not applicable.
Upper/lower flammability or explosive limits	
Flammability limit - lower (%)	1 %
Flammability limit - upper (%)	7 %
Explosive limit - lower (%)	See flammability limit
Explosive limit - upper (%)	See flammability limit
Vapor pressure	7 mm Hg (68 °F (20 °C))
Vapor density	3.7
Relative density	0.88 at 60/60 °F (15.6/15.6 °C)
Solubility(ies)	
Solubility (water)	Negligible
Partition coefficient (n-octanol/water)	Not available
Auto-ignition temperature	865 °F (462.78 °C)
Decomposition temperature	Not available
Viscosity	Not available
Other information	
Chemical family	Aromatic Hydrocarbon
Electrostatic properties	
Conductivity	≤ 50 pS/m
Molecular formula	C8H10
Molecular weight	106.16
Percent volatile	100 %
VOC	100 %

10. Stability and reactivity

Reactivity	See statements below.

Chemical stability	Material is stable under normal conditions.
Possibility of hazardous reactions	Not anticipated under normal conditions.
Conditions to avoid	Avoid unventilated areas, heat, open flames, sparks and ungrounded electrical equipment.
Incompatible materials	Incompatible with strong oxidizing agents and strong reducing agents. See precautions under Handling & Storage (Section 7).
Hazardous decomposition products	Not anticipated under normal conditions.

11. Toxicological information

Information on likely routes of exposure

Inhalation	Likely route of exposure
Skin contact	Likely route of exposure
Eye contact	Likely route of exposure
Ingestion	Likely route of exposure

Symptoms related to the physical, chemical and toxicological characteristics

INHALATION:
Breathing high concentrations may be harmful. May cause central nervous system depression or effects. Symptoms may include headache, excitation, euphoria, dizziness, incoordination, drowsiness, light-headedness, blurred vision, fatigue, tremors, convulsions, loss of consciousness, coma, respiratory arrest and death, depending on the concentration and duration of exposure.

Breathing high concentrations of this material, for example, in a confined space or by intentional abuse, can cause irregular heartbeats which can cause death. Breathing of the mists, vapors or fumes may irritate the nose, throat and lungs.

SKIN:
Contact may cause reddening, itching and inflammation. Skin contact may cause harmful effects in other parts of the body. Prolonged skin contact may defat the skin and cause drying, cracking and/or dermatitis.

EYES:
May cause severe eye irritation with pain, tearing, burning feeling, sensitivity to light, swelling and possible corneal damage. Effects may become more serious with repeated or prolonged contact.

INGESTION:
May cause irritation of the mouth, throat and gastrointestinal tract. Symptoms may include salivation, pain, nausea, vomiting and diarrhea.

Aspiration into lungs may cause chemical pneumonia and lung damage.

Exposure may also cause central nervous system symptoms similar to those listed under "Inhalation" (see Inhalation section).

Information on toxicological effects

Acute toxicity Harmful if inhaled.

Components	Species	Test Results
ORTHOXYLENE (CAS 95-47-6)		
Acute		
Dermal		
LD50	Rabbit	12126 mg/kg
Inhalation		
LC50	Rat	27124 mg/m3, 4 hr
Oral		
LD50	Rat	3523 mg/kg

Skin corrosion/irritation	Causes skin irritation.
Serious eye damage/eye irritation	Causes serious eye irritation.

Respiratory or skin sensitization

Respiratory sensitization	Not classified.

Skin sensitization Not classified.

Germ cell mutagenicity Not classified.

Carcinogenicity Not classified.

ACGIH Carcinogens

BENZENE (CAS 71-43-2)	A1 Confirmed human carcinogen.
ETHYLBENZENE (CAS 100-41-4)	A3 Confirmed animal carcinogen with unknown relevance to humans.
METAXYLENE (CAS 108-38-3)	A4 Not classifiable as a human carcinogen.
ORTHOXYLENE (CAS 95-47-6)	A4 Not classifiable as a human carcinogen.
PARAXYLENE (CAS 106-42-3)	A4 Not classifiable as a human carcinogen.
STYRENE (CAS 100-42-5)	A4 Not classifiable as a human carcinogen.
TOLUENE (CAS 108-88-3)	A4 Not classifiable as a human carcinogen.

IARC Monographs. Overall Evaluation of Carcinogenicity

BENZENE (CAS 71-43-2)	1 Carcinogenic to humans.
CUMENE (CAS 98-82-8)	2B Possibly carcinogenic to humans.
ETHYLBENZENE (CAS 100-41-4)	2B Possibly carcinogenic to humans.
METAXYLENE (CAS 108-38-3)	3 Not classifiable as to carcinogenicity to humans.
ORTHOXYLENE (CAS 95-47-6)	3 Not classifiable as to carcinogenicity to humans.
PARAXYLENE (CAS 106-42-3)	3 Not classifiable as to carcinogenicity to humans.
STYRENE (CAS 100-42-5)	2B Possibly carcinogenic to humans.
TOLUENE (CAS 108-88-3)	3 Not classifiable as to carcinogenicity to humans.

OSHA Specifically Regulated Substances (29 CFR 1910.1001-1052)

BENZENE (CAS 71-43-2)	Cancer

US. National Toxicology Program (NTP) Report on Carcinogens

BENZENE (CAS 71-43-2)	Known To Be Human Carcinogen.
CUMENE (CAS 98-82-8)	Reasonably Anticipated to be a Human Carcinogen.
STYRENE (CAS 100-42-5)	Reasonably Anticipated to be a Human Carcinogen.

Reproductive toxicity Not classified.

Specific target organ toxicity - single exposure May cause respiratory irritation. May cause drowsiness or dizziness.

Specific target organ toxicity - repeated exposure Not classified.

Aspiration hazard May be fatal if swallowed and enters airways.

Toxicological data

BENZENE: Studies of workers exposed to benzene show clear evidence that overexposure can cause cancer of the blood forming organs (acute myelogenous leukemia) and aplastic anemia, an often fatal disease. Some studies suggest overexposure to benzene may also be associated with other blood disorders including myelodysplastic syndrome. Some studies of workers exposed to benzene have shown an association with increased rates of chromosome aberrations in circulating lymphocytes. One study of women workers exposed to benzene suggested a weak association with irregular menstruation. However, other studies of workers exposed to benzene have not demonstrated clear evidence of an effect on fertility or reproductive outcome in humans. Benzene can cross the placenta and affect the developing fetus. Cases of aplastic anemia have been reported in the offspring of persons severely overexposed to benzene. Animal studies indicate that prolonged, repeated exposure to high levels of benzene vapor can cause bone marrow suppression and cancer in multiple organ systems. Studies in laboratory animals also show evidence of adverse effects on male reproductive organs following high levels of exposure but no significant effects on reproduction have been observed. Embryotoxicity has been reported in studies of laboratory animals but effects were limited to reduced fetal weight and skeletal variations has been classified as a known human carcinogen by OSHA and a Group 1 (carcinogenic to Humans) material by IARC, the International Agency for Research on Cancer.

CUMENE: Chronic studies in laboratory animals indicate evidence of respiratory tract hyperplasia, and adverse effects on the liver, kidney and adrenal glands following high levels of exposure. The relevance of these findings to humans is not clear at this time. Findings from National Toxicology Program (NTP) lifetime inhalation studies in rats showed an increased incidence of renal carcinomas and adenomas, respiratory epithelial adenomas, and interstitial cell adenomas of the testes. In mice, an increased incidence of carcinomas and adenomas of the bronchi and lung, liver neoplasms, hemangiosarcomas of the spleen, and adenomas of the thyroid were observed. NTP classified it as “reasonably anticipated to be a human carcinogen” and the International Agency for Cancer Research (IARC) has classified cumene as "possibly carcinogenic to humans" (Group 2B).

ETHYLBENZENE: Findings from National Toxicology Program (NTP) lifetime inhalation studies in rats showed an increased incidence of renal tumors in male rats (tubular carcinomas) and female rats (tubular adenomas) only at the highest exposure level (750 ppm). At this exposure level the incidence of tumors also was elevated in male mice (alveolar and bronchiolar carcinomas) and female mice (hepatocellular carcinomas). IARC has classified ethyl benzene as "possibly carcinogenic to humans" (Group 2B). Studies in laboratory animals report some evidence of renal malformations, resorptions, and developmental delays following high levels of maternal exposure to ethylbenzene. However, a two generation reproduction study conducted by NIOSH found no adverse effects on reproductive performance or developmental landmarks. Ototoxicity (hearing loss) in rats was reported following exposure levels as low as 300 ppm for 5 days. In contrast, guinea pigs showed no hearing loss after exposure to much higher ethyl benzene levels (2500 ppm, 5 days). There are other studies in laboratory animals that indicate some evidence of adverse effects on the liver, kidney, thyroid, and pituitary gland. The relevance of these findings to humans is not clear at this time.

XYLENES, ALL ISOMERS: Acute effects of xylene may be increased by the use of alcoholic beverages. Evidence of liver and kidney impairment were reported in workers recovering from a gross overexposure. Prolonged or repeated exposure to xylene was reported to cause impaired neurological function in workers exposed to solvents (including xylene). Studies in rats have shown evidence of impaired hearing following prolonged exposure to high concentrations of paraxylene. Studies in laboratory animals also suggest some changes in reproductive organs following high levels of exposure but no significant effects on reproduction were observed. Developmental toxicity studies in laboratory animals indicate skeletal and visceral malformations, developmental delays, and increased fetal resorptions following extremely high levels of maternal exposure. The relevance of these observations to humans is not clear at this time. In addition, adverse effects on the liver, kidney, bone marrow (changes in blood cell parameters) were observed in laboratory animals following high levels of exposure. The relevance of these observations to humans is not clear at this time.

Altered mental state, drowsiness, peripheral motor neuropathy, irreversible brain damage (so-called "petrol sniffers encephalopathy"), delirium, seizures, and sudden death have been reported from repeated overexposure to some hydrocarbon solvents, naphthas, and gasoline.

12. Ecological information

Ecotoxicity Toxic to aquatic life.

Components		Species	Test Results
ORTHOXYLENE (CAS 95-47-6)			
Aquatic			
Acute			
Algae	EC50	Pseudokirchnerella subcapitata	4.7 mg/l, 72 hr
Crustacea	IC50	Daphnia magna	1 mg/l, 24 hr
Fish	LC50	Oncorhynchus mykiss	7.6 mg/l, 96 hr
Chronic			
Crustacea	NOEC	Ceriodaphnia dubia	1.17 mg/l, 21 d
Fish	NOEC	Oncorhynchus mykiss	> 1.3 mg/l, 56 d

Persistence and degradability Readily biodegradable in the environment.

Bioaccumulative potential Not likely to bioaccumulate in aquatic organisms.

Mobility in soil May partition into air, soil and water. This material evaporates readily.

Other adverse effects No other adverse effects expected.

13. Disposal considerations

Disposal instructions This material, as supplied, when discarded or disposed of, is a listed hazardous waste according to Federal Regulations 40 CFR 261.33(f). Additionally, pursuant to 40 CFR 261.33(d) and (e), any residue remaining in a container that has held this material and any residue or contaminated soil, water or other debris resulting from the cleanup of a spill of this material is also a listed hazardous waste.

For additional handling information and protection of employees, see Section 7 (Handling and Storage) and Section 8 (Exposure Controls/Personal Protection).

Local disposal regulations Dispose in accordance with all applicable regulations.

Hazardous waste code See below. The proper waste code must be evaluated at the time of disposal and should be determined by the user and waste disposal company.

US RCRA Hazardous Waste U List: Reference

ORTHOXYLENE (CAS 95-47-6) U239

Waste from residues / unused products Dispose of this material in accordance with all applicable local and national regulations.

Contaminated packaging Empty containers should be taken to an approved waste handling site for recycling or disposal in accordance with government regulations. Packaging may contain residue that can be hazardous.

14. Transport information

General information BILL OF LADING - BULK (U. S. DOT): UN1307, Xylenes, (Orthoxylene), 3, PG III, RQ (Benzene, Paraxylene)
BILL OF LADING - NON-BULK (U. S. DOT): UN1307, Xylenes, (Orthoxylene), 3, PG III

The below description may not cover shipping in all cases. Please consult 49 CFR 100-185 for specific shipping information or Transportation Compliance Specialist (CSO).

DOT

UN number UN1307
UN proper shipping name Xylenes (Orthoxylene)
Transport hazard class(es)
Class 3
Subsidiary risk -
Label(s) Flammable Liquid
Packing group III
Special precautions for user Not available.
ERG number 130

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code Not classified for MARPOL. Please contact the Transportation Compliance CSO if transportation mode is ship or vessel to determine the need for a MARPOL classification.

DOT

15. Regulatory information

US federal regulations All ingredients are on the active TSCA inventory, or are not required to be listed on the active TSCA inventory.

Consult OSHA's Benzene standard 29 CFR 1910.1028 for provisions on air monitoring, employee training, medical monitoring, etc.

This product, as sold, is not approved to be transferred, sold or distributed as a pesticide product, device or active ingredient in a pesticide formulation under the Federal Insecticide, Fungicide, Rodenticide Act (FIFRA). This product is approved for use as an inert solvent or cosolvent in certain pesticidal formulations and is exempted from the requirement of a tolerance for grain storage, growing crops and animal applications under 40 CFR 180.910, 920 and 930, respectively. It is the responsibility of the user to determine if their use of the product is compliant with all FIFRA regulations.

This material contains toxic chemical(s) 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 information must be included in all SDSs that are copied and distributed for this material.

This material contains up to 100% volatile organic compounds (VOCs) per 40 CFR Part 51.100.

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

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

Not regulated.

CERCLA Hazardous Substance List (40 CFR 302.4)

BENZENE (CAS 71-43-2)	Listed.
CUMENE (CAS 98-82-8)	Listed.
ETHYLBENZENE (CAS 100-41-4)	Listed.
METAXYLENE (CAS 108-38-3)	Listed.
ORTHOXYLENE (CAS 95-47-6)	Listed.
PARAXYLENE (CAS 106-42-3)	Listed.
STYRENE (CAS 100-42-5)	Listed.
TOLUENE (CAS 108-88-3)	Listed.

SARA 304 Emergency release notification

Not regulated.

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

BENZENE (CAS 71-43-2)	0.1 %
CUMENE (CAS 98-82-8)	1.0 %
ETHYLBENZENE (CAS 100-41-4)	0.1 %
METAXYLENE (CAS 108-38-3)	1.0 %
ORTHOXYLENE (CAS 95-47-6)	1.0 %
PARAXYLENE (CAS 106-42-3)	1.0 %
STYRENE (CAS 100-42-5)	0.1 %
TOLUENE (CAS 108-88-3)	1.0 %

OSHA Specifically Regulated Substances (29 CFR 1910.1001-1052)

BENZENE (CAS 71-43-2)	Cancer Central nervous system Blood Aspiration Skin Eye respiratory tract irritation Flammability

Superfund Amendments and Reauthorization Act of 1986 (SARA)

SARA 302 Extremely hazardous substance

Not listed.

SARA 311/312 Hazardous chemical Yes

Classified hazard categories
Flammable (gases, aerosols, liquids, or solids)
Acute toxicity (any route of exposure)
Skin corrosion or irritation
Serious eye damage or eye irritation
Specific target organ toxicity (single or repeated exposure)
Aspiration hazard
Hazard not otherwise classified (HNOC)

SARA 313 (TRI reporting)

Chemical name	CAS number	% by wt.
ORTHOXYLENE	95-47-6	95 - 100
ETHYLBENZENE	100-41-4	≤ 0.1
METAXYLENE	108-38-3	≤ 1

Other federal regulations

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

BENZENE (CAS 71-43-2)
CUMENE (CAS 98-82-8)
ETHYLBENZENE (CAS 100-41-4)
METAXYLENE (CAS 108-38-3)
ORTHOXYLENE (CAS 95-47-6)
PARAXYLENE (CAS 106-42-3)
STYRENE (CAS 100-42-5)
TOLUENE (CAS 108-88-3)

Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130)

Not regulated.

Clean Water Act (CWA) Section 112(r) (40 CFR 68.130)	Hazardous substance
Safe Drinking Water Act (SDWA)	10 mg/l

Drug Enforcement Administration (DEA). List 2, Essential Chemicals (21 CFR 1310.02(b) and 1310.04(f)(2) and Chemical Code Number

TOLUENE (CAS 108-88-3)	6594

Drug Enforcement Administration (DEA). List 1 & 2 Exempt Chemical Mixtures (21 CFR 1310.12(c))

TOLUENE (CAS 108-88-3)	35 %WV

DEA Exempt Chemical Mixtures Code Number

TOLUENE (CAS 108-88-3)	594

FEMA Priority Substances Respiratory Health and Safety in the Flavor Manufacturing Workplace

STYRENE (CAS 100-42-5)	Other Flavoring Substances with OSHA PEL's

US state regulations

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

California Proposition 65

WARNING: This product can expose you to chemicals including BENZENE, which is known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov.

California Proposition 65 - CRT: Listed date/Carcinogenic substance

BENZENE (CAS 71-43-2)	Listed: February 27, 1987
CUMENE (CAS 98-82-8)	Listed: April 6, 2010
ETHYLBENZENE (CAS 100-41-4)	Listed: June 11, 2004
STYRENE (CAS 100-42-5)	Listed: April 22, 2016

California Proposition 65 - CRT: Listed date/Developmental toxin

BENZENE (CAS 71-43-2)	Listed: December 26, 1997
TOLUENE (CAS 108-88-3)	Listed: January 1, 1991

California Proposition 65 - CRT: Listed date/Male reproductive toxin

BENZENE (CAS 71-43-2)	Listed: December 26, 1997

16. Other information, including date of preparation or last revision

Issue date	02-06-2015
Revision date	02-19-2018
Version #	05
HMIS® ratings	Health: 2* Flammability: 3 Physical hazard: 0 * Indicates chronic health hazard
NFPA ratings	Health: 2 Flammability: 3 Instability: 0
List of abbreviations	CAS RN - Chemical Abstracts Service Registry Number DNEL - Derived-No-Effect-Levels FHR - Flint Hills Resources GHS: Globally Harmonized System of Classification and Labeling of Chemicals. LC - Lethal Concentration LD - Lethal Dose NOEC - No Observed Effects Concentration NIOSH: National Institute for Occupational Safety & Health. OEL - Occupational Exposure Limit PEL: Permissible Exposure Limit. STEL - Short Term Exposure Limit (STOT) RE - Repeated Exposure (STOT) SE - Single Exposure SCBA - Self-Contained Breathing Apparatus TSCA: Toxic Substance Control Act. TWA - Time Weighted Average

Disclaimer	THIS SDS HAS BEEN PREPARED TO COMPLY WITH FEDERAL REGULATIONS THAT ARE INTENDED TO QUICKLY PROVIDE USEFUL INFORMATION TO THE USER(S) OF THIS MATERIAL OR PRODUCT - IT IS NOT INTENDED TO SERVE AS A COMPREHENSIVE DISCUSSION OF ALL POSSIBLE RISKS OF HAZARDS, BUT RATHER PROVIDES INFORMATION GENERALLY ACCEPTED IN THE SCIENTIFIC COMMUNITY AS RELEVANT REGARDING THE POTENTIAL HAZARDS OF THIS PRODUCT. ADEQUATE TRAINING, INSTRUCTION, WARNINGS AND SAFE HANDLING PROCEDURES SHOULD BE PROVIDED TO HANDLERS AND USERS. USERS SHOULD REVIEW THE INFORMATION IN THE SDS, AND SATISFY THEMSELVES AS TO ITS SUITABILITY AND COMPLETENESS, INCLUDING ENSURING THAT THIS IS THE MOST CURRENT SDS.
Revision information	This document has undergone significant changes and should be reviewed in its entirety.
Completed by	Flint Hills Resources, LP - Operations EH&S