FLINT HILLS resources®

POLYPROPYLENE

P4G4Z-011

DESCRIPTION: Homopolymer

FEATURES: Good stiffness. Produced without animal derived components or phthalates.

APPLICATIONS: Injection Molding: multi purpose

PROPERTY	NOMINAL VALUE	SI UNIT		NOMINAL VALUE	ENGLISH UNIT		ASTM TEST METHOD
Melt Flow Rate	12	g/10 min.					D 1238
Density	0.90	g/cm^3					D 1505
Tensile Yield Strength Yield Elongation	 37 8	 MPa %		 5400 8	 psi %		D 638
Flexural Modulus 1% Secant Tangent	 1480 NA	 MPa		 214 NA	 kpsi		D 790
Deflection Temperature @ 66 psi (.455 MPa)	96	ºC		205	ºF		D 648
Rockwell Hardness				110	R		D 785
Notched Izod @ 23ºC	20	J/m		.4	ft-lb/in		D 256
Gardner Impact @ 23ºC	2	J		20	in-lb		D 5420

May-14

Regulatory
FDA – 21 CFR 177.1520 (c) 1.1a.
UL Certified 94HB
Drug Master File listed
USP Class VI certified

Notice regarding medical applications:
This Flint Hills product meets certain requirements for use in medical applications. It is the responsibility of the medical device or pharmaceutical manufacturer to determine that this Flint Hills product is safe, lawful and technically suitable for the intended use. Flint Hills encourages its customers to review their application with a Flint Hills technical representative to ensure that this product is not used in ways for which it was not intended or tested. Flint Hills makes no warranties (express or implied), promises or guarantees concerning the suitability of this product for use in any given medical application. Not intended for use in the manufacture of any form of implanted medical or surgical device.

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Processing Tips for Molding Polypropylene Resins

Polypropylene Injection Molding Start Points

Nominal Melt Flow Rate	g./10min	2 - 10			10 - 20			35 -50		
Section Thickness	in.	0.063	0.125	0.25	0.063	0.125	0.25	0.063	0.125	0.25
	mm	1.6	3.2	6.4	1.6	3.2	6.4	1.6	3.2	6.4
Melt Temperature	°F	460	440	420	440	420	400	420	400	380
	°C	238	227	216	227	216	204	216	204	193
Temperature Settings										
Rear Zone	°F	420	400	380	400	380	380	380	380	360
	°C	216	204	193	204	193	193	193	193	
Middle Zone	°F	440	420	400	420	400	400	400	400	380
	°C	227	216	204	216	204	204	204	204	
Front Zone	°F	460	440	420	440	420	400	420	400	380
	°C	238	227	216	227	216	204	216	204	
Nozzle	°F	440	420	400	420	400	400	400	400	380
	°C	227	216	204	216	204	204	204	204	
Mold	°F	50 – 100			50 – 100			50 – 100		
	°C	10 – 38			10 – 38			10 – 38		
Injection Pressure	psi	600 – 1500			600 – 1500			600 – 1500		
	MPa	4 – 10			4 – 10			4 - 10		

Polypropylene is an easy to process semi-crystalline polymer. This guide is intended to highlight injection molding process conditions and set up.

Molding Machine Considerations

Polypropylene can and has been successfully molded with plunger and reciprocating screw injection molding machines, including single and two-stage machines. A reciprocating screw machine is generally preferred for applications requiring melt homogeneity.

Injection machine requirements include 20,000 psi. injection high pressure and separate injection speed control. Injection and hold pressure profiling can also be of benefit. Using the lowest pressure that fills the mold can extend mold life. This will also reduce flashing, extending mold life.

Clamping forces between 1½ and 5 Tons/square inch have been used. Low viscosity (high melt flow rate) resins generally require lower tonnages than high viscosity resins. While a general-purpose screw can be used, many applications benefit from screw engineering to promote rapid melting and improved dispersion. Shot size should be 50 to 75% of barrel capacity.

Auxiliary Machines

Central and press-side auxiliary machines can be used for drying, mold temperature control and sprue & runner grinding. Selection will rely on individual plant engineering.

Drying

Polypropylene resins typically do not require drying before processing. Touch up drying may be required to reduce and eliminate splay from condensed moisture, as when resin is brought into a warm, moist building from cold transport or storage.

Mold Temperature Control

Heaters and or chillers will achieve mold temperature control. Low mold temperatures can give faster cycles, with the concern for molded in stresses. Higher mold temperatures will give more complete replication of mold surface features. Water or water/glycol mixtures

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are sufficient for most polypropylene molding requirements.

Grinders
Most conventional grinders are suitable for regrinding sprues, runners, and rejected parts. Screen diameters should be ~¼". Each application should be evaluated to determine the maximum acceptable level of regrind. The regrind should be kept clean, uncontaminated, and be well blended with virgin resin before molding.

Mold Design Highlights Mold Materials
Molds for polypropylene have been successfully made from many materials. Production molds are typically made from hardened steel, using pre-hardened bases and either stainless or higher hardness tool steel for the cavity and core inserts. Specialty inserts have been made from high conductivity materials such as copper alloys and/or self-venting porous materials. Prototype molds have been made from diverse materials such as aluminum, nickel coated epoxy, and cast zinc alloys.
Mold Design The **nozzle and sprue bushing** create the transition from injection molding machine to the mold. The nozzle and sprue need to be matched for both spherical radius (nozzle locating) and nozzle exit to sprue entrance diameter, for both cold sprue and hot sprue bushing applications. For cold sprue and runners, the nozzle will have an exit orifice typically ¼" diameter and the entrance of the sprue bushing will be 1/32" diameter larger. These dimensions will vary with specific parts and are intended to allow for the inevitable mis-match. The sprue and bushing diameters will probably be larger for hot sprue & runner applications. Matching these elements will aid part ejection and color transitions. Whether hot or cold runner systems are used, the runner should be as short and direct as possible. Runner and cavities should be balanced for multi-cavity molds. **Gate location** should be selected to minimize sinks, voids and weld lines. General practice is to gate the part into its thickest section. Many **gate designs** have been successfully used, among them - pinpoint, tunnel, cashew, rectangular, diaphragm or flash, and full round. Whatever gate design is selected, a smooth, tapered transition from runner to gate and short land length (~0.020") is preferred. Gate diameters range from 50% to 75% of the part thickness at the gate. **Cavity and runner venting** are essential for smooth, rapid filling and easy molding. Vents can be located on the parting line, along ejector pins, or with inserts made of porous mold materials as needed. Vent sizes can start at 0.0005" thick x 0.020" land x width to suit. In general, vents will increase in depth away from the cavity edge.

Part Design Highlights Shrink rates for polypropylene resins can range from 0.010 in./in. to 0.030 in./in., depending on selected resin, molding conditions, and part thickness. Prototyping critical applications will be needed to determine which shrink rate to use. The shrink rate with the flow will typically be greater then the shrink rate across the flow. Polypropylene materials will shrink at a greater rate in thick sections, compared to thin sections. Typical **draft** will be 1 degree per side. Less draft can make part ejection difficult. Polypropylene parts have been molded with as little as ½ degree per side draft. Textures will probably require more draft.

Molding Pointers Back Pressure can range from 50 to 250 psi. with machine capability. Increased back pressure will lengthen screw recovery time and increase mixing of additives such as colorants. Fast **Injection Speeds** will generally give better results than slow speeds. This can vary from one application to the next. Increased packing will generally give stronger and stiffer parts than under-packed. Caution is needed, as over-packed parts can be brittle. **Injection Pressures and Fill Rate** should be as high as possible. Transfer to hold should be set at 95 to 97% cavity fill. **Hold Pressure** should be 50 to 75% of Injection Pressure. Set **Hold Time to finish at Gate Freeze** to ensure packed parts.

MATERIAL SAFETY DATA SHEET

1. Identification

Material name	**POLYPROPYLENE HOMOPOLYMER**
Version #	23
Revision date	06-25-2013
CAS #	Mixture
Manufacturer	Flint Hills Resources Polymers, LLC 118 Huntsman Way Longview, TX 75602 United States
Supplier	Flint Hills Resources, LP 1330 Lake Robbins Drive Suite 400 The Woodlands, TX 77380 United States
Telephone numbers - 24 hour emergency assistance	
Chemtrec (US)	800-424-9300
Chemtrec (US - Direct Dial)	703-527-3887
Carechem24 (US/Canada)	866-928-0789
Carechem24 (Mexico)	52 555 004 8763
Flint Hills Resources, LP (after business hours)	432-296-1674
Telephone numbers - general assistance	
7-4 (M-F, CST) Customer Service	281-363-7200
8-5 (M-F, CST) MSDS Assistance	316-828-7988
Email:	msdsrequest@fhr.com
Product code(s)	11T55V; 21N2A; H0500HN; P4C4T-189; P4C5B-030; P4C5B-075; P4C5B-076; P4C5B-121; P4C5B-181B; P4C5K-123A; P4C5K-213X; P4C5N-046; P4C5N-046A; P4C5T-013; P4C5T-027B; P4C5T-195X; P4C5Z-027; P4C6B-024B; P4C6B-024D; P4C6B-134; P4C6B-134A; P4C6B-134J; P4C6B-194; P4C6B-196X; P4C6N-041; P4C6S-193A; P4C6T-063; P4C6Z-022; P4C6Z-059; P4G2K-152; P4G2K-152A; P4G2K-214X; P4G2K-215X; P4G2K-216X; P4G2T-077D; P4G2Z-026; P4G2Z-159; P4G2Z-192; P4G2Z-198; P4G2Z-211X; P4G3A-052; P4G3B-146; P4G3N-206; P4G3T-150X; P4G3Z-039; P4G3Z-039A; P4G3Z-050; P4G3Z-050F; P4G3Z-208; P4G4A-053; P4G4B-036; P4G4B-125A; P4G4B-207X; P4G4K-038; P4G4K-205; P4G4T-017; P4G4T-017A; P4G4Z-011; P4G4Z-011A; P4G8Z-080; P4G8Z-210X; P4G8Z-217X; P4M3R-209X; P9G8Z-036

2. Hazards identification

Emergency overview

CAUTION!

COLORLESS, MILD TO ODORLESS, SOLID

HEALTH HAZARDS
DUST MAY CAUSE SKIN, EYE AND RESPIRATORY TRACT IRRITATION
SEE "TOXICOLOGICAL INFORMATION" (SECTION 11) FOR MORE INFORMATION

FLAMMABILITY HAZARDS
DUST MAY FORM EXPLOSIVE MIXTURE IN AIR WHEN DISPERSED IN A CONFINED SPACE

REACTIVITY HAZARDS
STABLE

For additional safety information, consult the current editions of the National Fire Protection Association (NFPA) 654 Standard for the Prevention of Fire and Dust Explosions from the Manufacturing, Processing, and Handling of Combustible Particulate Solids, NFPA 499, Recommended Practice for the Classification of Combustible Dusts and of Hazardous (Classified) Locations for Electrical Installations in Chemical Process Areas, NFPA 77, Recommended Practice on Static Electricity, and NFPA 68, Standard on Explosion Protection by Deflagration Venting.

Potential health effects

Routes of exposure

Inhalation, ingestion, skin and eye contact.

Eyes

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

Skin

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

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).

Ingestion

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

3. Composition/information on ingredients

Components	CAS #	Percent
POLYPROPYLENE	9003-07-0	98 - 100 %
MODIFIERS - ADDITIVES	Mixture	0.0001 - 2 %

Composition comments

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

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

First aid procedures

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 medical attention if irritation persists.

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.

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

Treat symptomatically.

5. Fire-fighting measures

Flammable properties

Material will burn in a fire.

This material, as produced and not in its finely divided form as dust, is not explosive as defined by established regulatory criteria.

This material, in its finely divided form, presents an explosion hazard when dispersed in a confined area and ignited in air.

This material may accumulate static charge which can cause an electrical spark (ignition source) in some cases.

To avoid fire or explosion, dissipate static electricity during transfer by grounding and bonding containers and equipment before transferring material.

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

See Combustible Dust Property data in Section 9.

Extinguishing media

Suitable extinguishing media

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

Protection of firefighters

Specific hazards arising from the chemical

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

Fire fighting equipment/instructions

Evacuate area and fight fire from a safe distance.

Use water spray to cool adjacent structures and to protect personnel. 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.

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

6. Accidental release measures

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. Prevent or minimize formation of a dust cloud or layer. Eliminate all sources of ignition. Isolate hazard area and deny entry. Caution should be exercised regarding personnel safety and exposure to the released material. Notify local, provincial and/or federal authorities, if required.

Other information

Eliminate all sources of ignition (no smoking, flares, sparks or flames in immediate area). Prevent or minimize formation of a dust cloud or layer during cleanup. This material, in its finely divided form, presents an explosion hazard when dispersed in a confined area and ignited in air.

Small spills can be cleaned up using non-sparking tools. Avoid procedures that may result in formation of a dust cloud or in water pollution. Place in an appropriate container for disposal or recycle.

For large spills and releases follow the handling and storage recommendations as detailed in NFPA 654, NFPA 499 and NFPA 77. Grounding, bonding, and intrinsic safety of equipment used should be considered.

Emergency action

Keep unnecessary people away; isolate hazard area and deny entry. Stay upwind. (See Exposure Controls/Personal Protection in Section 8.)

7. Handling and storage

Handling

Avoid inhaling dust and contact with skin and eyes.

Minimize dust generation during handling and contact.

This material, as produced and not in its finely divided form as dust, is not explosive as defined by established regulatory criteria.

This material, in its finely divided form, presents an explosion hazard when dispersed in a confined area and ignited in air.

This material may accumulate electrostatic charge which may cause an electrical spark (ignition source) in some cases.

Ground and bond lines and equipment used during transfer to reduce the possibility of static spark-initiated fire or explosion. When airborne dust or a dust cloud is present, do not cut, grind, drill, weld or reuse containers unless adequate precautions are taken against these hazards.

Facilities using this material should assess their potential for combustible dust and static spark hazards and follow applicable federal, state and local laws and regulations and accepted codes and standards.

Avoid accumulation of dust on surfaces and hidden areas where dust may collect in the interior of buildings. Clean up dust using approved methods that do not generate dust clouds if ignition sources are present.

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.

For additional safety information, consult the current editions of the National Fire Protection Association (NFPA) 654 Standard for the Prevention of Fire and Dust Explosions from the Manufacturing, Processing, and Handling of Combustible Particulate Solids, NFPA 499, Recommended Practice for the Classification of Combustible Dusts and of Hazardous (Classified) Locations for Electrical Installations in Chemical Process Areas, NFPA 77, Recommended Practice on Static Electricity, and NFPA 68, Standard on Explosion Protection by Deflagration Venting.

Storage

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 oxidizers.

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

Occupational exposure limits

ACGIH

Material	Type	Value	Form
POLYPROPYLENE HOMOPOLYMER (Mixture)	TWA	5 mg/m3	PNOS (Particles not otherwise specified) - RESPIRABLE PARTICULATE (8-Hr)
		10 mg/m3	PNOC (Particles not otherwise classified) - INHALABLE PARTICULATE (8-Hr)

U.S. - OSHA

Material	Type	Value	Form
POLYPROPYLENE HOMOPOLYMER (Mixture)	TWA	5 mg/m3	PNOR (Particles not otherwise regulated) - RESPIRABLE FRACTION (8-Hr)
		15 mg/m3	PNOR (Particles not otherwise regulated) - TOTAL DUST (8-Hr)

Exposure guidelines

NOTE: Only ingredients with validated exposure limits are shown in section 8.

Engineering controls	Ventilation and other forms of engineering controls are the preferred means for controlling exposures. Do not breathe dust. Use explosion-proof equipment if high dust/air concentrations are possible. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit. It is recommended that all dust control equipment such as local exhaust ventilation and material transport systems involved in handling of this product contain explosion relief vents or an explosion suppression system or an oxygen deficient environment. Ensure that dust-handling systems (such as exhaust ducts, dust collectors, vessels, and processing equipment) are designed in a manner to prevent the escape of dust into the work area (i.e., there is no leakage from the equipment). Use only appropriately classified electrical equipment and powered industrial trucks.
Personal protective equipment	
Eye / face protection	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	Avoid skin contact with this material. Use appropriate chemical protective gloves, such as Vitron®, when handling. Additional protective clothing may be necessary.
Respiratory protection	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. See OSHA 29 CFR 1910.134 for more information regarding respiratory protection and Assigned Protection Factors (APFs).

9. Physical and chemical properties

Physical state	Solid.
Form	Pellet
Color	Colorless
Odor	Mild to odorless
Odor threshold	Not available
pH	Not available
Vapor pressure	Not available
Vapor density	Not available
Boiling point	Not available
Melting point/Freezing point	290 - 330 °F (143.3 - 165.6 °C) / Not available
Solubility (water)	Insoluble
Specific gravity	Not available
Relative density	Not available
Flash point	> 650 °F (> 343.3 °C) (PMCC)
Flammability limits in air, upper, % by volume	Not available
Flammability limits in air, lower, % by volume	Not available
Auto-ignition temperature	Not available
VOC	Not available
Evaporation rate	Not available
Viscosity	Not available
Percent volatile	Zero (estimated)
Partition coefficient (n-octanol/water)	Not available
Pour point	Not available
Molecular weight	Not available
Molecular formula	Not available
Other data	

Chemical family	Polypropylene Homopolymer
Density	0.89 - 0.91 g/ml @ 77 °F (25 °C)
Dust explosion properties	
Kst	101 bar-m/s (NFPA 68) (as polypropylene)
St class	1 (NFPA 68) (as polypropylene)
Minimum Explosible Concentration (MEC)	30 g/m3 (with median mass particle size of 25 µm - NFPA 68) (as polypropylene)
Minimum Ignition Energy (MIE) - dust cloud	25 - 400 mJ (NFPA 68) (as polypropylene)
Minimum Ignition Temperature (MIT) - dust cloud	788 °F (420 °C) (no antioxidant; NFPA 499) (as polypropylene)

10. Stability and reactivity

Chemical stability	Material is stable under normal conditions.
Conditions to avoid	Avoid high temperatures.
Incompatible materials	Incompatible with strong oxidizers. See precautions under Handling & Storage (Section 7).
Hazardous decomposition products	Not anticipated under normal conditions.
Possibility of hazardous reactions	Not anticipated under normal conditions.

11. Toxicological information

Carcinogenicity

IARC Monographs. Overall Evaluation of Carcinogenicity

POLYPROPYLENE (CAS 9003-07-0) 3 Not classifiable as to carcinogenicity to humans.

Toxicological data

POLYPROPYLENE BASED POLYMERS: 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.

Exposure to this material may cause adverse effects or damage to the following organs or organ systems: skin, eyes, and respiratory tract.

12. Ecological information

Ecotoxicity	Material not classified as harmful to aquatic organisms.
Persistence and degradability	Not readily biodegradable.
Bioaccumulation / Accumulation	Not classified in terms of bioaccumulation in aquatic organisms.
Mobility in environmental media	Not classified in terms of mobility in air, soil and water.

13. Disposal considerations

Disposal instructions

This material, as supplied, when discarded or disposed of, is not a hazardous waste according to Federal Regulations (40 CFR 261). Under the Resource Conservation and Recovery Act (RCRA), it is the responsibility of the user of the material to characterize and determine, at the time of disposal, whether the material is a hazardous waste subject to RCRA.

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

14. Transport information

General

BILL OF LADING - BULK (U. S. DOT): Non-regulated by DOT
BILL OF LADING - NON-BULK (U. S. DOT): Non-regulated by DOT

See Bill of Lading for proper shipping description.

15. Regulatory information

US federal regulations

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

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).

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.

This material is intended for use in the manufacture of articles and goods as appropriate. It is the responsibility of the manufacturer to determine that it is safe, lawful and technically suitable for the intended use. This material is not intended for use in the manufacture of any form of implanted medical or surgical device.

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

Not regulated.

DEA Essential Chemical Code Number

Not regulated.

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

Not regulated.

DEA Exempt Chemical Mixtures Code Number

Not regulated.

CERCLA (Superfund) reportable quantity

None

Superfund Amendments and Reauthorization Act of 1986 (SARA)

Hazard categories

Immediate Hazard - No
Delayed Hazard - No
Fire Hazard - No
Pressure Hazard - No
Reactivity Hazard - No

Section 302 extremely hazardous substance

No

Section 311 hazardous chemical

No

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.

US - Texas Effects Screening Levels: Annual ESL (ug/m3)

POLYPROPYLENE (CAS 9003-07-0)	100 ug/m3 5 ug/m3

US - Texas Effects Screening Levels: Short-term ESL (ug/m3)

POLYPROPYLENE (CAS 9003-07-0)	1000 ug/m3 50 ug/m3

16. Other information

HMIS® ratings

Health: 0
Flammability: 1
Physical hazard: 0

NFPA ratings

Health: 0
Flammability: 1
Instability: 0

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. Moreover, unless an employee or a customer accesses or receives a MSDS directly from the company, there is no assurance that a document obtained from alternate sources is the most currently available MSDS.
Issue date	05-04-2010
This data sheet contains changes from the previous version in section(s):	Fire-fighting measures: Flammable properties Fire-fighting measures: Fire fighting equipment/instructions Accidental release measures: Other information Handling and storage: Handling Handling and storage: Storage Exposure controls / personal protection: Exposure guidelines Exposure controls / personal protection: Engineering controls Exposure controls / personal protection: Skin protection Physical & Chemical Properties: Multiple Properties Stability and reactivity: Incompatible materials Disposal considerations: Disposal instructions Regulatory information: US federal regulations Other information: Further information
Completed by	Flint Hills Resources, LP - Operations EH&S