



Revision Date January 2011

S11: PPI Stock Natural Polypropylene

This resin is an Injection Grade Barefoot Homopolymer designed as a good base resin for injection molded closure and container applications.

Product Properties

Typical Properties	Method	Value Unit
Physical		
Melt Flow Rate (230°C/2.16kg)	ASTM D 1238	15-40 g/10 min
Density – Specific Gravity	ASTM D 792	0.900-0.905 sp gr

Mechanical

Tensile Strength @ Yield (2 in/min) (50 mm/min)	ASTM D 638	4600 psi 35 - 37 MPa
Flexural Modulus (0.05 in/min, 1% Secant, Procedure A) (1 mm/min, 1% Secant, Procedure A)	ASTM D 790	170000 psi 1480 MPa
Tensile Elongation @Yld	ASTM D 638	8 - 12 %

Impact

Notched izod impact (73 °F, Method A) (23 °C, Method A)	ASTM D 256	0.4 - 0.7 ft-lb/in 26.6 J/m
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Thermal

DTUL @66psi – Unannealed	ASTM D 648	92 °C
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Parkway Plastics sources resin from various vendors to maintain price stability. These vendors include distributors and material manufacturers such as Ashland, Plastic Solutions, Bamberger Polymers, Amco, M Holland, & Osterman Trading. In general we source FDA approved resins. To reduce our environmental footprint Parkway reintroduces low levels of factory generated regrind into our molding process. Parkway reserves the right to change our stock polypropylene resins from time to time without notice. We do attempt to reduce changes to our resin but factors will sometimes necessitate such changes.

Before using this product, the user is advised and cautioned to make its own determination and assessment of the safety and suitability of the product for the specific use in question and is further advised against relying on the information contained herein as it may relate to any specific use or application. It is the ultimate responsibility of the user to ensure that the product is suited and the information is applicable to the user's specific application. Parkway Plastics Inc does not make, and expressly disclaims, all warranties, including warranties of merchantability or fitness for a particular purpose, regardless of whether oral or written, express or implied, or allegedly arising from any usage of any trade or from any course of dealing in connection with the use of the information contained herein or the product itself. The user expressly assumes all risk and liability, whether based in contract, tort or otherwise, in connection with the use of the information contained herein or the product itself. Further, information contained herein is given without reverence to any intellectual property issues, as well as federal, state or local laws which may be encountered in the use thereof. Such questions should be investigated by the user.

For more information and technical assistance contact ConocoPhillips COPYLENE™ Polypropylene at www.COPYLENE.com.

COPYLENE™ CH350

Homopolymer

Applications

- Injection molding

Product Description

- COPYLENE™ CH350 is a controlled rheology, barefoot homopolymer designed for application as a base resin for compounding, consumer products and other injection molding applications.

Product Properties

Typical Properties	Method	Value Unit
Physical		
Melt Flow Rate (230°C/2.16kg)	ASTM D 1238	35 g/10 min
Density – Specific Gravity	ASTM D 792	0.902 sp gr
Mechanical		
Tensile Strength @ Yield (2 in/min) (50 mm/min)	ASTM D 638	5100 psi 35.1 MPa
Flexural Modulus (0.05 in/min, 1% Secant, Procedure A) (1 mm/min, 1% Secant, Procedure A)	ASTM D 790	215000 psi 1481 MPa
Tensile Elongation @Yld	ASTM D 638	9.2%
Impact		
Notched izod impact (73 °F, Method A) (23 °C, Method A)	ASTM D 256	0.5 ft-lb/in 26.6 J/m
Thermal		
DTUL @66psi – Unannealed	ASTM D 648	101 °C

For regulatory compliance information, see COPYLENE™ CH350 Product Stewardship Information Sheet. MSDS available upon request, or on our Web site at www.COPYLENE.com. The product specifications are nominal properties and do not reflect normal testing variance and should not be used for specification purposes.

Revision Date September 2010



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Processing Setup Sheet for Injection Molding Process

Injection Molding Parameter	Units	Typical Setting
Melt Temperature	°F	450 - 460
Nozzle	°F	440 - 450
Adapter	°F	450 - 460
Front	°F	450 - 470
Middle	°F	440 - 460
Rear	°F	430 - 450
Hot Runner/Manifold Temperature	°F	380-420
First or Boost Stage Injection:		
Time	sec	5-10 (less for smaller parts)
Pressure	psi	1,200-2,000 (max)
Fill Speed:		
First 10% of Shot	in/sec	1.5
Next 70% of Shot	in/sec	2.3
Last 20% of Shot	in/sec	1.2
Packing Stage Time	sec	4-8
Second or Hold Stage Injection:		
Time (with a packing stage)	sec	6-11
Time (without a packing stage)	sec	9-15
Pressure	psi	60% of max. inj. Pressure
Cushion	in	0.25 – 0.50 (dependent on shot size)
Screw Speed	rpm	60-100
Back Pressure	psi	50-200
Mold Temperature	°F	70-120 (actual surface pyrometer reading)
Clamp Pressure	tons/in ²	2.2(a)
Drying Conditions		usually not required
Purging		Polyethylene (PE), polypropylene (PP) or standard purging compound

(a) 2.2 tons/in² of projected mold area. This is dependent on wall thickness, flow distance and flow direction changes.

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Safety Data Sheet

According to OSHA HCS 2012 (29 CFR 1910.1200)



Section 1: Identification

Product Identifier: COPYLENE™ Polypropylene Pellets (All Grades)
Other means of identification: Polypropylene resin
SDS Number: 790273
Intended Use: Molded, extruded and fibrous plastic articles
Uses Advised Against: All others

Manufacturer:
Phillips 66 Company
P.O. Box 4428
Houston, Texas 77210

SDS Information:
Phone: 800-762-0942
Email: SDS@P66.com
URL: www.Phillips66.com

Emergency Health and Safety Number:
Chemtrec: 800-424-9300 (24 Hours)

Customer Service:
800-897-2774 *Technical Information:*
800-897-2774

Section 2: Hazards Identification

Classified Hazards
No classified hazards

Other Hazards
May form combustible dust concentrations in enclosed spaces during handling
Contact with hot product will cause thermal burns.

Label Elements

May form combustible dust concentrations in enclosed spaces during handling.
Contact with hot product will cause thermal burns.

Section 3: Composition / Information on Ingredients

Chemical Name	CASRN	Concentration ¹
Polypropylene	9003-07-0	0-99
Polypropylene Ethylene Copolymer	9010-79-1	0-99
Additives	Proprietary	<5

¹ All concentrations are percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.

Section 4: First Aid Measures

Eye Contact: For contact with hot material, gently open eyelids and flush affected eye(s) with cold (not icy) water. Seek immediate medical attention. For cold material, wash with plenty of water with eyelids open. If redness or pain develops, seek medical attention.

Skin Contact: First aid is not normally required. However, it is good practice to wash any chemical from the skin. For contact with molten material, leave material on skin and flush or immerse affected area(s) using cold, not icy, water. Seek immediate medical attention.

Inhalation (Breathing): First aid is not normally required. If breathing difficulties develop, move victim away from source of exposure and into fresh air in a position comfortable for breathing. Seek immediate medical attention.

Ingestion (Swallowing): First aid is not normally required; however, if swallowed and symptoms develop, seek medical attention.

Most important symptoms and effects:

Acute: None known or anticipated

Delayed: None known or anticipated. See Section 11 for information on effects from chronic exposure, if any.

Section 5: Fire-Fighting Measures

NFPA 704 Hazard Class

Health: 0 Flammability: 1 Instability: 0



0 (Minimal)
1 (Slight)
2 (Moderate)
3 (Serious)
4 (Severe)

Extinguishing Media: Dry chemical, carbon dioxide, foam, water spray, sand or earth is recommended. Carbon dioxide can displace oxygen. Use caution when applying carbon dioxide in confined spaces.

Specific hazards arising from the chemical

Unusual Fire & Explosion Hazards: This material may burn, but will not ignite readily. May form dust-air mixtures that present a fire hazard. Dense smoke is emitted when burned without sufficient oxygen.

Hazardous Combustion Products: Combustion may yield carbon monoxide, acetaldehyde, acetone, acetic acid, formic acid, formaldehyde and acrolein.

Special protective actions for firefighters: For fires beyond the initial stage, emergency responders in the immediate hazard area should wear protective clothing. When the potential chemical hazard is unknown, in enclosed or confined spaces, a self contained breathing apparatus should be worn. In addition, wear other appropriate protective equipment as conditions warrant (see Section 8).

Isolate immediate hazard area and keep unauthorized personnel out. Contain spill if it can be done safely. Move undamaged containers from immediate hazard area if it can be done safely. Cool equipment exposed to fire with water, if it can be done safely.

See Section 9 for Flammable Properties including Flash Point and Flammable (Explosive) Limits

Section 6: Accidental Release Measures

Personal precautions, protective equipment and emergency procedures: This material may burn, but will not ignite readily. Avoid the creation of dust when handling and avoid all possible sources of ignition (spark or flame). Spilled pellets present a slipping hazard on hard surfaces. Stay upwind and away from spill/release. Avoid direct contact with material. For large spillages, notify persons down wind of the spill/release, isolate immediate hazard area and keep unauthorized personnel out. Wear appropriate protective equipment, including respiratory protection, as conditions warrant (see Section 8). See Sections 2 and 7 for additional information on hazards and precautionary measures.

Environmental Precautions: Contain spill if it can be done safely. Prevent spilled material from entering sewers, storm drains, other unauthorized drainage systems, and natural waterways. Use water sparingly to minimize environmental contamination and reduce disposal requirements. If spill occurs on water notify appropriate authorities and advise shipping of any hazard.

Methods and material for containment and cleaning up: Notify relevant authorities in accordance with all applicable regulations. Carefully shovel or sweep up spilled material and place in a suitable container. Minimize dust generation.

Recommended measures are based on the most likely spillage scenarios for this material; however local conditions and regulations may influence or limit the choice of appropriate actions to be taken. See Section 13 for information on appropriate disposal.

Section 7: Handling and Storage

Precautions for safe handling: Nonsparking tools should be used. Avoid generating dust in enclosed spaces. Avoid contact with the heated material. Wash thoroughly after handling. Use good personal hygiene practices and wear appropriate personal protective equipment (see section 8). This material may be heated to high temperatures during use. Use caution when handling heated material, to avoid causing thermal burns. Vapors or fumes may cause watering or irritation of the eyes. May form combustible dust-air mixtures. Prevent accumulation of dust particles. Maintain proper grounding at all times. Avoid dust accumulation in enclosed space. Avoid dispersal of dust in the air (i.e., clearing dust surfaces with compressed air). Dust deposits should not be allowed to accumulate on surfaces, as these may form an explosive mixture if they are released into the atmosphere in sufficient concentration. Routine housekeeping should be instituted to ensure that dusts do not accumulate on surfaces. Electrostatic charge may accumulate and create a hazardous condition when handling or processing this material. To avoid fire or explosion, dissipate static electricity during transfer by grounding and bonding containers and equipment before transferring material. Explosion hazards apply only to dusts, not granular forms of this product. Do not handle or empty plastic bag or liner in presence of flammable vapor. Do not wear contaminated clothing or shoes.

Conditions for safe storage: Keep container(s) tightly closed and properly labeled. Use and store this material in cool, dry, well-ventilated area away from heat and all sources of ignition. Store only in approved containers. Keep away from any incompatible material (see Section 10). Protect container(s) against physical damage.

Section 8: Exposure Controls / Personal Protection

Chemical Name	ACGIH	OSHA	Other
Polypropylene	TWA-Tot.: 10mg/m ³ TWA-Resp.: 3 mg/m ³ Particles (insoluble or poorly soluble) n.o.s	TWA-Tot.: 15mg/m ³ TWA-Resp.: 5 mg/m ³ Particles (insoluble or poorly soluble) n.o.s	---
Polypropylene Ethylene Copolymer	TWA-Tot.: 10mg/m ³ TWA-Resp.: 3 mg/m ³ Particles (insoluble or poorly soluble) n.o.s	TWA-Tot.: 15mg/m ³ TWA-Resp.: 5 mg/m ³ Particles (insoluble or poorly soluble) n.o.s	---

Note: State, local or other agencies or advisory groups may have established more stringent limits. Consult an industrial hygienist or similar professional, or your local agencies, for further information.

Engineering controls: If current ventilation practices are not adequate to maintain airborne concentrations below the established exposure limits, additional engineering controls may be required. 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).

Eye/Face Protection: The use of eye protection that meets or exceeds ANSI Z.87.1 is recommended to protect against potential eye contact, irritation, or injury. Depending on conditions of use, a face shield may be necessary.

Skin/Hand Protection: The use of skin protection is not normally required; however, good industrial hygiene practice suggests the use of gloves or other appropriate skin protection whenever working with chemicals.

Respiratory Protection: Where there is potential for airborne exposure above the exposure limit a NIOSH certified air purifying respirator equipped with N95 filters may be used.

A respiratory protection program that meets or is equivalent to OSHA 29 CFR 1910.134 and ANSI Z88.2 should be followed whenever workplace conditions warrant a respirator's use. Air purifying respirators provide limited protection and cannot be used in atmospheres that exceed the maximum use concentration (as directed by regulation or the manufacturer's instructions), in oxygen deficient (less than 19.5 percent oxygen) situations, or under conditions that are immediately dangerous to life and health (IDLH).

Suggestions provided in this section for exposure control and specific types of protective equipment are based on readily available information. Users should consult with the specific manufacturer to confirm the performance of their protective equipment. Specific situations may require consultation with industrial hygiene, safety, or engineering professionals.

Section 9: Physical and Chemical Properties

Data represent typical values and are not intended to be specifications. N/A = Not Applicable; N/D = Not Determined

Appearance: Whitish 1/8" diameter pellets
Physical Form: Solid
Odor: No distinct odor
Odor Threshold: No data
pH: Not applicable
Vapor Density (air=1): Not applicable
Upper Explosive Limits (vol % in air): No data
Lower Explosive Limits (vol % in air): No data
Evaporation Rate (nBuAc=1): No data
Particle Size: N/A
Percent Volatile: No data
Flammability (solid, gas): May Ignite

Flash Point: Not applicable
Test Method: Not applicable
Initial Boiling Point/Range: No data
Vapor Pressure: Not applicable
Partition Coefficient (n-octanol/water) (Kow): No data
Melting/Freezing Point: > 248 °F / > 120 °C
Auto-ignition Temperature:
Decomposition Temperature: No data
Specific Gravity (water=1): 0.88-0.92 @ 68°F / 20°C g/cm3
Bulk Density: N/D
Viscosity: N/D
Solubility in Water: Negligible

Section 10: Stability and Reactivity

Reactivity: Stable under normal ambient and anticipated conditions of use.

Chemical stability: Stable under normal ambient and anticipated conditions of use.

Possibility of hazardous reactions: Hazardous reactions not anticipated.

Conditions to avoid: Avoid all possible sources of ignition. Avoid the creation of dust when handling. Extended exposure to high temperatures can cause decomposition.

Incompatible materials: Avoid contact with oxidizing agents.

Hazardous decomposition products: At extrusion temperatures (>350°F, >177°C), polypropylenes can release acetaldehyde, acetone, acetic acid, formic acid, formaldehyde and acrolein.

Section 11: Toxicological Information

Information on Toxicological Effects of Substance/Mixture

<u>Acute Toxicity</u>	<u>Hazard</u>	<u>Additional Information</u>	<u>LC50/LD50 Data</u>
Inhalation	Unlikely to be harmful		> 5 mg/L (dust, estimated)
Dermal	Unlikely to be harmful		>2 g/kg (estimated)
Oral	Unlikely to be harmful		> 5 g/kg (estimated)

Aspiration Hazard: Not applicable

Skin Corrosion/Irritation: Prolonged or repeated contact with dusts may be abrasive and mildly irritating to the skin. Solid material is not expected to be a skin irritant; however, skin contact with molten material may cause thermal burns.

Serious Eye Damage/Irritation: Dusts may be abrasive and irritating to the eyes. Contact with the heated material may cause thermal burns. Vapors or fumes may cause watering of the eyes.

Symptoms of Overexposure: Overexposure to dusts may result in irritation of the respiratory tract; Ingestion may result in irritation of the digestive tract.

Skin Sensitization: No information available.

Respiratory Sensitization: No information available.

Specific Target Organ Toxicity (Single Exposure): No information available on the mixture, however none of the components have been classified for target organ toxicity (or are below the concentration threshold for classification).

Specific Target Organ Toxicity (Repeated Exposure): No information available on the mixture, however none of the components have been classified for target organ toxicity (or are below the concentration threshold for classification).

Carcinogenicity: No information available on the mixture, however none of the components have been classified for carcinogenicity (or are below the concentration threshold for classification).

Germ Cell Mutagenicity: No information available on the mixture, however none of the components have been classified for germ cell mutagenicity (or are below the concentration threshold for classification).

Reproductive Toxicity: No information available.

Section 12: Ecological Information

GHS Classification:
No classified hazards

Toxicity: Not expected to be harmful to aquatic life

Persistence and Degradability: Expected to persist in the environment if spilled or released.

Bioaccumulative Potential: Not expected to bioaccumulate in the environment based on its physical properties.

Mobility in Soil: Because of its low solubility, this substance is expected to have low mobility in soil.

Other Adverse Effects: None anticipated.

Section 13: Disposal Considerations

The generator of a waste is always responsible for making proper hazardous waste determinations and needs to consider state and local requirements in addition to federal regulations.

This material, if discarded as produced, would not be a federally regulated RCRA "listed" hazardous waste and is not believed to exhibit characteristics of hazardous waste. See Sections 7 and 8 for information on handling, storage and personal protection and Section 9 for physical/chemical properties. It is possible that the material as produced contains constituents which are not required to be listed in the MSDS but could affect the hazardous waste determination. Additionally, use which results in chemical or physical change of this material could subject it to regulation as a hazardous waste.

Container contents should be completely used and containers should be emptied prior to discard.

Section 14: Transport Information

U.S. Department of Transportation (DOT)

Shipping Description: *Not regulated*

International Maritime Dangerous Goods (IMDG)

Shipping Description: *Not regulated*

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Not applicable

International Civil Aviation Org. / International Air Transport Assoc. (ICAO/IATA)

UN/ID #: *Not regulated*

	LTD. QTY	Passenger Aircraft	Cargo Aircraft Only
Packaging Instruction #:	---	---	---
Max. Net Qty. Per Package:	---	---	---

Section 15: Regulatory Information

CERCLA/SARA - Section 302 Extremely Hazardous Substances and TPQs (in pounds):

This material does not contain any chemicals subject to the reporting requirements of SARA 302 and 40 CFR 372.

CERCLA/SARA - Section 311/312 (Title III Hazard Categories)

Acute Health: No
Chronic Health: No
Fire Hazard: No
Pressure Hazard: No
Reactive Hazard: No

CERCLA/SARA - Section 313 and 40 CFR 372:

This material does not contain any chemicals subject to the reporting requirements of SARA 313 and 40 CFR 372.

EPA (CERCLA) Reportable Quantity (in pounds):

This material does not contain any chemicals with CERCLA Reportable Quantities.

California Proposition 65:

This material does not contain any chemicals which are known to the State of California to cause cancer, birth defects or other reproductive harm at concentrations that trigger the warning requirements of California Proposition 65.

International Hazard Classification

Canada:

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the SDS contains all the information required by the Regulations.

WHMIS Hazard Class:

None

National Chemical Inventories

All components are either listed on the US TSCA Inventory, or are not regulated under TSCA
All components are either on the DSL, or are exempt from DSL listing requirements.

U.S. Export Control Classification Number: EAR99

Section 16: Other Information

Date of Issue:	Previous Issue Date:	SDS Number:	Status:
06-Feb-2013	05-Nov-2012	790273	FINAL

Revised Sections or Basis for Revision:

Format change; Identified Hazards (Section 2)

Guide to Abbreviations:

ACGIH = American Conference of Governmental Industrial Hygienists; CASRN = Chemical Abstracts Service Registry Number; CEILING = Ceiling Limit (15 minutes); CERCLA = The Comprehensive Environmental Response, Compensation, and Liability Act; EPA = Environmental Protection Agency; GHS = Globally Harmonized System; IARC = International Agency for Research on Cancer; INSHT = National Institute for Health and Safety at Work; IOPC = International Oil Pollution Compensation; LEL = Lower Explosive Limit; NE = Not Established; NFPA = National Fire Protection Association; NTP = National Toxicology Program; OSHA = Occupational Safety and Health Administration; PEL = Permissible Exposure Limit (OSHA); SARA = Superfund Amendments and Reauthorization Act; STEL = Short Term Exposure Limit (15 minutes); TLV = Threshold Limit Value (ACGIH); TWA = Time Weighted Average (8 hours); UEL = Upper Explosive Limit; WHMIS = Worker Hazardous Materials Information System (Canada)

Disclaimer of Expressed and implied Warranties:

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Product Stewardship Information Sheet

CH350

Product Manufacturer:

This product is manufactured by Phillips 66 Company in Linden, NJ.

REACH (Regulation (EC) No. 1907/2006)

Substances of Very High Concern (SVHC)

This product does not contain any of the candidate chemical substances proposed to be Substances of Very High Concern (including the most recent list dated June 20th, 2016) above the 0.1% threshold as stated in REACH (Article 57, Regulation No. 1907/2006) determined either through (i) non-use of the substance, (ii) mass balance calculation, or (iii) specific testing.

Chemical Inventories:

All ingredients in this product are in compliance with the following chemical inventories:

- United States: Toxics Substances Control Act Inventory (TSCA)
- Canada: Domestic Substances List
- Europe: EINECS/ELINCS replaced by REACH
- Korea: Korean Existing Chemicals List (KECL)
- Australia Inventory of Chemical Substances (AICS)
- Japan: Japanese Inventory of Existing and new Chemical Substances (ENCS)
- The Philippines: Philippines Inventory of Chemicals and Chemical Substances (PICCS)
- China: Inventory of Existing Chemical Substances Manufactured or Imported in China (IECSC)
- New Zealand: New Zealand inventory of Chemicals (NZIoC)

This product has no special requirements under US TSCA (e.g. consent orders, test rules, 12(b) requirements, etc.).

Food Contact:

European Union (EU) Food Contact

This product complies with applicable European Union (EU) food-contact legislation, including (EU) No 10/2011, as amended, when used in food packaging applications, subject to the following conditions and limitations:

- All monomers and additives used in this product are included in the positive lists of (EU) No 10/2011, as amended.

It is the responsibility of the manufacturer of the finished food-contact article to verify compliance of the finished article with applicable EU legislation, including the SML noted above, as well as the overall migration limit. In addition, it is the responsibility of the manufacturer of the



finished article to verify that their final article, made according to good manufacturing practices (GMPs), does not modify the organoleptic properties of the food.

Provided that the above limitations are met in the finished article, the product complies with applicable EU law, including Article 3 of the Framework Regulation 1935/2004/EC, and (EU) No 10/2011, as amended.

2008/282/EC –CH350 is manufactured from propylene and does not contain recycled materials and is suitable for food contact applications as defined herein.

2006/2023/EC Good Manufacturing Practices – The manufacturing process for CH350 is compliant with the good manufacturing practices set out in this regulation and its amendments.

US Food and Drug Administration (FDA)

The base resin in this product complies with 21 CFR 177.1520(a) (1) (i) and (c) 1.1a. In addition, all other ingredients used in this product meet the requirements of their respective FDA regulations and 21 CFR 177.1520(b), subject to no limitations on temperature or food type contacted. Accordingly, this product can be used in contact with all food types listed in 21 CFR 176.170(c), Table 1, under Conditions of use A through H, identified in 21 CFR 176.170(c), Table 2.

Canada Health Protection and Food Branch (HPFB)

A letter of "no objection" for food contact use of this product has not been obtained from HPFB.

Tallow

Tallow derived additives may be used in the manufacture of this product.

Bovine Spongiform Encephalopathy (BSE)/Transmissible Spongiform Encephalopathy (TSE)/"Mad Cow"

This product may contain additives derived from animal sources. Our suppliers have stated that their additives are derived from bovine material. They have assured us that the animal material is sourced only from the United States, Canada and Mexico. The animal material undergoes high temperature hydrogenation and hydrolysis processes followed by further processing (distillation), all at >200 deg. C.

Kosher

We do not certify our resins to be Kosher or in compliance with Kosher requirements.

Food Allergens

The following list of allergens are not used in the manufacture of or formulation of this product.

The list includes:

- Peanuts, peanut oil, any peanut products; tree nuts (almonds, Brazil nuts, chestnuts, filberts, hazelnuts, hickory nuts, macadamia nuts, pecans, pine nuts, pistachios, and walnuts); refined or unrefined oils;
- Milk (casein) or milk products, dairy products, dairy derivatives, lactose with protein;
- Eggs or egg products;



- Soybeans, soy flour, any soy products;
- Fish (e.g. cod, salmon) or fish products;
- Shellfish, crustaceans (e.g. shrimp, crabs, lobsters, oysters, clams, scallops, crayfish);
- Mollusks (e.g. snails, clams, squid, octopi) or mollusk products;
- Sulfites;
- Food colors;
- Celery or celery products;
- Wheat (gluten) or wheat products;
- Seeds (e.g. cotton, poppy, sesame, sunflower, mustard) or seed products;
- Aspartame;
- Monosodium glutamate (MSG);
- Caffeine;
- Hydrogenated vegetable protein (HVP);
- Grains (e.g. rye, barley, oats);
- Lupine or lupine products.

European Pharmacopeia (EP)

This product has not been tested for E.P.

Drug Master File (DMF)

Information on this product is listed in a DMF.

US Pharmacopeia (USP)

This product has not been tested for USP Class VI.

Latex

"Natural rubber latex", "dry natural rubber", "synthetic latex" or "rubber that contains natural rubber" is not used in the manufacture of or the formulation of this product.

Coalition of Northeastern Governors (CONEG)

Cadmium, chromium (VI), lead and mercury are not used in the manufacture of or the formulation of this product. In addition, this product meets the CONEG requirements of less than 100 ppm for total incidental cadmium, chromium, lead and mercury.

European Union (EU) Directive - Packaging and Packaging Waste - 94/62/EC (as amended)

Cadmium, chromium (VI), lead and mercury are not used in the manufacture of or the formulation of this product. This product meets the year 2001 requirements of less than 100 ppm for total incidental cadmium, chromium (VI), lead and mercury. In addition, this product has the potential to be recycled according to these requirements.

Heavy Metals Testing Results

Testing of resins similar to this product has shown the following metals are not present at the sensitivities listed in parenthesis: antimony (3 ppm), arsenic (2 ppm), barium (2 ppm), cadmium (1 ppm), chromium (1 ppm), lead (2 ppm), mercury (0.01 ppm), selenium (3 ppm), silver (1 ppm).



California's Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65)

This product presents "no significant risk" for cancer to the people of California. This product contains no substances known to the State of California to cause reproductive toxicity at a level of exposure subject to the requirements of Proposition 65.

Butylated Hydroxytoluene (BHT) and Butylated Hydroxyanisole (BHA)

BHT and BHA are not used in the manufacture of or formulation of this product. However, this product has not been tested for these chemical substances.

Ozone Depleting Chemicals (ODCs)

Class I and Class II ODCs listed in the US Clean Air Act Amendments of 1990 are not used in the manufacture of or formulation of this product. ODCs listed in the Montreal Protocol are not used in the manufacture of or formulation of this product.

Phthalates

Plasticizers such as phthalates are not used in the manufacture of or the formulation of this product. However, diethyl phthalate (DEP) and diisobutyl phthalate (DIBP) are minor components of the catalyst system used to manufacture some of the base polyolefin resins. This is typical of polypropylene resins produced with high mileage catalysts. These phthalates are "technical support agents" as defined by European Union Directive 2007/19/EC. Historical testing demonstrated residual phthalates to be not detectable at 30 ppm sensitivity.

Acrylamide

Acrylamide (CAS number 79-06-1) is not used in the manufacture of or the formulation of this product. However, we do not test this product for acrylamide.

Aromatic Amines

Aromatic amines are not used in the manufacture of or formulation of this product. However, this product has not been tested for these chemical substances.

Asbestos

Asbestos is not used in the manufacture of or formulation of this product. However, this product has not been tested for this chemical substance.

Bisphenol A

Bisphenol A is not used in the manufacture of or the formulation of this product. However, this product has not been tested for this chemical substance.

Dioxin

Dioxin is not used in the manufacture of or formulation of this product. Dioxin is not known to be formed during processing of this product.

Epichlorohydrin

Epichlorohydrin (CAS number 106-89-8) is not used in the manufacture of or the formulation of this product. However, we do not test this product for epichlorohydrin.

Fluorocarbons

Fluorotelomers, Zonyl fluoroadditives (DuPont trade name), perfluorooctane sulfonate (PFOS),



perfluorooctanoic acid (PFOA), perfluorochemicals (PFC) or other fluorocarbon substances are not used in the manufacture of or formulation of this product. However, this product has not been tested for these substances.

Nonylphenol

Nonylphenol and Nonylphenol ethoxylates are not used in the manufacture of or the formulation of this product. However, this product has not been tested for these chemical substances.

Organo-tin Compounds

Tributyl-tin (TBT), dibutyl-tin (DBT), monobutyl-tin (MBT) or any other organo-tin compounds are not used in the manufacture of or the formulation of this product. However, this product has not been tested for these chemical substances.

Polychlorinated Biphenyls (PCBs), Polychlorinated Terphenyls (PCTs), Polychlorinated Naphthalenes (PCNs), Polybrominated Biphenyls (PBBs), Polybrominated Diphenyl Ethers (PBDEs) and Polybrominated Terphenyls (PBTs)

Polychlorinated biphenyls (PCBs), polychlorinated terphenyls (PCTs), polychlorinated naphthalenes (PCNs), polybrominated biphenyls (PBBs), polybrominated diphenyl ethers (PBDEs) and polybrominated terphenyls (PBTs) are not used in the manufacture of or formulation of this product. However, this product has not been tested for these chemical substances.

Styrene and Polystyrene

Styrene (chemical name: ethenylbenzene) (CAS number 100-42-5) and polystyrene resins are not used in the manufacture of or the formulation of this product. However, we do not test this product for these chemical substances.

Vinyl Chloride and Polyvinyl Chloride (PVC)

Vinyl chloride (CAS number 75-01-4) and PVC resins are not used in the manufacture of or the formulation of this product. However, we do not test this product for these chemical substances.

Chlorinated Paraffins

Chlorinated paraffins, including short-chain chlorinated paraffins, are not used in the manufacture of or the formulation of this product. However, this product has not been tested for these chemical substances.

Benzotriazole and 2-Mercaptobenzothiazole (MBT)

2-(2H-1, 2, 3-Benzotriazol-2-yl)-4,6-di-tert-butylphenol [also called 2-(2'-Hydroxy-3',5'-di-tert-butylphenyl) benzotriazole] (CAS No. 3846-71-7) and 2-Mercaptobenzothiazole [also called 2(3H)-Benzothiazolethione or Benzothiazole-2-thiol or MBT] (CAS No. 149-30-4) are not used in the manufacture of or formulation of this product. However, this product is not tested for these substances.

Azo Dyes and Pigments

Azo dyes and pigments are not used in the manufacture of or the formulation of this product. However, this product has not been tested for these chemical substances.



Regulation (EC) N.1895/2005

BADGE, NOGE and BFDGE are not used in the manufacture of or the formulation of this product according to requirement of Regulation N.1895/2005.

Polycyclic Aromatic Hydrocarbons (PAHs)

We do not intentionally use the following polycyclic aromatic hydrocarbons (PAHs) in the manufacture of or formulation of this product:

- 1,2-dihydro-acenaphthene (CAS# 83-32-9)
- acenaphthylene (CAS# 208-96-8)
- 9H-fluorene (CAS# 86-73-7) anthracene (CAS# 120-12-7)
- benz(a)anthracene (CAS# 56-55-3)
- benzo(a)pyrene (CAS# 50-32-8)
- benzo(b)fluoranthene (CAS# 205-99-2)
- benzo(e)pyrene (CAS# 192-97-2)
- benzo(ghi)perylene (CAS# 191-24-2)
- benzo(j)fluoranthene (CAS# 205-82-3)
- benzo(k)fluoranthene (CAS# 207-08-9)
- chrysene (CAS# 218-01-9)
- dibenz(a,h)anthracene (CAS# 53-70-3)
- fluoranthene (CAS# 206-44-0)
- fluorene (CAS# 86-73-7)
- indeno(1,2,3-cd)pyrene (CAS# 193-39-5)
- naphthalene (CAS# 91-20-3)
- phenanthrene (CAS# 85-01-8)
- pyrene (CAS# 129-00-0)

However, we do not test our resins for these substances.

Restriction of Hazardous Substances in Electric and Electronic Equipment (RoHS) – Directive 2002/95/EC, as amended.

The information for RoHS can be found in the "Heavy Metals" (cadmium, chromium, lead, mercury) and the "Polychlorinated Biphenyls (PCBs), Polybrominated bipheyls (PBBs), etc." (PBBs, PBDEs) sections above.

Composting - CEN Standard prEN 13432

This product is not suitable for composting.

Energy Recovery - CEN Standard prEN 13431

The calorific gain from polypropylene in an energy recovery process is 24 MJ/kg.

This Product Stewardship Information sheet ("PSI") is intended for informational purposes only. Phillips 66 Company makes no representations or warranties with respect to the accuracy or completeness of the information contained herein. This information in no way modifies, amends, enlarges or creates any specification or warranty, and ALL WARRANTIES, EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, ARE HEREBY EXCLUDED.



The information contained herein relates only to the specific product and/or material designated and may not be valid for such product and/or material used in combination with any other product and/or material. Determination of the suitability and fitness of the specific product and/or material for any particular application is the sole responsibility of the purchaser. Phillips 66 Company shall not be responsible for any damage or injury resulting from abnormal use, from any failure to follow appropriate practices or from hazards inherent in the nature of the product and/or material, nor for toxicological effects or industrial hygiene associated with particular use of any product described herein. Purchaser must make its own determination that its use of the product is safe and lawful (except as provided in the certifications set forth herein). Information provided is of the date hereof and Phillips 66 Company assumes no responsibility to update, revise or amend this PSI or the information contained herein.

NOTICE REGARDING MEDICAL APPLICATION RESTRICTIONS: In no event should a Phillips 66 Company COPYLENE™ product be used in any US FDA Class III Medical Device or Health Canada Class IV Medical Device. No Phillips 66 Company COPYLENE™ product should be used in any US FDA Class II Medical Devices or Health Canada Class II or Class III Medical Devices without prior written approval by Phillips 66 Company for each specific product or application.

Certified by/Contact:

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Bamberger Polymers Inc.

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Phone: 281-481-9100

Fax: 281-484-6222

August 21, 2014

Mr. Ned Rowan
Parkway Plastics Inc.
561 Stelton Road
Piscataway, NJ 08854

Via e-mail: ned.rowan@parkwayjars.com

RE: Fumigants - Fungicides - Preservatives - CONFIDENTIAL

Dear Mr. Rowan,

The statement below is made to the best of our knowledge and based on manufacturer feedback. It is made in made in reference to only prime propylene grades, *Copylene CH350* and *Copylene CR350CL-01*.

Fumigants - Fungicides - Preservatives

The manufacturer confirms that *Copylene CH350* and *Copylene CR350CL-01*, as manufactured and shipped from the manufacturing facility, are not intentionally formulated to contain chemical substances commonly identified as fungicides, preservatives (conventional preservatives), or fumigants.

These grades, however, as supplied, do contain small amounts of antioxidants or stabilizers, which might also be considered preservatives. These substances function to protect the polymer and are not intended to have any effect on foods contained in articles manufactured from this product.

Because P66 does not anticipate these types of chemical substances to be in this resin listed above, P66 does not analyze for their presence.

However, please be advised that Bamberger Polymers does not specifically analyze *Copylene CH350* and *Copylene CR350CL-01* for any of the aforementioned substances (even trace amounts) and/or protocols.

The information in this document is valid for cited regulations published as of the date this document was prepared. *It is the customer's responsibility to seek updated regulatory information on any specific resin.*

As always, we cannot be held responsible for any type of modification of *Copylene CH350* and *Copylene CR350CL-01* by any additions or conversion process(es), packaging materials (or their components), or inadequate use and/or storage of our material or the finished products by the end user. It is the responsibility of the customer to determine that all conditions and specifications contained in all pertinent regulatory categories are met, and that the products or articles produced from this material are acceptable and suitable for use in the intended applications.

We hope the aforementioned addresses your concerns. As always, if we can be of further assistance or need additional information, please do not hesitate to let us know.

Thank you for your continued patronage.

Sincerely yours,

Mario Umana
Bamberger Polymers

cc: Andy Fredericks (Bamberger Polymers- Sales)



Bamberger Polymers Inc.

12600 Featherwood Dr., Ste. 300
Houston, Texas 77034

Phone: 281-481-9100
Fax: 281-484-6222

May 1, 2013

Mr. Ned Rowan
Parkway Plastics Inc.
561 Stelton Road
Piscataway, NJ 08854

Via e-mail: ned.rowan@parkwayjars.com

RE: Conflict Materials - **CONFIDENTIAL**

Dear Mr. Rowan,

Regarding your request, the statement below is made to the best of our knowledge and based on manufacturer feedback. It is made in reference to only prime propylene grades, *Copylene CH350* and *Copylene CR350CL-01*.

Please note that Conflict minerals such as Columbite-tantalite, Cassiterite, Wolframite or Gold are not used in the manufacturing of *Copylene CH350*. However, none of the P66 polymers have been tested for presence of any trace amounts of these minerals.

However, please be advised that Bamberger Polymers does not specifically analyze for any of the aforementioned substances (even trace amounts) and/or protocols.

The information in this document is valid for cited regulations published as of the date this document was prepared. *It is the customer's responsibility to seek updated regulatory information on any specific resin.*

As always, we cannot be held responsible for any type of modification of *Copylene CH350* and *Copylene CR350CL-01* by any additions or conversion process(-es), packaging materials (or their components), or inadequate use and/or storage of our material or the finished products by the end user. It is the responsibility of the customer to determine that all conditions and specifications contained in all pertinent regulatory categories are met, and that the products or articles produced from this material are acceptable and suitable for use in the intended applications.

We hope the aforementioned addresses your concerns. As always, if we can be of further assistance or need additional information, please do not hesitate to let us know.

Thank you for your continued patronage.

Sincerely yours,

Mario Umana
Bamberger Polymers

cc: Chris Hessenius (*Bamberger Polymers*- Regional Manager)
Andy Fredericks (*Bamberger Polymers*- Sales)

Chemical Compatibility Guide

Interpretation of Chemical Resistance

The Chemical Resistance Chart and Chemical Resistance Summary Chart that follow are general guidelines for Thermo Scientific Nalgene products only. Because so many factors can affect the chemical resistance of a given product, you should test under your own conditions. If any doubt exists about specific applications of Nalgene® products, please contact Technical Service, Thermo Fisher Scientific, Nalgene and Nunc products, 75 Panorama Creek Drive, Rochester, New York 14625-2385, or call (800) 625-4327, Fax (800) 625-4363. International customers, contact our International Department at +1 (585) 899-7198, Fax +1 (585) 899-7195. In Europe, contact Nalgene at +44 (0) 1432 263933, Fax +44 (0) 1432 376567.

Additional Chemical Resistance Information

This chemical resistance chart is to be used for all labware including containers up to 50L. For NALGENE centrifugeware please refer to those charts in this catalog.

For chemical resistance of PETG (polyethylene terephthalate copolyester), see below.

For Nalgene fluorinated containers, including fluorinated high-density polyethylene (FLPE) and fluorinated polypropylene (FLPP), see inside back cover.

Effects of Chemicals on Plastics

Chemicals can affect the strength, flexibility, surface appearance, color, dimensions or weight of plastics. The basic modes of interaction which cause these changes are: (1) chemical attack on the polymer chain, with resultant reduction in physical properties, including oxidation; reaction of functional groups in or on the chain, and depolymerization; (2) physical change, including absorption of solvents, resulting in softening and swelling of the plastic; permeation of solvent through the plastic, and dissolution in a solvent, and (3) stress-cracking from the interaction of a "stress-cracking agent" with molded-in or external stresses. Also see "Chemical Resistance Classification".

The reactive combination of compounds of two or more classes may cause a synergistic or undesirable chemical effect. Other factors affecting chemical resistance include temperature, pressure and internal or external stresses (e.g., centrifugation), length of exposure and concentration of the chemical. As temperature increases, resistance to attack decreases. Mixing and/or dilution of certain chemicals in Nalgene labware can be potentially dangerous. The reactive combination of different chemicals

First letter of each pair applies to conditions at 20°C; the second to those at 50°C. At 20°C->EG<-at 50°C.

Resin Codes:

ECTFE	Halar ECTFE* (ethylene-chlorotrifluoroethylene copolymer)
ETFE	Tefzel ETFE [†] (ethylene-tetrafluoroethylene)
FEP	Teflon FEP [†] (fluorinated ethylene propylene)
HDPE	high-density polyethylene
FLPE	fluorinated polyethylene
LDPE	low-density polyethylene
PC	polycarbonate
PEI	polyetherimide

PETG	polyethylene terephthalate copolymer
PFA	Teflon PFA [†] (polyfluoroalkoxy)
PMMA	polymethyl methacrylate (acrylic)
PMP	polymethylpentene
PP	polypropylene
PPCO ^{††}	polypropylene copolymer
PS	polystyrene
PSF	polysulfone
PVC	polyvinyl chloride

PVDF	polyvinylidene fluoride
RESMER	RESMER manufacturing technology
SAN	styrene acrylonitrile
TFE	Teflon TFE [†] (tetrafluoroethylene)
TMX	Thermanox
PMX	Permanox
XLPE	cross-linked high-density polyethylene

*Halar is a registered trademark of Solvay Solexis.

[†]Or equivalent. Teflon and Tefzel are registered trademarks of DuPont.

^{††}PPCO has replaced polyallomer (PA) in all products.

or compounds of two or more classes may cause an undesirable chemical effect or result in an increased temperature which can affect chemical resistance (as temperature increases, resistance to attack decreases). Other factors affecting chemical resistance include pressure and internal or external stresses (e.g., centrifugation), length of exposure and concentration of the chemical.

Environmental Stress-Cracking

Environmental stress-cracking is the failure of a plastic material in the presence of certain types of chemicals. This failure is not a result of chemical attack. Simultaneous presence of three factors causes stress-cracking: a tensile strength, a stress-cracking agent and inherent susceptibility of the plastic to stress-cracking.

Common stress-cracking agents are detergents, surface active chemicals, lubricants, oils, ultra-pure water and plating additives such as brighteners and wetting agents. Relatively small concentrations of stress-cracking agent may be sufficient to cause cracking.

Mixing and/or dilution of certain chemicals may result in reactions that produce heat and can cause product failure. Pre-test your specific usage and always follow correct lab safety procedures.

ATTENTION: Please be aware that, although several polymers may have excellent resistance to various flammable organic chemicals and solvents, OSHA H CFR 29 1910.106 for flammable and combustible materials, or other local regulations, may restrict the volumes of solvents which may legally be stored in an enclosed area.

Caution

Do not store strong oxidizing agents in plastic labware except that made of FEP or PFA. Prolonged exposure causes embrittlement and failure. While prolonged storage may not be intended at time of filling, a forgotten container will fail in time and result in leakage of contents. Do not place any plastic labware in a flame.

**Quickly and easily search our extensive chemical resistance database at:
www.nalgenelabware.com**

CHEMICAL	LDPE		HDPE		PP		PPCO		PMP		PETG		FEP		TFE		PFA		ECTFE		ETFE		PC		Rigid PVC		Flex. PVC		PSF		PS		FLPE		RESMER		PMMA		SAN		PEI		XLPE		PVDF	
	20°	50°	20°	50°	20°	50°	20°	50°	20°	50°	20°	50°	20°	50°	20°	50°	20°	50°	20°	50°	20°	50°	20°	50°	20°	50°	20°	50°	20°	50°	20°	50°	20°	50°	20°	50°	20°	50°	20°	50°	20°	50°				
1,4-Dioxane, pure	G	F	G	G	N	N	G	F	F	N	-	-	E	E	E	E	E	E	E	F	E	F	N	N	N	N	N	N	N	N	E	E	F	N	N	N	N	-	-	F	N	N	N			
2,2,4-Trimethylpentane, pure	F	N	F	N	F	N	F	N	F	N	-	-	E	E	E	E	E	G	E	G	E	G	N	N	N	N	N	G	F	N	N	G	F	G	F	-	-	-	-	-	-	-	E	E		
2,4,6-Trinitrophenol, pure	N	N	N	N	N	N	N	N	E	E	-	-	E	E	E	E	E	G	F	G	F	N	N	N	N	N	N	G	F	N	N	G	F	-	-	E	E	-	-	G	N	G	N			
2-Methoxyethanol, pure	E	G	E	E	G	F	E	E	E	E	F	N	E	E	E	E	E	E	G	E	E	N	N	F	N	F	N	N	N	E	E	G	F	-	-	N	N	-	-	-	-	E	E			
2-Propanol, pure	E	E	E	E	E	E	E	E	E	E	-	-	E	E	E	E	E	E	E	E	E	E	E	E	E	E	F	G	N	G	F	E	G	E	E	E	E	N	N	E	F	E	E	E	E	
Acetaldehyde, pure	G	N	G	F	G	N	G	N	G	N	-	-	E	E	E	E	E	G	F	E	E	N	N	N	N	N	N	N	G	F	G	G	N	N	N	N	N	N	N	N	N	N	N			
Acetamide, saturated	E	E	E	E	E	E	E	E	E	E	-	-	E	E	E	E	E	E	E	E	E	E	N	N	N	N	N	E	E	G	G	E	E	-	-	E	E	E	-	E	E	G	N			
Acetic Acid, 5%	E	E	E	E	E	E	E	E	F	N	E	E	E	E	E	E	E	E	E	E	E	E	E	G	E	F	E	G	E	E	E	E	E	F	E	E	E	E	E	E	E	E	E			

E - No damage after 30 days of constant exposure.

G - Little or no damage after 30 days of constant exposure.

F - Some effect after 7 days of constant exposure.

N - Immediate damage may occur. Not recommended for continuous use.

CHEMICAL	LDPE	HDPE	PP	PCO	PMP	PETG	FEP	TFE	PFA	ECTFE	ETFE	PC	Rigid PVC	Flex. PVC	PSF	PS	FLPE	RESMER	PMMA	SAN	PEI	XLPE	PVDF																									
	20° 50°	20° 50°	20° 50°	20° 50°	20° 50°	20° 50°	20° 50°	20° 50°	20° 50°	20° 50°	20° 50°	20° 50°	20° 50°	20° 50°	20° 50°	20° 50°	20° 50°	20° 50°	20° 50°	20° 50°	20° 50°	20° 50°	20° 50°																									
Oil, Cedarwood	N	N	F	N	N	N	N	-	-	E	E	E	E	E	E	G	F	-	-	N	N	F	F	N	N	-	-	E	E	-	-	G	F	E	E	G	N	E	E									
Oil, Cinnamon	N	N	F	N	N	N	N	-	-	E	E	E	E	E	E	G	F	N	N	N	F	F	N	N	N	N	-	-	E	E	-	-	N	N	E	E	G	N	-	-								
Oil, Mineral	G	N	E	E	E	E	E	G	-	E	E	E	E	E	E	E	G	E	G	E	E	E	E	E	E	E	E	E	E	E	N	E	E	E	E	G	N	E	E									
Oil, Pine	G	N	F	N	E	G	E	G	G	F	-	-	E	E	E	E	E	G	F	F	N	N	F	F	N	N	E	G	E	E	-	-	N	N	E	E	G	N	E	E								
Orange Oil	F	N	G	F	G	F	G	F	F	F	-	-	E	E	E	E	E	E	E	F	F	F	N	N	F	F	N	N	E	G	F	N	-	-	G	F	-	-	-	-	E	E						
Oxalic Acid, 10%	E	E	E	E	E	E	E	E	-	-	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	-	-	E	E	E	G					
Ozone, pure	G	N	G	N	F	N	E	G	E	E	-	-	E	E	E	E	E	E	N	N	E	G	G	F	E	E	F	F	G	N	F	F	E	-	-	G	G	G	G	N	N	E	E					
p-Chloroacetophenone, pure	E	E	E	E	E	E	E	E	-	-	E	E	E	E	E	E	E	E	G	N	N	N	N	N	N	N	N	E	E	F	N	-	-	-	-	-	-	-	-	-	-	N	N					
p-Dichlorobenzene, pure	F	N	N	N	G	F	G	F	G	F	N	N	E	E	E	E	E	N	E	F	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	E	E			
Perchloric Acid, 70%	G	N	G	N	G	N	G	N	G	N	-	-	E	E	G	F	E	E	E	G	N	N	N	N	N	N	N	G	F	G	N	G	F	E	E	G	G	F	F	N	N	E	G					
Perchloric Acid, concentrated	G	N	G	N	G	N	G	N	G	N	-	-	G	F	G	F	G	F	G	F	G	F	N	N	G	N	N	N	N	G	F	G	N	G	F	E	E	G	G	F	F	N	N	E	G			
Perchloric Acid, pure	G	N	G	N	G	N	G	N	G	N	-	-	G	F	G	F	G	F	G	F	N	N	G	N	N	N	N	G	F	G	N	G	F	E	E	G	G	F	F	N	N	E	G					
Perchloroethylene, pure	N	N	N	N	N	N	N	N	-	-	E	E	E	E	E	E	E	E	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	E	E		
Petroleum	N	N	G	N	N	N	N	N	G	F	-	-	E	E	E	E	E	E	E	F	F	G	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	E	E	
Phenol, 50%	N	N	N	N	N	N	N	N	N	N	N	N	E	E	E	E	E	E	E	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	E	G	
Phenol, 100%	N	N	N	N	N	N	N	N	N	N	N	N	E	E	E	E	E	E	E	E	E	E	E	E	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	E	G
Phenol, Crystal	F	N	G	F	G	N	G	N	F	G	N	N	E	E	E	E	E	E	E	N	N	F	N	F	N	F	F	N	N	E	E	N	N	N	N	N	N	N	N	N	N	N	N	N	N	E	G	
Phenol, liquid	N	N	N	N	N	N	N	N	N	N	N	N	E	E	E	E	E	E	E	E	E	E	E	E	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	E	G
Phosphoric Acid, 5%	E	E	E	E	E	E	E	E	-	-	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	
Phosphoric Acid, 85%	E	N	E	E	E	G	E	G	E	G	-	-	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E		
Picric Acid, pure	N	N	N	N	N	N	N	N	N	N	-	-	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	
Pine Oil, pure	G	N	F	N	E	G	E	G	G	F	-	-	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	
Potassium Chloride, pure	E	E	E	E	E	E	E	E	-	-	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	
Potassium Hydroxide, 1%	E	E	F	F	E	E	E	E	-	-	E	E	E	E	E	E	E	E	E	F	N	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E		
Potassium Hydroxide, 30%	E	E	E	E	E	E	E	E	-	-	E	E	E	E	E	E	E	E	E	N	N	E	E	G	N	E	G	G	G	F	F	E	G	E	-	-	E	E	G	F	E	E	E	E	E	E		
Potassium Hydroxide, concentrated	E	E	E	E	E	E	E	E	N	N	E	E	E	E	E	E	E	E	E	N	N	E	G	F	N	E	F	G	G	F	F	E	G	E	N	E	G	G	F	E	E	E	E	E	E	E		
Potassium Permanganate, pure	E	E	E	E	E	G	E	E	E	E	-	-	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	
Propane, gas	N	N	E	E	N	N	N	N	-	-	E	E	E	E	E	E	E	E	E	F	N	E	G	F	N	E	G	F	N	F	F	N	N	E	E	G	F	-	-	E	E	-	-	-	-	E	E	
Propionic Acid, pure	F	N	E	F	E	G	E	G	E	F	-	-	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	
Propylene Glycol, pure	E	E	E	E	E	E	E	E	-	-	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	
Propylene Oxide, pure	E	G	E	E	E	G	E	G	E	G	-	-	E	E	E	E	E	E	N	N	E	F	G	F	F	N	F	N	G	G	N	N	E	E	F	N	-	-	N	N	-	-	-	-	N	N		
Pyridine, pure	N	N	N	N	E	E	N	N	F	N	-	-	E	E	E	E	E	E	N	N	E	G	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	
Resorcinol, 5%	E	E	E	E	E	E	E	E	-	-	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	
Resorcinol, saturated	E	E	E	E	E	E	E	E	-	-	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	
Salicylaldehyde, pure	E	G	E	E	E	G	E	G	E	G	-	-	E	E	E	E	E	E	N	E	G	G	F	F	N	N	F	F	N	N	E	E	F	N	-	-	N	N	-	-	-	-	-	-	E	G		
Salicylic Acid, powder	E	E	E	E	E	E	E	E	-	-	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	
Salicylic Acid, saturated	E	E	E	E	E	E	E	E	-	-	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E
sec-Butanol, pure	E	E	E	E	E	E	E	E	-	-	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	
sec-Butyl Alcohol, pure	E	E	E	E	E	E	E	E	-	-	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	
Silicone Oil, pure	E	G	E	E	E	E	E	E	N	N	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	
Silver Acetate, pure	E	E	E	E	E	E	E	E	-	-	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E
Silver Nitrate, pure	E	G	E	E	E	E	E	E	-	-	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	
Skydrol LD4 Aviation Hydraulic Fluid	G	F	E	G	E	G	E	G	-	-	E	E	E	E	E	E	E	E	E	N	N	N	N	N	N	N	N	N	N	E	G	F	N	-	-	-	-	F	N	-	-	-	-	E	F	E	F	
Sodium Acetate, pure	E	E	E	E	E	E	E	-	-	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	
Sodium Carbonate, pure	E	E	E	E	E	E	E	G	-	-	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	
Sodium Dichromate, pure	E	E	E	E	E	E	E	-	-	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E
Sodium Hydroxide, 1%	E	E	E	E	E	E	E	G	-	-	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E

E - No damage after 30 days of constant exposure.

G - Little or no damage after 30 days of constant exposure.

F - Some effect after 7 days of constant exposure.

N - Immediate damage may occur. Not recommended for continuous use.

CHEMICAL	LDPE	HDPE	PP	PCO	PMP	PETG	FEP	TFE	PFA	ECTFE	ETFE	PC	Rigid PVC	Flex. PVC	PSF	PS	FLPE	RESMER	PMMA	SAN	PEI	XLPE	PVDF				
	20° 50°	20° 50°	20° 50°	20° 50°	20° 50°	20° 50°	20° 50°	20° 50°	20° 50°	20° 50°	20° 50°	20° 50°	20° 50°	20° 50°	20° 50°	20° 50°	20° 50°	20° 50°	20° 50°	20° 50°	20° 50°	20° 50°	20° 50°				
Sodium Hydroxide, 10%	E	E	E	E	E	E	G	-	E	E	E	E	N	N	E	E	G	N	E	E	E	E	E				
Sodium Hydroxide, 50%	G	G	E	E	E	E	E	E	E	E	E	E	N	N	E	G	F	N	E	G	E	N	E	G			
Sodium Hydroxide, concentrated	G	G	E	E	E	E	N	N	E	E	E	E	N	N	E	G	F	N	E	G	E	N	E	G			
Sodium Hypochlorite, 15%	E	F	E	G	F	N	G	N	E	E	G	-	E	E	E	E	E	E	E	E	E	E	E	E			
Stearic Acid, pure	E	E	G	G	E	E	E	E	E	E	E	E	E	E	E	E	E	G	E	G	E	G	E	E			
Sulfur Dioxide, dry gas	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	G	E	G	F	N	G	N			
Sulfur Dioxide, liquid (46 psig)	N	N	F	N	E	E	N	N	N	N	-	-	E	E	E	E	E	E	G	G	N	F	N	N			
Sulfur Dioxide, wet gas	E	E	E	E	E	E	-	-	E	E	E	E	E	E	E	E	E	G	N	G	G	F	N	E	E		
Sulfur Dioxide, pure	N	N	F	N	E	E	N	N	N	N	-	-	E	E	E	E	E	G	N	F	N	N	N	G	G		
Sulfur Salts, pure	F	N	G	F	F	N	F	N	-	-	E	E	E	E	E	E	G	F	N	N	N	G	G	N	N		
Sulfuric Acid, 6%	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E		
Sulfuric Acid, 20%	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E		
Sulfuric Acid, 30%	E	E	E	E	E	E	G	-	E	E	E	E	E	E	E	E	G	F	E	G	F	N	E	E	E		
Sulfuric Acid, 60%	E	G	E	G	G	F	G	F	E	G	-	-	E	E	E	E	E	E	E	E	E	E	E	G	F		
Sulfuric Acid, 96%	G	G	F	N	F	N	F	N	G	F	N	N	E	E	E	E	E	E	N	N	F	N	N	N	G	N	
Sulfuric Acid, 98%	G	G	F	N	F	N	F	N	G	F	N	N	E	E	E	E	E	G	N	N	F	N	N	N	N	G	N
Sulfuric Acid, concentrated	G	G	F	N	N	N	N	N	N	N	-	-	E	E	E	E	E	E	G	N	N	G	N	N	N	N	
Tartaric Acid, pure	E	E	E	E	E	E	E	E	-	-	E	E	E	E	E	E	E	E	G	E	G	E	E	E	E	E	
TCA, pure	F	N	F	N	G	F	F	N	E	E	-	-	E	E	E	E	F	E	G	F	N	F	N	F	N		
tert-Butanol, pure	E	G	E	E	E	G	E	G	E	G	-	-	E	E	E	E	E	E	E	E	E	E	-	-	E	E	
tert-Butyl Alcohol, pure	E	G	E	E	E	G	E	G	E	G	-	-	E	E	E	E	E	E	G	F	G	G	F	N	G	F	
Tetrahydrofuran, pure	F	N	F	N	G	F	G	F	F	F	-	-	E	E	E	E	E	N	N	G	F	N	N	N	N	N	
THF, pure	F	N	F	N	G	F	G	F	F	F	-	-	E	E	E	E	N	N	G	F	N	N	N	N	N	N	
Thionyl Chloride, pure	N	N	N	N	N	N	N	N	-	-	E	E	E	E	E	E	N	N	N	N	N	N	N	N	N	N	
Tincture of Iodine	E	G	G	F	E	E	G	N	N	N	-	-	E	E	E	E	E	G	N	N	N	G	F	-	-	G	F
Toluene, pure	F	N	N	N	N	N	F	F	N	N	E	E	E	E	E	E	G	E	E	N	N	N	N	N	N	N	N
Tributyl Citrate, pure	G	F	E	G	G	F	G	F	G	F	-	-	E	E	E	E	E	G	E	G	N	N	E	N	N	N	N
Trichloroacetic Acid, pure	F	N	F	N	G	F	F	N	E	E	-	-	E	E	E	E	F	E	G	F	N	F	N	F	N	G	G
Trichloroethane, pure	N	N	N	N	N	N	N	N	-	-	E	E	E	E	E	E	G	N	N	N	N	N	N	N	N	N	N
Trichloroethylene, pure	N	N	N	N	N	N	N	N	-	-	E	E	E	E	E	N	N	E	E	N	N	E	E	N	N	N	N
Triethylene Glycol, pure	E	E	E	E	E	E	E	E	-	-	E	E	E	E	E	E	E	E	G	G	F	F	N	E	E	E	E
Tripropylene Glycol, pure	E	E	E	E	E	E	E	E	-	-	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E
Tris Buffer Solution, pH 11	E	G	E	G	E	G	E	G	F	N	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E
Tris Buffer Solution, pH 7.0	E	G	E	G	E	G	E	G	G	G	E	E	E	E	E	E	E	E	G	F	E	E	E	E	E	E	E
Trisodium Phosphate, pure	E	E	E	E	E	E	E	E	-	-	E	E	E	E	E	E	E	G	N	E	E	G	F	E	E	F	F
Turpentine	F	N	F	N	F	N	N	N	F	N	G	-	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E
Undecyl Alcohol, pure	E	F	E	G	E	G	E	G	E	G	-	-	E	E	E	E	E	E	G	F	E	F	G	F	F	F	G
Urea, pure	E	E	E	E	E	E	E	E	E	E	-	-	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E
Vinylidene Chloride, pure	N	N	F	N	N	N	N	N	-	-	E	E	E	E	E	G	F	G	F	N	N	N	N	N	N	N	N
Xylene, pure	N	N	F	N	N	N	F	N	-	-	E	E	E	E	E	E	E	G	N	N	N	N	N	N	N	N	N
Zinc Chloride, 10%	E	E	E	E	E	E	E	E	-	-	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E
Zinc Stearate, pure	E	E	E	E	E	E	E	E	-	-	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E
Zinc Sulfate, 10%	E	E	E	E	E	E	E	E	-	-	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E

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