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Material Safety Data Sheet

DELRIN® 500CL Natural and Black

EMERGENCY TELEPHONE: 724-746-6050 or 856-227-0500
ISSUE DATE: October 1, 1985
REVISION DATE: April 11, 2011
TRADE NAME: DELRIN®
PART NAME: 500CL
CHEMICAL NAME: Polyoxymethylene (POM)

1. Information on Ingredients

MATERIAL	CAS Number	%
Acetal Polymer		>94
Lubricant, Colorants, Stabilizer		<7
Carbon Black	1333-86-4	<2
Formaldehyde	50-00-0	<0.005

Material is not known to contain Toxic Chemicals under Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372.

Additives in this product do not present a respiration hazard unless the product is ground to a powder of respirable size and the dust is inhaled. All dusts can potentially cause injury to the respiratory tract if respirable particles are generated and inhaled in sufficiently high concentrations. Good industrial hygiene practices, as with all dusts, should include precautions to prevent inhalation of respirable particles.

2. Hazard Identification

ACETAL POLYMER

There are no known effects from exposure to the Delrin polymer itself. If overheated, the polymer releases formaldehyde which may cause skin, eye, and respiratory irritation and allergic reactions. Significant skin permeation and systemic toxicity after contact appears unlikely. There are inconclusive or unverified reports of human sensitization.

CARBON BLACK

Immediate effects of overexposure to Carbon Black by inhalation may include irritation of the nose, throat, and lungs with cough, difficulty breathing or shortness of breath.

If particles from Carbon Black contact the eye, mechanical irritation with tearing, pain or blurred vision may result.

Significant skin permeation, and systemic toxicity, after contact with Carbon Black appears unlikely. There are no reports of human sensitization.

Epidemiologic studies demonstrate no significant risk of human cancer from exposure to Carbon Black. While some reports cite an increased incidence of pulmonary abnormalities, such as decreased pulmonary function and radiological changes among Carbon Black workers, other reports show no correlation between exposure and effects on pulmonary function or disease.

Increased susceptibility to the effects of Carbon Black may be observed in persons with pre-existing disease of the lungs.

CARCINOGENICITY INFORMATION

The following components are listed by IARC, NTP, OSHA or ACGIH as carcinogens:

MATERIAL	IARC	NTP	OSHA	ACGIH
Formaldehyde	1	X	X	A2
Carbon Black	2B			

3. First Aid Measures

INHALATION

No specific intervention is indicated as the compound is not likely to be hazardous by inhalation. Consult a physician if necessary. If exposed to fumes from overheating or combustion, move to fresh air. Consult a physician if symptoms persist.

SKIN CONTACT

The compound is not likely to be hazardous by skin contact, but cleansing the skin after use is advised. If molten polymer gets on skin, cool rapidly with cold water. Do not attempt to peel polymer from skin. Seek medical treatment for thermal burn.

EYE CONTACT

In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Call a physician if irritation persists.

INGESTION

No specific intervention is indicated as compound is not likely to be hazardous by ingestion.

4. Fire Fighting Measures

FLAMMABLE PROPERTIES

Flash Point: Not Applicable
Delrin dust cloud ignition temperature: 440°C (824°F)

Fire and Explosion Hazards: Like most organic materials in powder form, dust generated from this product may form a flammable dust-air mixture. Potential for a dust explosion may exist. Minimize the generation and accumulation of dust. Keep away from sources of ignition. Burns with invisible flame. Hazardous gases/vapors produced in fire are carbon monoxide, formaldehyde.

EXTINGUISHING MEDIA

Water, Foam, Dry Chemical, CO₂

FIRE FIGHTING INSTRUCTIONS

Keep personnel removed and upwind of fire. Wear self-contained breathing apparatus.

5. Handling and Storage

HANDLING (Personnel)

See FIRST AID and PERSONAL PROTECTIVE EQUIPMENT Sections

HANDLING (Physical Aspects)

Minimize the generation and accumulation of dust.

STORAGE

Store in a cool dry place. Keep away from heat and sunlight.

6. Exposure Controls / Personal Protection

ENGINEERING CONTROLS

VENTILATION: If hot processing this material, use local and/or general exhaust ventilation to control the concentration of vapors and fumes below exposure limits.

In cutting, grinding, or machining operations with this material, use local exhaust to control the concentration of dust below exposure limits.

PERSONAL PROTECTIVE EQUIPMENT

EYE/FACE PROTECTION

Wear safety glasses. Wear overall chemical splash goggles and face shield when possibility exists for eye or face contact with molten material. A full face mask positive-pressure air-supplied respirator provides protection from eye irritation.

RESPIRATORS

When temperatures exceed 230°C and ventilation is inadequate to maintain concentrations below exposure limits, use a positive-pressure air-supplied respirator. Air-purifying respirators may not provide adequate protection.

During grinding, sawing, routing, drilling or sanding operations, use an NIOSH/MSHA approved air-purifying respirator with dust/mist cartridge or canister if airborne particulate concentrations are expected to exceed permissible exposure levels.

PROTECTIVE CLOTHING

If there is potential contact with hot/molten materials, wear heat resistant clothing and footwear. Wear leather or cotton gloves when grinding, sawing, routing, drilling or sanding.

EXPOSURE GUIDELINES

EXPOSURE LIMITS

“DELTRIN” Acetal

PEL (OSHA):	Particulates (not otherwise Regulated) 15 mg/m ³ , 8 hr. TWA, total dust 5 mg/ m ³ , 8 hr. TWA, respirable dust
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OTHER APPLICABLE EXPOSURE LIMITS

FORMALDEHYDE

PEL (OSHA):	0.75 ppm, 0.92mg/ m ³ , 8 hr. TWA STEL 2 ppm, 2.5 mg/ m ³
TLV (ACGIH):	Ceiling 0.3 ppm, A2 Sensitizer
AEL* (DuPont):	0.5 ppm, 8 & 12 hr. TWA 1 ppm, 15 minute TWA

CARBON BLACK

PEL (OSHA):	3.5 mg/ m ³ , 8 hr. TWA
TLV (ACGIH):	3.5 mg/ m ³ , 8 hr. TWA, A4
AEL* (DuPont):	0.5 mg/ m ³ , 8 & 12 hr. TWA, (Polynuclear Aromatic Hydrocarbon Content <0.1%) Includes Channel, Lamp, and thermal Black

*AEL is DuPont’s Acceptable Exposure Limit. Where governmentally imposed occupational exposure limits which are lower than the AEL are in effect, such limits shall take precedence.

7. Physical and Chemical Properties

PHYSICAL DATA

Melting Point:	175 – 183°C (347 - 361 °F)
Solubility in Water:	Insoluble
Odor:	Slight formaldehyde

Color: Off-white, Black, or custom color
Form: Rod, Plate, Sheet or Tube (stock shape product)
Specific Gravity: > 1

8. Stability and Reactivity

CHEMICAL STABILITY

Stable at normal temperatures and storage conditions.

CONDITIONS TO AVOID

Maintain polymer melt temperature below 230°C (446°F). Avoid prolonged exposure at or above the recommended processing temperatures.

INCOMPATIBLITY WITH OTHER MATERIALS

Incompatible with strong acids and bases (decomposes forming formaldehyde) and strong oxidizing agents. At melt temperature, acetal resins are incompatible with halogenated polymers such as PVC and PVDC and any elastomers containing halogenated polymers. Even small amounts of such contaminants can cause sudden and spontaneous formaldehyde gas formation. Workplace fume concentrations well above threshold levels are a likely result. Unsafe pressurization of equipment, e.g. extruders, molds, can also result.

Do not contaminate either virgin resin or rework. Do not mix virgin resin or rework with pigments or additives other than those designated by DuPont. Do not mix this grade with other grades of Delrin, nor with any other resins, without first consulting DuPont. Doing any of the above may change the thermal stability of this resin and potentially cause decomposition

DECOMPOSITION

Decomposition of this material depends on the length of time it is exposed to elevated temperatures. At the recommended processing temperature of 210 – 220°C (410 - 428°F), decomposition should not be significant until after 30 minutes. Decomposition may be accelerated by contaminants, pigments, and/or other additives.

Autoclaving with pressurized team may lead to a rapid decomposition and should be done for only minimum amounts of time. COOL COMPLETELY BEFORE OPENING the autoclave.

Hazardous gas/vapor produced is formaldehyde.

POLYMERIZATION

Polymerization will not occur.

9. Toxicological Information

ANIMAL DATA

DELRIN

Inhalation 6 hour LC50:	>22,000 mg/m ³ in rats
Oral LD50:	>11,000 mg/kg in rats

Delrin is not a skin irritant, and is not a skin sensitizer in animals. Single or repeated inhalation exposures to high concentrations of Delrin dust resulted in collapse of some areas of the lungs, other areas were over-inflated. This effect was seen as late as 11-19 days post-exposure.

No toxic effects were observed in animals ingesting Delrin.

No animal test reports are available to define carcinogenic, mutagenic, developmental, or reproductive hazards.

CARBON BLACK

Oral ALD, rat: >25,100 mg/kg

Repeated inhalation exposure of animals to Carbon Black caused inflammation of the respiratory tract, lungs and emphysema.

Repeated exposure to high doses of Carbon Black by ingestion or skin contact caused no significant toxicological defects.

No adequate studies have been conducted in animals to define the carcinogenicity of Carbon Black by ingestion. In several skin painting studies using various Carbon Blacks, no carcinogenicity was observed. Tests by inhalation for carcinogenicity in rats show significant increases in lung tumors in female rats but not in male rats. In another study using female mice exposed by inhalation to Carbon Black, there was no increase in the incidence of respiratory tract tumors. Researchers conducting the rat inhalation studies believe that these effects probably result from the massive accumulation of small dust particles in the lung which overwhelms the normal lung clearance mechanisms. This represents "lung overload" phenomenon, rather than a specific chemical effect of the dust particle in the lung.

Tests have shown that this material does not cause genetic damage in bacterial or mammalian cell cultures. Tests in animals for genetic toxicity have produced mostly negative results. No animal data are available to define developmental or reproductive toxicity.

10. Ecological Information

AQUATIC TOXICITY

No information is available. Toxicity is expected to be low based on insolubility in water. Do not discharge to streams, ponds, lakes or sewers.

11. Disposal Considerations

WASTE DISPOSAL

Preferred options for disposal are (1) recycling, (2) incineration with energy recovery, and (3) landfill. The high fuel value of this product makes option 2 very desirable for material that cannot be recycled, but incinerator must be capable of scrubbing out acidic combustion products. Treatment, storage, transportation, and disposal must be in accordance with applicable federal, state/provincial, and local regulation.

12. Transportation Information

SHIPPING INFORMATION

Not regulated in transportation by DOT/IMO/IATA.

13. Regulatory Information

U.S. FEDERAL REGULATIONS

TSCA Inventory Status: In compliance with TSCA Inventory requirements for commercial purposes.

STATE REGULATIONS (U.S.)

STATE RIGHT-TO-KNOW

No substances on the state hazardous substances list, for the states indicated below, are used in the manufacture of products on this Material Safety Data Sheet, with the exceptions indicated.

Substances on the Pennsylvania Hazardous Substances List present at a concentration of 1% or more (0.01% for special hazardous substances) – Carbon Black

WARNING – Substances known to the state of California to cause cancer, birth defects or other reproductive harm – Formaldehyde

The State of California, under Proposition 65, regulates Carbon Black – airborne, unbound particles of respirable size as a carcinogen. In this product, carbon black is not supplied in the form regulated in California.

Substances on the New Jersey workplace hazardous substance list present at the concentration of 1% or more (0.1% for substances indentified as carcinogens, mutagens or teratogens) – Carbon Black.

14. Other Information

ADDITIONAL INFORMATION

MEDICAL USE: CAUTION – Do not use in medical applications involving permanent implantation in the human body. For other medical applications see DuPont CAUTION Bulletin No. H-50102.

This Material Safety Data Sheet and the information it contains is offered to you in good faith as accurate. We have reviewed any information contained in this data sheet which we received from sources outside our company. We believe this information to be correct but cannot guarantee its accuracy or completeness. Health and safety precaution in this data sheet may not be adequate for all individuals and/or situations. It is the user's responsibility to evaluate and use this product safely and to comply with all applicable laws and regulations. No statement made in the data sheet shall be construed as a permission or recommendation for the use of any product in a manner that may infringe existing patents. No warranty is made, either expressed or implied.