

**DELRIN<sup>®</sup> 500P BK602 acetal resin**

Version 4.0

Revision Date 11/21/2012

Ref. 130000020645

This SDS adheres to the standards and regulatory requirements of the United States and may not meet the regulatory requirements in other countries.

**SECTION 1. PRODUCT AND COMPANY IDENTIFICATION**

Product name : DELRIN<sup>®</sup> 500P BK602 acetal resin  
MSDS Number : 130000020645

Manufacturer : DuPont  
1007 Market Street  
Wilmington, DE 19898

Product Information : 1-800-441-7515 (outside the U.S. 1-302-774-1000)  
Medical Emergency : 1-800-441-3637 (outside the U.S. 1-302-774-1139)  
Transport Emergency : CHEMTREC: 1-800-424-9300 (outside the U.S. 1-703-527-3887)

**SECTION 2. HAZARDS IDENTIFICATION****Potential Health Effects**

Exposure to dusts or the thermal decomposition products of this compound from heating may cause eye irritation with discomfort, tearing, or blurring of vision; or irritation of the upper respiratory passages, with coughing and discomfort.

Ingestion is not a likely route of exposure.

Following is known regulatory classification information on isolated substances.

**Skin**

Carbon black : May cause skin irritation.  
May cause: Discomfort, itching, redness, or swelling.

Formaldehyde : Causes severe skin burns. May cause:, Corrosion with pain, ulceration or blisters, cracking or peeling of skin., May cause permanent skin damage or scarring if not treated promptly., May cause sensitization of susceptible persons by skin contact., May cause allergic skin reaction with itching, rash, or swelling..

**Eyes**

Carbon black : Dust contact with the eyes can lead to mechanical irritation.



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Formaldehyde : Corrosive, may cause permanent eye injury if not promptly treated. May cause: Tearing, pain, redness, swelling, ulceration, visual impairment, or blindness..

Inhalation

Formaldehyde : Causes: Nasal irritation, May cause: Cough, sneezing, runny nose, sore throat, or shortness of breath..

Ingestion

Formaldehyde : Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhoea.

Repeated exposure

Carbon black : DuPont has classified this material as a possible human carcinogen.

Formaldehyde : An increased risk of cancer in humans has been shown in workplace-based studies. Adverse effects from repeated inhalation may include:  
Respiratory effects

Target Organ

Carbon black : Lungs

Formaldehyde : Respiratory Tract

Carcinogenicity

Material	IARC	NTP	OSHA
Carbon black	2B		
Formaldehyde	1	X	X

**SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS**

Component	CAS-No.	Concentration
Acetal Polymer		>95%


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Lubricants, stabilizers		<5 %
Carbon black	1333-86-4	<1 %
Formaldehyde	50-00-0	<0.005 %

As with any acetal polymer, low levels of formaldehyde may occur in the headspace of containers as received or in containers of formed parts after processing. Closed containers of resin or formed parts should be opened in well ventilated areas. Following is from measurements on representative acetal grades. Levels of formaldehyde can vary according to time, temperature, ventilation, & specific product grade. Please note that the formaldehyde level in a finished part is influenced by material/part handling and processing conditions.

Formaldehyde	50-00-0	<200 ppm
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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 are potentially injurious to the respiratory tract if respirable particles are generated and inhaled.

**SECTION 4. FIRST AID MEASURES**

- Skin contact : The material is not likely to be hazardous by skin contact, but cleansing the skin after use is advisable. Cool skin rapidly with cold water after contact with molten material. Do not peel polymer from the skin. Obtain 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.

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- Inhalation : If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician. Move to fresh air in case of accidental inhalation of fumes from overheating or combustion.
- Ingestion : No specific intervention is indicated. Consult a physician if necessary.

**SECTION 5. FIREFIGHTING MEASURES**

- Flammable Properties  
Flash point : not applicable
- Fire and Explosion Hazard : Combustible . Burns with invisible flame. Large molten masses may ignite spontaneously in air. Water quenching is good practice. Minimize the generation and accumulation of dust. Failure or malfunction of temperature control systems on processing equipment, such as extruders, may create explosion hazards.
- Hazardous combustion products : (see also section 10), Carbon monoxide, Carbon dioxide.
- Suitable extinguishing media : Water, Foam, Dry chemical, Carbon dioxide (CO<sub>2</sub>)
- Firefighting Instructions : Wear self-contained breathing apparatus and protective suit. Evacuate personnel and keep upwind of fire.

**SECTION 6. ACCIDENTAL RELEASE MEASURES**

NOTE: Review FIRE FIGHTING MEASURES and HANDLING (PERSONNEL) sections before proceeding with clean-up. Use appropriate PERSONAL PROTECTIVE EQUIPMENT during clean-up.

- Safeguards (Personnel) : Spilled material is a slipping hazard.
- Spill Cleanup : Sweep up to prevent slipping hazard.
- Accidental Release Measures : Do not discharge to streams, ponds, lakes or sewers.

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**SECTION 7. HANDLING AND STORAGE**

- Handling (Personnel) : Open container only in well-ventilated area. Wash hands thoroughly after handling. Minimize the generation and accumulation of dust. Do not breathe dust. Provide appropriate exhaust ventilation at dryers, machinery and at places where dust or volatiles can be generated.
- Storage : Residual monomer vapours can accumulate in the headspace of closed containers. Store in a cool, dry place. Keep containers tightly closed to prevent moisture absorption and contamination. Keep in an area equipped with sprinklers. Store in a well-ventilated area away from heat and sunlight.

**SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION**

- Engineering controls : General mechanical ventilation is normally adequate but use local exhaust where necessary to maintain exposures below acceptable limits. Use local exhaust to completely remove vapors and fumes liberated during hot processing from the work area. See Bulletin "Proper Use of Local Exhaust Ventilation During Processing of Plastics".
- Personal protective equipment  
Respiratory protection : A respiratory protection program that meets country requirements must be followed whenever workplace conditions warrant respirator use. Consult the respirator manufacturer to determine the appropriate type of equipment for a given application. Observe respirator use limitations specified by the manufacturer. Consult the OSHA respiratory protection information located at 29CFR 1910.134. Use a positive pressure air supplied respirator if exposure levels are not known or there are any other circumstances where air purifying respirators may not provide adequate protection.
- Hand protection : Additional protection: Wear leather or cotton gloves when grinding, sawing, routing, drilling or sanding.
- Hand protection : Additional protection: When handling hot material, use heat resistant gloves.
- Eye protection : Wear safety glasses with side shields. Wear tightly fitting chemical splash goggles and face shield when possibility exists for eye and face contact due to spattering or splashing of molten material. A full-face mask respirator provides protection from eye irritation.



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Skin and body protection : If there is a potential for contact with hot/molten material wear heat resistant clothing and footwear.

Exposure Guidelines

Exposure Limit Values

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Dust (inhalable and respirable fraction)

TLV	(ACGIH)	10 mg/m3	
		TWA Inhalable particles.	
		3 mg/m3	
		TWA Respirable particles.	
PEL:	(OSHA)	5 mg/m3	
		TWA Respirable fraction.	
		15 mg/m3	
		TWA Total dust.	

Carbon black

PEL:	(OSHA)	3.5 mg/m3	8 hr. TWA
TLV	(ACGIH)	3 mg/m3	TWA Inhalable fraction.
AEL *	(DUPONT)	0.5 mg/m3	8 & 12 hr. TWA Polynuclear Aromatic Hydrocarbons (PAH) < 0.1%

Formaldehyde

PEL:	(OSHA)	0.75 ppm	TWA
PEL:	(OSHA)	2 ppm	STEL
TLV	(ACGIH)	0.3 ppm	TLV-C
AEL *	(DUPONT)	0.5 ppm	8 & 12 hr. TWA
AEL *	(DUPONT)	1 ppm	15 minute TWA

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\* 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.

**SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES**

Form	: pellets
Color	: black
Odor	: slight, formaldehyde-like
Melting point/range	: 175 - 183 °C (347 - 361 °F)
Specific gravity	: > 1
Water solubility	: insoluble

**SECTION 10. STABILITY AND REACTIVITY**

Stability	: Stable at normal temperatures and storage conditions.
Conditions to avoid	: polymer melt temperature > 230 °C (> 446 °F) Avoid prolonged exposure at or above the recommended processing temperatures.
Incompatibility	: Incompatible with strong acids and bases (decomposes forming formaldehyde) and strong oxidizing agents. At melt temperatures, 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 to occur., Workplace fume concentrations well above threshold levels are likely., Unsafe pressurization of equipment, e.g., extruders, molds, can result., Do not contaminate either virgin resin or rework. Do not mix this resin with pigments or additives other than those designated by DuPont. Do not mix this grade with other grades of acetals, 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.
Hazardous decomposition products	: Decomposition of this material depends on the length of time it is exposed to elevated temperature, as well as pressure. At the recommended processing temperatures decomposition should not be significant until after 30 minutes.


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Decomposition may be accelerated by contaminants, pigments and/or other additives.

Autoclaving with pressurized steam may lead to a rapid decomposition and should be done for only minimum amounts of time.

Cool completely before opening the autoclave.

Hazardous thermal decomposition products may include:

Formaldehyde , Carbon monoxide, Carbon dioxide

Hazardous reactions : Polymerization will not occur.

**SECTION 11. TOXICOLOGICAL INFORMATION**

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Further information : No data is available on the product itself. For additional toxicity data, write to the company address or call the non-emergency number shown in Section 1.

Acetal Polymer

Oral LD50 : > 11,000 mg/kg , rat

Inhalation 6 h LC50 : 22 mg/l , rat

Inhalation : rat  
lung effects

Skin irritation : guinea pig  
non-irritant

Skin sensitization : guinea pig  
Animal test did not cause sensitization by skin contact.

human

Patch test on human volunteers did not demonstrate sensitization properties.

Repeated dose toxicity : Inhalation  
rat  
  
lung effects

Oral  
rat



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No toxicologically significant effects were found.

Oral - feed  
dog

No toxicologically significant effects were found.

## Carbon black

- Oral LD50 : > 8,000 mg/kg , rat
- Skin irritation : slight irritation, rabbit
- Eye irritation : Slight or no eye irritation, rabbit
- Carcinogenicity : Overall weight of evidence indicates that the substance is not carcinogenic.
- Mutagenicity : Did not cause genetic damage in animals.  
Tests on bacterial or mammalian cell cultures did not show mutagenic effects.

## Formaldehyde

- Dermal LD50 : 270 mg/kg , rabbit
- Oral Acute toxicity estimate : 100 mg/kg , rat
- Inhalation 4 h LC50 : 490 ppm , rat  
Target Organs: Respiratory Tract  
Respiratory tract irritation
- Skin irritation : Corrosive, rabbit
- Eye irritation : Corrosive, rat
- Skin sensitization : Positive in human patch test., human  
  
Causes skin sensitization., mouse  
  
There are rare or inconclusive reports of human respiratory sensitization.
- Repeated dose toxicity : Oral


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rat

Gastrointestinal effects

Inhalation  
rat

Nasal irritation, Eye irritation

- Carcinogenicity** : Animal experiments showed a statistically significant number of tumours.  
An increased risk of cancer in humans has been shown in workplace-based studies.
- Mutagenicity** : Overall weight of evidence indicates that the substance is not mutagenic.  
Genetic damage in animals was observed in some laboratory tests but not in others.  
Genetic damage in cultured mammalian cells was observed in some laboratory tests but not in others.  
Experiments showed mutagenic effects in cultured bacterial cells.
- Reproductive toxicity** : Evidence suggests the substance is not a reproductive toxin in animals.
- Teratogenicity** : Animal testing showed effects on embryo-fetal development at levels equal to or above those causing maternal toxicity.

**SECTION 12. ECOLOGICAL INFORMATION**

 Aquatic Toxicity  
Acetal Polymer

- : The substance is a polymer and is not expected to produce toxic effects.

Carbon black

96 h LC50

- : Zebra fish > 1,000 mg/l OECD Test Guideline 203

72 h EC50

- : Algae > 10,000 mg/l

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24 h EC50 : Daphnia magna (Water flea) &gt; 5,600 mg/l OECD Test Guideline 202

## Formaldehyde

96 h LC50 : Morone saxatilis (Striped bass) 6.7 mg/l

72 h EC50 : Desmodemus subspicatus (green algae) 4.89 mg/l

48 h EC50 : Daphnia pulex (Water flea) 5.8 mg/l

## Environmental Fate

## Carbon black

Biodegradability : Product is not expected to be biodegradable.

Bioaccumulation : Bioaccumulation is unlikely.

## Formaldehyde

Biodegradability : 90 % OECD Test Guideline 301  
Readily biodegradable.Bioaccumulation : Fish  
Bioconcentration factor (BCF) : < 1

Additional ecological information : No data is available on the product itself. Toxicity is expected to be low based on insolubility in water.

**SECTION 13. DISPOSAL CONSIDERATIONS**

Waste Disposal : Preferred options for disposal are recycling, incineration with energy recovery, and landfill. The high fuel value of this product makes incineration very desirable for material that cannot be recycled. Treatment, storage, transportation, and disposal must be in accordance with applicable federal, state/provincial, and local regulations.

**SECTION 14. TRANSPORT INFORMATION**

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Not classified as dangerous in the meaning of transport regulations.

**SECTION 15. REGULATORY INFORMATION**

- TSCA Status : In compliance with TSCA Inventory requirements for commercial purposes.
- SARA 313 Regulated Chemical(s) : SARA 313: This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.
- California Prop. 65 : WARNING! This product contains a chemical or chemicals known to the State of California to cause cancer. Carbon black , Ethylene oxide , Acrylamide , Formaldehyde  
WARNING! This product contains a chemical known to the State of California to cause birth defects or other reproductive harm. Ethylene oxide , Acrylamide  
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.
- The following impurities, if still present at all, are below the indicated levels:  
Ethylene oxide < 0.10PPM  
Acrylamide < 0.20PPM
- PA Right to Know Regulated Chemical(s) : Substances on the Pennsylvania Hazardous Substances List present at a concentration of 1% or more (0.01% for Special Hazardous Substances):  
None known.
- NJ Right to Know Regulated Chemical(s) : Substances on the New Jersey Workplace Hazardous Substance List present at a concentration of 1% or more (0.1% for substances identified as carcinogens, mutagens or teratogens): Carbon black

**SECTION 16. OTHER INFORMATION**

- Restrictions for use : Do not use DuPont materials in medical applications involving implantation in the human body or contact with internal body fluids or tissues unless the material has been provided from DuPont under a written contract that is consistent with DuPont policy regarding medical applications and



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expressly acknowledges the contemplated use. For further information, please contact your DuPont representative. You may also request a copy of the DuPont POLICY Regarding Medical Applications H-50103-3 and DuPont CAUTION Regarding Medical Applications H-50102-3.

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The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

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