



DuPont Polymers

VSP001

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# "VESPEL" POLYIMIDE PARTS AND SHAPES ALL IN SYNONYM LIST VSP001

## CHEMICAL PRODUCT/COMPANY IDENTIFICATION

### Material Identification

"VESPEL" is a registered trademark of DuPont.

Corporate MSDS Number DU003855

### # Tradenames and Synonyms

"VESPEL" SP1, SP3, SP21, SP22, SP211, SP221, SP1D,	
"VESPEL" SP21D, SP22D, SP211D, SP221D, ST2000, ST2000D	#
"VESPEL" ST2005, ST2005D, ST2010, ST2010D, ST2030,	
"VESPEL" ST2030D	

### Company Identification

MANUFACTURER/DISTRIBUTOR  
 DuPont Engineering Polymers  
 1007 Market Street  
 Wilmington, DE 19898

### PHONE NUMBERS

Product Information	1-800-441-7515
Transport Emergency	1-800-424-9300
Medical Emergency	1-800-441-3637

## COMPOSITION/INFORMATION ON INGREDIENTS

### Components

Material	CAS Number	%
	25038-81-7	
POLY-N,N'-(p,p'-OXYDIPHENYLENE) PYROMELLITIMIDE		50-100
PRESENT IN SP21,22,211,221, & ST SERIES ONLY:		
GRAPHITE (None in ST2000)	7782-42-5	2-40
PRESENT IN TYPE SP3 ONLY:		

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**COMPOSITION/INFORMATION ON INGREDIENTS**(Continued)

MOLYBDENUM SULFIDE	1317-33-5	15
IN SP211,221 (10-15%) AND D-TYPES (<1%) ONLY:		
POLYTETRAFLUOROETHYLENE (PTFE)	9002-84-0	0.2-15

**Components (Remarks)**

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.

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**HAZARDS IDENTIFICATION**

## Potential Health Effects

"Vespel" polyimide parts and shapes are not hazardous as shipped.

For SP211, 221 and D-types, machining of parts may generate particles that contain polytetrafluoroethylene (PTFE). Machining with a dull tool and/or no coolant may cause temperatures to exceed 260 deg C (500 deg F). The primary hazard associated with PTFE is the inhalation of fumes from overheating (>260 deg C or >500 deg F) or burning PTFE, which may cause "polymer fume fever", a temporary flu-like illness with fever, chills, and sometimes cough, of approximately 24 hour duration. Smokers should avoid contamination of tobacco products with this material. Small amounts of carbonyl fluoride and hydrogen fluoride may also be evolved when PTFE is overheated or burned.

## POLY-N,N'-(p,p'-OXYDIPHENYLENE) PYROMELLITIMIDE

The polymer resin is a slight skin irritant, but is not a skin sensitizer in animals. Effects of a single exposure by inhalation include discomfort and difficult respiration (4 hour LC50 is 15,600 mg/m3 in rats). Effects of repeated oral exposure include reduced food consumption and reduced rate of weight gain.

Human health effects of overexposure by skin contact may include skin irritation with discomfort or rash. Inhalation may cause irritation of the upper respiratory passages, with coughing and discomfort. No acceptable information is available to confidently predict the effects of excessive human exposure by eye contact, or ingestion. Significant skin permeation, and systemic toxicity, after contact appears unlikely. There are no reports of human sensitization.

## POLYTETRAFLUOROETHYLENE (PTFE):

(Continued)

## HAZARDS IDENTIFICATION (Continued)

The compound is not a skin irritant. Effects in animals from single exposure by inhalation to high concentration of the dust include irritation of the lungs. Repeated oral doses resulted in no observable toxic effects except for alteration in the number of circulating white blood cells after long-term dosing (25% of diet for 90 days). Tests demonstrate no developmental toxicity in animals, and no genetic damage in animals or in bacterial cell cultures.

### HUMAN HEALTH EFFECTS OF OVEREXPOSURE TO PTFE:

Inhalation of fumes from overheating PTFE may cause polymer fume fever, a temporary flu-like illness with fever, chills, and sometimes cough, of approximately 24 hours duration. There are some reports in the literature of persistent pulmonary effects in individuals, especially smokers, who have had repeated episodes of polymer fume fever. Because of complicating factors, such as mixed exposures and smoking history, these findings are uncertain. Protection against acute exposure should also provide protection against any potential chronic effects. Smokers should avoid contamination of tobacco products, and should wash their hands before smoking. Significant skin permeation after contact appears unlikely. There are no reports of human sensitization. Small amounts of carbonyl fluoride and hydrogen fluoride may also be evolved when PTFE is overheated or burned.

Inhalation of low concentrations of HYDROGEN FLUORIDE can initially include symptoms of choking, coughing, and severe eye, nose, and throat irritation. Possibly followed after a symptomless period of 1 to 2 days by fever, chills, difficulty in breathing, cyanosis, and pulmonary edema. Acute or chronic overexposure to HF can injure the liver and kidneys.

Inhalation, ingestion, or skin or eye contact with CARBONYL FLUORIDE may initially include: skin irritation with discomfort or rash; eye corrosion with corneal or conjunctival ulceration; irritation of the upper respiratory passages; or temporary lung irritation effects with cough, discomfort, difficulty breathing, or shortness of breath. By analogy with phosgene, symptoms may be delayed.

Individuals with preexisting diseases of the lungs may have increased susceptibility to the toxicity of excessive exposures from thermal decomposition products.

### GRAPHITE

Very low toxicity by ingestion (oral LD50 >5,000 mg/kg in rats). The compound is not an eye irritant. Human health effects of overexposure by long term inhalation may include chronic lung disorders with symptoms of lung insufficiency.

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**HAZARDS IDENTIFICATION**(Continued)

Individuals with preexisting diseases of the lungs may have increased susceptibility to the toxicity of excessive exposures to graphite.

**MOLYBDENUM DISULFIDE**

Skin absorption LD50 >16,000 mg/kg in rabbits. Oral LD50 >16,000 mg/kg in rats. Repeated inhalation exposures of animals produced only an increase in respiration rate. A single ingestion exposure produced only marked diarrhea in animals. Repeated exposures produced no signs of toxicity.

No acceptable information is available to confidently predict the effects of excessive human exposure to this compound.

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**Carcinogenicity Information**

None of the components present in this material at concentrations equal to or greater than 0.1% are listed by IARC, NTP, OSHA or ACGIH as a carcinogen.

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**FIRST AID MEASURES****First Aid**  
INHALATION

No specific intervention is indicated as the compound is not likely to be hazardous by inhalation. Consult a physician if necessary.

## SKIN CONTACT

The compound is not likely to be hazardous by skin contact but cleansing the skin after use is advisable.

## EYE CONTACT

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

## INGESTION

No specific intervention is indicated as compound is not likely to be hazardous by ingestion. Consult a physician if necessary.

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**FIRE FIGHTING MEASURES****Flammable Properties**

Will not burn without external flame.

Fire and Explosion Hazards:

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**FIRE FIGHTING MEASURES**(Continued)

Hazardous gases/vapors produced in fire are: carbon monoxide, carbon dioxide, smoke. SP211, 221 and D-types may also produce hydrogen fluoride, carbonyl fluoride and low molecular weight fluorocarbons.

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**Extinguishing Media**

Use media appropriate for surrounding material.

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**Fire Fighting Instructions**

Wear self-contained breathing apparatus.

In a fire, SP211, 221 and D-types form hydrogen fluoride fumes which react with water to form hydrofluoric acid. Wear neoprene gloves when handling refuse from a fire involving these types.

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**ACCIDENTAL RELEASE MEASURES****Safeguards (Personnel)**

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

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**Spill Clean Up**

Recover undamaged and minimally contaminated material for reuse and reclamation. Shovel or sweep up.

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**HANDLING AND STORAGE****Handling (Personnel)**

Avoid contamination of cigarettes or tobacco with dust from this material.

Avoid breathing dust.

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**Handling (Physical Aspects)**

Avoid dust generation.

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**EXPOSURE CONTROLS/PERSONAL PROTECTION****Engineering Controls**

Use local ventilation to control dusts from cutting, sanding.

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**Personal Protective Equipment****EYE/FACE PROTECTION**

For machining operations wear appropriate protective equipment such as goggles or safety glasses with side shields.

**RESPIRATORS**

During grinding, sanding, or sawing operations use a

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**EXPOSURE CONTROLS/PERSONAL PROTECTION**(Continued)

NIOSH/MSHA approved air purifying respirator with dust/mist cartridge or canister if airborne particulate concentrations are expected to exceed permissible exposure levels.

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**Exposure Guidelines****Exposure Limits**

"VESPEL" POLYIMIDE PARTS AND SHAPES ALL IN SYNONYM LIST VSP001  
PEL (OSHA) Particulates (Not Otherwise Regulated)  
15 mg/m<sup>3</sup>, 8 Hr. TWA, total dust  
5 mg/m<sup>3</sup>, 8 Hr. TWA, respirable dust

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**Other Applicable Exposure Limits**

POLY-N,N'-(p,p'-OXYDIPHENYLENE) PYROMELLITIMIDE  
PEL (OSHA) None Established  
TLV (ACGIH) None Established  
AEL \* (DuPont) 10 mg/m<sup>3</sup>, 8 Hr. TWA, total dust  
5 mg/m<sup>3</sup>, 8 Hr. TWA, respirable dust

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GRAPHITE (None in ST2000)

PEL (OSHA) 5 mg/m<sup>3</sup>, respirable dust, 8 Hr. TWA  
TLV (ACGIH) 2 mg/m<sup>3</sup>, respirable dust, 8 Hr. TWA  
AEL \* (DuPont) None Established

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MOLYBDENUM SULFIDE

PEL (OSHA) 5 mg/m<sup>3</sup>, and soluble compounds, as Mo  
Insoluble compounds: 15 mg/m<sup>3</sup>, Total  
Dust as 8 Hr TWAs  
TLV (ACGIH) 10 mg/m<sup>3</sup>, insoluble compounds, as Mo  
5 mg/m<sup>3</sup>, soluble compounds as Mo as  
8 Hr TWAs  
AEL \* (DuPont) None Established

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POLYTETRAFLUOROETHYLENE (PTFE)

PEL (OSHA) None Established  
TLV (ACGIH) None Established  
AEL \* (DuPont) 10 mg/m<sup>3</sup>, 8 Hr. TWA, total dust  
5 mg/m<sup>3</sup>, 8 Hr. TWA, respirable dust

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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.

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**PHYSICAL AND CHEMICAL PROPERTIES****Physical Data**

Melting Point None  
% Volatiles NA  
Solubility in Water Insoluble  
Odor None  
Form Solid parts & shapes  
Specific Gravity 1.33 to 1.67

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## STABILITY AND REACTIVITY

### Chemical Stability

Stable at normal temperatures and storage conditions.

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### Decomposition

Decomposes with heat.

Decomposition temperature 260 C (500 F)

Hazardous gases/vapors produced are carbon monoxide at temperatures over 300 deg C; small amounts of hydrogen fluoride from SP211, 221 and D-types.

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### Polymerization

Polymerization will not occur.

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## ECOLOGICAL INFORMATION

### Ecotoxicological Information

Aquatic Toxicity

No information available. Toxicity is expected to be low based on the insolubility of the product in water.

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## DISPOSAL CONSIDERATIONS

### Waste Disposal

Dispose of in compliance with federal, state and local regulations. Preferred options for disposal are (1) incineration with energy recovery, and (2) landfill. The high fuel value of this product makes option 1 very desirable, but incinerator must be capable of scrubbing out acidic combustion products for SP211, 221 and D-types.

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## TRANSPORTATION INFORMATION

### Shipping Information

DOT

Proper Shipping Name            Not regulated.

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## REGULATORY INFORMATION

### U.S. Federal Regulations

TSCA Inventory Status            Listed.

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**OTHER INFORMATION****NFPA, NPCA-HMIS**

NFPA Rating	
Health	2
Flammability	1
Reactivity	0

**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.

**STATE RIGHT-TO-KNOW LAWS**

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): Graphite (7782-42-5) in types SP21, 22, 211, 221 and ST types. Polytetrafluoroethylene (9002-84-0) in SP211 and 221. Polytetrafluoroethylene is listed, but we believe it was listed in error, and have petitioned to have it delisted.

WARNING: SUBSTANCES KNOWN TO THE STATE OF CALIFORNIA TO CAUSE CANCER, BIRTH DEFECTS OR OTHER REPRODUCTIVE HARM: None known.

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): Molybdenum sulfide (1317-33-5).

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The data in this Material Safety Data Sheet relates only to the specific material designated herein and does not relate to use in combination with any other material or in any process.

Responsibility for MSDS	J. P. BOLLMEIER
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# Indicates updated section.

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End of MSDS