



A Milacron Company

Dear Customer:

Enclosed in the **REVISED** Material Safety Data Sheet for our product:

D-M-E Gate Shell Insulator

The products we distribute are not normally hazardous in their natural state. However, steel does contain elements deemed by OSHA to be hazardous when released by manufacturing, such as brazing, burning, grinding, sawing or welding, etc. Failure to control dust and fumes can result in chronic health problems.

We believe the information, supplied by the Manufacturer, on the enclosed MSDS to be accurate; however, D-M-E makes no warranty with respect to the accuracy of the information or the suitability of the recommendations, and assumes no liability for the information so presented.

Should you require additional information, please call or write the Manufacturer listed on the MSDS.

Sincerely yours,

D-M-E Company
Director of Operations
Ken Jasina

Revised: December, 1999



The MSDS format adheres to the standards and regulatory requirements of the United States and may not meet regulatory requirements in other countries.

DuPont
Material Safety Data Sheet

Page 1

"VESPEL" POLYIMIDE PARTS AND SHAPES ALL IN SYNONYM LIST VSP001
VSP001 Revised 29-MAR-2002

CHEMICAL PRODUCT/COMPANY IDENTIFICATION

Material Identification

"VESPEL" is a registered trademark of DuPont.

Corporate MSDS Number : DU003855

Tradenames and Synonyms

"VESPEL" SP-1, SP-3, SP-21, SP-22,
"VESPEL" SP-101, SP-102, #
"VESPEL" SP-211, SP-214, SP-215, SP-221, SP-224,
"VESPEL" SP-262, SP-2624,
"VESPEL" ST-2010, ST-2010G, ST-2010H,
"VESPEL" ST-2030, ST-2030G, ST-2030H,

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	%
POLY-N,N'-(p,p'-OXYDIPHENYLENE) PYROMELLITIMIDE	25038-81-7	30-100
POLYTETRAFLUOROETHYLENE (PTFE)	9002-84-0	0-18
GRAPHITE	7782-42-5	0-60
MOLYBDENUM DISULFIDE	1317-33-5	0-15
CARBON FIBER	70892-43-2	0-10

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.

(COMPOSITION/INFORMATION ON INGREDIENTS - Continued)

All ingredients comprising this part are bound in a thermoset polymer. These substances do not present a respiration hazard unless the part 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 in sufficiently high concentrations. Good industrial hygiene practices, as with all dusts, should include precautions to prevent inhalation of respirable particles.

HAZARDS IDENTIFICATION

Potential Health Effects

ADDITIONAL HEALTH EFFECTS

Vespel(R) polyimide parts and shapes are not hazardous as shipped.

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 a cough, of approximately 24 hours 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.

MOLYBDENUM DISULFIDE

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

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

Inhalation of SP Polymer dust may cause irritation of the upper respiratory passages, with coughing and discomfort.

GRAPHITE

Long-term inhalation of Graphite dust or powder may cause chronic lung disorders with symptoms of lung insufficiency.

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

CARBON FIBER

(HAZARDS IDENTIFICATION - Continued)

Skin contact with Carbon Fibers may cause mechanical irritation of the skin with itching, redness, swelling or rash. Contact dermatitis with itching or rash, inflammatory eruptions and drying of the skin have been reported after contact with Carbon Fibers.

Eye contact with Carbon Fibers may cause eye irritation with discomfort, tearing, or blurred vision.

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.

FIRST AID MEASURES

First Aid

INHALATION

No specific intervention is indicated, as the compound is not likely to be hazardous by inhalation. 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 washing with soap and water after handling is advisable.

EYE CONTACT

Not a probable route of exposure for finished parts. In case of contact with fibers or dusts, 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.

FIRE FIGHTING MEASURES

Flammable Properties

Will not burn without external flame.

Fire and Explosion Hazards:

Hazardous gases/vapors produced in fire are carbon monoxide, carbon dioxide, smoke.

(FIRE FIGHTING MEASURES - Continued)

Hydrogen fluoride, carbonyl fluoride and low molecular weight fluorocarbons may also be produced, more so from SP-101, SP-211, SP-215, and SP-221.

Extinguishing Media

Use media appropriate for surrounding material.

Fire Fighting Instructions

Wear self-contained breathing apparatus. Hydrogen fluoride fumes emitted during a fire can react with water to form hydrofluoric acid. Wear neoprene gloves when handling refuse from fire.

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.

Spill Clean Up

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

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

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

Avoid breathing dust.

Handling (Physical Aspects)

Avoid dust generation.

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

Use local ventilation to control dusts from cutting, sanding.

Personal Protective Equipment

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

(EXPOSURE CONTROLS/PERSONAL PROTECTION - Continued)

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

Exposure Guidelines

Exposure Limits

"VESPEL" POLYIMIDE PARTS AND SHAPES ALL IN SYNONYM LIST VSP001
 PEL (OSHA) : Particulates (Not Otherwise Regulated)
 15 mg/m³, 8 Hr. TWA, total dust
 5 mg/m³, 8 Hr. TWA, respirable dust

Other Applicable Exposure Limits

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

PEL (OSHA) : None Established
 TLV (ACGIH) : None Established
 AEL * (DuPont) : 10 mg/m³, 8 Hr. TWA, total dust
 5 mg/m³, 8 Hr. TWA, respirable dust

POLYTETRAFLUOROETHYLENE (PTFE)

PEL (OSHA) : None Established
 TLV (ACGIH) : None Established
 AEL * (DuPont) : 10 mg/m³, 8 Hr. TWA, total dust
 5 mg/m³, 8 Hr. TWA, respirable dust

GRAPHITE

PEL (OSHA) : 5 mg/m³, respirable dust, 8 Hr. TWA
 TLV (ACGIH) : 2 mg/m³, respirable dust, 8 Hr. TWA
 AEL * (DuPont) : None Established

MOLYBDENUM DISULFIDE

PEL (OSHA) : 5 mg/m³, and soluble compounds, as Mo
 Insoluble compounds: 15 mg/m³, Total
 Dust as 8 Hr TWAs
 TLV (ACGIH) : 0.5 mg/m³ (Soluble compounds), as Mo, A3
 10 mg/m³ (Metal and Insoluble Compounds)
 (Inhalable fraction)
 3 mg/m³ (Respirable fraction)
 Notice of Intended Changes (2002)
 0.5 mg/m³ (Soluble compounds), as Mo, A2
 (Respirable fraction)
 AEL * (DuPont) : None Established

CARBON FIBER

(Other Applicable Exposure Limits - Continued)

PEL (OSHA) : None Established
TLV (ACGIH) : None Established
AEL * (DuPont) : 3.5 mg/m³, 8 Hr. TWA, total dust
1 Fiber/cc-8 Hr. TWA, Fibers <3 microns
in diameter, >5 microns in length and
with an aspect ratio of >3:1

* 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.

PHYSICAL AND CHEMICAL PROPERTIES

Physical Data

Melting Point : None
% Volatiles : NA
Solubility in Water : Insoluble
Odor : None
Form : Solid parts & shapes
Specific Gravity : 1.2-2.0

STABILITY AND REACTIVITY

Chemical Stability

Stable at normal temperatures and storage conditions.

Decomposition

Decomposes with heat.

For types containing PTFE - Prolonged heating above 260 C (500 F) may cause evolution of particulate matter, which can cause polymer fume fever (see HUMAN HEALTH EFFECTS). Trace amounts of hydrogen fluoride and carbonyl fluoride may also begin evolving at this temperature, with potentially higher amounts generated at higher temperatures. Hazardous gases/vapors generated from the base resin are primarily carbon monoxide and carbon dioxide, at temperatures above 300 C (572 F).

Trace amounts of hydrogen fluoride and carbonyl fluoride may be evolved at 400 C (752 F) with larger amounts at higher temperatures.

Hazardous gases/vapors produced at temperatures over 300 deg C are carbon monoxide and small amounts of hydrogen fluoride.

Polymerization

Polymerization will not occur.

TOXICOLOGICAL INFORMATION

Animal Data

SP Polymer

Inhalation 4 hour ALC: > 5.0 mg/L in rats

SP Polymer is not a skin irritant or a skin sensitizer in tests on animals.

Single high inhalation exposures caused slight to moderate body weight loss within one day of exposure, otherwise weight gain occurred during the remainder of the study.

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

Graphite

Oral LD50: > 5,000 mg/kg in rats

Graphite was not an eye irritant when tested in animals.

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

Carbon Fibers

Carbon Fibers are not skin irritants, but are severe eye irritants in animal tests.

Guinea pigs exposed repeatedly by inhalation to approximately the AEL had no abnormal histopathology. Long term exposure of rats produced a reduction in body weight gain and a decrease in absolute lung weights, but there was no effect suggesting systemic toxicity or pulmonary dysfunction.

Tests in animals demonstrate no carcinogenic activity. Tests for developmental or reproductive toxicity have not been performed.

Carbon Fibers did not produce genetic damage in bacterial or mammalian cell cultures.

ECOLOGICAL INFORMATION

Ecotoxicological Information

AQUATIC TOXICITY:

Toxicity is expected to be low based on insolubility in water.

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.

TRANSPORTATION INFORMATION

Shipping Information

DOT
Proper Shipping Name : Not regulated.

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)- Graphite, Polytetrafluoroethylene

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.

(REGULATORY INFORMATION - Continued)

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
disulfide.

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.

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 : I. V. BEBENSEE
Address : DUPONT ENGINEERING POLYMERS
CHESTNUT RUN PLAZA 713
WILMINGTON, DE 19880-0713
Telephone : 302-999-4257

Indicates updated section.

This information is based upon technical information believed to be
reliable. It is subject to revision as additional knowledge and
experience is gained.

End of MSDS