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

CHEMICAL RESISTANT PARTS AND SHAPES ALL IN SYNONYM LIST VSP026
VSP026 Revised 26-JAN-2007

CHEMICAL PRODUCT/COMPANY IDENTIFICATION

Material Identification

Corporate MSDS Number : DU008508

Tradenames and Synonyms (Remarks)

Material Identification

"VESPEL", "ZYMAXX" AND "TEFLON" are registered trademarks of DuPont.

Tradenames and Synonyms

"VESPEL" CR-6100, CR-6200, CR-6300, CR-6400, #
"VESPEL" CR-6700, #
"ZYMAXX" T-6100, T-6200, T-6300, T-6400, #
"ZYMAXX" T-6700,

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	%
"TEFLON" FLUOROCARBON RESIN (PFA)	26655-00-5	>60
Heated above 400 deg C (750 deg F) can evolve as degradation products		
Hydrogen Fluoride	7664-39-3	<1
Carbonyl Fluoride	353-50-4	<1
IN CR-6100, CR-6200, CR-6700:		
CARBON FIBER		<40
IN CR-6300:		
FIBROUS GLASS		<40
IN CR-6400:		
PARA-ARAMID RFP	26125-61-1	<40

(COMPOSITION/INFORMATION ON INGREDIENTS - Continued)

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.

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 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

"VESPEL" and "ZYMAXX" parts and shapes are not hazardous as shipped.

PFA

Inhalation of PFA dust may cause generalized irritation of the nose, throat and lungs with cough, difficulty breathing or shortness of breath.

Heating PFA above 300 degrees C may liberate a fine particulate fume. Inhalation may produce polymer fume fever, a temporary flu-like condition with fever, chills, nausea, shortness of breath, chest tightness, muscle or joint ache, and sometimes cough and elevated white blood cell count. The symptoms are often delayed 4 to 24 hours after exposure. These signs are generally temporary, lasting 24-48 hours and resolve without further complications. However, some individuals with repeated episodes of polymer fume fever have reported persistent pulmonary effects. Protection against polymer fume fever should also provide protection against any potential chronic effects.

Exposure to decomposition products from PFA heated above 400 degrees C may cause pulmonary inflammation, hemorrhage or edema. These more serious consequences of exposure may occur from extreme thermal decomposition of PFA which can liberate fume particles, and toxic gases (carbonyl fluoride, hydrogen fluoride, and other fluorinated gases) especially under conditions of poor ventilation and/or confined spaces. These decomposition products may initially produce chest tightness or pain, chills, fever, nausea, with shortness of breath, cough, wheezing and progression into pulmonary edema. Edema may be delayed in onset and requires medical treatment. In severe cases, if medical intervention is delayed, pulmonary edema may become life threatening. Recovery is generally complete within a few days; in some rare cases,

(HAZARDS IDENTIFICATION - Continued)

persistent lung function abnormalities have been reported.

Compared to nonsmokers, polymer fume fever symptoms appear to be more prevalent and serious in smokers. Smokers must avoid contamination of tobacco with residual polymer from their hands or from fumes, and should wash their hands before smoking.

No skin irritation is expected during routine or occasional handling of PFA. Prolonged skin contact may cause mild skin irritation. Significant skin permeation after contact appears unlikely. There are no reports of human sensitization.

If particles of PFA contact the eye mechanical irritation with tearing, pain or blurred vision may result.

Individuals with pre-existing diseases of the lungs or cardiovascular system may have increased susceptibility to the reduction in blood oxygen that may develop after excessive exposures to thermal decomposition products.

CARBON FIBER

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.

FIBROUS GLASS

The mechanical action of the sharp fibers from Fiber Glass may cause skin irritation with discomfort or rash.

Eye contact with Fiber Glass particles may cause mechanical eye irritation with discomfort, tearing, or blurring of vision.

Inhalation of Fiber Glass particles may cause irritation of the upper respiratory passages, with coughing and discomfort.

Results from epidemiology studies suggest no causal relationship between Fiber Glass exposure and cancer. One epidemiology study does indicate a slight increase in lung cancer deaths. The evidence that fiber glass is related to these increased lung cancer deaths is considered weak.

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

PARA-ARAMID RFP

(HAZARDS IDENTIFICATION - Continued)

The mechanical action of the para-aramid RFP may cause slight skin irritation at clothing binding points and mild irritation of the eyes and nasal passages. Skin sensitization has not been observed in human skin tests.

Based on animal experiments, long term exposures to high airborne concentrations of para-aramid RFP could lead to pulmonary inflammation and subsequent development of chronic lung disease.

After a through evaluation, IARC has concluded that there is inadequate evidence in humans and in experimental animals for the carcinogenicity of para-aramid fibrils. Thus, according to IARC, para-aramid fibrils cannot be classified as to their carcinogenicity in humans.

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

Flash Point : Not Applicable

Not a fire or explosion hazard. Will not burn without external flame.

Fire and Explosion Hazards:

Hazardous gases/vapors produced in fire are hydrogen fluoride (HF), carbon monoxide, potentially toxic fluorinated compounds, nitrogen oxides.

Extinguishing Media

Use media appropriate for surrounding material.

Fire Fighting Instructions

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

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.

HANDLING AND STORAGE

Handling (Personnel)

Avoid breathing dust or fibers. Avoid contact of fibers or dusts with eye, skin, or clothing. Wash thoroughly with soap and water after performing operations that involve fiber or dust handling. Avoid contamination of cigarettes or tobacco with dust from this material.

Avoid unnecessary rehandling of scrap materials. Keep waste disposal equipment as close as possible to work areas involving operations where there is potential for generation of dust and fibers.

Disposable clothing and equipment contaminated with fibers should be bagged in plastic and properly labeled for disposal.

(HANDLING AND STORAGE - Continued)

Clean up fines, dusts, and/or fibers with high efficiency particulate air (HEPA) filtered vacuum equipment.

EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering Controls

If parts require cleaning after dry machining, rinse with DI water. If parts require cleaning after wet machining, remove cutting fluids with soap and water.

Note: Any processes that have the potential to generate dust, for example, cutting, machining or grinding, should be performed using engineering controls, such as isolation, enclosures, local exhaust ventilation, wetting with coolant, or dust collection systems, to control airborne fibers and dusts below applicable limits.

Note: Wet machining is the preferred method since the liquid both cools the parts and reduces dust generation. Aqueous-based coolants are preferred. Organic-based cutting fluids may degrade the in-use performance of the product and should not be used. Clean parts after cutting or before use.

As with any wet machining technique, mist collection systems should be used.

Skin that becomes contaminated with fibers and dusts should be promptly washed with soap and water.

Personal Protective Equipment

EYE/FACE PROTECTION
When cutting, grinding or mechanically working this product, wear safety glasses or coverall goggles.

RESPIRATORS
When cutting, grinding or mechanically working this product, wear NIOSH/MSHA approved respiratory protection if there is potential for airborne exposures in excess of applicable limits; or if there is potential for irritation of the nasal passages to occur due to the mechanical action of the fibers.

CLOTHING
When performing operations that generate airborne fibers or dusts, wear clothing and gloves to protect against potential irritation which may occur due to the mechanical action of fibers on the skin.

Where there is potential for airborne fibers or dusts in excess of applicable exposure limits or for skin irritation

(EXPOSURE CONTROLS/PERSONAL PROTECTION - Continued)

from contact with the fibers, workers should be required to shower following a workshift and prior to putting on street clothes. Clean work clothing should be provided daily. Non-disposable clothing contaminated with fibers should be laundered separately from other clothing. Rinse washing machine thoroughly after use.

For general handling of the product, wear gloves to protect against cuts or abrasions which may occur from contact with the sharp edges.

Exposure Guidelines

Exposure Limits

CHEMICAL RESISTANT PARTS AND SHAPES ALL IN SYNONYM LIST VSP026

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

"TEFLON" FLUOROCARBON RESIN (PFA)

PEL	(OSHA)	: None Established
TLV	(ACGIH)	: None Established
AEL *	(DuPont)	: 10 mg/m3, 8 & 12 Hr. TWA, total dust 5 mg/m3, 8 & 12 Hr. TWA, respirable dust

Hydrogen Fluoride

PEL	(OSHA)	: 3 ppm, 8 Hr. TWA, as F
TLV	(ACGIH)	: 0.5 ppm, 8 Hr. TWA, as F Ceiling 2 ppm, as F
AEL *	(DuPont)	: 3 ppm, 15 minute TWA

Carbonyl Fluoride

PEL	(OSHA)	: None Established
TLV	(ACGIH)	: 2 ppm, 5.4 mg/m3, 8 Hr. TWA STEL 5 ppm, 13 mg/m3
AEL *	(DuPont)	: None Established

CARBON FIBER

PEL	(OSHA)	: None Established
TLV	(ACGIH)	: None Established
AEL *	(DuPont)	: 1 Fiber/cc, 8 and 12 hour TWA, respirable fibers 3.5 mg/m3, 8 and 12 hour TWA, non-fibrous particulate or non-respirable fibers

FIBROUS GLASS

(Other Applicable Exposure Limits - Continued)

PEL (OSHA)	:	None Established
TLV (ACGIH)	:	5 mg/m3, 8 Hr.TWA, inhalable particulate A4
AEL * (DuPont)	:	5 mg/m3 total dust - 8 Hr. TWA, non-respirable fiber (> 3 microns in diameter) non-fibrous particulate.

PARA-ARAMID RFP

AEL * (DuPont)	:	2 fibers/cc, 8 and 12 hour TWA, respirable fibers 5 mg/m3, 8 and 12 hour TWA, non-fibrous particulate or non-respirable fibers

* 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

Solubility in Water	:	Insoluble
Form	:	Solid.
Color	:	Gray (dark).
Melting Point	:	Not applicable
Specific Gravity	:	>1

STABILITY AND REACTIVITY

Chemical Stability

Stable at normal temperatures and storage conditions.

Incompatibility with Other Materials

None reasonably foreseeable.

Decomposition

Heating above 300 deg C (572 deg 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 be evolved at about 400 deg C (750 deg F), with larger amounts at higher temperatures.

Polymerization

Polymerization will not occur.

TOXICOLOGICAL INFORMATION

Animal Data

PFA
Oral LD50: > 11,000 mg/kg in rats

There was no skin irritation after dermal injection of extracts from PFA into rabbits.

The effects in animals from a single inhalation exposure to thermal decomposition products of PFA include congestion, edema, and hemorrhage of the lungs.

Administration of oral doses of PFA equivalent to the LD50 produced body weight losses, congestion and other nonspecific effects. Repeated administration with 25% and 10% PFA in an oral feeding study did not produce any effects in rats.

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

Carbon Fibers
Carbon fiber, tested as filament bundles, was not a skin irritant in rabbits, but was a severe eye irritant in rabbits.

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.

Fiber Glass
Skin irritation and mild eye irritation occurs in animals, but these effects are attributed primarily to mechanical damage rather than a chemical effect.

The effects in mice from single exposure by intratrachael instillation with Fiber Glass include an inflammatory response. Repeated inhalation exposures invoked pulmonary macrophage reactions similar to biologically inert dusts.

Tests in some animals with Fiber Glass demonstrate carcinogenic activity. However, these studies were by artificial implantation or injection of fine glass fibers into the chest, abdominal cavity, or trachea and are judged to be irrelevant to industrial exposure. Chronic inhalation exposure of animals to fiber glass at low concentrations produced minimal fibrosis in one study and no adverse effects in a different study.

(TOXICOLOGICAL INFORMATION - Continued)

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

para-Aramid RFP
Oral ALD: > 7500 mg/kg in rats

para-Aramid RFP is not a skin irritant, and is not a skin sensitizer in animals.

In a two week inhalation study, respirable para-aramid RFP at concentrations of 1000-2000 fibrils per cubic centimeter of air caused mild fibrosis, nonspecific effects such as weight loss, and respiratory irritation but no effects at concentrations of 400 fibrils per cubic centimeter.

A two year inhalation study with para-aramid RFP (refined to increase its respirable content) showed lung fibrosis at concentrations of 25, 100 and 400 fibrils per cubic centimeter, and lung lesions, previously identified as cystic keratinizing squamous cell carcinomas, in some rats exposed to respirable fibrils at concentrations of 100 and 400 fibrils per cubic centimeter. To further characterize the latter lesions, a panel of pathologists from North America and Europe diagnosed them as "proliferative keratin cysts," and agreed that the lesions are not malignant neoplasms and are most likely not neoplastic. This is a unique type of lesion not found in humans and may be indicative of a nonspecific biological response to the respirable material rather than an indication of para-aramid RFP toxicity. No lung fibrosis was seen in animals exposed to 2.5 respirable fibrils per cubic centimeter for two years. In another study, no intra-abdominal tumors were observed.

para-Aramid RFP did not produce genetic damage in bacterial or mammalian cell cultures.

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

ECOLOGICAL INFORMATION

Ecotoxicological 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.

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 regulations.

TRANSPORTATION INFORMATION

Shipping Information

Not regulated in transportation by DOT/IMO/IATA.

REGULATORY INFORMATION

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)- None known.

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 (O.1% FOR SUBSTANCES IDENTIFIED AS CARCINOGENS, MUTAGENS OR TERATOGENS)- None known.

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.

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.

(Continued)

Responsibility for MSDS : REGULATORY AFFAIRS
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# 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