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Material Safety Data Sheet

NORYL®Modified PPE Black

EMERGENCY TELEPHONE:	724-746-6050 or 856-227-0500
ISSUE DATE:	October 1, 1985
REVISION DATE:	June 28, 2011
TRADE NAME:	NORYL®
PART NAME:	Modified PPE
CHEMICAL NAME:	Modified Polyphenylene ether

1. Information on Ingredients

MATERIAL	CAS Number	%
Polyphenylene ether	25134-01-4	
High impact polystyrene	9003-55-8	
Polystyrene	9003-53-6	Blend Commercial Product
Triphenyl phosphate	115-86-6	1 - 5
Carbon Black	1333-86-45	0.1 – 1.0

This product may contain proprietary ingredients.

This is a polymeric material. Any hazardous constituents are wetted by the polymer system, and therefore are unlikely to present exposure under normal conditions of processing, machining, and handling.

2. Hazard Identification

EMERGENCY OVERVIEW

- Stock shape products with slight or no odor
- Machining shavings may create a slipping hazard
- Can burn in a fire generating dense, toxic smoke
- Molten material in contact with skin can cause severe thermal burns
- Fumes produced during melt processing may cause eye, skin and respiratory tract irritation. Severe over-exposure may result in nausea, headache, chills and fever.
- Secondary operations such as grinding, sanding or cutting can generate dust which may present an explosion or respiratory hazard.

HMIS Rating **Health: 0** **Flammability: 1** **Reactivity: 0**

POTENTIAL HEALTH EFFECTS

Immediate Effects

Inhalation	Dust irritating to the respiratory tract. Processing fumes from PPE resin are not considered toxic. In acute inhalation tests, laboratory rats were exposed to processing fumes at concentrations exaggerating those that would likely occur in workplace situations. During the exposure periods (6 hour duration) signs of eye and nasal irritation were observed. These signs of irritation disappeared shortly after the animals were removed from the exposure chamber. No deaths or signs of toxicity were noted during the fume exposure period. There were no distinct or consistent treatment related tissue or organ changes noted in gross necropsies
Skin	Polymer particles may cause mechanical irritation. The molten product can cause serious burns.
Eyes	Dust and particles, like other inert materials, are mechanically irritating to eyes
Ingestion	Low toxicity by this route is expected based on the biological activity of high molecular weight polymers.
Other Info	OSHA, IARC and/or NTP have listed carbon, titanium dioxide, crystalline silica (quartz), respirable glass and certain heavy metals, present in some colorants and fillers, as carcinogens. If these materials are in this product at significant quantities, they are shown in Section 1. These materials are essentially bound to the plastic matrix and are unlikely to contribute to workplace exposure under recommended processing conditions.

Medical conditions which may be aggravated by exposure:

There are no known health effects aggravated by exposure to this product. However, certain sensitive individuals and individuals with respiratory impairments may be affected by exposure to components in the processing vapors.

Processing vapors may cause irritation to the eyes, skin and respiratory tract. In cases of severe exposure, nausea and headache can also occur. Grease-like processing vapor condensates on ventilation ductwork, molds, and other surfaces can cause irritation and injury to skin.

3. First Aid Measures

INHALATION

Move to fresh air in case of accidental inhalation of vapors. Seek medical attention immediately if symptoms occur.

SKIN CONTACT
The compound is not likely to be hazardous by skin contact, but cleansing the skin after use is advised. If molten polymer contacts the 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 tat 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. If swallowed, do not induce vomiting – seek medical advice.

PRECAUTIONS
Processing fumes inhalation may be irritating to the respiratory tract. If symptoms are experienced removed victim from the source of contamination or move the victim to fresh air and obtain medical advice.

4. Fire Fighting Measures

FLAMMABLE PROPERTIES

Autoignition Temperature:		490°C (914°F), estimated
Explosive Limits	Upper:	Not determined
	Lower:	Not determined

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.
Hazardous gases/vapors produced in fire are dense black smoke containing hazardous combustion products, carbon oxides, hydrocarbon fragments.

EXTINGUISHING MEDIA
Water spray mist, Foam
Unsuitable extinguishing Media for safety reasons: Carbon dioxide and dry chemical are not recommended because of their lack of cooling capacity may permit re-ignition

FIRE FIGHTING INSTRUCTIONS
Keep personnel removed and upwind of fire. Wear self-contained breathing apparatus and protective suit.

5. Handling and Storage

HANDLING

Protection – fire and explosion

Do not handle hot or molten material without appropriate protective equipment. Maintain good housekeeping in work areas. Do not exceed recommended process temperatures to minimize release of decomposition products.

STORAGE

Material Storage

Store in a cool dry place. Keep away from heat sources, sources of ignition 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.

PRESONAL PROTECTIVE EQUIPMENT

EYE/FACE PROTECTION

Wear safety glasses. Wear coverall 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^{o}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 standing 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.

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

CARBON BLACK

PEL (OSHA): 3.5 mg/m^3, 8 hr. TWA, total dust

TLV (ACGIH): 3.5 mg/ m^3, 8 hr. TWA, respirable dust

TRIPHENYL PHOSPHATE

PEL (OSHA): 3 mg/m^3, 8 hr. TWA, total dust

TLV (ACGIH): 3 mg/ m^3, 8 hr. TWA, respirable dust

7. Physical and Chemical Properties

PHYSICAL DATA

Melting Point:	This product does not exhibit a sharp melting point but softens gradually over a wide range of temperatures
Ignition Temperature:	490°C (914°F), estimated
Solubility in Water:	Insoluble
Odor:	None or Slight
Color:	Translucent Clear or Black
Form:	Rod, Plate, Sheet or Tube (stock shape product)
Specific Gravity:	>1; (water = 1)

8. Stability and Reactivity

CHEMICAL STABILITY

Stable at normal temperatures and storage conditions. Hazardous polymerization does not occur.

CONDITIONS TO AVOID

Avoid temperatures above 490°C (914°F). To avoid thermal decomposition, avoid elevated temperatures. Heating can result in the formation of gaseous decomposition products, some of which may be hazardous. Do not exceed melt temperature recommendations. In order to avoid Autoignition and hazardous decomposition of hot thick masses of plastic purgings should be collected in small, flat, thin shapes and quenched with water to allow for rapid cooling. Do not allow product to remain in barrel at elevated temperatures for extended periods of time: purge with a general purpose resin.

HAZARDOUS COMBUSTION OR DECOMPOSTION

Process vapors under recommended processing conditions may include trace levels of hydrocarbon fragments, alkylphenols, aldehydes, alcohols, aliphatic amines, dimethycyclohexanone, trimethylanisole, dihydrobenzofuran

POLYMERIZATION

Polymerization will not occur.

9. Toxicological Information

ACUTE TOXICITY

LD50/oral/rat:	>15 g/kg estimated
LD50/dermal/rabbit:	>2 g/kg estimated
Inhalation:	Unlikely due to physical form. Processing fumes from PPE resin are not considered toxic. In acute inhalation tests, laboratory rats were exposed to processing fumes at concentrations exaggerating those that would likely occur in workplace situations. During the exposure periods (6 hour duration) signs of eye and nasal irritation were observed. These signs of irritation disappeared shortly after the animals were removed from the exposure chamber. No deaths or signs of toxicity were noted during the fume exposure period. There were no distinct or consistent treatment related tissue or organ changes noted in gross necropsies.
Eye Contact:	Particles, like other inert materials, are mechanically irritating
Ingestion:	Unlikely due to physical form
Chronic Toxicity:	No information available
Subchronic Toxicity:	In a 13 week dust inhalation study, laboratory rats were exposed to up to 50 mg/m^3 PPE dust for 6 hrs/day for 13 weeks with a 13 week non-exposure recovery period. There was no evidence of systemic toxicity at the highest dose. Localized toxicity was observed in the lungs and regional lymph nodes of the 50 mg/m^3 exposure group. These findings decreased in severity in the 7 and 1 mg/m^3 exposure groups. A no adverse effect level for PPE is estimated to be 7 mg/m^3 and a no observable effect level is 1 mg/m^3.
Primary Irritation:	Does not generally irritate and is only mildly irritating to skin
IARC:	Not listed
OSHA:	Not regulated
NTP:	Not Tested
Special Studies:	*Polyphenylene ether:* In two independent 2 year dietary studies, purebred beagles and laboratory rats were fed polypheylene ether resin powder (up to 10% by weight in the animal diet). In both studies, there were no adverse effects on physical appearance, behavior, growth, food consumption, survival, clinical laboratory results, organ weights or gross or microscopic pathology. In a 6 month chronic inhalation study, rats and guinea pigs exposed 6 hrs/day to up to 300 mg/m^3 PPE dust developed no physical, nutritional, hematologic, clinical or pathological reaction except to lung tissue changes which consisted of macrophage accumulation, many of which were degenerative in the pulmonary alveoli. Polyphenylene ether is

not a mutagen by Ames (Salmonella) Assay with and without activation.

Carbon Black: The international Agency for Research on Cancer (IARC) has determined that carbon black is a class 2B known animal and possible human carcinogen by the route of inhalation. Rats exposed to high doses of carbon black by inhalation developed statistically significant increases in lung fibrosis and lung tumors.

Triarylphosphate esters: The triarylphosphate esters contained in this product have undergone extensive toxicology testing. They are not acutely toxic via oral (LD50's >5 g/kg), dermal (LD50's >2 g/kg) or inhalation (LC50's >4.14 mg.L) routes of exposure. These triarylphosphate esters may be mild and transient skin and eye irritants and have not been shown to be sensitizers. They produce only minimal systemic effects at relatively high concentrations, consisting primarily of increase in liver and lung weight. The triarylphosphate were not mutagenic in bacterial and mammalian assays and did not produce chromosomal aberrations in either in vitro on in vivo test systems.

In recent acute and delayed neurotoxicity studies in hens, these triarylphosphate esters were not found to be neurotoxic and did not inhibit neurotoxic esterase (NTE) activity. In reproductive and developmental toxicity studies, no adverse effects have been observed. Consistent with aryl phosphates, these substances inhibit plasma acetylcholinestrase (AcHE) and monocyte nonspecific esterase (MNSE). However, when tested in an extensive and validated immunotoxicity testing battery. MNSE staining inhibition showed no adverse effects on immune system function. This staining phenomenon has not been observed at exposures below 10 µg/m^3.

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.

ENVIRONMENTAL FATE/INFORMATION

This material is considered to be non-biodegradable

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.
SARA 313 Chemicals:	Contains no substances at or above the reporting threshold under Section 313.

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.

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

CANADIAN REGULATIONS
WHMIS Classification:
Not a WHMIS controlled product.
WHMIS Ingredient Disclosure List:
This product does not contain substances required to be disclosed according to the Canada WHMIS Ingredient Disclosure List

WHMIS Classification:
Not a WHMIS controlled product.

RoHS EU Directive 2002/95/EC
This product complies with RoHS – it does not intentionally contain banned chemicals

14. Other Information

ADDITIONAL INFORMATION

MEDICAL USE: CAUTION – Do not use in medical applications involving permanent implantation in the human body.

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.