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Material Data Safety Sheets
PVDF (Hylar® 460)

Section 1 – Chemical Product

Product Name:	Hylar® 460
Chemical Name:	Polyvinylidene Fluoride
Chemical Family:	Fluoropolymer
Synonyms:	PVDF, PVF2

Emergency Overview:
Clear pellets. Thermal decomposition will generate Hydrogen Fluoride (HF), which is corrosive.

Section 2 – Compositional Information

Name:	Homopolymer of 1.1 – Difluoroethene
CAS #:	24937-79-9
Approximate Weight (% wt):	100

Section 3 – Potential Health Effects

Effects of Overexposure:

Eye Contact:	Eye contact with fumes can cause mechanical irritation.
Skin Contact:	Skin contact with pellets or fumes can cause irritation.
Inhalation:	Inhalation of fumes may cause respiratory tract irritation.
Ingestion:	No ill effects are expected. Treat as an inert solid material.

Section 4 – First Air Measures

Eye Contact:	Flush eyes for 15 minutes with copious amounts of water, retracting eyelids often. If thermal decomposition of product is suspected, seek medical attention immediately, preferable an eye specialist.
Skin Contact:	Wash skin thoroughly with mild soap and water. Flush with lukewarm water for 15 minutes. If thermal decomposition of product is suspected, consult a physician.
Inhalation:	If symptoms of irritation, discomfort or overcome by exposure, remove affected person to fresh air. Give oxygen or artificial respiration as needed. If thermal decomposition of product is suspected, seek emergency medical attention.
Ingestion:	If conscious, drink three to four 8 ounce glasses of water or milk. Call a

physician. If unconscious take the affected person immediately to a hospital. Do not give anything by mouth to an unconscious person.

Thermal Decomposition: See Section 16, Additional Information, for emergency first aid.

Section 5 – Fire Fighting Measures

Flash Point:	Not applicable
Lower Explosive Limit:	Not applicable
Upper Explosive Limit:	Not applicable
Auto-ignition Temperature:	Not applicable
Extinguishing Media:	Water (spray, stream or fog), foam, dry chemical or Carbon Dioxide (CO_2).

Unusual Fire Hazards:
Fluoropolymers will degrade upon prolonged heating or in a fire, liberating Hydrogen Fluoride (HF) and Carbonyl Fluoride (COF_2). This gas is toxic if inhaled or it comes into contact with moist skin. HF has an ACGIH PIL TLV (8-hr TWA) of 0.5 ppm and a ceiling limit of 2 ppm (1.7 mg/m^3). COF_2 has an ACGIH TLV of 2 ppm (5.4 mg/m^3) and an OSHA PEL TWA of 2 ppm (5 mg/m^3).

Fire Fighting Procedures:
Use self-contained breathing apparatus (SCBA) and skin protection to protect against Hydrogen Fluoride (HF). Do not enter fire area without proper protection. Fight fire from safe distance.

Section 6 – Accidental Release Measures

Releases: In case of a release or spill, sweep or scoop up material and dispose of according to applicable local, state and federal regulations. Place spilled material into a covered container for disposal. Extinguish all ignition sources and evacuate the area. Be careful – the spill area may be slippery. Only personnel equipped with eye and skin protection should be allowed in the area.

Section 7 – Handling and Storage

Keep containers closed. Keep away from heat, sparks and flames. Do not store near combustible materials.

Section 8 – Exposure Controls/Personal Protection

ACGIH threshold Limit Value (8-hr. time weighted average): None established

OSHA Permissible Exposure Limit Value (8-hr. time weighted average): Non established

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Engineering Controls:

Ventilation Requirements:

Local Exhaust:	Vent vapors from melt processing away from operating personnel. Local exhaust ventilation at a rate of 50 feet per minute.
Decomposition by Product:	Treat as Hydrogen Fluoride (HF) exposure. Check for air contamination, consult an industrial hygienist or occupational health specialist.

Personal Protective Equipment:

Respiratory Protection:	No occupational exposure standards have been developed for this material. In situations where exposure to fumes is likely, NIOSH/MSHA approved respirators are recommended. Use supplied air equipment for protection from HF decomposition by-product. Respirator use limitations made by NIOSH/MSHA or (the manufacturer must be observed). Respiratory protection programs must be in accordance with 29 CFR 1910.134.
Eye Protection:	Eye/Face Protection: ANSI Z87.1 approved safety glasses or equivalent, face shield and goggles recommended for protection from HF decomposition by-product.
Skin Protection:	Use heat insulating gloves for hot molds, polymer, etc. Use Polyethylene gloves as protection from HF decomposition by-product. Use skin protection against HF vapors.

Section 9 – Physical and Chemical Properties

Appearance:	Pellets
Color:	Clear
Odor:	Odorless
pH:	Not applicable
Vapor Pressure:	0 @ 15 – 32°C/60 – 90°F
Vapor Density (Air = 1):	0 @ 15-32°C/60 – 90°F
Boiling Point:	Not applicable
Melting Point:	156 – 160°C (313 – 320°F)
Specific Gravity (Water = 1):	1.76 @ 23°C (73°F)
Solubility in Water:	Negligible
Molecular Formula:	$(CH_2CF_2)n$
Molecular Weight:	534,000
% Volatile by Volume:	0

Section 10 – Stability and Reactivity

Stability:
This material is stable.

Conditions to Avoid:
Heat, flames, and thermal decomposition. Thermal decomposition of polymer due to overheating (>600°F) either alone or in contact with Silica, Boron, or Titanium pigments ($Ti0_2$).

Hazardous Decomposition Products:
Thermal decomposition of this product will generate Hydrogen Fluoride (HF), which is corrosive, causing burns on contact with skin and other tissue. HG has an ACGIH TLV ceiling limit of 3 ppm (2.6 mg/m_3) and an OSHA PEL TWA of 3 ppm.

Incompatibility (Materials to Avoid):
Silica (glass fibers, etc), Boron, and Titanium Dioxide will accelerate thermal decomposition of polymer at elevated temperatures.

Section 11 – Toxicological Information

No toxicology data is available for this material. However, similar materials have not exhibited acute toxicological effects.

Section 12 – Ecotoxicological Information

No ecological information is available for this material.

Section 13 – Disposal Considerations

Waste Disposal: Material, as supplied, is not hazardous waste according to RCRA. Landfill according to current federal, state and local regulations. Incinerate in a high-temperature incinerator designed to burn Fluorine containing materials. Processing, use or contamination may make this information inaccurate or incomplete.

Section 14 – Transportation Information

Shipping Class: Not regulated by DOT.

Section 15 – Regulatory Information

All components of this product are listed on the Toxic Substances Control Act (TSCA) Section 8(b) Chemical Inventory, and on the Canadian Environmental Protection Act (CEPA) provisional Domestic Substances List (DSL). This product is not a “hazardous substance” as defined by OSHA Hazard Communication Standard (29 CFR 1910.1200). This product is not a “controlled product” as defined by the Canadian Workplace Hazardous Materials Information System (WHMIS).

SARA 313 Toxic Chemicals: Not listed

SARA 311/312:	Acute:	No
	Chronic:	No
	Fire:	No
	Reactivity:	No
	Sudden Release of Pressure:	No

SARA 302 Extremely Hazardous Substances: Not listed

Section 16 – Additional Information

NFPA Ratings (Scale of 0 – 4)
Health = 1
Fire = 0
Reactivity = 0

Emergency First Aid:
Thermal Decomposition: Hydrofluoric Acid (HF) Exposure
When HF is first detected during decomposition, do not turn the equipment off. Lower the temperature and keep the machine running to purge the HF. Implement the shutdown procedure for the extruder. Remove all personnel from the immediate area: *Personnel decontaminating equipment must use personal protective equipment.* Contact industrial hygienist or safety department for necessary PPE in addition to the special protection information cited below. The HF decomposition by-product is extremely corrosive. Inhalation, eye or skin contact can cause severe burns which may not be immediately visible.

In case of eye or skin contact: Immediately flush eyes (holding eyelids open) or skin with plenty of water for at least 15 minutes or until medical treatment is received. Pay particular attention to flushing skin under nails. While flushing, remove contaminated clothing and shoes. Destroy – do not attempt to clean or launder. Get emergency medical attention.

If swallowed, do not induce vomiting. Give large quantities of water or milk. Do not give anything by mouth an unconscious person. Get emergency medical attention.

If inhaled, move victim to fresh air. If not breathing, give artificial respiration. Get emergency medical attention.

Notes to Physician:
For Skin, follow water flushing by immersing exposed area in or applying frequent compresses of an iced aqueous solution of Benzalkonium Chloride (0.13% Zephicen® Chloride); if available, 2.5% Calcium Gluconate Gel may be used as an optional topical skin treatment. For deep burns, a 5 – 10% aqueous solution of Calcium Gluconate may be subcutaneously injected.

For Eyes, follow water flushing by irrigation with a 1% solution of Calcium Gluconate in physiological saline solution. After irrigation, use 1% Calcium Gluconate in saline as eye drops. Follow-up care by an ophthalmologist is recommended.

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For absorption by any route of exposure, monitor electrocardiogram for signs of Calcium depletion (prolongation of the Q1 interval). Consider intravenous Calcium Gluconate fluid therapy.

Material Safety Data Sheets contain country-specific regulatory information; therefore, the MSDS's provided are for use only by customers of Solvay Solexis, Inc. in North America. If you are located in a country other than Canada, Mexico or the United States, please contact the Solvay Group company in your country for MSDS information applicable to your location.

The previous information is based upon our current knowledge and experience of our product and is not exhaustive. It applies to the product as defined by the specifications. In case of combinations or mixtures, one must confirm that no new hazards are likely to exist. In any case, the user is not exempt from observing all legal, administrative and regulatory procedures relating to the product, personal hygiene, and integrity of the work environment. (Unless noted to the contrary, the technical information applies only to pure product).

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