



Material Safety Data Sheet
COPO VDF-TrFE - PWD

1. PRODUCT AND COMPANY IDENTIFICATION

Company

Arkema Inc.
900 First Avenue
King of Prussia, Pennsylvania 19406

Fluoropolymers Division

Customer Service Telephone Number: (800) 932-0420
(Monday through Friday, 8:30 AM to 5:30 PM EST)

Emergency Information

Transportation: CHEMTREC: (800) 424-9300
(24 hrs., 7 days a week)
Medical: Rocky Mountain Poison Center: (866) 767-5089
(24 hrs., 7 days a week)

Product Information

Product name: COPO VDF-TrFE - PWD
Synonyms: copolymère VDF-TrFE
Molecular formula: Not available
Chemical family: fluoropolymer
Product use: Films

2. HAZARDS IDENTIFICATION

Emergency Overview

Color: White - yellow (Slightly)
Physical state: solid
Form: powder
Odor: None.

WARNING!
MAY FORM COMBUSTIBLE DUST-AIR MIXTURES.
PROCESSING MAY RELEASE VAPORS AND/OR FUMES WHICH CAUSE EYE, SKIN AND RESPIRATORY TRACT IRRITATION.
FOR RESEARCH AND DEVELOPMENT USE ONLY BY TECHNICALLY QUALIFIED INDIVIDUALS UNDER SECTION 6(h)(3) OF THE TOXIC SUBSTANCES CONTROL ACT.

Potential Health Effects

Primary routes of exposure:
Inhalation and skin contact.

Signs and symptoms of acute exposure:
High molecular weight polymer. The product, in the form supplied, is not anticipated to produce significant adverse human health effects. Inhalation of fume may cause flu-like symptoms. Decomposition gives toxic and corrosive products. Effects due to processing releases: Irritating to eyes, respiratory system and skin. Prolonged or repeated exposure may cause: headache, drowsiness, nausea, weakness, (severity of effects depends on extent of exposure).

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Remarks:

Handle in accordance with good industrial hygiene and safety practice. (powder) This product may release fume and/or vapor of variable composition depending on processing time and temperature. Hazardous decomposition products including toxic and corrosive hydrogen fluoride may be liberated during processing at high temperatures (effects may not be immediately painful or visible).

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Name	CAS-No.	Wt/Wt	OSHA Hazardous
Proprietary polymer	Proprietary*	> 99 %	N

The substance(s) marked with a "Y" in the Hazard column above, are those identified as hazardous chemicals under the criteria of the OSHA Hazard Communication Standard (29 CFR 1910.1200).

*The specific chemical identity is withheld because it is trade secret information of Arkema Inc.

While this material is not classified as hazardous under Federal OSHA regulations, this MSDS contains valuable information critical to the safe handling and proper use of this product. This MSDS should be retained and available for employees and other users of this product.

4. FIRST AID MEASURES

Inhalation:
If inhaled, remove victim to fresh air.

Skin:
In case of contact, immediately flush skin with plenty of water. If molten polymer gets on the skin, cool rapidly with cold water. Do not peel solidified product off the skin. Obtain medical treatment for thermal burns. Remove material from clothing. Wash clothing before reuse. Thoroughly clean shoes before reuse.

Eyes:
Immediately flush eye(s) with plenty of water. Obtain medical treatment for thermal burns.

Ingestion:
If swallowed, DO NOT induce vomiting. Get medical attention immediately. If victim is fully conscious, give a cupful of water. Never give anything by mouth to an unconscious person.

Notes to physician:
GENERIC FIRST AID - For hydrogen fluoride (HF). If thermal decomposition of this product occurs releasing HF, additional first aid measures are required. HF decomposition by-product is extremely corrosive and can cause severe burns which may not be immediately visible or painful. Exposure to HF may be fatal if absorbed through the skin, inhaled or swallowed.
In all cases of major hydrogen fluoride exposure (including skin burns about the size of the palm of the hand) hypocalcemia may be present. Monitor calcium levels frequently and EKG for signs of calcium depletion. Patients with burns of the neck or face, or with signs of respiratory irritation, should be monitored for delayed pulmonary edema, and edema of the upper airway with respiratory obstruction. Respiratory care should be closely supervised and may include further administration of 2.5% calcium gluconate by nebulization. Do not administer anesthetics after and may include further administration of 2.5% calcium gluconate by nebulization. Do not administer anesthetics after skin contact as the level of pain is an indication of the effectiveness of the calcium gluconate treatment. If pain continues longer than 30 minutes, consider injecting calcium gluconate (5%) into the skin and subcutaneous tissue beneath, around and within the affected area. If swallowed, DO NOT induce vomiting. Administer 4 to 8 ounces of water followed by 2 to 4 ounces of an antacid containing calcium or magnesium.

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First Aid Supplies for Hydrogen Fluoride Use of the following has been shown to be useful for HF treatment as explained above: 2.5% calcium gluconate gel, 1.0% calcium gluconate in saline ocular solution, 2.5% calcium gluconate in saline inhalant, antacid containing calcium or magnesium.

5. FIRE-FIGHTING MEASURES

Flash point: No data available

Auto-ignition temperature: No data available

Lower flammable limit (LFL): No data available

Upper flammable limit (UFL): No data available

Extinguishing media (suitable):
Water spray, Carbon dioxide (CO₂), Foam, Dry chemical

Protective equipment:
Fire fighters and others who may be exposed to products of combustion should wear full fire fighting turn out gear (full Bunker Gear) and self-contained breathing apparatus (pressure demand / NIOSH approved or equivalent).

Further firefighting advice:
Do not use a solid stream of water.
A solid stream of water can cause a dust explosion.
Fire fighting equipment should be thoroughly decontaminated after use.

6. ACCIDENTAL RELEASE MEASURES

In case of spill or leak:
Prevent further leakage or spillage if you can do so without risk. Evacuate area of all unnecessary personnel. Ventilate the area. Eliminate all ignition sources. Avoid dust formation and dispersal of dust in the air. Wet down (dampen) the spilled material with water. Sweep or scoop up using non-sparking tools and place into suitable properly labeled containers for prompt disposal. The sweepings should be wetted down further with water. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Implement workplace practices such that dusts are not allowed to accumulate on surfaces, as these may form an explosive mixture if they are released into the atmosphere in sufficient concentration. Consult a regulatory specialist to determine appropriate state or local reporting requirements, for assistance in waste characterization and/or hazardous waste disposal and other requirements listed in pertinent environmental permits.

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7. HANDLING AND STORAGE

Handling

General information on handling:
Keep away from heat, sparks and flames.
Avoid breathing processing fumes or vapors.
Avoid breathing dust.
Handle in accordance with good industrial hygiene and safety practices. These practices include avoiding unnecessary exposure and removal of material from eyes, skin, and clothing.
Implement routine housekeeping practices to ensure that dusts do not accumulate on surfaces.
Dry powders can build static electricity charges when subjected to the friction of transfer and mixing operations.
Keep container closed.
Avoid creating dust in handling, transfer or clean up.
Prevent dust accumulation.
Check that all equipment is properly grounded and installed to satisfy electrical classification requirements.
Container hazardous when empty.
Emptied container retains product residue.
Follow label warnings even after container is emptied.
RESIDUAL DUSTS MAY EXPLODE ON IGNITION.
DO NOT CUT, DRILL, GRIND, OR WELD ON OR NEAR THIS CONTAINER.
Improper disposal or reuse of this container may be dangerous and/or illegal.

Storage

General information on storage conditions:
Store in well ventilated area away from heat and sources of ignition such as flame, sparks and static electricity. Ensure that all storage and handling equipment is properly grounded and installed to satisfy electrical classification requirements. Static electricity may accumulate when transferring material. All metal and groundable storage containers, including but not limited to drums, cylinders, Returnable Intermodal Bulk Containers (RIBCs) and Class C Flexible Intermodal Bulk Containers (FIBCs) must be bonded and grounded during filling and emptying operations. Observe all federal, state and local regulations and National Fire Protection Association (NFPA) Codes, which pertain to the specific local conditions of storage and use, including NFPA 654.

Storage incompatibility - General:
Store separate from acids and oxidizers.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Airborne Exposure Guidelines:

Particles Not Otherwise Specified / Nuisance Dust

US, ACGIH Threshold Limit Values

Form:	Inhalable particles.
Time Weighted Average (TWA):	10 mg/m ³
Form:	Respirable particles.
Time Weighted Average (TWA):	3 mg/m ³

US, OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000)

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Form: Respirable fraction.
PEL: 5 mg/m3

Remarks: All inert or nuisance dusts, whether mineral, inorganic, or organic, not listed specifically by substance name are covered by the Particulates Not Otherwise Regulated (PNOR) limit which is the same as the inert or nuisance dust limit of Table Z-3.

Form: Total dust.
PEL: 15 mg/m3

Remarks: All inert or nuisance dusts, whether mineral, inorganic, or organic, not listed specifically by substance name are covered by the Particulates Not Otherwise Regulated (PNOR) limit which is the same as the inert or nuisance dust limit of Table Z-3.

Only those components with exposure limits are printed in this section. Limits with skin contact designation above have skin contact effect. Air sampling alone is insufficient to accurately quantitate exposure. Measures to prevent significant cutaneous absorption may be required. Limits with a sensitizer designation above mean that exposure to this material may cause allergic reactions.

Engineering controls:

Investigate engineering techniques to reduce exposures below airborne exposure limits or to otherwise reduce exposures. Provide ventilation if necessary to minimize exposures or to control exposure levels to below airborne exposure limits (if applicable see above). If practical, use local mechanical exhaust ventilation at sources of air contamination such as open process equipment.

Check that all dust control equipment such as local exhaust ventilation, material transport systems, and air-material separation devices involved in handling this product contain explosion relief vents or an explosion suppression system or an oxygen-deficient environment. Isolation devices may be appropriate to prevent propagation from one unit to another. Ensure that dust-handling systems are designed in a manner to prevent the escape of dust into the work area (i.e., there is no leakage from the equipment). Consult ACGIH ventilation manual, NFPA Standard 91 and NFPA Standard 654 for design of exhaust system and safe handling.

Respiratory protection:

Avoid breathing processing fumes or vapors. Avoid breathing dust. Where airborne exposure is likely or airborne exposure limits are exceeded (if applicable, see above), use NIOSH approved respiratory protection equipment appropriate to the material and/or its components and substances released during processing. Consult respirator manufacturer to determine appropriate type equipment for a given application. Observe respirator use limitations specified by NIOSH or the manufacturer. For emergency and other conditions where there may be a potential for significant exposure or where exposure limit may be significantly exceeded, use an approved full face positive-pressure, self-contained breathing apparatus or positive-pressure airline with auxiliary self-contained air supply. Respiratory protection programs must comply with 29 CFR § 1910.134.

Skin protection:

Processing of this product releases vapors or fumes which may cause skin irritation. Minimize skin contamination by following good industrial hygiene practice. Wash hands and contaminated skin thoroughly after contact with processing fumes or vapors. Wash thoroughly after handling. NOTE: In the event of thermal

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decomposition resulting in an HF exposure or release, decontamination of the equipment involves the use of protective equipment. Contact an Industrial Hygienist or safety personnel for type of equipment necessary.

Eye protection:

Use good industrial practice to avoid eye contact. Processing of this product releases vapors or fumes which may cause eye irritation. Where eye contact may be likely, wear chemical goggles and have eye flushing equipment available.

9. PHYSICAL AND CHEMICAL PROPERTIES

Color: White - yellow (Slightly)

Physical state: solid

Form: powder

Odor: None.

pH: No data available

Density: 1.77 - 1.79 g/cm3

Vapor pressure: No data available

Vapor density: No data available

Boiling point/boiling range: No data available

Melting point/range: > 284 °F (> 140 °C)

Solubility in water: insoluble

Thermal decomposition > 599 °F (> 315 °C)

10. STABILITY AND REACTIVITY

Stability:

The product is stable at normal handling and storage temperatures.

Hazardous reactions:

Hazardous polymerization does not occur.

Materials to avoid:

Acids
Oxidizing agents

Conditions / hazards to avoid:

Thermal decomposition of polymer will generate hydrogen fluoride (HF). Thermal decomposition of the polymer begins to generate HF at 600 degrees F (315 degrees C) and the evolution of HF becomes rapid at 700 degrees F (370 degrees C). Normal melt processing conditions rarely exceed a melt temperature of 535 degrees F (280 degrees C). The tip and mandrel are often set at higher temperatures. Laboratory testing has shown high polymer

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stability (TGA in nitrogen) at temperatures up to and including 600 degrees F (315 degrees C). Above this melt temperature, processors should exercise extreme caution because degradation may occur. We recommend that the product manufacturer's technical personnel are consulted if elevated melt temperature processing is required. Note: When HF is first detected or the decomposition of the polymer is noted, continue to run the equipment with the heat source turned off and turn off the polymer feed. Run the equipment dry, ventilate the area, and remove non-essential personnel. Purging this product from the equipment can be accomplished using a high viscosity polyethylene. In case of a major decomposition event, evacuate all personnel immediately and call the emergency number listed on the first page of this MSDS.

Hazardous decomposition products:

Thermal decomposition giving toxic products
Carbon oxides
Hydrogen fluoride

11. TOXICOLOGICAL INFORMATION

No data are available.

12. ECOLOGICAL INFORMATION

Chemical Fate and Pathway
No data are available.

Ecotoxicology
No data are available.

13. DISPOSAL CONSIDERATIONS

Waste disposal:
Where possible recycling is preferred to disposal or incineration. Dispose of in an approved landfill if allowed locally. Incinerate only if the incinerator is fitted to scrub out hydrogen fluoride and other acidic combustion gases. Dispose of in a permitted waste management facility if incineration or landfill is not practical. Pigmented, filled and/or solvent laden product may require special disposal practices in accordance with federal, state and local regulations. Dispose of in accordance with federal, state and local regulations. Consult a regulatory specialist to determine appropriate state or local reporting requirements, for assistance in waste characterization and/or hazardous waste disposal and other requirements listed in pertinent environmental permits. Note: Chemical additions to, processing of, or otherwise altering this material may make this waste management information incomplete, inaccurate, or otherwise inappropriate. Furthermore, state and local waste disposal requirements may be more restrictive or otherwise different from federal laws and regulations.

14. TRANSPORT INFORMATION

US Department of Transportation (DOT): not regulated

International Maritime Dangerous Goods Code (IMDG): not regulated

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15. REGULATORY INFORMATION

Chemical Inventory Status

EU. EINECS	EINECS	Conforms to
US. Toxic Substances Control Act	TSCA	FOR RESEARCH AND DEVELOPMENT USE ONLY BY TECHNICALLY QUALIFIED INDIVIDUALS UNDER SECTION 5(h)(3) OF THE TOXIC SUBSTANCES CONTROL ACT.
Australia. Industrial Chemical (Notification and Assessment) Act	AICS	Does not conform
Canada. Canadian Environmental Protection Act (CEPA). Domestic Substances List (DSL). (Can. Gaz. Part II, Vol. 144)	DSL	This product contains one or several components that are not on the Canadian DSL nor NDSL lists.
Japan. Kashin-Hou Law List	ENCS (JP)	Does not conform
Korea. Existing Chemicals Inventory (KECI)	KECI (KR)	Does not conform
Philippines. The Toxic Substances and Hazardous and Nuclear Waste Control Act	PICCS (PH)	Does not conform
China. Inventory of Existing Chemical Substances	IECSC (CN)	Does not conform
New Zealand. Inventory of Chemicals (NZIoC), as published by ERMA New Zealand	NZIOC	Does not conform

United States - Federal Regulations

SARA Title III - Section 302 Extremely Hazardous Chemicals:

The components in this product are either not SARA Section 302 regulated or regulated but present in negligible concentrations.

SARA Title III - Section 311/312 Hazard Categories:
Fire Hazard

SARA Title III - Section 313 Toxic Chemicals:

SARA 313: This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) - Reportable Quantity (RQ):

The components in this product are either not CERCLA regulated, regulated but present in negligible concentrations, or regulated with no assigned reportable quantity.

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OSHA Regulated Carcinogens (NTP, IARC, OSHA Listed):

NTP:

No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

IARC:

No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

OSHA:

No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

United States – State Regulations

New Jersey Right to Know

No components are subject to the New Jersey Right to Know Act.

Pennsylvania Right to Know

Chemical Name
Proprietary polymer

CAS-No.
Proprietary

California Prop. 65

This product does not contain any chemicals known to the State of California to cause cancer, birth defects, or any other reproductive defects.

16. OTHER INFORMATION

Miscellaneous:

Other information: Refer to National Fire Protection Association (NFPA) Code 654, Standard for the Prevention of Fire and Dust Explosions from the Manufacturing, Processing, and Handling of Combustible Particulate Solids, for safe handling.

Latest Revision(s):

Revised Section(s): Updated Corporate Address Change and Rocky Mountain Poison Center Phone Number
Reference number: 000000066057
Date of Revision: 07/11/2011
Date Printed: 12/27/2012

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TSCA R&D Exemption material
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12/27/2012

One or more of the chemicals we are shipping you are not on the Toxic Substance Control Act (TSCA) Inventory list and are being sent to you as a research and development (R&D) chemicals. In order to be exempt from Premanufacturing Notification (PMN) requirements, the EPA requires that these chemicals be used solely for R&D and that all research is supervised by a "technically qualified individual" as defined in 40 C.F.R. 720.3(ee) (see below).

The chemical, physical, and toxicological properties of these chemicals may not have been fully investigated. Use due caution in the handling of this material and follow appropriate good industrial hygiene and safety precautions to control exposure. Consult the enclosed (attached) Material Safety Data Sheet (MSDS) for additional information.

Because the conditions of handling and use are beyond our control, we make no guarantee of results and assume no liability for injuries, damages, or penalties resulting from the use whether or not our suggestions are followed. Such recommendations are not to be taken as a license to operate under or to infringe any patent.

40 C.F.R. 720.3(ee): Technically qualified individual means a person or persons (1) who, because of education, training, or experience, or a combination of these factors, is capable of understanding the health and environmental risks associated with the chemical substance which is used under his or her supervision, (2) who is responsible for enforcing appropriate methods of conducting scientific experimentation, analysis, or chemical research to minimize such risks, and (3) who is responsible for the safety assessments and clearances related to the procurement, storage, use, and disposal of the chemical substance required within the scope of conducting a research and developmental activity.