

MATERIAL SAFETY DATA SHEET



A5000

1. PRODUCT AND COMPANY NAME

PRODUCT NAME: A5000 Release Film (Violet, White, Clear, Red)

DESCRIPTION: High Elongation FEP Fluorocarbon Release Films, Plain and Perforated

MANUFACTURER: Richmond Aircraft Products
12801 Ann Street
Santa Fe Springs, CA 90670

FOR MORE INFORMATION CALL: 562-906-3300
IN CASE OF EMERGENCY CALL: 562-906-3300

2. COMPOSITION/INFORMATION ON INGREDIENTS

<u>Ingredient Name</u>	<u>CAS #</u>	<u>% of Ingredient</u>
Tetrafluoroethylene-hexafluoropropylene copolymer In Violet, Red films: White and Clear films:	(CAS 25067-11-2)	>95% 85-95%
Titanium dioxide Violet films: White and Clear films:	(CAS 13463-67-7)	<0.05% 5-15%
Cobalt Phosphate In Violet Films only:	(CAS 13455-36-2)	<2%
<u>Red films only:</u> Red Pigment Heated above 400C (750F) can evolve as degradation products:	(CAS 4948-15-6)	<1%
Hydrogen fluoride	(CAS 7664-36-3)	<1%
Carbonyl fluoride	(CAS 353-50-4)	<1%
Perfluoroisobutylene	(CAS 382-21-8)	<0.01%

* Disclosure as a toxic chemical is required under Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR part 372.

MATERIAL SAFETY DATA SHEET



3. HAZARD IDENTIFICATION

POTENTIAL HEALTH HAZARDS

Route of Entry:	Inhalation
Target Organs:	Respiratory
Inhalation:	<p>Inhalation of fumes from overheating FEP may cause polymer fume fever, a temporary flu-like illness with fever, chills, and sometimes a cough, of approximately, 24 hours duration. There are some reports in the literature of persistent pulmonary effects in individuals, especially smokers, who have had repeated episodes of polymer fume fever. Because of complicating factors, such as mixed exposures and smoking history, these findings are uncertain. Protection against acute exposure should also provide protection against any potential chronic effects. Smokers should avoid contamination of tobacco products, and should wash their hands before smoking. Significant skin permeation after contact appears unlikely. There are no reports of human sensitization. Small amounts of carbonyl fluoride, hydrogen fluoride and Perfluoroisobutylene may also be evolved when FEP COPOLYMER is overheated or burned. Inhalation of low concentrations of HYDROGEN FLUORIDE can initially include symptoms of choking, coughing, and severe eye, nose, and throat irritation, possibly followed after a symptomless period of 1 to 2 days by fever, chills, difficulty in breathing, cyanosis, and pulmonary edema. Acute or chronic overexposure to HF can injure the liver and kidneys. PERFLUOROISOBUTYLENE is an extremely toxic as for which inhalation is the most likely route of human exposure. Inhalation exposure may cause severe symptoms of pulmonary edema with wheezing, difficulty in breathing, coughing up sputum and bluish discoloration of the skin. Coughing and chest pain may occur initially. However, severe symptoms of pulmonary edema may be delayed for several hours and then become rapidly worse. Over-exposure may cause death. (Inhalation 2-hour LC50 w 1.05 ppm in rats) Individuals with preexisting diseases of the lungs may have increased susceptibility to the toxicity of excessive exposures from thermal decomposition products.</p>
Skin Contact:	Skin irritation with discomfort or rash
Eye Contact:	Eye corrosion with corneal or conjunctival ulceration
Ingestion:	Not a route of exposure

MATERIAL SAFETY DATA SHEET



Carcinogenicity: The following components are listed by the IARC, NTP, OSHA, or ACGIH as carcinogens:

Materials IARC NTP OSHA ACIGH

Titanium Dioxide 2B

4. FIRST AID MEASURES

Inhalation: None needed under normal usage. If exposed to vapors at elevated processing temperatures, remove to fresh air. If symptoms persist consult a physician.

Skin Contact: The compound is not likely to be hazardous by skin contact, but cleansing the skin after use is advisable. If molten polymer gets on skin, cool rapidly with cold water do not attempt to peel polymer from skin. Obtain medical treatment for thermal burn.

Eye Contact: In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Call a physician.

Ingestion: None needed. Consult a physician if necessary.

5. FIRE FIGHTING MEASURES

FLAMMABLE PROPERTIES

Flash Point (ASTM D1929): 530-550C (986-1022F) for White, Violet, Red films
470C (878F) for Clear films

Self Ignition Temperature (ASTM D1929): 520-560C (968-1040F)

UL-94 Flammability Rating: V-0

Extinguishing Method: Water, foam, dry chemical, CO2

Limiting Oxygen Index (ASTM D2863): >95

Extinguishing Media: Water, foam, Dry chemical, CO2

Special Fire Fighting Procedures: Wear NIOSH/MSHA approved positive pressure self-contained breathing apparatus and full protective clothing.

MATERIAL SAFETY DATA SHEET



Unusual Fire and Explosion Hazards: Does not burn without an external flame. Protect from hydrogen fluoride fumes which react with water to form hydrofluoric acid. Wear Neoprene gloves when handling refuse from a fire.

6. ACCIDENTAL RELEASE MEASURES

Always wear recommended personal protective equipment. Collect and place in a solid waste container.

7. HANDLING AND STORAGE

Handling Precautions: Avoid contamination of cigarettes or tobacco with dust from this material. Do not use a torch to clean this material from equipment without local exhaust ventilation and respirator.

Storage Requirements: Keep container closed to prevent contamination.

8. EXPOSURE CONTROL/PERSONAL PROTECTION

Engineering Controls: Use local exhaust to completely remove vapors and fumes liberated during hot processing from the work area.

Protective Equipment: Wear safety glasses. Wear coverall chemical splash goggles and face shield when possibility exists for eye and face contact due to splashing or spraying of molten material. A respirator is not required if local exhaust ventilation is adequate. At processing temperatures less than 400 deg C (750 deg F) a NIOSH/MSHA approved air purifying respirator with dust/mist cartridge or canister may provide protection from airborne particulates which cause polymer fume fever. At higher processing temperatures if ventilation is inadequate to maintain hydrogen fluoride and carbonyl fluoride concentrations below exposure limits, use a positive pressure air supplied respirator. Air purifying respirators may not provide adequate protection. If there is potential contact with hot/molten material, wear heat resistant clothing and footwear.

MATERIAL SAFETY DATA SHEET



Exposure Guideline/Other:

"Teflon" Release Film all in LON004 (LON001 for Clear)

PEL (OSHA)	Particulates (Not Otherwise Regulated) 15 mg/m ³ , 8 Hr. TWA, total dust 5 mg/m ³ , 8 Hr. TWA, respirable fraction
TLV (ACGIH)	10 mg/ m ³ , TWA Inhalable particles 3 mg/ m ³ Respirable particles

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.

Tetrafluoroethylene-Hexafluoropropylene Copolymer (White, Violet, Red Films)

PEL (OSHA)	None Established
TLV (ACGIH)	None Established

Cobalt Phosphate (In Violet films)

TLV (ACGIH)	0.02 mg/ m ³ , TWA as Co
-------------	-------------------------------------

Titanium Dioxide (White/Clear/Violet Films)

PEL (OSHA)	15 mg/ m ³ , total dust, 8 Hr. TWA
TLV (ACGIH)	10 mg/ m ³ , total dust, 8 Hr. TWA, A4

Hydrogen Fluoride (Violet films)

PEL (OSHA)	3 ppm, 8 Hr. TWA, as F
TLV (ACGIH)	0.5 ppm, 8 Hr. TWA, as F ceiling 2 ppm, as F

Carbonyl Fluoride (Violet films)

PEL (OSHA)	None Established
TLV (ACGXH)	2 ppm, 5.4 mg/m ³ , 8 Hr. TWA STEL 5 ppm, 13 mg/m ³

Perfluoroisobutylene (Violet films)

PEL (OSHA)	None Established
TLV (ACe1H)	Ceiling 0.01 ppm, 0.082 mg/m ³

Biological Exposure Indices (Violet films)

Cobalt Phosphate

BEI (ACGIH)	1 µg/l Cobalt/Blood Sampling time: End of shift at end of work week
BEI (ACGIH)	1 µg/l Cobalt/Urine Sampling time: End of shift at end of work week

MATERIAL SAFETY DATA SHEET



9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	Clear, translucent, or colored plastic film
Physical Status:	Solid
Odor:	No odor
pH:	N/A
Vapor Pressure:	N/A
Vapor Density:	N/A
Boiling Point:	N/A
Freezing/Melting Point:	260-275C (500-527F) for White, Clear, Violet, Red films 215-230C (419-446F) for CLZF, CLZFP
Solubility:	Insoluble
Spec. Grav./Density:	2.1 – 2.2 (White, Clear, Violet, Red Films) 1.7 (Clear)

10. STABILITY AND REACTIVITY

Stability:	Normally Stable
Conditions to avoid:	Avoid exposure to open flame or temperatures exceeding recommended processing temperatures. The maximum temperature to which the film can be exposed will vary with exposure (dwell) time. RAP should be contacted if questions arise concerning specific processing conditions.
Materials to avoid (Incompatibility):	Incompatible or can react with finely divided metal powders (e.g., aluminum and magnesium) and potent oxidizers like fluorine (P2) and related compounds (e.g., chlorine trifluoride, C1F3). Contact with incompatibles can cause fire, an explosion.
Hazardous Decomposition Products:	Heating above, 275C (527 F), may cause evolution of particulate matter, which can cause polymer fume fever (see HUMAN HEALTH EFFECTS). Trace amounts of hydrogen fluoride, carbonyl fluoride, and perfluoroisobutylene may be evolved at about 380C (716F), with larger amounts at higher temperatures.
Hazardous Polymerization:	Will not occur

MATERIAL SAFETY DATA SHEET



11. TOXICOLOGICAL INFORMATION

Immediate (Acute) Effects: See Section 3
Delayed (Sub-chronic and chronic) Effects: See Section 3
Other Data:

In White, Violet, Red films:

TETRAFLUOROETHYLENE-HEXAFLUOROPROPYLENE COPOLYMER (FEP)

Inhalation 4 h LC50: > 8mg/l, rat
Repeated dose toxicity: Oral
Rat
No toxicologically significant effects were found

Inhalation
Rat
No toxicologically significant effects were found

Further information The substance is a polymer and is not expected to produce toxic effects

COBALT PHOSPHATE

Oral LD50: 387 mg/kg, rat
No data available

TITANIUM DIOXIDE

Oral LD50: >5,000 mg/kg, rat (Violet films)
Oral ALD: >24,000 mg/kg, rat (Clear, White films)
Inhalation 4h LC50 > 6.82 mg/l, rat (Violet films)
Dermal ALD >10,000 mg/kg, rabbit (Clear, White films)
Skin Irritation No skin irritation, rabbit
Eye irritation No eye irritation, rabbit
Skin sensitization Did not cause sensitization on laboratory animals. , mouse
Did not cause sensitization on laboratory animals. , guinea pig
Repeated dose toxicity Oral
Rat
No toxicologically significant effects were found
Carcinogenicity: Titanium Dioxide will not cause lung cancer or chronic respiratory diseases in humans at concentrations experienced in the workplace.
Mutagenicity Did not cause genetic damage in animals. Tests on bacterial or mammalian cell cultures did not show mutagenic effects

MATERIAL SAFETY DATA SHEET



In Clear films:

ETHYLENE-TETRAFLUOROETHYLENE POLYMER

4 hour, LC50, rat: 7300 mg/m³

None of the *components* present in this material at concentrations equal to or greater than 0.1% are listed by IARC, NTP, OSHA or ACQIH as a carcinogen.

12. ECOLOGICAL INFORMATION

Aquatic Toxicity

Hexafluoropropene/Tetrafluoroethylene copolymer

The substance is a polymer and is not expected to product toxic effects

Cobalt Phosphate

Very toxic to aquatic organisms, may cause long term adverse effects in the aquatic environment

Titanium Dioxide

96h LC50: Pimephales promelas (fathead minnow) >1,000 mg/l

72h EC50: Psuedokirchneriella subcapitata (green algae) 61 mg/l

48h EC50: Daphnia magna (Water flea) > 1,000 mg/l

Additional ecological information: This product has no known eco-toxicological effects

13. DISPOSAL CONSIDERATIONS

Waste Disposal: Like most thermoplastic plastics the product can be recycled. If recycling is not practicable, dispose of in compliance with local regulations. Incinerate only if incinerator is capable of scrubbing out hydrogen fluoride and other acidic combustion products.

Environmental Hazards: Empty container should betaken to an approved waste handling site for recycling or disposal.

14. TRANSPORT INFORMATION

US DOT Hazard Class: Not regulated
US DOT ID Number: Not applicable

For additional information on shipping regulations affecting this material, contact the information number found in Section 1.

MATERIAL SAFETY DATA SHEET



15. REGULATORY INFORMATION

U.S. Federal Regulations

TSCA Inventory Status:	Listed or in compliance with inventory
SARA 313 Regulated Chemicals:	Cobalt Phosphate
CERCLA Reportable:	76 lbs
Quantity	Based on the percentage composition of this chemical product: Tricobalt bis(orthophosphate) – Violet films
California Prop. 65:	Tetrafluoroethylene is a known chemical to the State of California to cause cancer

State Regulations (US)

State Right-To-Know

NJ Right to Know:

Substances on the New Jersey Workplace Hazardous Substance List present at the concentration of 1% or more (0.1% for substances identified as carcinogens, mutagens or teratogens): Cobalt Phosphate

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) – Titanium dioxide.

PA Right to Know:

Substances on the Pennsylvania Hazardous Substances List present a concentration of 1% or more (0.01% for Special Hazardous Substances): Titanium dioxide

16. OTHER INFORMATION

Current Issue Date: 07/2/2011
Previous Issue Date: 06/27/2011