



13503 PUMICE STREET
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Material Safety Data Sheet
 Revision date: July, 2003

Product Name: HS 250, Stretch-Vac 250

SECTION I

Manufacturer

Richmond Aircraft Products, Inc.
 13503 Pumice Street
 Norwalk, CA 90650

Chemical Name/Synonym

Thermoplastic polyurethane film

CAS Registry No.

Not applicable to physical mixtures

Composition

Thermoplastic polyurethane polymer and proprietary process and performance additives

SECTION II - HAZARDOUS INGREDIENTS/IDENTITY INFURIAATION

- This product contains the following substances(s) subject to Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA) and 40 CFR372 at or above de minimus amounts: none known
- This product is a solid material (e.g., diced/granule/pellet/chopped strand). All components are physically bound in the matrix during our manufacturing process and are not expected to create an exposure to individual components when the product is handled at ambient temperatures. (See Section V).

SECTION 3* PHYSICAL/CHEMICAL CHARACTERISTICS (Typical data, not specifications)

<u>Solubility in Water</u>	<u>Appearance and Odor</u>	<u>Specific Gravity</u>
Insoluble	Pigmented or unpigmented films. Faint odor.	(H ₂ O=1) 1.1 - 1.3

Other

Characteristics such as boiling point, vapor pressure, vapor density, and evaporation rate are not applicable.



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SECTION 4: FIRE AND EXPLOSION HAZARD DATA

<u>Flash-Ignition Temp. *</u>	<u>Self-Ignition Temp. *</u>	<u>Flammable Limits in Air</u>
740/760°F (393-404°C)	765-970°F (407-521°C)	(% by volume)
*ASTM D-1929		Lower: NA Upper: NA

Flash-Ignition Temperature is the lowest initial temperature of air passing around the specimen at which sufficient combustible gas is evolved to be ignited by a small external pilot flame.

Self-Ignition Temperature is the lowest initial temperature of air passing around the specimen at which, in the absence of an ignition source, ignition occurs of itself, as indicated by an explosion, flame, or sustained glow.

Extinguishing Media

Water is most effective. ABC dry chemical, AFFF, and protein-type air foams are also effective. DUREFLEX films are "ordinary combustibles" (NFPA defined Class A). Carbon dioxide is not generally recommended for use on Class A fires as a lack of cooling capacity may result in reignition.

Special Firefighting Procedures

Wear positive pressure self-contained breathing apparatus (SCBA). Personnel not having suitable respiratory protection must leave the area to prevent significant exposure to toxic combustion gases from any source. In enclosed or poorly ventilated areas, wear SCBA during clean-up immediately after a fire as well as during the attack phase of firefighting operations.

Unusual Fire and Explosion Hazards

None known. Like virtually all organic materials, thermoplastic polyurethane can be forced to burn by continuous application of intense heat. Protect product from flames of any kind and maintain proper clearance when using heat devices, etc. Store flammable liquids away from this product.



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SECTION 5: REACTIVITY DATA

<u>Stability</u>	<u>Hazardous Polymerization</u>	<u>Incompatibility</u>
Stable	Will not occur	Conditions to avoid: Overheating Materials to avoid: None Known

Hazardous Decomposition Products (e.g., combustion, overheating, etc.)

CO, CO₂, and small amounts of hydrogen cyanide, oxides of nitrogen, aromatic and aliphatic hydrocarbons, water vapor, and smoke. Trace amounts of diisocyanate may occur under certain conditions of combustion. **Note:** Hydrogen cyanide is a typical decomposition product of nylon, wool, and other materials containing nitrogen.

Thermal Processing Emissions (e.g., extrusion, molding, heat laminating, etc.)

The sum total of ingredients present in virtually any thermoplastic compound will emit fumes, vapors, and odors during normal processing. Volatile emissions from general purpose DUREFLEX compounds during processing may include water vapor and small quantities of materials such as tetrahydrofuran, butanediol, cyclopentanone, and carbon dioxide. To protect your employees' health, conduct any operation emitting fumes or vapors under well-ventilated conditions.

Special Note: Diisocyanate monomer, a skin and pulmonary irritant, is so substantially reacted during resin polymerization that it is not expected to be detectable as a volatile from processing. Further processing from the resin state to a film state via heat extrusion further reduces potential detectable volatile.

<u>Potential Processing Vapor Component</u>	<u>CAS NUMBER</u>	<u>ACGIH TLV-TWA</u>	<u>OSHA PEL</u>
Carbon Dioxide	124-38-9	5,000 ppm	5,000 ppm
Tetrahydrofuran	109-99-9	200 ppm	200 ppm
Butanediol	584-03-02	-----None Established-----	
Cyclopentanone	120-92-3	-----None Established-----	

Notes: q1 TLV-TWA: Threshold Limit Value - Time Weighted Average for concentration of the chemical substance in the ambient workplace air for normal 8-hour workday, 40-hour workweek, to which nearly all workers may be repeatedly exposed without adverse effect. American Conference of Governmental Industrial Hygienists, 1987/1988 Edition.

OSHA PEL: OSHA permissible Exposure Limit, 8-hour TWA, 29CFR1910.1000

SECTION 6: HEALTH HAZARD DATA

<u>Threshold Limit Value</u>	<u>Carcinogenicity</u>	<u>Medical Conditions</u>
None established by OSHA or ACGIH	Not listed by IARC, NTP, or OSHA	Aggravated by Exposure None Known
<u>Acute Health Effects</u>	<u>Chronic Health Effects</u>	<u>Routes of Entry</u>
See "Effects" below	None known	Inhaling process vapors



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Effect of Overexposure

- There are no known health hazards from DUREFLEX film at ambient temperature.
- No adverse health effects are expected from processing DUREFLEX film when potential exposures are eliminated by good industrial hygiene practice and well-ventilated conditions. At processing temperatures, the sum total of all ingredients may emit fumes and vapors that are irritating to the respiratory tract, eyes and/or skin of sensitive people. Typically, these effects are expected. Most importantly, the potential for irritation will depend on the effectiveness of exhaust ventilation provided to the process area.
- Inhalation of the respiratory tract, eyes and skin. Depending on the severity of exposure, physiological response will be coughing, pain and inflammation.

Emergency and First Aid Procedure

If irritation persists from exposure to processing vapors or decomposition products, remove the affected individual{s} from the area. Call a physician. Provide protection before allowing re-entry.

SECTION 7: PRECAUTIONS FOR SAFE HANDLING AND STORAGE

Steps to be taken in case material is released or spilled.

Vacuum or sweep into a closed container for reuse or disposal.

Waste Disposal Method

Dispose of waste in a licensed landfill or by incineration in accordance with Federal, State and local regulations. For waste disposal purposes, these products are not defined or designated as hazardous by current provision of the Federal (EPA) Resource Conservation and Recovery Act (RCRA, 40FR261).

Precautions to be taken in handling and storage

- Normal Melt Processing. Virtually all thermoplastic materials will emit fumes and/or vapors when heated to processing temperatures. The concentration and composition of these vapors will depend upon variables, such as the specific formulation and processing method and temperatures. Always use DUREFLEX polyurethane under well-ventilated conditions and avoid continued or prolonged breathing of process vapors. For personal hygiene, wash thoroughly after processing films, especially before eating, smoking, or using toilet facilities. Do not store or consume food in processing areas. Do not use processing equipment to heat food.
- Clean-up following normal processing should always be performed under well-ventilated conditions. Films may be held at process temperatures for a short time without significant thermal degradation. However, it should be recognized that exposure to either elevated temperature or excessive heat history (time) will result in decomposition. Equipment should not be shut down for extended time periods with film in it, or decomposition will occur.
- Static electric buildup and discharge may occur when conveying or transferring polymer or compound. This may be sufficient to ignite flammable vapors or liquids, such as solvents used in adhesive preparation. As the need exists, implement precautions such as humidification, bonding, and grounding of conveying equipment, ventilation, or other means appropriate to the individual operation.



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SELECTION 8: CONTROL MEASURES

Ventilation

Provide effective exhaust ventilation, including local exhaust when necessary, to draw fumes, vapors or smoke away from workers to prevent routine inhalation. Hot melt processing (extruding, molding, etc.), cutting, regrinding, heat welding, soldering, and/or any other processing or post-processing operation involving heat sufficient to result in polymer breakdown, and operations involving solvents such as adhesives preparation, must be examined to ensure well-ventilated conditions. Ventilation guideline/techniques may be found in publications such as Industrial Ventilation, 19th Edition, American Conference of Governmental Industrial Hygienists, 6500 Glenway Avenue, Bldg. D-7, Cincinnati, OH 45211-4438 (\$20.00 as of January 1998).

Respiratory Protection

Not normally necessary. Abnormal conditions such as equipment malfunction, use of improper equipment or procedures may cause decomposition. If general dilution or local exhaust ventilation is not adequate to keep fumes or vapor concentrations at non-irritating levels, then employees involved in removing decomposing material must be provided with suitable air-supplied respirators, such as NIOSH/MSHA-approved positive pressure self-contained breathing apparatus.

Protective Equipment

- Safety glasses.
- Protective gloves for handling hot material during processing.

SECTION 10: TRANSPORTATION

For domestic transportation purposes, these products are not defined or designated as hazardous materials by the U.S. Department of Transportation under Title 49 of the Code of Federal Regulations, 1986 Edition..