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MATERIAL SAFETY DATA SHEET

Issue No: 6 **Effective Date:** October 1994 **Serial No.:** RAY/3122

PRODUCT IDENTIFICATION

THIS MSDS IS FURNISHED FOR A GROUP OF PRODUCTS WHICH HAVE SIMILAR PROPERTIES DURING NORMAL CONDITIONS OF USE, BUT WHICH MAY EMIT DISSIMILAR THERMAL DEGRADATION BYPRODUCTS IF OVERHEATED. FOR MORE SPECIFIC INFORMATION, PLEASE CALL (650) 361-4907.

Product Name: Thermofit Heat-Shrinkable Polymeric Products (excluding Solder Sleeves see separate MSDS)

Manufacturer: **Raychem Corporation**
300 Constitution Drive
Menlo Park, CA 94025

Chemical Name: Not applicable, mixture
CAS #: Not applicable, mixture
DOT Proper Shipping Name: Not regulated
DOT Identification No.: Not regulated
DOT Hazard Classification: Not regulated
TSCA Inventory Status: Exempt

FOR CHEMICAL EMERGENCY, SPILL, LEAK, FIRE, EXPOSURE or ACCIDENT
Call CHEMTREC - Day or Night - 1-800-424-9300 Toll free in the continental U.S., Hawaii, Puerto Rico, Canada, Alaska or Virgin Islands. For calls originating elsewhere: (703) 527-3887 (collect calls accepted)

For non-emergency health and safety information, call: (650) 361-4907

HAZARDOUS INGREDIENTS

Heat-Shrinkable Polymeric Products are not hazardous during proper installation, but may emit hazardous thermal decomposition and combustion byproducts if overheated to degradation. See "Thermal Degradation and Combustion Byproduct" section of this MSDS for more specific information. Base polymer materials include polyethylene and olefin copolymers, fluoropolymers, chloropolymers, polyamides, polyesters, and silicones. Heat-shrinkable products may be coated with or used in conjunction with adhesives/mastics which are based on olefin copolymers or polyamides.

PRODUCT APPLICATIONS

Typical uses of heat-shrinkable polymeric products include primary electrical insulation, EMI/RFI shielding, cable jacketing and repair, strain relief, component encapsulation, waterproofing, packaging, environmental/mechanical protection, and cable joining, splicing, and termination in commercial and military/aerospace electronic applications.

PHYSICAL PROPERTIES

Appearance and Odor: Plastic tubing and molded parts in a variety of shapes, sizes and colors. No odor.

Boiling Point: Not applicable

Volatility (% by Volume): Not applicable

Specific Gravity (Water=1): Not applicable

Flash Point (°F)/Method: Not applicable

Vapor Pressure (mm Hg @ 20°C): Not applicable

Vapor Density: Not applicable

Evaporation Rate: Not applicable

Solubility In Water (%): Insoluble

Flammable Limits in Air (volume %): **Lower** Not applicable **Upper** Not applicable

HEALTH HAZARD INFORMATION

Exposure Limits: There are no established exposure limits for polymer mixtures.

Health Effects/Symptoms of Exposure:

Proper installation of this product creates no known acute or chronic health hazards.

Acute (Short-Term Exposure):

Eye Contact: Contact with molten material may cause thermal burns.

Skin Contact: This product is not expected to be a skin irritant. Contact with the molten material may cause thermal burns. No harmful effects are expected from skin absorption of this product.

Ingestion (Swallowing): Ingestion of this product is highly unlikely. There is insufficient information available on this material to predict the effects from ingestion.

Inhalation (Breathing): In common with most organic materials, thermal degradation and combustion byproducts may be toxic and should not be inhaled. (See Comments below and the Thermal Degradation and Combustion Byproducts Section for more specific information.)

Chronic (Long-Term Exposure):

None of the ingredients to which users may be exposed and which are present at equal to or greater than 0.1% of the product, are listed by OSHA, NTP, or IARC as suspect carcinogens.

Comments: Overheating the product to charring or burning may produce vapors that may cause eye, skin, nose and throat irritation. Persons with pre-existing eye, skin, or respiratory disorders (e.g., asthma conditions) may be more susceptible to the effects of these vapors.

STORAGE, HANDLING, AND PREVENTIVE MEASURES

Stability at room temperature: This product is stable under normal conditions.

Conditions to Avoid: Avoid overheating of product.

Incompatibilities (Materials to Avoid): None known.

Hazardous Polymerization: Will not occur. No known polymerization conditions to avoid.

Thermal Degradation and Combustion Byproducts: In common with most organic materials, degradation and combustion byproducts may be toxic and should not be inhaled. Thermal degradation is not significant at temperatures achieved during proper installation, as directed by product installation guides. At temperatures higher than those recommended for proper installation, most significantly if the product burns, the thermal degradation and combustion byproducts will depend on the base polymer used, and may include, but are not limited to, carbon monoxide, carbon dioxide, aldehydes, acetic acid, low molecular weight hydrocarbons, silicon dioxide, hydrogen chloride, hydrogen fluoride, hydrogen bromide, fluoro-olefins, and oxides of nitrogen, phosphorus, and sulfur.

Handling: Avoid any vapors given off if the product is heated to decomposition, as shown by a darkening and browning of the sleeve. Avoid contact with molten material. Heat-resistant gloves are required if hot products are handled after installation. Do not consume food, beverages or tobacco in the immediate work area. Wash hands before eating, drinking or smoking.

Other Precautions: Avoid heating products beyond temperatures required for normal installation. See installation instructions for proper installation procedures. If product chars or burns, immediately stop heating. Avoid inhaling any fumes which may be given off under such circumstances. Allow any vapors to disperse and ventilate before continuing work in the area.

Ventilation: In accordance with good industrial hygiene practice, ensure adequate ventilation during installation.

Respiratory Protection: If installation occurs in a confined, unventilated area, NIOSH/MSHA-approved respirators are recommended.

Protective Clothing: OSHA, ANSI, or NIOSH guidelines should be followed. If there is a danger of molten material contacting the skin or eyes, use eye/face protection and heat resistant gloves. If it is necessary to handle grossly overheated or fire-damaged products, wear natural rubber gloves to prevent possible contact with potentially corrosive inorganic acid residues.

Transportation: These products are non-hazardous under Department of Transportation Regulations 49, CFR Section 171.8, IATA, IMO, and AFR 71-4. Because there are no applicable shipping regulations for these products, labels are not required on the outside shipping container for these products and all products may be shipped through the U.S. Postal Services.

Disposal: Dispose in accordance with all local, state and federal regulations. If there are local regulations covering the controlled incineration of halogenated materials, then all halogen-containing products will be subject to such regulations. Refer to the product literature for identification of halogen-containing products.

Installation: Follow appropriate Raychem installation instructions and application guides to ensure that installation is performed properly. Ensure that any local requirements/legislation concerning the use of hand-held electrical equipment are observed. When using IR (infrared) heating devices, observe specific instructions. Do not touch hot surfaces on installation equipment.

EMERGENCY AND FIRST AID PROCEDURES

Eyes: If eye irritation occurs, hold eyelids apart and flush affected area(s) with clean water. Seek medical attention.

Skin: First aid is normally not required. After handling product, it is good work practice to wash your hands. If molten material contacts skin, cool area immediately in water. DO NOT attempt to remove material from the skin. Treat as a burn, and seek medical attention.

Ingestion: Not a normal route of exposure. However, if swallowed and symptoms develop, seek medical attention.

Inhalation: If respiratory symptoms or other symptoms of exposure develop, move victim to fresh air. If symptoms persist, seek medical attention. If breathing difficulties develop, oxygen should be administered by qualified personnel. Seek immediate medical attention. If victim is not breathing, immediately begin artificial respiration. Keep victim warm and quiet; seek immediate medical attention.

Steps to be Taken in Case of Release or Spill: Wear appropriate personal protection when responding then sweep up and collect in a suitable container for disposal or reuse.

Unusual Fire and Explosion Hazards: Toxic fumes may be given off in a fire. See also sections on Thermal Degradation and Combustion Byproducts and Other Precautions.

Special Fire Fighting Procedures: Firefighters should wear self-contained breathing apparatus with a full facepiece operated in the positive demand mode when fighting fires.

Extinguishing Media: carbon dioxide X **water** X **dry chemical** X **foam** X **other** ___

This information is supplied in accordance with the OSHA Hazard Communication Standard (29 CFR 1910.1200) and the California Safe Drinking Water and Toxics Enforcement Act of 1986 (California Health & Safety Code 25249.6). Users are advised that they may have additional disclosure obligations under other federal, state, and local laws. Users are advised to ensure that this information is brought to the attention of the employees, agents, or contractors handling this product. Distributors of this product are advised to forward this document, or the information contained herein, to their purchaser. Raychem makes no warranties as to its accuracy or completeness and disclaims any liability in connection with its use. Raychem's obligations shall be only as set forth in Raychem's standard terms and conditions of sale for this product and in no case will Raychem be liable for any incidental, indirect, or consequential damages arising out of the sale, resale, use or misuse of the product. Users of Raychem products should make their own evaluation to determine the suitability of each such product for the specific application and to establish safe handling and installation procedures.

Data Sheet Prepared By: Linda Massey, Corporate Toxicology **Date:** October 1994

Data Sheet Approved By: Ron Watson, Thermofit Division **Date:** October 1994