SAFETY DATA SHEET
RAY3122

SECTION 1: PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: **Raychem Heat-Shrinkable Polymeric Products (excluding solder Sleeves see separate SDS)**

PART NUMBERS **TUBING**: AP-2000, ATUM, BATTU, BLOX-100, BRST, BSTS, BSTS-FR, CCUV, CGAT, CGPE-105, CGPE-HW, CGPT, CRN, DCPT, DR-25, Duraseal, DWFR, DWP-125, DWST, DWTC, EFSET, ES1000, ES2000, ES-SLV, FB2, FILS-125, FL2500, FTS, HCTE (Convolex), HF, HFT5000, HRHF, HRHT, HRNF, HRSR, HT-200, HTAT, HT-SCE, HT-TMS, LSTT, LWTT, NETM1000, NETM2000, NT, NTFR, NT-MIL, PolyGP, PTCM, QS1500, QSAP, QSZH, Rayblock 100, Rayblock 105, Rayblock 85, RAYFLEX, RAYRIM, RBK-, RHW, RMW, RNF-100, RNF-150, RNF-3000, RP-4800, RPPM, RPT-120, RT-14, RT-21, RT-218, RT-220, RT-3, RT-375, RT-555, RT-770, RT-780, RT-790, RW-125, RW-135, RW-175, RW-175-E, RW-200, RW-200-E, SAS, SASR, SCE, SCL, SCT, SEP-PAK, SFR, SRFR, SST, SST-FR, SWFR, TAK, TAK-SLEEVE, TAT-125, TECT, TEH, TFE, TFER, TMS, TMS-SCE, TPEM, TSAS, TUGA, TUGA - GP, TW-TMS, URHR, URHT, V2, V4, Versafit, Versaflex, Versathin, VKT, VPB, X2, X4, XFFR, ZH, ZH-100, ZHTM, and related products.

MOLDED PARTS: RAY-3, -4, -5, -6, -12, -15, -25, -25C, -25L, -50, -51, -55, -71, -100C, -125, -146, -152, -770, -780, -790, ES-Caps, PD-Caps, TC Caps and related parts.

MANUFACTURER: TE Connectivity
DIVISION: All Divisions
ADDRESS: 6900 Paseo Padre Parkway
Fremont, CA 94555 USA

EMERGENCY TELEPHONE NUMBERS:
US: CHEMTREC 1-800-424-9300
CN: CHEMTREC 1-800-424-9300
Outside North America: 1-703-527-3887
(Collect calls accepted)

NON-EMERGENCY HEALTH/SAFETY INFORMATION:
(US) 1-800-522-6752
(CAN) 1-905-475-6222

CHEMICAL FAMILY: Not Applicable

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

These products are not hazardous when used as recommended or intended. If these products are overheated, charred, or burned the health and safety information presented in this SDS may apply.

Thermal decomposition and combustion byproducts may be regulated under US-OSHA; CAN-WHMIS; IOSH; ISO; UK-CHIP; or EU Directives (67/548/EEC-Dangerous Substance Labelling, 98/24/EC-Chemical Agents at Work, 99/45/EC-Preparation Labeling, 2001/58/EC-SDS Content and 1907/2006/EC-REACH).

SECTION 2: HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW:

OSHA HAZARDS: Combustion byproducts may be considered hazardous in accordance with paragraph (d) of §1910.1200 (Hazard Communication).

GHS CLASSIFICATION: Combustion byproducts may be classified as hazardous under GHS.

GHS LABEL ELEMENTS, INCLUDING PRECAUTIONARY STATEMENTS

PICTOGRAM:

SIGNAL WORD: WARNING

HAZARD STATEMENT(S)

H320	Causes eye irritation during thermal degradation and combustion
H335	May cause respiratory irritation

PRECAUTIONARY STATEMENT(S):

P240	Ground container and receiving equipment.
P261	Avoid breathing vapors of thermal degradation and combustion byproducts.
P271	Use only in well ventilated areas.
P280	Wear eye protection.
P284	In case of inadequate ventilation wear respiratory protection.
P370 + P378	In case of fire: Use carbon dioxide, dry chemical, or foam to extinguish.

HMIS HAZARD CLASSIFICATIONS (US/CN/EU):

HEALTH: 1 FLAMMABILITY: 1 REACTIVITY: 0 PROTECTION: See PPE section.

NFPA HAZARD CLASSIFICATIONS (US/CN/EU):

HEALTH: 1 FLAMMABILITY: 1 REACTIVITY: 0

POTENTIAL HEALTH EFFECTS:

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

ACUTE HEALTH HAZARDS:

EYES: Contact with molten material may cause thermal burns.

SKIN: These products are not expected to be a skin irritant. Contact with the molten material may cause thermal burns. Hydrogen fluoride fumes emitted during a fire can react with water to form hydrofluoric acid. Have calcium gluconate available for hydrofluoric acid exposure.

INGESTION: Ingestion of these products is highly unlikely. There is insufficient information available on this material to predict the effects from ingestion.

INHALATION: 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 HEALTH HAZARDS:

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

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE:

Overheating these products 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.

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

INGREDIENTS (Chemical/Common Names):	CAS No.:	% by Wt:	EC No.:

Not applicable – These products are manufactured articles with no reportable hazardous substance(s) or complex substance(s).

Heat-Shrinkable Polymeric Products are not hazardous during proper installation, but heat-shrinkable tubing may emit hazardous thermal decomposition and combustion byproducts if overheated to degradation. See “Hazardous Combustion Products” section of this SDS for more specific information. Base polymer materials include fluoropolymers, nylons, olefin copolymers, polyethylenes and polyesters. Heat-shrinkable products may be coated with or used in conjunction with adhesives/mastics, which are based on olefin copolymers or polyamides. Some products may contain Antimony Trioxide (CAS# 1309-64-4), which is known to the State of California to cause cancer.

SECTION 4: FIRST AID MEASURES

EYE CONTACT: If eye irritation occurs, flush with clean water for 15 minutes while holding eyelids apart. Seek medical attention.

SKIN CONTACT: 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. Apply calcium gluconate to area of potential hydrofluoric acid exposure and seek immediate 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, qualified personnel should administer oxygen. Seek immediate medical attention. If victim is not breathing, immediately begin artificial respiration. Keep victim warm and quiet; seek immediate medical attention.

SECTION 5: FIRE-FIGHTING MEASURES

FLAMMABLE PROPERTIES

FLASHPOINT: Not applicable

METHOD USED: Not applicable

FLAMMABLE LIMITS

UPPER FLAMMABILITY LIMIT (% BY VOLUME): Not applicable

LOWER FLAMMABILITY LIMIT (% BY VOLUME): Not applicable

AUTOIGNITION TEMPERATURE: Not applicable

SUITABLE EXTINGUISHING MEDIA:

Use carbon dioxide, water, dry chemical or foam.

Selection of extinguishing media should be based upon the size of the fire, the firefighting training/experience of the individual attempting to extinguish or control the fire, and the packaging materials exposed to the fire.

SPECIAL FIRE FIGHTING PROCEDURES & PROTECTIVE EQUIPMENT:

Firefighters should wear self-contained breathing apparatus with a full-face piece operated in the positive pressure demand mode when fighting fires. Use water spray to keep fire-exposed containers cool.

UNUSUAL FIRE AND EXPLOSION HAZARDS:

Toxic fumes may be given off in a fire. See sections on Thermal Degradation and Combustion Byproducts and Other Precautions.

SPECIFIC HAZARDS IN CASE OF FIRE:

Thermal degradation and combustion byproducts may be toxic and should not be inhaled. Fluoropolymers will degrade upon prolonged heating or in a fire, liberating hydrogen fluoride (HF). This gas is toxic if inhaled or it comes into contact with moist skin. Apply calcium gluconate to area of hydrofluoric acid exposure and seek immediate medical attention.

HAZARDOUS COMBUSTION PRODUCTS:

Thermal 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, organic acids, aldehydes (including formaldehyde), acetic acid, low molecular weight hydrocarbons, silicon dioxide, hydrogen chloride, hydrogen fluoride, hydrogen bromide, fluoro-olefins, and oxides of nitrogen, phosphorus and sulfur.

SECTION 6: ACCIDENTAL RELEASE MEASURES

PERSONAL PRECAUTIONS:

Wear appropriate personal protection when responding to a release, as specified under Section 8: EXPOSURE CONTROLS / PERSONAL PROTECTION

ENVIRONMENTAL PRECAUTIONS:

Prevent spilled material from entering sewers and waterways.

SPILL CONTAINMENT & CLEANUP METHODS/MATERIALS:

Sweep up and collect in a suitable container for proper disposal or reuse.

SECTION 7: HANDLING AND STORAGE

PRECAUTIONS FOR SAFE HANDLING AND STORAGE:

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 thoroughly after handling compound.

Installation: Follow appropriate TE installation instructions and application guides to ensure 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.

Storage: No special storage requirements.

OTHER PRECAUTIONS (e.g.; Incompatibilities):

Avoid heating products beyond temperatures required for normal installation. See installation instructions for proper installation procedures. If products char or burn, immediately stop heating. Avoid inhaling any fumes which may be given off under such circumstances. Ventilate and allow any vapors to disperse before continuing work in the area.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS/SYSTEM DESIGN INFORMATION:

None

VENTILATION:

Provide general or local exhaust ventilation systems

RESPIRATORY PROTECTION:

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

EYE PROTECTION:

Use safety glasses with side shield or goggles to prevent contact with eyes, as appropriate to the given operation.

SKIN PROTECTION:

Avoid contact with skin. Use heat resistant rated gloves to prevent skin contact, as appropriate to the given operation. 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.

Fluoropolymers will degrade upon prolonged heating or in a fire, liberating hydrogen fluoride (HF). This gas is toxic if inhaled or it comes into contact with moist skin. If skin contact occurs, apply calcium gluconate to area of hydrofluoric acid exposure and seek immediate medical attention.

OTHER PROTECTIVE CLOTHING OR EQUIPMENT: If products char or burn the surface may contain hydrogen fluoride condensate which may cause severe burns. In this case wear neoprene gloves.

EXPOSURE GUIDELINES & LIMITS:

There are no established exposure limits for polymer mixtures.

OSHA	Permissible Exposure Limit (PEL/TWA)	NE
ACGIH	Threshold Limit Value (TLV)	NE
Quebec	Permissible Exposure Value (PEV)	NE
Ontario	Occupational Exposure Level (OEL)	NE
Germany	Maximale Arbeitsplatzkonzentrationen (MAK)	NE
United Kingdom	Occupational Exposure Standard (OES)	NE

TWA – 8-Hour Time Weighted Average NE – Not Established

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE:	Plastic tubing and molded parts in a variety of shapes, sizes and colors.
ODOR:	No odor
ODOR THRESHOLD:	Not applicable
PHYSICAL STATE:	Solid
pH:	Not applicable
BOILING POINT:	Not applicable
MELTING POINT:	70° – 330° C (158° - 625° F)
FREEZING POINT:	Not applicable
VAPOR PRESSURE (mmHg @ 20°C):	Not applicable
VAPOR DENSITY (AIR = 1):	Not applicable
SPECIFIC GRAVITY (H2O = 1):	0.93 – 2.15
EVAPORATION RATE: (Butyl acetate=1)	Not applicale
SOLUBILITY IN WATER:	Insoluble
FLASH POINT:	Not applicable
AUTO-IGNITION TEMPERATURE:	Not applicable
LOWER EXPLOSIVE LIMIT (LEL):	Not applicable
UPPER EXPLOSIVE LIMIT (UEL):	Not applicable
PARTITION COEFFICIENT:	Not applicable
VISCOSITY (centipoise @ 25° C):	Not applicable
DECOMPOSITION TEMPERATURE:	Not Determined

SECTION 10: STABILITY AND REACTIVITY

STABILITY:	These products are stable under normal use.
INCOMPATIBILITY (MATERIAL TO AVOID):	None known.
HAZARDOUS DECOMPOSITION OR BY-PRODUCTS:	See Section 5: FIRE FIGHTING MEASURES (Hazardous Combustion Products).
HAZARDOUS POLYMERIZATION:	Will not occur. No known polymerization conditions to avoid.
CONDITIONS TO AVOID:	Avoid overheating of product.

SECTION 11: TOXICOLOGICAL INFORMATION

ACUTE TOXICITY (Test Results Basis and Comments):

LD_{50} (Oral, Rat): Not determined

LC_{50} (Inhalation, Rat): Not determined

ROUTES OF ENTRY/EFFECTS OF ACUTE OVEREXPOSURE:

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

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

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

Inhalation (Breathing): Thermal degradation and combustion byproducts may be toxic and should not be inhaled. (See the Thermal Degradation and Combustion Byproducts Section for more specific information.)

SUBCHRONIC/CHRONIC TOXICITY (Test Results and Comments):

IRRITANCY OF PRODUCT: See above

SENSITIZATION TO MATERIAL: Not known.

CARCINOGENICITY: 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 carcinogens. Some products may contain Antimony Trioxide (CAS# 1309-64-4), which is known to the State of California to cause cancer.

REPRODUCTIVE TOXICITY: None known.

TERATOGENICITY: None known.

MUTAGENICITY: None known.

TOXICOLOGICALLY SYNERGISTIC PRODUCTS: None known

SECTION 12: ECOLOGICAL INFORMATION

PERSISTENCE & DEGRADABILITY:

No data available on biodegradation.

BIO-ACCUMULATIVE POTENTIAL (Including Mobility):

No data available on bioaccumulation.

AQUATIC TOXICITY (Test Results & Comments):

No data available on aquatic toxicity.

Additional Information

- No known effects on stratospheric ozone depletion.
- Water Endangering Class (WGK): NA

SECTION 13: DISPOSAL CONSIDERATIONS

WASTE DISPOSAL METHOD:	Treatment, storage, and disposal must be in accordance with applicable federal, state, provincial, and local regulations.
HAZARDOUS WASTE	Waste resulting from these products as supplied is not known to be classified as hazardous.
CLASS/CODE:	US - Not applicable to material as manufactured for distribution into commerce. CN – Not applicable to material as manufactured for distribution into commerce. EWC – Not applicable to material as manufactured for distribution into commerce.

Additional Information

Not Included – Dispose/Recycle as allowed by local jurisdiction for the end-of-life characteristics as-disposed.

SECTION 14: TRANSPORT INFORMATION

GROUND – US-DOT/CAN-TDG/EU-ADR/APEC-ADR:

Proper Shipping Name	Not Subject to HMR		
Hazard Class	NA	ID Number	NA
Packing Group	NA	Labels	NA

AIRCRAFT – ICAO-IATA:

Proper Shipping Name	Not Subject to DGR		
Hazard Class	NA	ID Number	NA
Packing Group	NA	Labels	NA

VESSEL – IMO-IMDG:

Proper Shipping Name	Not Subject to IMDG		
Hazard Class	NA	ID Number	NA
Packing Group	NA	Labels	NA

Additional Information

- Transportation must be in accordance with applicable federal, state, provincial and local regulations.
- Transport requires proper packaging and paperwork, including the Nature and Quantity of goods, per applicable origin/destination/customs points as-shipped. Statement of Jurisdictional/Modal Special Provision(s) required.
- Not restricted for any mode of international transport as finished goods.
- Not a Marine Pollutant as-shipped per IMO/IMDG.

SECTION 15: REGULATORY INFORMATION

INVENTORY STATUS:
All components are listed on the TSCA; EINECS/ELINCS; and DSL, unless noted otherwise below.

U.S. FEDERAL REGULATIONS:

- **TSCA Section 8b – Inventory Status**: All chemicals comprising these products are either exempt or listed on the TSCA Inventory.

TSCA Section 12b – Export Notification: If these products contain chemicals subject to TSCA Section 12b export notification they are listed below:

Chemical	CAS #	% wt
None	NA	NA

CERCLA (COMPREHENSIVE RESPONSE COMPENSATION, AND LIABILITY ACT)
Chemicals present in these products which could require reporting under the statute:

Chemical	CAS #	% wt
None	NA	NA

SARA TITLE III (SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT)
If these products contain chemicals subject to the reporting requirements of Section 313 of SARA Title III, they are listed below.

Chemical	CAS #	% wt
None	NA	NA

CERCLA SECTION 311/312 HAZARD CATEGORIES: Note that these products are exempt from these regulations.

Fire Hazard	No
Pressure Hazard	No
Reactivity Hazard	No
Immediate Hazard	No
Delayed Hazard	No

STATE REGULATIONS (US):

California Proposition 65
Some of these products can expose you to chemicals including Antimony Trioxide (CAS# 1309-64-4), which is known to the State of California to cause cancer. For more information go to www.P65Warnings.ca.gov.

INTERNATIONAL REGULATIONS (Non-US):

Canadian Domestic Substance List (DSL)
Not applicable.

WHMIS Classifications
Not applicable.

These products have been classified in accordance with the hazard criteria of the *Controlled Products Regulations* and the SDS contains all of the information required by the *Controlled Products Regulations*."

NPRI and Ontario Regulation 127/01
These products contain the following chemicals subject to the reporting requirements of Canada NPRI and/or Ont. Reg. 127/01:

Chemical	CAS #	% Wt
None	NA	NA

European Inventory of Existing Commercial Chemical Substances (EINECS)
All ingredients remaining in these products as distributed into commerce are exempt from, or included on, the European Inventory of Existing Commercial Chemical Substances.

European Communities (EC) Hazard Classification according to directives 67/548/EEC and 1999/45/EC.

R-Phrases	S-Phrases
None	None

Additional Information

These products may be regulated under additional regulations and laws not identified above, such as for uses other than described or as-designed/as-intended by the manufacturer or for distribution into specific domestic destinations.

SECTION 16: OTHER INFORMATION

OTHER INFORMATION:

Distribution into Quebec to follow Canadian Controlled Product Regulations (CPR) 24(1) and 24(2).

Distribution into the EU to follow applicable Directives to the Use, Import/Export of the product as-sold.

SDS PREPARATION INFORMATION:

Department Issuing SDS: TE Connectivity, Fremont, CA

DATE OF ISSUE: ***January 19, 2020*** SUPERCEDES: ***January 28, 2019***

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