

# PHOTOCAP® Encapsulants

## Material Safety Data Sheet

### Section 1 – Product and Company Identification

**PRODUCT NAME:** PHOTOCAP® EVA, photovoltaic encapsulant supplied as film or sheet

**MANUFACTURER'S NAME & ADDRESS:**

Specialized Technology Resources, Inc., STR Solar

Specialized Technology Resources, Inc. (USA)  
 10 Water Street  
 Enfield, CT 06082  
 UNITED STATES OF AMERICA

Specialized Technology Resources, (España)  
 Parque Tecnológico de Asturias, parcela 36  
 33428 Llanera, Asturias  
 SPAIN

Specialized Technology Resources (Malaysia)  
 Plot D20, Jalan Tanjung A/3,  
 Port of Tanjung Pelepas  
 81560 Gelang Patah, Johor  
 MALAYSIA

Specialized Technology Resources, Ltd. (Suzhou)  
 Changkun Industrial Park, No. 26 Nanxin Road  
 Sha Jiabang, Changshu  
 215542 Suzhou  
 CHINA

**PRODUCT IDENTIFIERS:**

0140P	15420P	15455P/S	15580S	16685P	A9918P/S
0507P	15420P/S	15505	15580P/S	33554	FC280P
15295	15435	15555	15580W	33554P	FC295P
15295/S	15435P	15555P	15585	33554P/S	SC918P
15295P	15435P/S	15505P	15585P	A9918	X4314C
15295P/S	15455	15580	15585S	A9918/S	X4347
15420	15455P	15580P	16680P	A9918P	7728P

**EMERGENCY NUMBERS:**

NORTH AMERICA

Phone: +1 860-272-4235  
 Hours: 8:00 am to 5:00 pm  
 (UTC/GMT -5 hours)

CHEM-TREC 1-800-424-9300  
 24 hours

EUROPE

Phone: +34 985 73 23 33  
 Fax: +34 985 73 23 32  
 Hours: 8:00 am to 5:00 pm  
 (UTC/GMT +1 hour)

ASIA

Phone: +607 5073185  
 Fax: +607 5073190  
 Hours: 8:00 am to 5:00 pm  
 (UTC/GMT +8 hours)

### Section 2 – Hazards Identification

**EMERGENCY OVERVIEW:**

This product is NOT HAZARDOUS by USA OSHA Regulation or European EC Hazard Communication definition. The product is supplied as a sheet (or foil) on a roll and is considered a “manufactured article.”

PHYSICAL STATE: solid

COLOR: translucent to white

ODOR: faint

**POTENTIAL HEALTH EFFECTS:**

ROUTES OF EXPOSURE: Eye, Inhalation, Skin

Eye: Mechanical irritation is possible.

Inhalation: Vapors released during thermal processing may cause respiratory irritation.

Skin: Molten polymer may cause thermal burns.

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**Section 3 – Composition Information**

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COMPONENT	CAS Registry No.	EC No.	Amount (weight %)
Compounded thermoplastic copolymer with additives	Trade secret	All monomers and additives are EINECS listed	100 %
Polymer of ethylene and vinyl acetate	24937-78-8	Monomers are EINECS listed	> 80%
Organic peroxide	Trade secret	All additives are EINECS listed	0.0 – 5.0 %

PHOTOCAP encapsulant products with a “/S” on the product name are manufactured as laminated structures with non-woven fiberglass scrim, cloth, or tissue. Fiberglass non-woven cloth can contain a very small amount of particulates which could be inhaled.

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**Section 4 – First Aid Measures**

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**GENERAL ADVICE:**

Take proper precautions to ensure your own health and safety before attempting rescue and providing first aid.

SKIN: If molten material contacts the skin, immediately flush with large amounts of water to cool the affected tissue and polymer. Do not attempt to peel polymer from skin. Obtain immediate emergency medical attention if burn is deep or extensive.

INHALATION: If symptoms are experienced, move victim to fresh air.

EYES: Flush eyes thoroughly with water for several minutes and seek medical attention if discomfort persists.

INGESTION: Adverse health effects due to ingestion are not anticipated.

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**SECTION 5 – Fire Fighting Measures**

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**FLAMMABLE PROPERTIES:**

CLASSIFICATION: Not Classified. Polymer will burn but does not easily ignite.

FLASH POINT: No Data Available. Flash point is anticipated to be greater than 200°C / 400°F

LOWER EXPLOSION LIMIT: Not applicable.

UPPER EXPLOSION LIMIT: Not applicable.

**EXTINGUISHING MEDIA:**

SMALL FIRE: Use dry chemical, CO<sub>2</sub>, water spray or regular foam.

LARGE FIRES: Use large quantities of water spray.

**PROTECTIVE EQUIPMENT AND PRECAUTIONS FOR FIREFIGHTERS:**

Wear an approved positive pressure self-contained breathing apparatus and firefighter turnout gear. Wear an approved positive pressure self-contained breathing apparatus and firefighter turnout gear.

**HAZARDOUS COMBUSTION PRODUCTS:**

During a fire, smoke may contain the original material in addition to combustion products of varying composition which may be toxic and/or irritating. Combustion products may include and are not limited to: Carbon monoxide, Carbon dioxide.

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## **SECTION 6 – Accidental Release Measures**

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### **Protective Equipment:**

Use appropriate skin and eye protection

### **Small Spill:**

Shovel or scoop up, solid residue waste disposal.

### **Large Spill:**

Shovel or scoop up solid residue waste disposal.

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## **SECTION 7 – Handling and Storage**

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### **HANDLING:**

Keep away from heat and sources of ignition. Use with adequate ventilation. Spilled material can make walking hazardous, potentially causing falls and serious injury. After handling, always wash hands thoroughly with soap and water.

### **STORAGE:**

Keep container dry. Store away from excessive heat and away from strong oxidizing agents. Keep container closed to prevent contamination.

*Please refer to "Storage Conditions for PHOTOCAP PV Encapsulants", available from STR. In order to maintain the product shelf life, the storage temperature should be less than 35 °C.*

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## **SECTION 8 – Exposure Controls / Personal Protection**

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### **EXPOSURE LIMITS:**

Although some of the additives used in this product may have exposure guidelines, these additives are encapsulated in the product and no exposure would be expected under normal handling conditions.

### **PERSONAL PROTECTION:**

**EYE/FACE PROTECTION:** Use safety glasses (with side shields). If there is a potential for exposure to particles which could cause eye discomfort, wear chemical goggles. If exposure causes eye discomfort, use a full-face respirator.

**SKIN PROTECTION:** No precautions other than clean body-covering clothing should be needed.

**HAND PROTECTION:** Chemical protective gloves should not be needed when handling this material. Consistent with general hygienic practice for any material, skin contact should be minimized. Use gloves to protect from mechanical injury. Selection of gloves will depend on the task. Use gloves with insulation for thermal protection, when needed.

*(Note that it is good manufacturing practice to use gloves when handling PHOTOCAP encapsulants to prevent contamination of the product by skin oils, which could cause optical blemishes on the manufactured photovoltaic modules or panels.)*

**RESPIRATORY PROTECTION:** When workers are facing airborne particulates/dust concentrations above the exposure limit, then they must use approved certified respirators.

During high temperature processing of this product, some volatile organic components are released and may cause objectionable odors or respiratory irritation. Ventilation should be provided where the product is used for manufacturing articles to ensure that atmospheric levels of organic vapors are below exposure guidelines. When respiratory protection is required for certain operations, use an approved air-purifying respirator with an organic vapor cartridge with particulate pre-filter.

Consult with your company's local procedures for selection, training, inspection and maintenance of respirators.

**INGESTION:** Use good personal hygiene. Do not consume or store food in the work area. Wash hands before smoking or eating.

**GENERAL HYGIENE CONSIDERATIONS:** Wash hands before breaks and immediately after handling the product. Do not consume or store food in the work area.

**ENGINEERING CONTROLS:**

Ventilation: Provide general and/or local exhaust ventilation to control organic vapors released by the product during thermal processing.

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**SECTION 9 – Physical and Chemical Properties**

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APPEARANCE: solid translucent to white.

EXPLOSIVE PROPERTIES: No Data Available.

ODOR: Faint, characteristic.

OXIDIZING PROPERTIES: No Data Available.

ODOR THRESHOLD: No Data Available.

VAPOR PRESSURE: Not applicable.

pH: Not applicable.

EVAPORATION RATE: Not applicable.

BOILING POINT/BOILING RANGE: Not applicable.

RELATIVE DENSITY: 0.92 - 0.98 (water=1).

MELTING/FREEZING POINT: 55-110°C (130-230°F).

RELATIVE VAPOR DENSITY: Not applicable.

FLASH POINT: No Data Available.

VISCOSITY: Not applicable.

FLAMMABILITY: Not Classified. Polymer will burn but does not easily ignite.

WATER SOLUBILITY: Insoluble.

LOWER EXPLOSION LIMIT: Not applicable.

PARTITION COEFFICIENT: N-OCTANOL/WATER: No Data Available.

UPPER EXPLOSION LIMIT: Not applicable.

OTHER PHYSICO-CHEMICAL PROPERTIES: No additional information available.

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**SECTION 10 – Stability and Reactivity**

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CHEMICAL STABILITY: The product is stable. The product does contain chemical additives that are intended to react at temperatures above 100°C.

CONDITIONS TO AVOID: Exposure in air to temperatures higher than 200°C / 400°F for times greater than several minutes can cause product to decompose and release hazardous fumes (such as carbon monoxide.)

MATERIALS TO AVOID: Material can be softened by some hydrocarbons. Avoid contact with strong oxidation agents.

HAZARDOUS DECOMPOSITION PRODUCTS: Not expected to decompose under normal conditions.

HAZARDOUS POLYMERIZATION: Will not occur.

THERMAL DECOMPOSITION: Decomposition products depend upon temperature, air supply and the presence of other materials. Normal thermal processing may release fumes and other decomposition products. At temperatures exceeding the melt temperature, polymer fragments can be released. Fumes can be irritating. Decomposition products can include, and are not limited to: Alcohols, Aldehydes, Ketones, and Organic Acids. Decomposition products can include trace amounts of Hydrocarbons.

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**SECTION 11 – Toxicological Information**

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**ACUTE TOXICITY:**

**INGESTION:**

Very low toxicity if swallowed. Harmful effects not anticipated from swallowing small amounts. May cause choking if swallowed.

Single dose oral LD50 has not been determined.

Typical for this family of materials. Estimated. LD50, Rat > 5,000 mg/kg

Aspiration hazard

Based on physical properties, not likely to be an aspiration hazard.

**DERMAL:**

No adverse effects anticipated by skin absorption.

The dermal LD50 has not been determined.

Typical for this family of materials. Estimated. LD50, Rabbit > 2,000 mg/kg

**INHALATION:**

No adverse effects are anticipated from single exposure to dust. Vapors released during thermal processing may cause respiratory irritation.

The LC50 has not been determined.

**SKIN CORROSION/IRRITATION:**

Mechanical injury only. Under normal processing conditions, material is heated to elevated temperatures; contact with the material may cause thermal burns.

**SENSITIZATION:**

SKIN: No relevant information found.

RESPIRATORY: No relevant information found.

**REPEATED DOSE TOXICITY:**

Additives are encapsulated in the product and are not expected to be released under normal processing conditions or foreseeable emergency.

**CHRONIC TOXICITY AND CARCINOGENICITY:**

No relevant information found.

**DEVELOPMENTAL TOXICITY:**

No relevant information found.

**REPRODUCTIVE TOXICITY:**

No relevant information found.

**GENETIC TOXICOLOGY:**

No relevant information found.

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**SECTION 12 – Ecological Information**

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Ecological testing has not been conducted on this product.

**Movement & Partitioning**

No bioconcentration is expected because of the relatively high molecular weight (MW greater than 1000). In the terrestrial environment, material is expected to remain in the soil. In the aquatic environment, materials with a specific gravity > 1 will sink and remain in the sediment, while those with a specific gravity <= 1 are expected to float.

**Persistence and Degradability**

This water-insoluble polymeric solid is expected to be inert in the environment. No appreciable biodegradation is expected.

**Ecotoxicity**

Not expected to be acutely toxic, but material in particulate form may mechanically cause adverse effects if ingested by waterfowl or aquatic life.

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**SECTION 13 – Disposal Considerations**

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Dispose of as hazardous waste in compliance with local and national regulations. Comply with federal, state, or local regulations for disposal.

**SECTION 14 – Transport Information**

DOT: not regulated  
 PROPER SHIPPING NAME: Plastic sheeting.  
 HAZARD CLASS: None.  
 UN NUMBER: Not applicable

This information is not intended to convey all specific regulatory or operational requirements/information relating to this product. Additional transportation system information can be obtained through an authorized sales or customer service representative. It is the responsibility of the transporting organization to follow all applicable laws, regulations and rules relating to the transportation of the material.

**SECTION 15 – Regulatory Information**

**Notification Status:**

All components of this product are on the following national chemical inventories, or are exempted from listing:

Country	Inventory / Notification
Australia	AICS
Canada	DSL
China (PRC)	IECSC
European Union	EINECS
Japan	ENCS/ISHL
Korea	KECL
Philippines	PICCS
United States of America	TSCA
New Zealand	NZIoC

**USA - TSCA:**

All components of this product are listed on the TSCA Inventory of Chemical Substances or qualify for the TSCA Polymer Exemption.

**USA - SARA (Superfund Amendments and Reauthorization Act):**

Fire Hazard: No  
 Immediate Hazard: No  
 Delayed Health Hazard: No  
 Sudden Release of Pressure Hazard: No

**European Union – REACH, European Directive 2006/1907/EC**

All component of this product are confirmed to be pre-registered, or registered, with the European Union per the REACH Regulation (EU 2006/1907/EC).

**European Union – REACH, Article 33, Communication of information on substances in articles:**

This product does not contain any substances that are on the list of Annex XIV of REACH “Substances of Very High Concern” or SVHC’s (as defined by REACH Regulation) at concentrations which are above the required disclosure limits, as of the Revision date of this MSDS.

**European Union – 2002/95/EC (RoHS), 2003/11/EC and 2002/96/EC (WEEE), and amendments:**

None of the components of this product contain substances that are listed in these directives.

**Japan - Poisonous and Deleterious Substances Control Act**

No substances or components in this product are controlled or listed by this legislation, as of the Revision date of this MSDS.

**Singapore - Environmental Protection and Management Act (EPMA), List of Controlled Hazardous Substances.**

No substances or components in this product are controlled or listed by this legislation, as of the Revision date of this MSDS.

**SECTION 16 – Other Information**

**MATERIAL SAFETY DATA SHEET, PHOTOCAP® ENCAPSULANTS**

Revision Date: 28-April-2015

Supersedes Form Dated: 01-January-2015



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**DISCLAIMER**

The above information is accurate to the best of our knowledge. However, since the data, safety standards, and government regulations are subject to change and the conditions of handling and use, or misuse are beyond our control, neither SPECIALIZED TECHNOLOGY RESOURCES, INC. nor any of its affiliates, MAKES NO WARRANTY, EITHER EXPRESS OR IMPLIED, WITH RESPECT TO THE COMPLETENESS OR CONTINUING ACCURACY OF THE INFORMATION CONTAINED HEREIN AND DISCLAIMS ALL LIABILITY FOR RELIANCE THEREON. User should satisfy himself that he has all current data relevant to his particular use. This information is for use by technically skilled persons at their own discretion and risk, and does not relate to the use of any product in combination with any other substance or in any process. The above information gives typical properties only and is not to be used for specification purposes.