



SILFAB SOLAR MODULES SAFETY DATA REPORT (MSDS)

This document provides important safety information for the handling of Silfab Solar panels. It is meant to provide information typically included in a Material Safety Data Sheet. A solar panel is considered an Article as defined by OSHA HCS, 29 C.F.R 1910.1200 and is therefore exempt from Safety Data Sheet labeling requirements per said standard. This document provides important safety information in lieu of a full module standard for interested parties seeking a product safety datasheet and does not replace any other installation guidelines, warranty or safety documents provided by Silfab Solar Inc.

SECTION 1: IDENTIFICATION OF PRODUCT AND COMPANY

- Product Name: SIL-440 QD+, SIL-530 XM, SIL-580 XM+
- Product Type: Monocrystalline, Bifacial, NTC
- Company Info: Silfab Solar Inc.
- Address: 1770 Port Drive, Burlington, WA, 98233, United States
- Telephone: +1 360 569 4733

SECTION 2: SAFETY RISKS (HAZARD IDENTIFICATION)

Primary Hazards: Electrical shock, mechanical injury.

- Hazard Symbols: None under normal operating conditions.
- Environmental Hazard: None under normal operating conditions.

SECTION 3: COMPOSITION & INFORMATION OF INGREDIENTS

Section	Component	Material	Ratio (%)	Comments
Laminate	Glass	Silicon dioxide, Sodium oxide, Calcium oxide, Magnesium oxide	65%-75%	Not Hazardous
	Backsheet/ Encapsulant	Plastics (EVA, POE, PET, PPO, PE)	5%-10%	No Hazards Known
	Cell	Silicon	2%-4%	Not Hazardous
	Ribbons/ Metallization	Copper, Tin, Aluminum	< 2%	Not Hazardous
		Lead	< 0.1%	Hazardous
		Silver	<0.1%	Not Hazardous
Frame	Metal	Al / Magnesium/ Iron / Silicon	10%-20%	Not Hazardous
	Adhesive	Silicone	1%-2%	Not Hazardous
Wiring	Cables/ Connectors / Junction Box	Copper	<1%	Not Hazardous
		Plastics (PPO, PPE, PE)	<0.5%	No Hazards Known
		Silicone	<0.5%	Not Hazardous

SECTION 4: FIRST AID MEASURES

- Eye Contact: Rinse if debris enters eyes.
- Skin Contact: Rinse if in contact with molten polymer.
- Inhalation: None under normal operating conditions.
- Electrocutation: Follow OSHA guidelines.

SECTION 5: FIRE FIGHTING MEASURES

- Suitable Extinguishing Media: CO2, dry powder
- Special Equipment: A firefighter should use electrical-rated PPE and stay upwind.
- Risk of Reignition: Present when array is exposed to light.

SECTION 6: ACCIDENTAL RELEASE MEASURES

- Clean-up Procedure: Handle broken glass with gloves; dispose as electronic waste.
- Environmental Protection: Prevent runoff from entering water bodies.

SECTION 7: HANDLING AND STORAGE

- Store in dry and ventilated areas.
- Do not stack modules in a manner different from the way that they were originally packaged.
- Do not lift modules from the cables or junction box.
- Keep away from flammable gases and heat sources.
- Follow installation instructions.
- Panels should only be installed by qualified personnel.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION EQUIPMENT

- Protective Gloves: Are recommended during installation.
- Eye Protection: Safety glasses are recommended.
- Clothing: Use protective clothing if the module is broken or in a fire.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

- Physical State: Solid
- Weight: QD = 46.3lbs, XM = 57.8lbs, XM+ = 62.8lbs
- Appearance: Glass-covered solar module
- Odor: Odorless
- Solubility in Water: Insoluble
- Operating Temperature Range: -40°C to +85°C
- Voltage per Module: Refer to electrical data sheet per module (avg. 50V max)

SECTION 10: STABILITY AND REACTIVITY

- Stability: Stable under normal use.
- Conditions to Avoid: Fire, high humidity, direct impact
- Hazardous Decomposition: CO, SiO₂ fumes if combusted
- Incompatibility: Strong oxidizing agents

SECTION 11: TOXICOLOGICAL INFORMATION

- Acute Toxicity: None expected under normal use.
- Skin/Eye Irritation: None unless broken.
- Carcinogenicity: Not classified

SECTION 12: ECOLOGICAL INFORMATION

- Long Lasting components, non-biodegradable
- Recommended recycling at end-of-life

SECTION 13: DISPOSAL CONSIDERATIONS

- Recycle according to local e-waste guidelines
- Do Not incinerate

SECTION 14: TRANSPORT INFORMATION

- Not Classified as hazardous
- Pack with care to prevent damage during transit

SECTION 15: REGULATORY INFORMATION

- Compliant with: IEC 61215, IEC 61730, UL 61730
- OSHA Classification: Article (not hazardous chemicals)

Printed documents are UNCONTROLLED unless stamped as "Controlled Document."

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1. Identification

Product identifier HyVolt II
Other means of identification None.
Recommended use Transformer Oil
Recommended restrictions None known.
Manufacturer/Importer/Supplier/Distributor information
Company: Ergon, Inc.
Address: P.O. Box 1639
Jackson, MS 39215
E-mail: sds@ergon.com
Emergency Contacts
Customer Service: 1-800-222-7122
Chemtrec: 1-800-424-9300 After Business Hours (North America Only)
1-703-527-3887 After Business Hours (International)

2. Hazard(s) identification

Physical hazards Not classified.
Health hazards Aspiration hazard Category 1
Environmental hazards Not classified.
OSHA defined hazards Not classified.

Label elements

Signal word Danger
Hazard statement May be fatal if swallowed and enters airways.
Precautionary statement
Prevention Do not breathe gas/mist/vapors/spray.
Response IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician. Do NOT induce vomiting.
Storage Store locked up.
Disposal Dispose of contents/container to an appropriate treatment and disposal facility in accordance with applicable laws and regulations, and product characteristics at time of disposal. See section 13 of this SDS for disposal instructions.
Hazard(s) not otherwise classified (HNOC) None known.
Supplemental information None.

3. Composition/information on ingredients**Mixtures**

Chemical name	Common name and synonyms	CAS number	%
DISTILLATES (PETROLEUM), HYDROTREATED LIGHT NAPHTHENIC		64742-53-6	30.0 - 99.9
LUBRICATING OILS (PETROLEUM), C15-30, HYDROTREATED NEUTRAL OIL-BASED		72623-86-0	0 - 50

Chemical name	Common name and synonyms	CAS number	%
DISTILLATES (PETROLEUM), HYDROTREATED LIGHT PARAFFINIC		64742-55-8	0 - 30
DISTILLATES (PETROLEUM), SOLVENT-DEWAXED LIGHT PARAFFINIC		64742-56-9	0 - 10
2,6-DI-TERT-BUTYL-P-CRESOL [BUTYLATED HYDROXYTOLUENE (BHT)]		128-37-0	< 0.3

4. First-aid measures

Inhalation	Move to fresh air. Oxygen or artificial respiration if needed. IF exposed or concerned: Get medical advice/attention.
Skin contact	Wash contact areas with soap and water. Remove contaminated clothing. Launder contaminated clothing before reuse. If skin irritation or an allergic skin reaction develops, get medical attention.
Eye contact	Flush thoroughly with water. If irritation occurs, get medical assistance.
Ingestion	Do NOT induce vomiting. If vomiting occurs naturally, have victim lean forward to reduce risk of aspiration. Call a poison control center immediately.
Most important symptoms/effects, acute and delayed	Defatting of the skin.
Indication of immediate medical attention and special treatment needed	Treat symptomatically.
General information	Contact physician if discomfort continues.

5. Fire-fighting measures

Suitable extinguishing media	Halon. Dry chemicals. Foam. Carbon dioxide (CO2). Water spray or fog. Do not use water jet as an extinguisher, as this will spread the fire.
Unsuitable extinguishing media	Do not use a solid water stream as it may scatter and spread fire.
Specific hazards arising from the chemical	No unusual fire or explosion hazards noted.
Special protective equipment and precautions for firefighters	Wear full protective clothing, including helmet, self-contained positive pressure or pressure demand breathing apparatus, protective clothing and face mask.
Fire fighting equipment/instructions	Cool containers exposed to flames with water until well after the fire is out. Firefighters must use standard protective equipment including flame retardant coat, helmet with face shield, gloves, rubber boots, and in enclosed spaces, SCBA. Use pressurized air mask if product is involved in a fire.
General fire hazards	No unusual fire or explosion hazards noted. Flammability Class: Combustible IIIB

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures	Keep unnecessary personnel away. Local authorities should be advised if significant spillages cannot be contained. Wear appropriate protective equipment and clothing during clean-up. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Ensure adequate ventilation.
Methods and materials for containment and cleaning up	<p>Large Spills: ELIMINATE all ignition sources (no smoking, flares, sparks or flames in immediate area). Stop the flow of material, if this is without risk. Dike the spilled material, where this is possible. Cover with plastic sheet to prevent spreading. Absorb in vermiculite, dry sand or earth or absorbent material then place into containers. Following product recovery, flush area with water.</p> <p>Small Spills: Wipe up with absorbent material (e.g. cloth, fleece). Clean surface thoroughly to remove residual contamination.</p> <p>Never return spills in original containers for re-use. For waste disposal, see section 13 of the SDS.</p>

Environmental precautions

Prevent further leakage or spillage if safe to do so. Prevent entry into waterways, sewer, basements or confined areas. Avoid discharge to the aquatic environment. Contact local authorities in case of spillage to drain/aquatic environment. Avoid discharge into drains, water courses or onto the ground. If this material is spilled into navigable waters and creates a visible sheen, it is reportable to the National Response Center.

7. Handling and storage**Precautions for safe handling**

DO NOT handle, store or open near an open flame, sources of heat or sources of ignition. Protect material from direct sunlight. Do not breathe dust/fume/gas/mist/vapors/spray. Wash hands after handling and before eating. Do not get this material in contact with eyes. Avoid contact with skin. Avoid prolonged exposure. All handling to take place in well-ventilated area. Shower after work. Remove and wash contaminated clothing promptly.

Conditions for safe storage, including any incompatibilities

Store locked up. Keep away from heat, sparks and open flame. Store in a well-ventilated place. Use care in handling/storage.

8. Exposure controls/personal protection**Occupational exposure limits****US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000)**

Components	Type	Value	Form
DISTILLATES (PETROLEUM), HYDROTREATED LIGHT NAPHTHENIC (CAS 64742-53-6)	PEL	5 mg/m3	Mist.
DISTILLATES (PETROLEUM), HYDROTREATED LIGHT PARAFFINIC (CAS 64742-55-8)	PEL	5 mg/m3	Mist.
DISTILLATES (PETROLEUM), SOLVENT-DEWAXED LIGHT PARAFFINIC (CAS 64742-56-9)	PEL	5 mg/m3	Mist.

US. ACGIH Threshold Limit Values

Components	Type	Value	Form
2,6-DI-TERT-BUTYL-P-CRESOL [BUTYLATED HYDROXYTOLUENE (BHT)] (CAS 128-37-0)	TWA	2 mg/m3	Inhalable fraction and vapor.
DISTILLATES (PETROLEUM), HYDROTREATED LIGHT PARAFFINIC (CAS 64742-55-8)	TWA	5 mg/m3	Inhalable fraction.
LUBRICATING OILS (PETROLEUM), C15-30, HYDROTREATED NEUTRAL OIL-BASED (CAS 72623-86-0)	TWA	5 mg/m3	Inhalable fraction.

US. NIOSH: Pocket Guide to Chemical Hazards

Material	Type	Value	Form
HyVolt II	STEL	10 mg/m3	Mist.
	TWA	5 mg/m3	Mist.

US. NIOSH: Pocket Guide to Chemical Hazards
Components

2,6-DI-TERT-BUTYL-P-CRES
 OL [BUTYLATED
 HYDROXYTOLUENE (BHT)]
 (CAS 128-37-0)

TWA

Value

10 mg/m3

Form

DISTILLATES
 (PETROLEUM),
 HYDROTREATED LIGHT
 NAPHTHENIC (CAS
 64742-53-6)

Ceiling

1800 mg/m3

DISTILLATES
 (PETROLEUM),
 HYDROTREATED LIGHT
 PARAFFINIC (CAS
 64742-55-8)

STEL

10 mg/m3

Mist.

STEL

10 mg/m3

Mist.

DISTILLATES
 (PETROLEUM),
 SOLVENT-DEWAXED LIGHT
 PARAFFINIC (CAS
 64742-56-9)

TWA

5 mg/m3

Mist.

STEL

10 mg/m3

Mist.

TWA

5 mg/m3

Mist.

Biological limit values

No biological exposure limits noted for the ingredient(s).

Appropriate engineering controls

Provide adequate ventilation, including appropriate local extraction, to ensure that the defined occupational exposure limit is not exceeded.

Individual protection measures, such as personal protective equipment

Eye/face protection

Goggles/face shield are recommended.

Skin protection

Hand protection

Chemical resistant gloves are recommended. If contact with forearms is likely wear gauntlet style gloves.

Other

Chemical/oil resistant clothing is recommended. Launder contaminated clothing before reuse.

Respiratory protection

Under normal conditions, respirator is not normally required. When workers are facing concentrations above the exposure limit they must use appropriate certified respirators.

Thermal hazards

Not available.

General hygiene considerations

Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing to remove contaminants. Discard contaminated footwear that cannot be cleaned.

9. Physical and chemical properties

Appearance

Clear & bright

Physical state

Liquid.

Form

Liquid.

Color

Water White to Pale

Odor

Mild Petroleum Odor

Odor threshold

Not available.

pH

Not applicable

Melting point/freezing point

-85 °F (-65 °C) ASTM D5950

Initial boiling point and boiling range

545 °F (285 °C) ASTM D2887/ ISO 3294

Flash point

289.4 °F (143.0 °C) Pensky-Martens Closed Cup ASTM D93/ ISO 2719
 311.0 °F (155.0 °C) Cleveland Open Cup ASTM D92/ ISO 2592

Evaporation rate

Not available.

Flammability (solid, gas)

Not available.

Upper/lower flammability or explosive limits

Flammability limit - lower (%)	Not available.
Flammability limit - upper (%)	Not available.
Explosive limit - lower (%)	Not available.
Explosive limit - upper (%)	Not available.
Vapor pressure	Not available.
Vapor density	Not available.
Relative density	0.89 (59 °F (15 °C) ASTM D4052/ ISO 12185)
Solubility(ies)	
Solubility (water)	Insoluble
Partition coefficient (n-octanol/water)	Not established.
Auto-ignition temperature	> 599 °F (> 315 °C) ASTM E659
Decomposition temperature	Not available.
Viscosity	9.5 cSt (104 °F (40 °C) ASTM D445)

10. Stability and reactivity

Reactivity	The product is stable and non-reactive under normal conditions of use, storage and transport.
Chemical stability	Stable.
Possibility of hazardous reactions	Hazardous polymerization does not occur.
Conditions to avoid	Heat, flames and sparks. Avoid temperatures exceeding the flash point.
Incompatible materials	Strong oxidizing agents.
Hazardous decomposition products	Upon decomposition, this product emits carbon monoxide, carbon dioxide and/or low molecular weight hydrocarbons.

11. Toxicological information**Information on likely routes of exposure**

Inhalation	May be fatal if swallowed and enters airways.
Skin contact	Frequent or prolonged contact may defat and dry the skin, leading to discomfort and dermatitis.
Eye contact	May be irritating to eyes.
Ingestion	May cause gastrointestinal discomfort if swallowed. Do not induce vomiting. Vomiting may increase risk of product aspiration. May be fatal if swallowed and enters airways.

Symptoms related to the physical, chemical and toxicological characteristics Defatting of the skin. Coughing. Shortness of breath. Discomfort in the chest.

Information on toxicological effects

Acute toxicity	Not applicable.
Skin corrosion/irritation	May cause defatting of the skin, but is neither an irritant nor a sensitizer.
Serious eye damage/eye irritation	Not classified. May cause minor irritation on eye contact.

Respiratory or skin sensitization

Respiratory sensitization	Not classified.
Skin sensitization	Not classified. May cause defatting of the skin, but is neither an irritant nor a sensitizer.

Germ cell mutagenicity No data available to indicate product or any components present at greater than 0.1% are mutagenic or genotoxic.

Carcinogenicity This product is not considered to be a carcinogen by IARC, ACGIH, NTP, or OSHA. Nota L - Meets EU requirement of less than 3% (w/w) DMSO extract for total polycyclic aromatic compound (PAC) using IP 346. Not classified.

IARC Monographs. Overall Evaluation of Carcinogenicity

Not listed.

OSHA Specifically Regulated Substances (29 CFR 1910.1001-1052)

Not regulated.

US. National Toxicology Program (NTP) Report on Carcinogens

Not listed.

Reproductive toxicity	Contains no ingredient listed as toxic to reproduction
Specific target organ toxicity - single exposure	Not classified.
Specific target organ toxicity - repeated exposure	Not classified.
Aspiration hazard	May be fatal if swallowed and enters airways.
Chronic effects	Prolonged inhalation may be harmful. Prolonged exposure may cause chronic effects.
Further information	Risk of chemical pneumonia after aspiration.

12. Ecological information

Ecotoxicity Not expected to be harmful to aquatic organisms.

Product		Species	Test Results
HyVolt II			
Aquatic			
Crustacea	EC50	Daphnia	800 mg/l, 48 hours estimated
Components		Species	Test Results
2,6-DI-TERT-BUTYL-P-CRESOL [BUTYLATED HYDROXYTOLUENE (BHT)] (CAS 128-37-0)			
Aquatic			
Crustacea	EC50	Water flea (Daphnia pulex)	1.44 mg/l, 48 hours

Not available. * Estimates for product may be based on additional component data not shown.

Persistence and degradability	Not inherently biodegradable.
Bioaccumulative potential	Bioaccumulation is unlikely to be significant because of the low water solubility of this product.
Mobility in soil	Not available.
Other adverse effects	No other adverse environmental effects (e.g. ozone depletion, photochemical ozone creation potential, endocrine disruption, global warming potential) are expected from this component.

13. Disposal considerations

Disposal instructions	When this product as supplied is to be discarded as waste, it does not meet the definition of a RCRA waste under 40 CFR 261. Disposal recommendations are based on material as supplied. Disposal must be in accordance with current applicable laws and regulations, and material characteristics at time of disposal.
Hazardous waste code	Not applicable.
Waste from residues / unused products	Dispose of in accordance with local regulations. Avoid discharge into water courses or onto the ground.
Contaminated packaging	Empty containers should be taken to an approved waste handling site for recycling or disposal. Since emptied containers may retain product residue, follow label warnings even after container is emptied. Offer rinsed packaging material to local recycling facilities.

14. Transport information

DOT

Not regulated as dangerous goods.

IATA

Not regulated as dangerous goods.

IMDG

Not regulated as dangerous goods.

Transport in bulk according to Not available.

Annex II of MARPOL 73/78 and the IBC Code

General information Not regulated as dangerous goods.

15. Regulatory information

US federal regulations This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

All components are on the U.S. EPA TSCA Inventory List.

CERCLA/SARA Hazardous Substances - Not applicable.

HyVolt oils are certified to be PCB-free. HyVolt oils are processed from naturally occurring raw materials with no additives or recycled oils that might introduce PCB contamination.

TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)

Not regulated.

CERCLA Hazardous Substance List (40 CFR 302.4)

Not listed.

SARA 304 Emergency release notification

Not regulated.

OSHA Specifically Regulated Substances (29 CFR 1910.1001-1052)

Not regulated.

Superfund Amendments and Reauthorization Act of 1986 (SARA)

SARA 302 Extremely hazardous substance

Not listed.

SARA 311/312

Yes

Hazardous chemical

Classified hazard categories

Aspiration hazard

SARA 313 (TRI reporting)

Not regulated.

Other federal regulations

Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List

Not regulated.

Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130)

Not regulated.

Safe Drinking Water Act (SDWA)

Not regulated.

US state regulations

This product does not contain a chemical known to the State of California to cause cancer, birth defects or other reproductive harm. California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65): This material is not known to contain any chemicals currently listed as carcinogens or reproductive toxins.

International Inventories

Country(s) or region	Inventory name	On inventory (yes/no)*
Australia	Australian Inventory of Chemical Substances (AICS)	Yes
Canada	Domestic Substances List (DSL)	Yes
Canada	Non-Domestic Substances List (NDSL)	No
China	Inventory of Existing Chemical Substances in China (IECSC)	Yes
Europe	European Inventory of Existing Commercial Chemical Substances (EINECS)	Yes
Europe	European List of Notified Chemical Substances (ELINCS)	No
Japan	Inventory of Existing and New Chemical Substances (ENCS)	Yes
Korea	Existing Chemicals List (ECL)	Yes
New Zealand	New Zealand Inventory	Yes
Philippines	Philippine Inventory of Chemicals and Chemical Substances (PICCS)	Yes
Taiwan	Taiwan Chemical Substance Inventory (TCSI)	Yes

Country(s) or region	Inventory name	On inventory (yes/no)*
United States & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	Yes

*A "Yes" indicates that all components of this product comply with the inventory requirements administered by the governing country(s)
A "No" indicates that one or more components of the product are not listed or exempt from listing on the inventory administered by the governing country(s).

16. Other information, including date of preparation or last revision

Issue date	01-13-2014
Revision date	04-17-2019
Version #	09
Further information	Local CHEMTREC Numbers: CHEMTREC Mexico: 1-800-681-9531
NFPA ratings	Health: 1 Flammability: 1 Instability: 0
References	ACGIH EPA: AQUIRE database NLM: Hazardous Substances Data Base US. IARC Monographs on Occupational Exposures to Chemical Agents IARC Monographs. Overall Evaluation of Carcinogenicity National Toxicology Program (NTP) Report on Carcinogens ACGIH Documentation of the Threshold Limit Values and Biological Exposure Indices Chemical Abstracts Service Registry Handbook CRC: Handbook of Chemistry and Physics ILO Safety Cards International Labour Organization International Maritime Organization Marine Pollutants List NFPA Hazardous Chemical Data Sheets NIOSH Pocket Guide Registry of Toxic Effects of Chemical Substances (RTECS) US DOT Hazardous Materials Regulations
Disclaimer	The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.
Revision information	Hazard(s) identification: Response Composition / Information on Ingredients: Ingredients Physical & Chemical Properties: Multiple Properties Toxicological Information: Toxicological Data