

SOLAR GUARD

SAFETY DATA SHEET ACCORDING TO USA FEDERAL HAZCOM 012

1. IDENTIFICATION

1.1. Product Identifier

Code:
Product name

A-SOLAR

SOLAR GUARD

1.2. Relevant identified uses of the substance or mixture and uses advised against

Intended use

*Photocatalytic self-cleaning protection for photovoltaic panels.
For professional use only.*

1.3. Details of the supplier of the safety data sheet

Name
Full address

Armus LLC
137 Grand Street 3rd Floor
New York, NY 10013
United States
Tel. (+1) 917-957-5383

Country

E-mail address of the competent person responsible for
the Safety Data Sheet

bill@armussolutions.com

1.4. Emergency telephone number

For urgent inquiries refer to

Tel. (+1) 917-957-5383 United States

2. HAZARDS IDENTIFICATION

2.1. Classification of the substance or mixture

The product is classified as hazardous pursuant to the provisions set forth in OSHA Hazard Communication Standard (HCS) (29 CFR 1910.1200). The product thus requires a safety datasheet.

Any additional information concerning the risks for health and/or the environment is given in sections 11 and 12 of this sheet.

Classification and Hazard Statement

Flammable liquid, category 3

Eye irritation, category 2

Specific target organ toxicity – single exposure, category 3

Flammable liquid and vapor

Causes serious eye irritation

May cause drowsiness or dizziness

Hazard pictograms:



Signal words: **WARNING**

Hazard statements:

H226	Flammable liquid and vapor
H319	Causes serious eye irritation
H336	May cause drowsiness or dizziness

Precautionary statements:**Prevention:**

P210	Keep away from heat, hot surfaces, sparks, open flames, and other ignition sources. No smoking.
P242	Use only non-sparking tools.
P233	Keep container tightly closed.
P280	Wear protective gloves / eye protection / face protection.
P264	Wash with plenty of water and soap thoroughly after handling.

Response:

P305+P351+P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and continue rinsing.
P303+P361+P353	IF ON SKIN: Remove contaminated clothing immediately. Rinse skin with water / shower.
P337+P313	If eye irritation persists, seek medical attention.
P370+P378	In case of fire: use dry powder or Carbon Dioxide fire extinguisher to extinguish

Storage:

P403+P235	Store in a cool, well-ventilated place.
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Disposal:

P501	Dispose of contents or container according to local/ national/ international regulations
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2.2 Other hazards

Not applicable.

3. COMPOSITION / INFORMATION ON INGREDIENTS

3.1. Components

<i>Chemical Name</i>	<i>CAS-No</i>	<i>INDEX</i>	<i>Conc. %</i>	<i>Classification</i>
PROPAN-2-OL	67-63-0	603-117-00-0	30 < x < 55	Flammable liquid, category 2 H225, Eye irritation, category 2 H319, Specific target organ toxicity – single exposure, category 3 H336
ETHYL SILICATE	78-10-4	014-005-00-0	1 < x < 5	Flammable liquid, category 3 H226, Acute toxicity, category 4 H332, Eye irritation, category 2 H319, Specific target organ toxicity – single exposure, category 3 H335

The full wording of hazard (H) phrases is given in section 16 of the sheet.

4. FIRST-AID MEASURES

4.1. Description of first aid measures**GENERAL ADVICE:**

Move out of work / application area.
Consult a physician.
Show this material safety data sheet to the doctor in attendance.

EYES:

Remove contact lenses.
In the case of contact with eyes, rinse immediately with plenty of water and seek medical attention.
Keep eyes wide open while rinsing.

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Continue rinsing eyes during transport to medical facility or for at least 30-60 minutes.

SKIN:	Take off contaminated clothing and shoes immediately. Shower immediately. Seek medical advice / attention if irritation persists. Wash contaminated clothing before using again.
INHALATION:	Move to fresh air. Seek medical advice / attention immediately.
INGESTION:	Seek medical advice / attention immediately. Induce vomiting only if indicated by the doctor. Never give anything by mouth to an unconscious person, unless authorized by a doctor.

4.2. Most important symptoms and effects, both acute and delayed

Specific information on symptoms and effects caused by the product is unknown.

4.3. Indication of any immediate medical attention and special treatment needed

Not applicable based on available information.

5. FIRE-FIGHTING MEASURES

5.1. Extinguishing media

<i>Suitable extinguishing equipment</i>	Extinguishing substances are: carbon dioxide, foam, chemical powder. For product loss or leakage that has not caught fire, water spray can be used to disperse flammable vapors and protect those trying to stem the leak.
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<i>Unsuitable extinguishing equipment</i>	Do not use jets of water. Water can be used to cool containers exposed to flames to prevent explosions.
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5.2. Special hazards arising from the substance or mixture

<i>Specific hazards during fire fighting</i>	Excess pressure may form in containers exposed to fire at a risk of explosion. Do not breathe combustion products.
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5.3. Advice for firefighters

<i>General information</i>	Use jets of water to cool the containers to prevent product decomposition and the development of substances potentially hazardous for health. Always wear full fire prevention gear. Collect extinguishing water to prevent it from draining into the sewer system. Dispose of contaminated water used for extinction and the remains of the fire according to applicable regulations.
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<i>Special protective equipment for firefighters</i>	Normal firefighting clothing i.e., fire kit (BS EN 469), gloves (BS EN 659) and boots (HO specification A29 and A30) in combination with self-contained open circuit positive pressure compressed air breathing apparatus (BS EN 137).
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6. ACCIDENTAL RELEASE MEASURES

6.1. Personal precautions, protective equipment, and emergency procedures

Block the leakage.

Wear suitable protective equipment (including personal protective equipment referred to under section 8 of the safety data sheet) to prevent any contamination of skin, eyes, and clothing.

These indications apply for both product users and those involved in emergency procedures.

6.2. Environmental precautions

The product must not enter the sewer system or come into contact with surface water or groundwater.

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6.3. Methods and material for containment and cleaning up

Collect the leaked product.

Absorb the remainder with inert absorbent material.

Make sure the leakage site is well-aired.

Contaminated material should be disposed of in compliance with the provisions set forth in section 13.

6.4. Reference to other sections

Any information on personal protection and disposal is given in sections 8 and 13.

7. HANDLING AND STORAGE

7.1. Precautions for safe handling

Keep away from heat, sparks, and open flames.

Do not eat, drink, or smoke during use.

Without adequate ventilation, vapors may accumulate and, if ignited, catch fire even at a distance, with the danger of backfire.

When performing transfer operations involving large containers, connect to an earthing system and wear anti-static footwear.

Vigorous stirring and flow through the tubes and equipment may cause the formation and accumulation of electrostatic charges.

In order to avoid the risk of fires and explosions, never use compressed air when handling.

Open containers with caution as they may be pressurized.

The product must not enter the sewer system or come into contact with surface water or groundwater.

7.2. Conditions for safe storage, including any incompatibilities

Store only in the original container.

Store the containers sealed, in a well-ventilated place, away from direct sunlight.

Store in a cool and well-ventilated place, away from sources of heat, open flames and sparks, and other sources of ignition.

7.3. Specific end use(s)

Refer to section 1.2

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

8.1. Control parameters

Regulatory References:

USA	NIOSH-REL	NIOSH publication No. 2005-1 49, 3 rd printing, 2007.
USA	OSHA-PEL	Occupational Exposure Limits- Limits for Air Contaminants Table Z-1-1910-1000
USA	CAL/OSHA-PEL	California Division of Occupational Safety and Health (Cal-OSHA) Permissible Exposure Limits (PELs).
EU	OEL EU	Directive (EU) 2019/1831; Directive (EU) 2019/130; Directive (EU) 2019/983; Directive (EU) 2017/2398; Directive (EU) 2017/164; Directive 2009/161/EU; Directive 2006/15/EC; Directive 2004/37/EC; Directive 2000/39/EC; Directive 98/24/EC; Directive 91/322/EEC.
	TLV-ACGIH	ACGIH 2020

PROPAN-2-OL						
Threshold Limit Value						
Type	Country	TWA / 8h		STEL/15min		Remarks / Observations
		mg/m3	ppm	mg/m3	Ppm	
TLV-ACGIH	-	492	200	983	400	
OSHA	USA	980	400			
CAL/OSHA	USA	980	400	1225	500	
NIOSH	USA	980	400	1225	500	

ETHYL SILICATE						
Threshold Limit Value						
Type	Country	TWA / 8h		STEL/15min		Remarks / Observations
		mg/m3	ppm	mg/m3	Ppm	
OEL	EU	44	5			
TLV-ACGIH	---	85	10			
OSHA	USA	850	100			
CAL/OSHA	USA	85	10			
NIOSH	USA	85	10			

Legend:

(C) = CEILING
 INHAL = Inhalable Fraction
 RESP = Respirable Fraction
 THORA = Thoracic Fraction

8.2. Exposure controls

As the use of adequate technical equipment must always take priority over personal protective equipment, make sure that the workplace is well aired through effective local ventilation.

Personal protective equipment must comply with current regulations.

<i>Hand Protection</i>	Protect hands with category III work gloves (OSHA 29 CFR 1910.138). The following should be considered when choosing work glove material: compatibility, degradation, failure time and permeability. The work gloves' resistance to chemical agents should be checked before use, as it can be unpredictable. The gloves' wear time depends on the duration and type of use.
<i>Skin Protection</i>	Wear category I professional long-sleeved overalls and safety footwear. Wash body with soap and water after removing protective clothing.
<i>Eye Protection</i>	Wear airtight protective goggles (OSHA 29 CFR 1910.133).
<i>Respiratory Protection</i>	If the threshold value (e.g., TLV-TWA) is exceeded for the substance or one of the substances present in the product, wear a mask with a NIOSH certified filter, whose class must be chosen according to the limit of use concentration (NIOSH 42 CFR 84, OSHA 29 CFR 1910.134). In the presence of gases or vapors of various kinds and/or gases or vapors containing particulate (aerosol sprays, fumes, mists, etc.) combined filters are required. Respiratory protection devices must be used if the technical measures adopted are not suitable for restricting the worker's exposure to the threshold values considered. The protection provided by masks is in any case limited. If the substance considered is odorless or its olfactory threshold is higher than the corresponding TLV-TWA and in the case of an emergency, wear open-circuit compressed air breathing apparatus or external air-intake breathing apparatus. For a correct choice of respiratory protection device, see standard NIOSH 42 CFR 84, OSHA 29 CFR 1910.134.
<i>Environmental Exposure Controls</i>	The emissions generated by manufacturing processes, including those generated by ventilation equipment, should be checked to ensure compliance with environmental standards.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1. Information on basic physical and chemical properties

Appearance	Alcohol-based suspension
Color	Milky white that dries clear
Odor	Slight rubbing alcohol odor

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pH	9.29 ± 0.5
VOC Content	576 g/L
Melting Point / Freezing Point	Not available
Flash Point	> 75.2°F (24°C)
Viscosity	2.8 ± 0.5 cP @ 68°F (20°C)

10. STABILITY AND REACTIVITY

10.1. Reactivity

There are no particular risks of reaction with other substances in normal conditions of use.

10.2. Chemical stability

The product is stable in normal conditions of use and storage.

10.3. Possibility of hazardous reactions

The vapors may also form explosive mixtures in the air.

10.4. Conditions to avoid

Avoid overheating and all sources of ignition.

10.5. Incompatible materials

None based on available information.

10.6. Hazardous decomposition products

In the event of thermal decomposition or fire, gases and vapors that are potentially dangerous to health may be released.

11. TOXICOLOGICAL INFORMATION

In the absence of experimental data for the product itself, health hazards are evaluated according to the properties of the substances it contains, using the criteria specified in the applicable regulation for classification. It is therefore necessary to take into account the concentration of the individual substances indicated in section 3, to evaluate the toxicological effects of exposure to the product.

11.1. Information on toxicological effects

Metabolism, toxicokinetics, mechanism of action and other information

Not classified based on available information.

Information on likely routes of exposure

Not classified based on available information.

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Not classified based on available information.

Interactive effects

Not classified based on available information.

Acute toxicity

PROPAN-2-OL

LD50 (Oral (Rat)) 4710 mg/kg
 LD50 (Dermal (Rat)) 12800 mg/kg
 LC50 (Inhalation (Rat)) 72.6 mg/ liter
 Exposure time: 4h

ETHYL SILICATE

LD50 (Oral (Rat)) 2.5mg/kg
 LCD0 (Dermal (Rabbit)) 5878 mg/kg
 LC50 (Inhalation (Rat)) 11 mg/ liter
 Exposure time: 4h

Skin corrosion / irritation

Not classified based on available information.

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Serious eye damage / irritation

Causes serious eye irritation.

Respiratory or skin sensitization

Not classified based on available information.

Germ cell mutagenicity

Not classified based on available information.

Carcinogenicity

Not classified based on available information.

This product is not considered to be a carcinogen by IARC, ACGIH, NTP, and OSHA.

Reproductive toxicity

Not classified based on available information.

STOT – single exposure

May cause drowsiness or dizziness.

STOT – repeated exposure

Not classified based on available information.

Aspiration toxicity / hazard

Not classified based on available information.

12. ECOLOGICAL INFORMATION

Use this product according to good working practices. Avoid littering. Inform the appropriate authorities should the product reach waterways or contaminate soil or vegetation.

12.1. Toxicity

Ethyl Silicate

Toxicity to fish	LC50: > 245 mg/l Exposure time: 96 h
Toxicity Crustacea	EC50 > 75 mg/l Exposure time: 48 h
Toxicity for Algae / Aquatic Plants	EC50 > 100 mg/l Exposure time: 72 j

12.2. Persistence and degradability

Ethyl Silicate

Solubility in Water	1000-10000 mg/l
Degradability:	Rapidly degradable

PROPAN-2-OL

Degradability:	Rapidly degradable
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12.3. Bioaccumulative potential

Ethyl Silicate

Partition Co-efficient: N-octanol/water	3.18
BCF	3.16

PROPAN-2-OL

Partition Co-efficient: N-octanol/water	0.05
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12.4. Mobility in soil

None based on available information.

12.5. Results of PBT and vPvB assessment

On the basis of available data, the product does not contain any Persistent, Bioaccumulative and Toxic (PBT) or very Persistent and very Bio-accumulative (vPvB) substances in percentage greater than 0.1%.

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13. DISPOSAL CONSIDERATIONS

Disposal methods


<i>Waste from residues</i>	Reuse when possible. Unused product should be considered special non-hazardous waste. Disposal must be performed through an authorized waste management firm, in compliance with local, national, and international regulations.
<i>Contaminated Packaging</i>	Contaminated packaging must be recovered or disposed of in compliance with all waste management regulations.

14. TRANSPORTATION INFORMATION

ADR/RID

UN/ID No.	UN 1993
Proper shipping name	FLAMMABLE LIQUID, (PROPAN-2-OL; ETHYL SILICATE)
Class	3
Packing Group	III
Labels	Label 3 
Environmental Hazards	NO
Environmental Labels	N/A
HIN – Kemler:	30
Limited Quantities:	5L
Tunnel Restriction Code:	(D/E)

IMDG

UN/ID No.	UN 1993
Proper shipping name	FLAMMABLE LIQUID, (PROPAN-2-OL; ETHYL SILICATE)
Class	3
Packing Group	III
Labels	Label 3 
Environmental Hazards	NO
Environmental Labels	N/A
EMS:	F-E, S-E
Limited Quantities:	5L

IATA

UN/ID No.	UN 1993
Proper shipping name	FLAMMABLE LIQUID, (PROPAN-2-OL; ETHYL SILICATE)
Class	3
Labels	Label 3 
Environmental Hazards	NO
Environmental Labels	N/A
Packing instruction (cargo aircraft)	Maximum Quantity: 220L, Packing instruction: 366
Packing instruction (passenger aircraft)	Maximum Quantity: 60L, Packing instruction: 355
Special precautions for user:	None.

15. REGULATORY INFORMATION

U.S. Federal Regulations

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EPCRA 313 TRI	Toxics Release Inventory (Section 313 Category Code)
GHS	Globally Harmonized System of classification and labeling of chemicals
IATA DGR	International Air Transport Association Dangerous Goods Regulation
IC50	Immobilization Concentration 50%
IMDG	International Maritime Code for dangerous goods
IMO	International Maritime Organization
LC50	Lethal Concentration 50%
LD50	Lethal Dose 50%
OEL	Occupational Exposure Level
PEL	Predicted Exposure Level
RCRA Code	Resource Conservation and Recovery Act Code
REL	Recommended Exposure Limit
RID	Regulation concerning the international transport of dangerous goods by train
TLV	Threshold Limit Value
TLV CEILING	Concentration that should not be exceeded during any time of occupational exposure.
TSCA	Toxic Substances Control Act
TWA STEL	Short-term Exposure Limit
TWA	Time-weighted Average Exposure Limit
VOC	Volatile Organic Compounds
WHMIS	Workplace Hazardous Materials Information System

GENERAL BIBLIOGRAPHY:

- GHS rev. 3
- The Merck Index. 10th Edition
- Handling Chemical Safety
- Niosh - Registry of Toxic Effects of Chemical Substances
- INRS - Fiche Toxicologique (toxicological sheet)
- Patty - Industrial Hygiene and Toxicology
- N.I. Sax - Dangerous properties of Industrial Materials-7, 1989 Edition
- ECHA website
- Database of SDS models for chemicals - Ministry of Health and ISS (Istituto Superiore di Sanità) - Italy
- 6 NYCRR part 597
- Cal/OSHA website
- California Safe Drinking Water and Toxic Enforcement Act
- EPA website
- Hazard Communication Standard (HCS 2012)
- IARC website
- List Of Lists EPA: Consolidated List of Chemicals Subject to EPCRA, CERCLA and Section 112© of the Clean Air Act
- Massachusetts 105 CMR Department of public health 670.000: "Right to Know"
- Minnesota Chapter 5206 Department of Labor and Industry Hazardous Substances, Employee "Right to Know".
- New Jersey Worker and Community Right to know Act N.J.S.A.
- NTP. 2011. Report on Carcinogens, 12th Edition.
- OSHA website
- Pennsylvania, Hazardous Substance List, Chapter 323

NOTE FOR USERS:

The information contained in the present sheet are based on our own knowledge on the date of the last version. Users must verify the suitability and thoroughness of provided information according to each specific use of the product.

This document must not be regarded as a guarantee on any specific product property.

The use of this product is not subject to our direct control; therefore, users must, under their own responsibility, comply with the current health and safety laws and regulations. The producer is relieved from any liability arising from improper uses.

Purchasers must provide product users with adequate training on how to use chemical products.

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CALCULATION METHODS FOR CLASSIFICATION

Product classification derives from criteria established by the OSHA Hazard Communication Standard (HCS) (29 CFR 1910.1200), unless determined otherwise in Section 11 and 12.

The data for evaluation of chemical-physical properties are reported in section 9.

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