SPI Supplies Division
Structure Probe, Inc.
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Manufacturer's CAGE: 1P573

Safety Data Sheet

Date Effective: October 7, 2020

SPI Catalog # 02827-AF
SPI-Chem DDSA (Dodecenyl Succinic Anhydride)

Component of 02635-AB
SPI-Pon™ 812 - Araldite® 6005 Epoxy Embedding Kit

Component of 02649-AB
SPI-Chem™ Araldite® 502 Embedding Resin Kit

Component of 02650-AA, 02650-AB
SPI-Chem™ Araldite® 6005 Embedding Resin Kit

Component of 02658-AB
SPI-Chem™ Araldite® 502/BDMA Embedding Resin Kit

Component of 02660-AB
SPI-Pon™ 812 Embedding Kit, DMP-30(2x30ml) Formulation

Component of 02663-AB
SPI-Pon™ 812 Kit, BDMA Formulation

Section 1.1: Identification

Chemical Name/Synonyms ..... n-Dodecenyl Succinic Anhydride; 3-(2-dodecenyl) succinic anhydride; n-DDSA

Product or Trade Name ……SPI-Chem DDSA (Dodecenyl Succinic Anhydride)

CAS #'s 19780-11-1

REACH Registration Number ... 01-2119980547-24-0001 (US manufactured material only),
..... 01-2119980547-24-0003 (UK manufacture material)

Section 1.2: Relevant Uses/Restrictions

Epoxy curing agent; Chemical intermediate; Lubricants; Formulation of industrial preparations.

Section 1.3: Supplier of the Safety Data Sheet

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Section 1.4: Emergency telephone number

Emergencies
Contacting CHEMTREC:

24 Hour Emergency Use Only #'s...
Worldwide phone: 1-(703)-741-5970
Toll-free phone: 1-(800)-424-9300 USA + Canada only

Section 2: Hazard Identification

2.1 Classification of the substance
GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)

Skin Sensitization Category 1A
Serious Eye Irritation Category 2
Skin Irritation Category 2

Label elements:
Pictogram

Signal Word: Warning
Hazard Statements:
H317 May cause an allergic skin reaction.
H319 Causes serious eye irritation.
H315 Causes skin irritation

Precautionary Statements:
P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.
P302 + P352 IF ON SKIN: Wash with plenty of soap and water.
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do. Continue rinsing.
P333 + P313 If skin irritation or rash occurs: Get medical advice / attention.
P36: Take off contaminated clothing and wash before reuse.
P337 + P313 If eye irritation persists: Get medical advice / attention.

GHS Classification of the substance or mixture (According to Regulation (EC) No 1272/2008)

Skin Sensitization Category 1A
Serious Eye Irritation Category 2
Skin Irritation Category 2

Label elements:
Pictogram

Signal Word: Warning

Hazard Statements:

H317 May cause an allergic skin reaction.
H319 Causes serious eye irritation.
H315 Causes skin irritation

Precautionary Statements:

P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.
P302 + P352 IF ON SKIN: Wash with plenty of soap and water.
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do. Continue rinsing.
P333 + P313 If skin irritation or rash occurs: Get medical advice / attention.
P362 Take off contaminated clothing and wash before reuse.
P337 + P313 If eye irritation persists: Get medical advice / attention.

2.3 Other Hazards:

Hazardous Material Information System USA

Health 2
Fire Hazard 1
Reactivity 0
Personal Protection .....

NFPA Rating (estimated)

Health 2
Flammability..... 1
Reactivity 0

Section 3: Composition

3.1 Substances:

3-(2-dodecenyl)succinic anhydride

CAS Number: 19780-11-1 EC Number: 243-296-6 Concentration: ~100%
CLP Inventory/Annex VI: Not listed
EU CLP Classification (1272/2008): Skin Irrit. 2, H315; Eye Irrit. 2, H319; Skin Sens. 1, H317

Section 4: First Aid Measures

4.1 Description of first aid measures:

Skin contact: Remove contaminated clothing and wash before reuse... Wash the affected area with soap and water. If irritation develops or symptoms are observed, call a physician.

Eye contact: Immediately flush eyes with plenty of water for 15 minutes, lifting the eyelids. Remove contact lenses if present and easy to do so. Get medical attention, if irritation or other symptoms exist.

Inhalation: Remove from exposure. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get immediate medical attention.

Ingestion: If swallowed, contact physician or poison control center immediately. Do not induce vomiting. Never give anything by mouth to an unconscious person.

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

Acute: Causes moderate eye irritation. Can cause skin irritation. Prolonged or frequently repeated skin contact may cause allergic reactions in some individuals. Mists, fumes and vapors from this product may cause respiratory irritation. Ingestion may cause irritation of the mouth, throat and digestive tract.

Delayed Effects: None known.

4.3 Indication of any immediate medical attention and special treatment needed

Note to Physician: No specific indications. Treatment should be based on the judgment of the physician in response to the reactions of the patient.

Section 5: Fire Fighting Measures

5.1 Extinguishing media:

Appropriate Extinguishing Media: Water spray, alcohol-resistant foam, carbon dioxide, dry chemical Use water spray to cool fire exposed containers.

5.2 Special hazards arising from the substance or mixture:

Hazardous Products of Combustion: Dense smoke, irritating and toxic fumes and vapors may be generated by thermal decomposition and combustion. As with other organic materials, combustion will produce carbon monoxide and carbon dioxide.

Potential for Dust Explosion: Not available.

Special Flammability Hazards: Not applicable.

5.3 Advice for firefighters:

Basic Fire Fighting Guidance: Wear self-contained breathing apparatus and full protective clothing (i.e., Bunker gear). Using water can cause frothing with increasing fire intensity. Water runoff can cause environmental damage. Dike and collect water used to fight fire.

Section 6: Accidental Release Measures

6.1 Personal precautions, protective equipment and emergency procedures:

Evacuation procedures: Isolate the hazard area and deny entry to unnecessary and unprotected personnel.

Special Instructions: See Section 8 for personal protective equipment recommendations. Remove all contaminated clothing to prevent further absorption. Decontaminate affected personnel using the first aid procedures in Section 4. Leather shoes that have been saturated must be discarded.

6.2 Environmental precautions:

Prevent releases to soils, drains, sewers, and waterways.

6.3 Methods and material for containment and cleaning up:

Vacuum, scrape or scoop the material into a chemical waste container.

Large Spills: Shut off leak if safe to do so. Avoid generation of dust clouds during clean-up.

6.4 Reference to other sections:

Refer to section 8 for information on selecting personal protective equipment.
Refer to section 13 for information on spilled product, absorbent and clean-up material disposal instructions.

Section 7: Handling and Storage

7.1 Precautions for safe handling

Wear appropriate protective equipment when performing maintenance on contaminated equipment.
Wash hands thoroughly before eating or smoking after handling the material.
Do not eat, drink or smoke in work area.
Prevent contact with incompatible materials.
Avoid spills and keep away from drains.
Handle in a manner to prevent generation of aerosols, vapors or dust clouds.
Use with adequate ventilation.
Do not get on skin or in eyes.
Do not ingest or inhale.

Information about protection against explosions and fires:

Substance / product can reduce the ignition temperature of flammable substances.

7.2 Conditions for safe storage, including any incompatibilities

Requirements to be met by storerooms and receptacles: No special requirements.

Information about storage in one common storage facility:

Store away from flammable substances.
Store away from oxidizing agents.
Do not store with organic materials, amines.
Store away from alkali metals.

Further information about storage conditions:

Keep container tightly sealed.
Store in cool, dry conditions in well-sealed containers.

7.3 Specific end uses:

Catalyst for embedding resin kits.
This material is not being offered for clinical or diagnostic applications, agricultural uses or for human or animal consumption.

Section 8: Exposure Controls and Personal Protection

8.1 Control parameters:

Occupational Exposure Limit: Not applicable.
Air Monitoring method: No data available

Derived No Effect Levels (DNELs) – Workers:

Acute – systemic effects (dermal): Qualitative due to skin sensitization
Long-term – systemic effects (dermal): 0.33 mg/kg bw/day
Long-terms – systemic effects (inhalation): Not established exposure unlikely
Long term – local effects (dermal): Qualitative due to skin sensitization

Derived No Effect Levels (DNELs) – General Population:

Acute – systemic effects (oral, dermal, inhalation): No applications involving general population.
Long-terms – systemic effects (oral): No applications involving general population.
Long-term – systemic effects (dermal): No applications involving general population.
Long-term – Systemic effects (inhalation): No applications involving general population.
Acute and long-term – local effects (dermal, inhalation): No applications involving general population.

Predicted No Effect Concentrations (PNECs):
PNEC aqua (freshwater) – 0.02 mg/L
PNEC (marine water) – 0.002 mg/L
PNEC aqua (intermittent releases) – 0.13 mg/L
PNEC aqua (STP) – 0.130 mg/L
PNEC sediment (freshwater) – 1.7 mg/kg sediment dry weight
PNEC sediment (marine water) – 0.17 mg/kg sediment dry weight
PNEC soil – 0.2 mg/kg soil dry weight
PNEC oral (wildlife exposures) – Derivation waived -log K_{ow}>3

8.2 Exposure Controls:

8.2.1 **Other Engineering Controls:** All operations should be conducted in well-ventilated conditions. Local exhaust ventilation should be provided. If user operations generate dust, fumes, gas, vapor or mist, use process enclosures. Local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.

8.2.2 **Personal Protective equipment:** Neoprene, nitrile or polyvinyl chloride gloves conforming to at least EN374. Use safety glasses with side shields under normal exposure conditions; use chemical goggles where there is potential for splashing, spraying or generation of mists or vapors. Respiratory protection is not normally required, but where overexposure is a concern, use NIOSH-approved chemical cartridge respirator with organic vapor cartridges.

Respirator Caution: Observe OSHA regulations for respirator use (29 CFR 1910.1340. Air-purifying respirators must not be used in oxygen-deficient atmospheres.

Thermal Hazards: Not applicable.

8.2.3 **Environmental Exposure Controls:** The level of protection and types of controls necessary will vary depending upon potential exposure conditions. Select controls based on a risk assessment of local circumstances. If user operations generate dust, fumes, gas, vapor or mist, use process enclosures, local exhaust ventilation, or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.

Section 9: Physical and Chemical Properties

9.1 Information on basic physical and chemical properties

State: Viscous Liquid
Appearance: Clear, pale yellow to pink solid
Odor: slight odor
Molecular Formula: $C_{16}H_{26}O_3$
Molecular Weight: 266.37
Vapor Pressure: <0.06 Pa
Evaporation Rate: <1 (n-Butyl acetate = 1)
Specific Gravity or Density: 0.9663 g/cm^3 @ 20°C
Vapor Density (air = 1): 9.2
Boiling Point: (decomposes) 360°C (680 °F)
Freezing / Melting Point: 36°C (97 °F)
Solubility in Water: 0.13 mg/L @ 20 °C
Octanol/Water Coefficient: log Kow > 4.38 (modeled)
pH: No data available
Odor Threshold: No data available

Viscosity: 430 mPa-s @ 20°C
Auto-ignition Temperature: 310-313°C
Flash Point: 287.6°F (142°C)
Flammable Limits: No data available
Flammability (solid, gas): Not flammable
Decomposition Temperature: No data available
Explosive Properties: Not explosive
Oxidizing Properties: No data available

9.2 Other information

No further relevant information available.

Section 10: Stability and Reactivity

10.1 Reactivity: Not classified as dangerously reactive.

10.2 Chemical Stability: Stable under normal conditions.

10.3 Possibility of Hazardous Reactions: Not expected to occur.

10.4 Conditions to avoid: Moisture, Incompatible materials.

10.5 Incompatible materials: Strong oxidizing agents, Alkali metals, Amines**.**

10.6 Hazardous decomposition products: Products from combustion may include dense smoke, irritating and toxic fumes and vapors. Products of incomplete combustion may include carbon monoxide, carbon dioxide and dense smoke.

Section 11: Toxicological Information

11.1 I**nformation on toxicological effects:**

a. Acute Toxicity

Acute Oral LD50:	rat	>2000 mg/kg	KEY: (Lowe,2012)
Acute Dermal LD50:	rabbit	>2000 mg/kg	KEY: (Lowe, 2012)
Acute Inhalation LC50:	rat	>5300 mg/cubic meter	KEY: Welch (1982)

b. Skin Irritation: Severely irritating to skin.

c. Eye Irritation: May cause slight eye irritation.

d. Skin Sensitization: Possible skin sensitizer. May cause allergic skin reaction.

e. Mutagenicity: Negative for mutagenic activity in Ames Assay, both with and without metabolic activation.

f. **Reproductive / Developmental Toxicity:** No evidence of reproductive or developmental toxicity.

g. Carcinogenicity: This material is not listed by IARC, NTP or OSHA as a carcinogen. No test data is available that indicates that this material is a carcinogen.

h. Target Organs: No data available.

i..Aspiration Hazard: No data available.

j. Primary Route(s) of Exposure: Inhalation, Ingestion, Eye contact, Skin contact.

k. Most important symptoms and effects, both acute and delayed:

Prolonged skin contact may cause irritation or dermatitis.
Direct contact with the eyes may cause irritation; symptoms may include redness, pain and tearing.

l. Delayed effects: None known.

m. Additive or Synergistic effects: None known.

Section 12: Ecological Information

12.1 Toxicity:

LC50	Oncorhynchus mykiss	>100 mg/L/96 hours	Dinehart, Simon (2014)
EC50	Daphnia magna	>100 mg/L	Novak (2013)
EC50	Selenastrum capricornutum (algae)	= 110 mg/L/96 hours	Ward, et al (1997)

12.2 Persistence and degradability: The substance was not shown to be readily biodegradable in a ready biodegradability assay, although the substance was shown to exhibit properties of inherent ultimate biodegradability.

12.3 Bio-accumulative potential: Bio-concentration is not expected to occur.

12.4 Mobility in soil: This material is expected to have essentially no mobility in soil. It absorbs strongly to most soil types.

12.5 Results of PBT and vPvB assessment: This substance is not a PBT or vPvB.

12.6 Other adverse effects: No data available.

Section 13: Disposal Considerations

13.1 **Waste treatment methods:**

US EPA Waste Number: Non applicable

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Waste Disposal: NOTE: Generator is responsible for proper waste characterization. State hazardous waste regulations may differ substantially from federal regulations. Dispose of this material responsibly, and in accordance with standard practice for disposal of potentially hazardous materials as required by applicable international, national, regional, state or local laws, and environmental protection duty of care principles. Do NOT dump into any sewers, on the ground, or into any body of water. For disposal within the EC, the appropriate classification code according to the European Community List of Wastes should be used. Note that disposal regulations may also apply to empty containers and equipment.

Section 14: Transport Information

14.1 The following information applies to all shipping modes (DOT/IATA/ICAO/IMDG/ADR/RID/ADN) unless otherwise indicated:

UN Number:	Not applicable
UN proper shipping name:	Chemicals, n.o.s. (n-Dodecenylsuccinic Anhydride)
Transport hazard class(es):	Not applicable
Packing group:	Not applicable
Environmental hazards:	Not applicable
Special precautions for user:	Not applicable
NA Emergency Guidebook Number:	Not applicable
IMDG EMS:	Not applicable
Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code:	Not applicable

Section 15: Regulatory Information

US Regulations:

SARA 302: No components listed.
SARA 313: No chemical components listed.
SARA 311/312: Acute Health Hazard

State Regulations:

Listed on the Pennsylvania Right-to-Know list.
Listed on the New Jersey Right-to-Know list.

California Prop. 65 Components

This product does not contain chemicals known to the State of California to cause birth defects or other reproductive harm.

Chemical Inventory Lists:

USA TSCA:	Listed on the Active Inventory List.
EINECS:	Listed (247-7816-)
Canada(DSL):	Listed (NDSL)
Japan:	Listed ((2)-852
Korea:	Listed (KE-10752)
Australia:	Listed
China:	Listed
Philippines:	Listed
Taiwan:	Listed
New Zealand:	Listed

15.2 Chemical Safety Assessment: Has not been carried out.

Date of Preparation: 07 October 2020

Abbreviations and acronyms

bw: body weight
IMDG: International Maritime Code for Dangerous Goods
DOT: US Department of Transportation
CMRG: Chemical Manufacturer's Recommended Guidelines
IATA: International Air Transport Association
ACGIH: American Conference of Governmental Industrial Hygienists
AIHA: American Industrial Hygiene Association
EINECS: European Inventory of Existing Commercial Chemical Substances
ELINCS: European List of Notified Chemical Substances
CAS: Chemical Abstracts Service (division of the American Chemical Society)
NFPA: National Fire Protection Association (USA)
HMIS: Hazardous Materials Identification System (USA)
LC50: Lethal concentration, 50 percent
LD50: Lethal dose, 50 percent
PBT: Persistent, Bio-accumulative and Toxicological
vPvB: very Persistent and very Bio-accumulative
NIOSH: National Institute for Occupational Safety
OSHA: Occupational Safety Health
ATE: Acute Toxicity Estimates
TLV: Threshold Limit Value
PEL: Permissible Exposure Limit
REL: Recommended Exposure Limit
STEL: Short Term Exposure Limit
CEIL: Ceiling
TSCA: Toxic Substances Control Act (USA)

DSL: Domestic Substances List (Canada)
PICCS: Philippine Inventory of Chemicals and Chemical Substances
ENCS: Existing and New Chemical Substances (Japan)
AICS: Australian Inventory of Chemical Substances
IECSC: Inventory of Existing Chemical Substances in China
KECL: Korea Existing Chemicals List

Key Data Sources: Literature Review

Water Soluble Fraction (WSF) to the Rainbow Trout, Onchorhyncus mykiss, Determined Under Static-Renewal Conditions, Testing Laboratory, ABC Laboratories, Inc., Study No. 80483.

Hersham (1983) Summary of results of primary eye irritation study, The Lubrizol Corp.

Lowe (2012) Acute Oral toxicity up and down in rats, DDSA-OSA Consortium.

Lowe (2012) Primary Skin irritation Study in Rabbits, DDSA-OSA Consortium.

Nakamura (1999) A quantitative comparison of induction challenge concentrations inducing a 50% positive response in three skin sensitization tests, published J Toxicological Sciences

Novak (2013) Triponenyl succinic acid Acute immobilization Test to Daphnia magna, static 48 hour limit test. Clariant Produckt.

Dinehart, Simon, (2014) Tetrapropenyl Succinic Anhydride Acute Toxicity of the Water Soluble Fraction (WSF) to the Rainbow Trout, Onchorhyncus mykiss, ABC Study No. 80483.

Schreib (2012) Reverse Mutation Assay Using Bacteria with n-Dodecenyl succinic anhydride, DDSA-OSA Consortium.

Takawale, Pradeep (2013) Reproduction/Developmental Toxicity Screening Test including Sperm Analysis in Water Rats with Novoperm, Clariant Produckt.

Ward, Magazu, Boeri (1997) Acute Toxicity of the Water Accommodated Fraction of OS# 1823OU to the Freshwater Algae, The Lubrizol Corporation.

Welch (1982) Inhalation Toxicity Study in Rats with EPA Response, Buffalo Color Corp.

Section 16: Other Information

Disclaimer of Liability:

Caution! Do not use SPI Supplies products or materials in applications involving implantation within the body; direct or indirect contact with the blood pathway; contact with bone, tissue, tissue fluid, or blood; or prolonged contact with mucous membranes. Products offered by SPI Supplies are not designed or manufactured for use in implantation in the human body or in contact with internal body fluids or tissues. SPI Supplies will not provide to customers making devices for such applications any notice, certification, or information necessary for such medical device use required by US FDA (Food and Drug Administration) regulation or any other statute. SPI Supplies and Structure Probe, Inc. make no representation, promise, express warranty or implied warranty concerning the suitability of these materials for use in implantation in the human body or in contact with internal body tissues of fluids.

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