



FIELD-APPLIED COMPOSITE SYSTEMS LLC
925 North Todd Avenue, Azusa, CA 91702 USA
Phone (626) 633-0294 www.facs.llc

SAFETY DATA SHEET

PowerSleeve™ 439 Matrix-Part B Hardener

SECTION 1: CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: PowerSleeve™ 439 Matrix-Part B Hardener
MFR'S NAME: Field-Applied Composite Systems LLC, 925 North Todd Avenue, Azusa CA 91702
EMERGENCY PHONE: 800.424.9300 (CHEMTREC) **GENERAL INFORMATION:** 626.633.0294
USE OF THE SUBSTANCE: Hardener for epoxy resin used with fiberglass or carbon fabric for the repair of pipelines or other structures.

SECTION 2: HAZARDS IDENTIFICATION

OSHA/HCS status: This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

GHS Label Elements:

Hazard Pictograms:



Signal Word: Danger!

Hazard Statements and GHS Classifications:

H315, H319	Causes skin and eye irritation.	Category 2
H314	Causes severe skin burns and eye damage.	Category 1C
H318	Causes serious eye damage.	Category 1
H304	May be fatal if swallowed or inhaled.	Category 1
H 317	May cause an allergic skin reaction.	Category 1
H402	Hazardous to the aquatic environment.	Category 3, Acute
H411	Hazardous to the aquatic environment.	Category 2, Chronic
H332	Harmful if inhaled.	Category 4
H312	Harmful in contact with skin.	Category 4
H302	Harmful if swallowed.	Category 4
H361	Suspected of damaging fertility or the unborn child. (4,4'-isopropylidenediphenol only.)	Category 2

Precautionary Statements:

Prevention: P201: Obtain special instructions before use.
P202: Do not handle until all safety precautions have been read and understood.
P260: Do not breathe mists.
P261: Avoid breathing fumes, mist, vapors and spray.
P264: Wash hands thoroughly after handling.
P270: Do not eat, drink or smoke when using this product.
P271: Use only outdoors or in a well-ventilated area.
P272: Contaminated work clothing should not be allowed out of the workplace.
P273: Avoid release to the environment.

P280: Wear protective gloves, clothing, and eye/face protection.

Responses:

P301+P310+P330+P331: IF SWALLOWED: Rinse mouth. Do NOT induce vomiting. Call POISON CENTER or doctor immediately.

P303+P352+P353+P361+P364: IF ON SKIN: Immediately remove all contaminated clothing and wash before reuse. Rinse skin with water/shower and wash with plenty of soap and water.

P333+P313: If skin irritation or rash occurs: Get medical attention.

P362+P364: Take off contaminated clothing and wash it before reuse.

P304+P340: IF INHALED: Remove person to fresh air and keep comfortable for breathing.

P305+P351+P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P308+P337+P313: If eye or other irritation persists or the exposed person is concerned, get medical attention.

P391: Collect spillage.

Storage:

P403+P233: Store in a well-ventilated place. Keep containers tightly closed.

P405: Store in a secured area.

Disposal:

P501: Dispose of contents and containers in accordance with all local, regional and international regulations.

Other Hazards:

None known.

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

Substance/Mixture: Mixture.

CHEMICAL NAME	CAS NUMBER	CONTENT
Isophoronediamine	2855-13-2	30-40%
1,3-Benzenedimethanamine	1477-55-0	1-15%
2-methyl-1,5-pentanediamine	15520-10-2	1-15%
Polyoxypropylenediamine	9046-10-0	1-15%
Tetraethylenepentamine	112-57-2	1-15%
4,4'-isopropylidenediphenol	80-05-7	1-15%
Diethylenetriamine	111-40-0	1-15%
Methylimidazole, 1-	616-47-7	1-15%

Amounts specified are typical and do not represent a specification. Remaining components are proprietary and non-hazardous.

Occupational Exposure Limits, if available, are listed in Section 8.

SECTION 4: FIRST AID MEASURES

Description of necessary first aid measures:

General

Get medical attention immediately for any person who is having trouble or not breathing, or any unconscious person. Provide oxygen or artificial respiration to a person if they have trouble breathing. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Place an unconscious person in a recovery position, maintain an open airway and loosen tight clothing.

Inhalation

Remove victim to fresh air and keep warm and at rest in a position comfortable for breathing. In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours. Get medical attention immediately.

Skin Contact

Immediately remove contaminated clothing and shoes. Wash the affected area with plenty of soap and water until no evidence of the chemical remains (at least 15-20 minutes). Launder clothing before reuse. Get medical attention immediately.

Eye Contact Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids and roll eyes in a circular motion. Check for and remove any contact lenses if easy to do. Continue to rinse for at least 15 minutes. Get medical attention immediately.

Ingestion Wash out mouth with water. Remove dentures, if any. Remove victim to fresh air and keep at rest in a position comfortable for breathing. DO NOT induce vomiting. Get medical attention immediately.

Most Important Symptoms/Effects, Acute and Long –Term:

Potential Acute Health Effects:

Inhalation Exposure to decomposition products may cause a health hazard. Serious effects may be delayed after exposure. Harmful if inhaled in high airborne concentrations. Persons with sensitive airways (e.g., asthmatics) may react to vapors.

Skin Contact Causes skin irritation. May cause an allergic skin irritation. Pre-existing skin conditions may be aggravated by prolonged or repeated contact.

Eye Contact Irritating and may cause redness and pain.

Ingestion May cause discomfort if swallowed.

Overexposure Signs/Symptoms:

Inhalation No specific data.

Skin Contact Adverse symptoms may include the following: Irritation and/or Redness.

Eye Contact Adverse symptoms may include the following: Pain or Irritation. Watering. Redness.

Ingestion No specific data.

Indication of Immediate Medical Attention and/or Special Treatment needed:

Notes to Physician Treat symptomatically. In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be under medical surveillance for up to 48 hours.

Specific Treatments No specific treatment(s).

See also Toxicological Information in Section 11.

SECTION 5: FIRE FIGHTING MEASURES

Extinguishing Media Dry chemicals, water spray, foam or carbon dioxide. Spray containers with water to keep cool and avoid rupture due to pressure buildup.

Unsuitable Media None known.

Specific Hazards Material is not considered a fire hazard but will burn if ignited.

National Fire Protection Association (USA):

Labeling: No data available.

Hazardous Thermal Decomposition Products

Irritating or toxic substances may be emitted upon burning or decomposition. See **Section 10** for additional information.

Special Protective Actions for Fire Fighters

Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.

Special Protective Equipment for Fire Fighters

Fire Fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in a positive pressure mode during the attack phase of firefighting operations. During cleanup, if area is poorly ventilated, SCBA should be used. See **Section 9** for additional information.

SECTION 6: ACCIDENTAL RELEASE MEASURES

Personal Precautions, Protective Equipment and Emergency Procedures

Keep unauthorized persons away. Provide adequate ventilation and avoid breathing vapors. Put on appropriate personal protective equipment (see **Section 8**). If spilled in an enclosed area, ventilate area or use SCBA. Remove potential ignition sources.

Environmental Precautions

Avoid dispersal of material and runoff from contact with soil, waterways, drains and/or sewers.

Methods and Materials for Containment and Cleaning Up (Small or Large Spill)

Stop leak if possible without risk. Move containers from spill area. Absorb spilled material with vermiculite, dry sand or earth and put into containers and dispose of via a licensed waste disposal contractor. Clean spillage area with solvents or plenty of water. Do not allow runoff into sewers or water sources

SECTION 7: HANDLING AND STORAGE

Precautions for Safe Handling/Personal Hygiene

Use appropriate personal protective equipment as per **Section 8**. Keep in the original container or an approved alternative; keep containers tightly closed when not in use. Do not reuse containers.

Keep away from heat, sparks and open flame. Eating, drinking and/or smoking should be prohibited where this material is being used. Workers should remove contaminated clothing/protective equipment and wash hands and face and before entering eating areas and eating, drinking and/or smoking.

Conditions for Safe Storage, including any Incompatibilities

Store in sealed original containers, or approved alternatives, when not in use in a dry, well-ventilated area. Protect containers from direct sunlight in a dry, cool and well ventilated area. Do not allow to freeze or exceed 40°C (~110°F). Do not reuse containers.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

Control Parameters

Occupational Exposure Limits:

<u>CHEMICAL NAME</u>	<u>CAS NUMBER</u>	<u>ACGIH TLV TWA</u>	<u>OSHA PEL TWA</u>
Isophoronediamine	2855-13-2	Not available	Not available
1,3-Benzenedimethanamine	1477-55-0	Not available	Not available
2-methyl-1,5-pentanediamine	15520-10-2	Not available	Not available
Polyoxypropylenediamine	9046-10-0	0.05 mg/m ³ (Dow IHG, SKIN, D-SEN)	Not available
Tetraethylenepentamine	112-57-2	Not available	Not available
4,4'-isopropylidenediphenol	80-05-7	Not available	Not available
Diethylenetriamine	111-40-0	1 ppm	Not available
Methylimidazole, 1-	616-47-7	Not available	Not available

Appropriate Engineering Controls

Good general ventilation should be sufficient to control worker exposure to any airborne contaminants. If working in enclosed spaces, provide additional local ventilation. Eyewash fountains and safety showers are recommended, as well as good laboratory procedures and care.

Exposure controls

Respiratory Protection

If necessary, a properly-fitted vapor mask/respirator (organic vapor respirator) or SCBA should be used.

Hand Protection

Chemical-resistant (impervious) gloves (such as nitrile rubber, PVC, etc. of .35mm thickness or similar) should be worn when handling this material. Contaminated gloves should be disposed of properly.

Body Protection

Chemically resistant long-sleeved shirts and long pants and/or lab coats are recommended. Contaminated clothing should be washed separately from other clothes before reuse. Footwear appropriate for the work being performed should be worn and cleaned carefully if contaminated, before reuse. Heavily soiled clothing or shoes should be disposed of properly.

Eye/Face Protection

Safety eyewear and full-face shields are required.

General

Use good laboratory/workplace procedures. Easy access to eyewash fountains and/or safety showers is recommended.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Physical State:	Liquid	Color:	Clear amber
Odor:	Amine-like	Odor Threshold:	N/A
pH:	N/A	Melting Point:	N/A
Boiling Point:	N/A	Flash Point:	>93°C (~215°F)
Evaporation Rate:	N/A	Vapor Pressure/Density:	<1mm Hg at 20°C Heavier than air.
Relative Density:	1.02	Viscosity:	720 cP at 25°C
Auto-Ignition Temp.:	N/A	Decomposition Temp.	N/A
Solubility:	Slight.	VOC Content:	None

SECTION 10: STABILITY AND REACTIVITY

Reactivity: Exothermic reactions including polymerization may occur in contact with strong acids or bases, alcohols, strong oxidizing agents and excessive heat.

Chemical Stability: This product is stable under normal conditions.

Possibility of Hazardous Reactions: See "Reactivity" above for cautions.

Conditions to Avoid: Avoid excessive heat and ignition sources.

Incompatible Materials: Strong acids, bases, and oxidizing agents.

Hazardous Decomposition Products: Thermal decomposition may produce smoke, oxides of carbon and nitrogen, aldehydes, and other products of incomplete combustion.

SECTION 11: TOXICOLOGICAL INFORMATION

Acute Toxicity

CHEMICAL NAME	LC ₅₀ INHALATION (RAT)	LD ₅₀ ORAL (RAT)	LD ₅₀ DERMAL (RABBIT)
Isophoronediamine	Not available	1,030 mg/kg	Not available
1,3-Benzenedimethanamine	Not available	930 mg/kg	2,000 mg/kg
2-methyl-1,5-pentanediamine	4.9 mg/L/1h	1,690 mg/kg	Not available
Polyoxypropylenediamine	Not available	2,885 mg/kg	2,978 mg/kg
Tetraethylenepentamine	Not available	Not available	Not available
4,4'-isopropylidenediphenol	Not available	>2,000 mg/kg	>2,000 mg/kg
Diethylenetriamine	Not available	1,080 – 2,330 mg/kg	672 – 1,240 mg/kg
Methylimidazole, 1-	Not available	>1,130 mg/kg	>400 mg/kg

Skin Corrosion/Irritation: Skin Irritation-Category 1
Serious Eye Damage/Irritation: Eye Damage-Category 1
Respiratory or Skin Sensitization: Skin Sensitization-Category 1
Mutagenicity: No specific data. **Carcinogenicity:** No specific data.
Reproductive Toxicity: Category 2 **Teratogenicity:** No specific data.
Aspiration Hazard: No specific data.
Specific Target Organ Toxicity (Single and Repeated Exposure): No specific data.
Information on the Likely Routes of Exposure: Eyes, skin, inhalation and ingestion.
Potential Acute Health Effects and Related Symptoms:

See **Section 4.**

Delayed, immediate and chronic effects from short and long term exposure:

Some persons may become sensitized after chronic exposure and may exhibit moderate to severe allergic reactions when exposed.

SECTION 12: ECOLOGICAL INFORMATION

Toxicity:

CHEMICAL NAME	TEST	SPECIES	RESULT
Isophoronediamine	LC ₅₀ (96 hrs) EC ₅₀ (48 hrs) EC ₁₀ (18 hrs)	Fish Daphnia Bacteria	110 mg/L 23 mg/L 1,120 mg/L
1,3-Benzenedimethanamine	LC ₅₀ EC ₁₀	Golden Orfe Bacteria	130 mg/L 90 mg/L
2-methyl-1,5-pentanediamine	LC ₅₀ (48 hrs)	Ide, Silver or Golden Orfe	130 mg/L
Polyoxypropylenediamine	LC ₅₀ (96 hrs) EC ₅₀ (48 hrs) NOEC (3 hrs)	Fish Daphnia Bacteria	772 mg/L 418 mg/L 310 mg/L
Tetraethylenepentamine	N/A	N/A	N/A
4,4'-isopropylidenediphenol	LC ₅₀ (96 hrs) EC ₅₀ (48 hrs) EC ₅₀ (96 hrs)	Fish Daphnia Algae	7.5mg/L 3.9-10.2 mg/L 2.5-3.1 mg/L
Diethylenetriamine	N/A	N/A	N/A
Methylimidazole, 1-	LC ₅₀ (96 hrs)	Golden Orfe	100-200 mg/L

Persistence and Degradability:

CHEMICAL NAME	TEST	PERIOD	RESULT
Isophoronediamine	EU EC C.4-A Biodegradation: Determination of the "Read" Biodegradability: Dissolved Organic Carbon (DOC) Die-Away Test	28 Days	8%
1,3-Benzenedimethanamine	OECD 301B Ready Biodegradability – CO ₂ Evolution Test	21 Days	49%
2-methyl-1,5-pentanediamine	N/A	N/A	N/A
Polyoxypropylenediamine	OECD 301B Ready Biodegradability – CO ₂ Evolution Test	28 days	0%
Tetraethylenepentamine	N/A	N/A	N/A
4,4'-isopropylidenediphenol	EU EC C.4-A Biodegradation: Determination of the "Read" Biodegradability: Dissolved Organic Carbon (DOC) Die-Away Test	28 days	1-2%
Diethylenetriamine	N/A	N/A	N/A

Methylimidazole, 1-	N/A	N/A	N/A
---------------------	-----	-----	-----

Bioaccumulative Potential:

Mobility in Soil (soil/water partition coefficient-K_{oc}): No data is available for any components.

Other Adverse Effects: Other information is not available.

SECTION 13: DISPOSAL CONSIDERATIONS

Dispose of unused contents (incineration) in accordance with national and local regulations. Dispose of container in accordance with national and local regulations. Ensure the use of properly authorized waste management companies, where appropriate. See **Section 8** for recommendations on the use of personal protective equipment.

SECTION 14: TRANSPORTATION INFORMATION

UN No's: DOT/TG: UN2289 IMDG: 2289 ICAO: 2289
DOT/TDG/UN Proper Shipping Name: Isophoronediamine Solution
Hazard Classes: DOT: 8 TDG: 8 IMDG: 8 ICAO: 8 ADR/RID: 8
Hazard Labels: DOT: 98 TDG: 8
Pack Groups: DOT: III IMDG: III AIR: III
Environmental Hazards: **Marine Pollutant:** Yes **Hazardous Substance (USA):** No.

Special Precautions for User: No information is available.

Transporting in Bulk per Annex II of MARPOL73/78 and IBC: No information is available.

Label for Conveyance:



SECTION 15: REGULATORY INFORMATION

International and US Inventory Lists

Canada Inventory (DSL)	All components listed or exempt.	EU-ELINCS	Not listed.*
Canada Inventory (NDSL)	Not listed.*	EU-EINECS	Listed or Exempt
US Toxic Substances Control Act (TSCA)	All components listed or exempt.	REACH, Annex XIV and Annex XVII	None of the components is listed
SARA 313	4,4'-isopropylidenediphenol (CAS 80-05-7)		
Other	Not determined, no additional information is available.		

***Note:** There is no listing on the public inventory, no information is available or the component has not been reviewed.

Substances of Very High Concern: None of the components are listed.

CA Prop 65 Chemicals: 4,4'-isopropylidenediphenol (CAS 80-05-7) is listed.

SECTION 16: OTHER INFORMATION

ABBREVIATIONS:

ACGIH: American Conference of Governmental Industrial Hygienists
ADR/RID: European dangerous goods transport, road and rail, regulations
CAS: Chemical Abstract Service Registry
DOT: Department of Transportation (U.S.)
GHS: Globally Harmonized System of Classification and Labeling of Chemicals
IATA: International Air Transport Association
ICAO: International Civil Aviation Organization
IMDG: International Maritime Dangerous Goods code
OEL: Occupational Exposure Limits
OSHA: Occupational Safety and Health Administration (U.S.)
PEL: Permissible Exposure Limit
RQ: Reportable Quantity
SDS: Safety Data Sheet
STEL: Short Term Exposure Limit (15 minute Time Weighted Average)
TDG: Canadian Transportation of Dangerous Goods Act and Regulations
TPQ: Threshold Planning Quantity
RQ: Reportable Quantity
UN: United Nations
U.S.: United States
N/A: Not available or not applicable.

Revision Date: January 30, 2024
Revision: 0
Reason for Revision: N/A

Notice:

The information contained herein is provided is correct to the best of our knowledge, information and belief at the date of publication. However, Field-Applied Composite Systems LLC makes no representation as to its completeness and accuracy. The information given is designed only as guidance for safe handling, use, processing, storage, transportation, disposal and release. This information is not to be considered a warranty or quality specification. Since the conditions of handling and use are beyond FACS's control, we make no guarantee of results and assume no liability for damages incurred by use of this material. This information relates only to the specific material designated and may not be valid if used in combination with any other materials or in any process not specified in the text. It is the responsibility of the user to comply with all applicable federal, state and local laws and regulations.

END OF SDS