The One Source for All of Your Fluid Flow Systems' Repair and Maintenance Needs...

MATERIAL SAFETY DATA SHEET for Coatings, Resins and Related Materials
NA = Not Applicable NE = Not Established

SECTION I – PRODUCT IDENTIFICATION

Manufacturer:
ENECON Corporation
6 Platinum Court
Medford, NY 11763-2251 U.S.A.

Information Phone: 516-349-0022
Chem-Tel, Inc.: 800-255-3924 (U.S.A.)
813-248-0585 (International)

Product Name: **ENECLAD FPS BASE**
C.A.S. Number: NA-Mixture
Hazard Rating: Health: 2 Fire: 1 Reactivity: 0 Personal Protection: B

SECTION II – HAZARDOUS INGREDIENTS

	CAS Number	%	Exposure Limits	
			ACGIH/TLV	OSHA/PEL
Bisphenol A Diglycidyl Ether Polymer	25068-38-6	30–40	NE	NE
Epoxy Phenol Novolac Resin	28064-14-4	10-20	NE	NE
Aliphatic Diglycidyl Ether	17557-23-2	<10	NE	NE
Titanium Dioxide	13463-67-7	<5	10mg/m3	15mg/m3

SECTION III – PHYSICAL AND CHEMICAL PROPERTIES

Appearance / Odor:	Pigmented/colored liquid / None	Melting Point:	NA
% Volatile:	nil	Boiling Point:	>200°C
Evaporation Rate:	Not Volatile	Specific Gravity:	1.5
Vapor Pressure (mm Hg):	NA	Vapor Density:	NA

SECTION IV – FIRE AND EXPLOSION HAZARD DATA

Flammability Class: 111B	Flash Range: >250°C
LEL: NE	UEL: NE
EXTINGUISHING MEDIA:	Water fog, CO2, dry chemical, foam.
SPECIAL FIREFIGHTING PROCEDURES:	Wear self-contained breathing apparatus with positive pressure.
UNUSUAL FIRE & EXPLOSION HAZARDS:	Combustion products may be toxic.

SECTION V – HEALTH HAZARD DATA

Lethal Dose Information	Oral LD50	Skin LD50	Inhalation LC50
Bisphenol A Diglycidyl Ether	>5000 mg/kg (rats)	>6000 mg/kg (rabbit)	No data
Epoxy Phenol Novolac Resin	>10000 mg/kg (rats)	3000 mg/kg (rabbit)	1.7 mg/l/4 hrs
Aliphatic Diglycidyl Ether	No data	>2000 mg/kg (rat)	No data
Titanium Dioxide	>24g/kg (rats)	> 1g/m3 (rabbits)	>6.82 mg/L (rats)

PERMISSIBLE EXPOSURE LEVEL: See Section II
CARCINOGENICITY: NTP: Not Listed IARC: titanium dioxide 2B OSHA: Not Listed
EFFECTS OF OVEREXPOSURE:
Eyes: Can cause irritation.
(*Continued on next page...*)

Skin: Prolonged or repeated contact can cause irritation, dermatitis and sensitization.
Breathing: Vapors are not likely to pose a problem unless heated.
PRIMARY ROUTES OF EXPOSURE: Skin contact.
MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: Pre-existing skin conditions
FIRST AID:
Eyes: Flush with water for 15 minutes. See Physician.
Skin: Wash with soap and water. Launder contaminated clothing before reuse.
Breathing: Remove to fresh air. If breathing is difficult, give oxygen.
Swallowing: DO NOT induce vomiting. Get medical attention. Single oral dose toxicity is considered to be low.

SECTION VI –REACTIVITY DATA

STABILITY: Stable
HAZARDOUS POLYMERIZATION: Will not occur
CONDITIONS TO AVOID: Contact with strong oxidizers, bases and acids. Uncontrolled reactions with amines and bases.
HAZARDOUS DECOMPOSITION PRODUCTS: May form carbon dioxide, carbon monoxide and phenolic materials as products of incomplete combustion.

SECTION VII –SPILL OR LEAK PROCEDURE

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED:
Soak up with absorbent materials or scrape up. Keep out of sewers or drains. Wear appropriate protective gear.
WASTE DISPOSAL METHOD:
Dispose of in accordance with all Federal, State and local regulations.

SECTION VIII –EXPOSURE CONTROL/PERSONAL PROTECTION

RESPIRATORY PROTECTION: None required at normal temperature and under normal conditions. If applicator experiences respiratory discomfort, use a NIOSH approved organic vapor cartridge respirator.
VENTILATION: Good general ventilation should be sufficient for most use.
PROTECTIVE GLOVES: Impervious rubber gloves.
EYE PROTECTION: Safety glasses or goggles.

SECTION IX –HANDLING AND STORAGE

Store in tightly closed containers. Avoid any contact with skin or eyes.

SECTION X –ADDITIONAL REGULATORY INFORMATION

SARA TITLE III SECTION 313:
Does not contain any chemicals subject to the reporting requirements under Sec. 313 (40CFR372)
TSCA INVENTORY STATUS:
All ingredients are listed on the TSCA Inventory of Chemical Substances.

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Information Phone: 516-349-0022
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813-248-0585 (International)

Product Name: **ENECLAD FPS ACTIVATOR**
C.A.S. Number: NA-Mixture
Hazard Rating: Health: 3 Fire: 1 Reactivity: 1 Personal Protection: G

SECTION II – HAZARDOUS INGREDIENTS

	CAS Number	%	Exposure Limits	
			ACGIH/TLV	OSHA/PEL
Polyoxyalkyleneamine	9046-10-0	60-70	NE	NE
Nonyl Phenol	84852-15-3	30-40	NE	NE
Benzyl Alcohol	100-51-6	>4	NE	NE
Cycloaliphatic Amine	Trade Secret	<7	NE	NE

SECTION III – PHYSICAL AND CHEMICAL PROPERTIES

Appearance / Odor:	Amber liquid / Ammonia odor	Melting Point:	NA
% Volatile:	nil	Boiling Point:	>250°C
Evaporation Rate:	NA	Specific Gravity:	0.96
Vapor Pressure (mm Hg):	NA	Vapor Density:	NA

SECTION IV – FIRE AND EXPLOSION HAZARD DATA

Flammability Class: 111B	Flash Range: >120°C
LEL: NE	UEL: NE
EXTINGUISHING MEDIA:	Water fog, CO2, dry chemical, foam.
SPECIAL FIREFIGHTING PROCEDURES:	Wear self-contained breathing apparatus with positive pressure.
UNUSUAL FIRE & EXPLOSION HAZARDS:	Delayed lung damage after exposure to combustion products.

SECTION V – HEALTH HAZARD DATA

Lethal Dose Information	Oral LD50	Skin LD50	Inhalation LC50
Activator	400<LD50<=2000mg/kg	400<LD50<=2000mg/kg	1<LC50<=5mg/L

PERMISSIBLE EXPOSURE LEVEL: See Section II
CARCINOGENICITY: NTP: Not Listed IARC: Not Listed OSHA: Not Listed
EFFECTS OF OVEREXPOSURE:
Eyes: Contact may cause chemical burn in eye. Vapors may be irritating to eyes.
Skin: Prolonged or repeated contact can cause irritation, dermatitis and sensitization. Can be corrosive to the skin. (*Continued on next page...*)

Breathing: Vapors can be irritating to the respiratory tract.
PRIMARY ROUTES OF EXPOSURE: Skin contact and inhalation.
MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: Pre-existing skin conditions and respiratory disorders.
FIRST AID:
Eyes: Flush with water for 15 minutes. See Physician.
Skin: Wash with soap and water. Launder contaminated clothing before reuse.
Breathing: Remove to fresh air. If breathing is difficult, give oxygen.
Swallowing: DO NOT induce vomiting. Get medical attention.

SECTION VI –REACTIVITY DATA

STABILITY: Stable
HAZARDOUS POLYMERIZATION: Will not occur
CONDITIONS TO AVOID: Contact with strong oxidizers and acids.
HAZARDOUS DECOMPOSITION PRODUCTS: May form carbon dioxide, carbon monoxide. oxides of nitrogen and unidentified organic compounds.

SECTION VII –SPILL OR LEAK PROCEDURE

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED:
Soak up with absorbent materials or scrape up. Keep out of sewers or drains. Wear appropriate protective gear.
WASTE DISPOSAL METHOD:
Dispose of in accordance with all Federal, State and local regulations.

SECTION VIII –EXPOSURE CONTROL/PERSONAL PROTECTION

RESPIRATORY PROTECTION: None required at normal temperature and under normal conditions. If applicator experiences respiratory discomfort, use a NIOSH approved organic vapor cartridge respirator.
VENTILATION: Good general ventilation should be sufficient for most use.
PROTECTIVE GLOVES: Impervious rubber gloves.
EYE PROTECTION: Safety glasses or goggles.

SECTION IX –HANDLING AND STORAGE

Store in tightly closed containers. Avoid any contact with skin or eyes.

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ENECON®

Using ENECLAD® FPS

PLEASE READ THESE INSTRUCTIONS AND MATERIAL SAFETY DATA SHEET (MSDS) CAREFULLY PRIOR TO USE

ENECLAD® FPS is a two component, solvent free, 100% solids, polymer composite used for creating a durable and protective coating on all types of floors and decking. ENECLAD® FPS provides extraordinary protection in many of the most severe industrial environments.

SURFACE PREPARATION

1. Brush loose dirt from the surface to be coated and remove all oil, grease and other contaminants using a solvent which leaves no residue such as acetone, MEK, isopropyl alcohol, etc.

. . . for metal surfaces

2. Thoroughly roughen the area to be repaired by abrasive blasting, insuring that the air used for this operation is free of oil, water or other contaminants.

3. Some metal surfaces which have been in service in salt water or chemical environments normally absorb contaminants which must be removed before proceeding. This can be accomplished by applying heat to the area and/or allowing the component to "leach out" these contaminants.

4. The grit blasting equipment and material should be sufficient to yield a "white metal" surface and a minimum 3 mil anchor profile. As a guide, a sharp, angular #16-#32 grit is recommended.

5. Commence the application of the ENECLAD® FPS immediately upon completion of the surface preparation procedures.

. . for cementitious surfaces

2. Clean and roughen the area of repair by abrasive blasting, steam cleaning, pressure washing or other suitable means.

3. After removing all surface and sub-surface contamination, flush the area thoroughly and allow to dry completely.

4. Apply CHEMCLAD® P4C Primer (see "Priming Concrete Surfaces") and commence the application of ENECLAD® FPS within the specified overcoating times.

PRIMING CONCRETE SURFACES

CHEMCLAD® P4C is a two component, water borne, polymeric "adhesion enhancer" specifically formulated to help seal concrete / cementitious surfaces and insure optimum interface bonding between the surface and the ENECLAD® FPS.

. our the Activator component into the Base container and mix thoroughly until a uniform, streak-free, off-white color is achieved. Apply the mixed CHEMCLAD® P4C to the surface using a brush or roller. Coat the area thoroughly but DO NOT flood or pool the CHEMCLAD® P4C.

After first mixing the Base and Activator components together, the CHEMCLAD® P4C may be thinned using a small amount of water to improve application characteristics. As a guide, the maximum amount of water which may be added is that amount necessary to fill the Base container after the Base and Activator components have been combined. While thinning with water does not increase coverage rate, it will help insure that the optimum coverage rate is achieved for the given surface conditions.

While surface contour, roughness, porosity, etc. can affect coverage rate, as a guide, each kilogram of CHEMCLAD® P4C will cover approximately 70 - 80 square feet (6 - 7 square meters) when applied at the recommended dry film thickness of 3 mils on a relatively smooth, uniform surface.

***Please note:** Should less than a full unit quantity of CHEMCLAD® P4C be required for a particular application, a partial mix can be accomplished by mixing 2 parts Base to 5 parts Activator by volume (2:5, v/v).*

All CHEMCLAD® P4C must be applied and overcoated with ENECLAD® FPS in accordance with the following guidelines:

CHEMCLAD® P4C Technical Data

Theoretical coverage rate per kg. @ 3 mils. 70 - 80 ft² / 6 - 7 m²

Mixing ratio	Base	Activator	
-by volume	2	5	
-by weight	2	5	
Ambient Temperature	Working Life	Minimum Overcoating	Maximum Overcoating
41°F 5°C	120 min	16 hrs	48 hrs
59°F 15°C	75 min	12 hrs	36 hrs
77°F 25°C	60 min	8 hrs	24 hrs
86°F 30°C	50 min	5 hrs	16 hrs

***Please note**: On severely pitted concrete floors / floor areas, the use of the ENECLAD® Self Priming Screed is recommended as an alternative to the CHEMCLAD® P4C.*

MIXING AND APPLICATION

1. Pour the entire contents of the Activator container into the Base container.

2. Mix components thoroughly with a powered mixing device (such as a paint mixer in an electric drill) or other appropriate tool until the material reaches a uniform, streak-free color. Scrape down sides and bottom of container and re-mix.

3. Apply the mixed ENECLAD® FPS to the prepared surface using a brush or roller (foam or adhesive type rollers are

suggested), pressing firmly to insure intimate contact with the prepared surface. Care should be taken to apply a uniform thickness of approximately 12 mils over the area.

Where a non-slip surface is desired, apply two thinner coats of ENECLAD® FPS. After applying the first coat at about 6 – 8 mils, the selected aggregate should be sprinkled on and then back-rolled into the layer. Within the specified overcoating time, apply a second coat at a thickness of about 4 – 6 mils to lock in the aggregate.

***Please note:** Should less than a full unit quantity of ENECLAD® FPS 2000 be required, a partial mix can be accomplished by mixing 2 parts Base to 1 parts Activator by volume (2:1, v/v).*

OVERCOATING

When applying multiple layers of ENECLAD® FPS, the best time to do so is when the previously applied material is just surface tacky. If overcoating is not done within the maximum times specified, the surface must be abraded prior to the application of additional material.

CURING TIME

Since ENECLAD® FPS cures at rates which are temperature dependent, the following table should be used as a guide to cure times:

Working Life & Cure Times

Ambient Temperature		Working Life	Touch Dry	Maximum Overcoat	Full Cure
59°F	15°C	90 min	24 hrs	48 hrs	6 days
77°F	25°C	70 min	16 hrs	24 hrs	4 days
86°F	30°C	55 min	8 hrs	16 hrs	3 days

FOR BEST RESULTS . . .

Please insure that, at time of application,

- *all surfaces are dry*
- *the ambient temperature is above 59°F / 15°C*
- *all surfaces have been thoroughly and properly prepared.*

Technical Data

Volume capacity per kg.	46 in^3 / 750 cc	
Mixed density	0.048 lbs per in^3 / 1.31 gm per cc	
Coverage rate per kg. @ 12 mils / 300 microns	25 ft^2 / 2.3 m^2	
Shelf life	Indefinite	
Volume solids	100%	
Mixing ratio	Base	Activator
By volume	2	1
By weight	3	1

Physical Properties

	Typical Values		Test Method
Compressive strength	11,000 psi	770 kg/cm^2	ASTM C-695
Flexural strength	9,000 psi	630 kg/cm^2	ASTM D-790
Hardness - Shore D	86		ASTM D-2240
Abrasion resistance	35 mg / 1,000 cycles		ASTM D-4060
Shear adhesion - steel	4,100 psi	287 kg/cm^2	ASTM D-1002

Elcometer Adhesion - to properly prepared cementitious surfaces is greater than the cohesive strength of the substrate.

Chemical Resistance

Gasoline	EX	Detergent Solution	EX
Kerosene	EX	Trisodium Phosphate	EX
50% Anti-Freeze	EX	20% Calcium Chloride	EX
Transmission Fluid	EX	10% Hydrochloric Acid	EX
Power Steering Fluid	EX	10% Sulfuric Acid	EX
Motor Oil	EX	10% Sodium Hydroxide	EX

EX - Suitable for most applications including immersion.
G - Suitable for intermittent contact, splashes, etc.

HEALTH & SAFETY

Every effort is made to insure that ENECON® products are as simple and safe to use as possible. Normal industry standards and practices for housekeeping, cleanliness and personal protection should be observed. For further information and guidance, please refer to the detailed MATERIAL SAFETY DATA SHEETS (MSDS) supplied with the material and also available on request.

CLEANING EQUIPMENT

Clean tools, equipment and overspray, while wet, with warm soapy water. Dried residue can be cleaned with solvents such as mineral spirits or alcohol.

TECHNICAL SUPPORT

The ENECON® engineering team is always available to provide technical support and assistance. For guidance on difficult application procedures or for answers to simple questions, call your local ENECON® Fluid Flow Systems Specialist or the ENECON® Engineering Center.

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