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

METHOD STATEMENT

AQUAWRAP™
G03 and G05 FABRIC

- Installation Guide
- SDS Sheet
- Data sheet

AN ISO 9001 : 2015 CERTIFIED SUPPLIER.

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INSTALLATION PROCEDURE FOR PIPING

Aquawrap®

G-03 Fabric – G-05 Fabric – C-2 Carbon Fabric and Bear™ types

READ AND UNDERSTAND ALL SDS's FOR THESE PRODUCTS PRIOR TO HANDLING OR INSTALLING THEM. CHEMICAL GLOVES AND SAFETY GLASSES ARE MANDATORY. A FACTORY AUTHORIZED TRAINING SESSION IS REQUIRED FOR INSTALLATION ON ANY CODE REGULATED PIPING SYSTEM. THE FOLLOWING INSTRUCTIONS SERVE AS AN ADDITION TO TRAINING.

1. This product is not recommended for pipes with leaks or pipes which may develop leaks.
2. Planning is an essential part of a good installation. The elements of a good plan are having a proper wrap design (Note that the calculators we have available will assist in the development of a good wrap design.). The next step is to develop a wrap plan. This should include the number of lifts required and for long wraps segmenting the wrap on the pipe. Note that the number of layers per lift should be limited to 25 for the G-03 fabric 8 for the G-05 and 5 for the C-2 fabric. It is also important to mark the areas on the pipe so that the wrap gets installed in the proper position along the length of the pipe.
3. Major surface contamination buildup should be removed prior to any high quality cleaning. This is often done with water-based pressure washer machinery and high-alkalinity detergent wash.
4. Paint may or may not need to be removed, depending on the type of repair. Generally any paint or coating must be removed. All pipeline tape wraps, bitumen coatings, insulation, etc. must be removed.
5. Abrasive blast to a near white (NACE No.2/SSPC-SP 10) level all surfaces that the composite will contact. This is adequate for most work. Installations requiring structural adhesion, or for isolated patch applications where the patch is held to the work surface by its adhesion, must be white metal blasted (NACE No.1/SSPC-SP 5). Where abrasive blasting is dangerous or impossible, surfaces that the composite will contact should be abraded (scratched up) with the equivalent of an 80-grit abrasive and the metal surfaces should be brought to the equivalent of the appropriate NACE level mentioned above. If abrasive cleaning is not allowed, chemical cleaning of the affected are must be done. In addition, a high strength, high build epoxy should be applied over the worst areas and allowed to cure before the application of the composite reinforcement. (Fig.1 and Fig. 2). For wet or submerged applications high pressure washing may be adequate.
6. For pipes with dents with gouges the gouge must be ground out to remove any residual cracks. Dye pen or mag particle inspection must be used to verify that any residual cracking has been removed. There must be at least 60% wall remaining in the gouge area. The dent should then be filled with structural filler compound per paragraph 8 below.

Fig. 1 – The sandblasting done on this line revealed more damage than was visible during the initial inspection. Proper cleaning is essential to a sound repair.

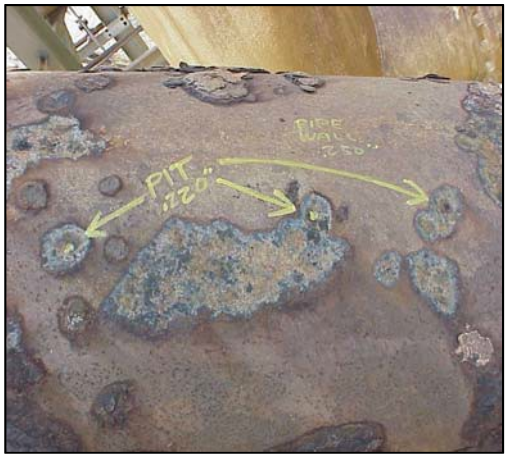


Fig. 2 – Surface preparation as shown is generally unacceptable. In cases where the pipe cannot be properly cleaned, it should be noted that the final ultimate properties of the composite layup may be compromised (such as bonding to the steel surface).

7. Excess dust and residue from the abrading should be blown or wiped away with oil-free compressed air or new, clean solvent wipes. Acetone or hexane are suggested for low temperature applications. Cleaning preparations such as degreasing fluids which may leave a residue should not be used. Special precautions should be observed when cleaning surfaces operating at high temperatures (above 100°F), or for applications where a low flash point solvent is inappropriate. For this type of cleaning, use of Bromothane S solvent is recommended. It is non-flammable and leaves no residue on the surface.
8. All sharp corners, corrosion pits, dents, leak repairing patches and wall/diameter offsets greater than 1/8th-inch (3mm) (1/16th-inch for fluid-tight installations) should be smoothed with a high compressive and high flexural strength filleting and filling compound. The recommended load transfer for structural applications is BIO-FIX 911 or BIO-DUR 563 (Fig. 3 and Fig. 4). For wet concrete BP-4 is recommended. Alternative load transfer materials may be used only for non-structural applications. Most circumferential piping welds and the like require no special filleting or smoothing. Check with a straight edge to confirm the surface is level.

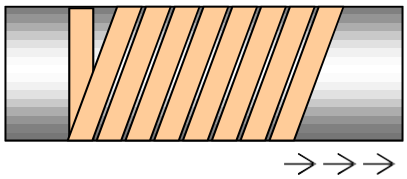
The defect must be completely filled in and the compound must be smoothed and leveled out. Remove high spots and fill any low spots.

Use a straight edge to confirm evenness

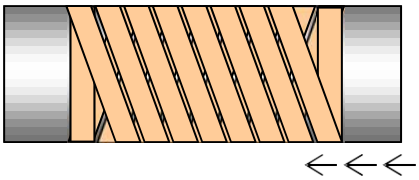
9. After filling and smoothing, wipe the surface again with a clean cloth and a solvent cleaner. Remove any dust or foreign matter from the surface of the pipe in the area of the repair.
10. Plan the wrap. Most applications are best done with spiral wrapping, but some require circumferential wrapping. The appropriate design calculator will assist in the wrap selection process. It is usually best to begin the wrap at one end of the damaged area. In the event that the damaged area is too long to complete the wrap before the resin cures the wrap must be done in sections. It is good practice to mark the areas of the pipe to be wrapped.
11. Apply primer. It is important to select the proper primer for the application you are working on. BP-1 is generally best for dry applications. For wet steel BIO-DUR 563 is recommended. For wet concrete BP-4 is recommended. The preferred method to apply BP-1 is a short nap paint roller. For underwater installations painters' mits are recommended. For most applications it is best to allow the primer to tack off for several minutes but in any case the wrap should be applied before the adhesive is fully cored. Refer to our list of primers for more information, or contact our office for a recommendation.

SPIRAL WRAP: (Note that for underwater installations spiral wrapping is preferred over circumferential wrapping as the longer pieces of fabric are easier to manage as they do not tend to float away from the column.)

a. Open the first Aquawrap® pouch and begin the first layer of the wrap by doing one complete wrap, straight around the pipe.
b. When the first wrap is applied, continue wrapping and start a spiral toward the far end of the area to be wrapped. The wrap should be spiraled down the pipe with no edge to edge overlap. Continue to spiral the material around the pipe without overlapping so that each wrap's bottom or beginning edge just touches top or ending of the preceding one. Continue to wrap until the roll ends or the opposite end of the area to be wrapped is reached. Proceed to pull significant tension on the roll and wrap it around the pipe until the requisite number of layers is applied, thoroughly spraying with water, **EVERY** layer, as it is being wrapped.
c. When the roll has been completely applied, begin another roll starting the new roll's beginning end back about 6 inches onto the end of the previous roll.
d. When the opposite end of the area to be wrapped is reached stop and thoroughly spray the wrapped area with water. At this end of the wrapping area, make one complete straight wrap around and then begin spiraling the fabric the opposite way toward the beginning of the wrapping area. As before, the pitch of the spiral should such that the edge of each layer just touches the preceding layer without overlap. Spray each subsequent layer with water.
e. When the required number of layers has been applied secure the end. (See "SECURING THE WRAP", below.) If there is excess material on the roll which is not needed immediately for another wrap simply continue wrapping it until the roll is finished.



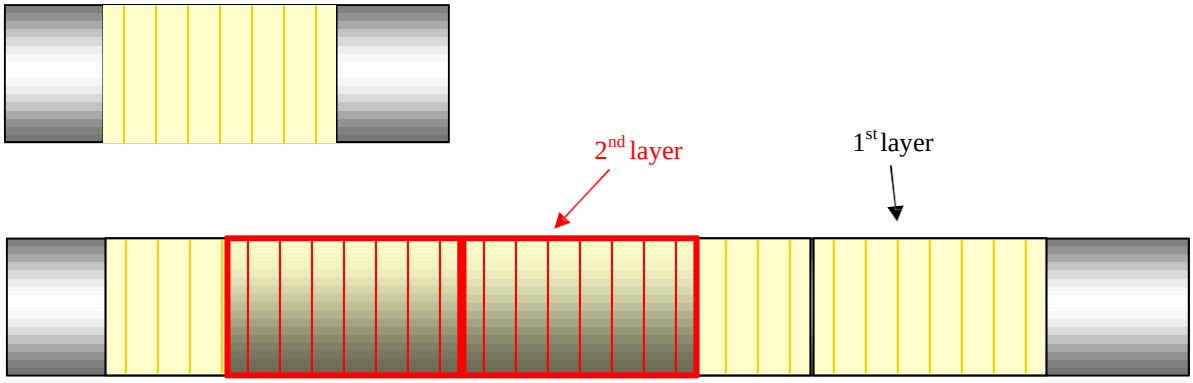
First Wrap



Second Wrap

CIRCUMFERENTIAL WRAP:

a. Begin the first course by applying the required number of layers of fabric to one end of the area to be wrapped. Proceed to pull significant tension on the roll and wrap it around the pipe until the requisite number of layers is applied, thoroughly spraying with water, **EVERY** layer, as it is being wrapped.
b. Lay the second course next adjacent to the first. Adjacent layers should be edge to edge.
c. Continue wrapping until the opposite end of the pipe has been reached.



d. If more than one roll of material is required per course, overlay the first layer or fabric with the second by about 6inches.
e. Secure the entire wrap.
f. Press the end of the roll down onto the pipe surface to be wrapped. An assistant should hold this starting point in tight contact with the pipe at .all times.

Exceptions:

i) When passing around or over obstructions, relax the tension while pressing downwards into the repair surface. Continue on around and do not start pulling tension again until you are certain that you are not pulling the Aquawrap® off of the obstruction. Apply extra layers in these regions.

ii) When transitioning from a large diameter down to a smaller diameter (for example, a concentric reducer) do not pull tension in the area of the transition, or the Aquawrap® will slip off of the larger diameter.

12. While wrapping, tiny droplets of water should be visible squeezing through the weave of the Aquawrap® fabric. If at any time there is a lack of such droplets visible, more activating water should be misted over the Aquawrap® surfaces with any appropriate sprayer.
13. If wrapping is interrupted, and the applied material cures to the “dry to touch” stage, BP-2 Primer should be brushed or rolled onto the dry surfaces before continuing with wrapping.

14. Tack the termination of the final layer of the final roll to the composite structure with Stricture Banding™ or FACS Tiger Tabs™. All high performance repairs should be over-wrapped with Stricture Banding™. Apply the first wrap of Stricture Banding™ smoothly and with only slight tension; subsequent layers should be tightly stretched while wrapping.

Note: For areas of diameter transition (see Exceptions, above) the Stricture Banding™ should be applied first, tightly, only to the large diameter. A very light tension must be used in the actual transition area; followed by a full tension application in the smaller diameter area. Special techniques are available to overcome this situation where warranted. Contact Field-Applied Composite Systems LLC Technical Support for details.

15. Perforate the surfaces of Stricture Banding™ using any suitable pointed object, such as the Perforator Tool, available from F.A.C.S. LLC.
16. When cured to the touch, remove all Stricture Banding™. After the installation is fully dry (about 120 minutes) thumb-nail test), tie-in to existing/adjacent coating on both sides of Aquawrap®. F.A.C.S. LLC can furnish high quality paint for this over-coating. For buried pipeline applications a 2 part epoxy coating or tape coat is sufficient. For water-submerged applications, a special primer and over-coating is required. Standard poly pipe tape may be used for applications below ground, provided there is not a significant amount of ground water.

INSTALLATION CHECKLIST INCLUDING HOLD POINTS
Aquawrap®

Instructions should be carefully read and understood prior to beginning the installation. Also read and understand the SDS sheets for these materials prior to beginning the installation. Proper factory training is required, as the following checklist covers only the basic steps of proper installation. If you have technical questions, please call Field-Applied Composite Systems LLC Technical Support at 626- 633-0294. Chemical gloves and safety glasses are mandatory, along with any other PPE specific to your application environment.

- ☐ Measurements, Temperatures, and Product in line confirmed
- ☐ Proper repair materials confirmed
- ☐ Pipe surface preparation
- ☐ Filler material applied and smoothed
- ☐ Mix primer and apply
- ☐ **Hold** – Allow primer to become tacky. This takes about ten minutes.
- ☐ Wet-out fabric and install onto piping
- ☐ Apply Stricture Banding™
- ☐ **Hold –** composite should cure to “fingernail” hard before proceeding
- ☐ Remove Stricture Banding™ completely
- ☐ Check for voids and unacceptable imperfections
- ☐ Apply PowerCoat™ Paint or other environmentally suitable coating. For under water installations either [illegible] DUR 560 or BP-4 are recommended.
- ☐ Aquawrap® should be allowed to completely cure (up to 7 days at 77°F) before exposure to maximum [illegible] conditions.

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SAFETY DATA SHEET

AquaWrap™ (G01, G03, G05 and G22 BEAR Fabrics-All Colors)

SECTION 1: CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: AquaWrap™ (G01, G03, G05, G22 Fabrics-All Colors)
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: A composite system with a resin and various weights of fiberglass fabric for the repair of pipelines or other structures. Information below, except as noted, relates to the resin component of the product.

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: Warning! Danger!

Hazard Statements and GHS Classifications:

H315, H319	Causes skin and eye irritation.	Category 2
H317	May cause an allergic skin reaction.	Category 1
H334	May cause allergy or asthma symptoms if inhaled.	Category 1
H332	Harmful if inhaled.	Category 4
H335	May cause respiratory irritation.	Category 3
H373	May damage organs through repeated exposure.	Category 2
H351	Suspected of causing cancer (by inhalation).	Category 2

Precautionary Statements:

Prevention:
P260: Do not breathe dust, 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.
P273: Avoid release to the environment.
P280: Wear protective gloves, clothing, and eye/face protection.

Responses:
P302+P352: IF ON SKIN: 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. Get medical attention.
P308+P313: If exposed or 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.

Ingredient	% by WT	CAS #	67/548/EEC	Regulation (EC) 1272/2008 (CLP)
Fiberglass Fabric	>62.5%	65997-17-3	Not classified	Not classified
Pre-polymer based on Polyisocyanate	<26%	67815-87-6	See GHS Classifications above.	
Diphenylmethane- diisocyanate, isomers and homologues	<8%	9016-87-9		
Chopped Fiberglass	<2%	65997-17-3	Not classified	Not classified
Titanium Dioxide	<1.5%	13463-67-7	Not classified	Not classified

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.

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 if symptoms occur. Soiled or soaked clothing or footwear should be soaked with water until material cures and disposed of. Cured material is NOT hazardous.

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. Continue to rinse for at least 15 minutes. Get medical attention.

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. If person is conscious, give small amounts of water unless they feel sick. Get medical attention.

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.

Skin Contact Dust from this product may cause mechanical irritation.

Eye Contact Dust from this product may cause mechanical irritation.

Ingestion Although ingestion is unlikely to occur, it may cause illness or irritation of the mouth, throat and/or gastrointestinal tract.

Overexposure Signs/Symptoms:

Inhalation Respiratory tract irritation, coughing, wheezing, breathing difficulty or asthmatic reaction.

Skin Contact Irritation and/or Redness.

Eye Contact Pain or Irritation. Watering. Redness.

Ingestion No further 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. Contact poison treatment center immediately if large quantities have been ingested or inhaled. 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 High pressure water jet.

Specific Hazards Burning releases oxides of of carbon and nitrogen, isocyanate vapors and traces of hydrogen cyanide. Fiberglass fabric will not burn but may smoke. See also **Section 10.**

National Fire Protection Association (USA):

Labeling: No data available.

Hazardous Thermal Decomposition Products

Irritating or toxic substances may be emitted upon burning or decomposition, as above. 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. Fire water runoff should be contained and not discharged into sewers, drains or the soil. Material will not support combustion.

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.

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.

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, put into containers and dispose of via a licensed waste disposal contractor if material has not cured. If possible, soak materials with water and allow material to cure while lightly covered. Cover any remaining material with wet, absorbent material. Allow to sit about one hour. Transfer absorbent to containers and cover lightly (evolution of CO2). Do not allow runoff into sewers or water sources. Cured material is non-hazardous. Decontamination solution (if required): 8-10% sodium carbonate and 2% liquid soap mixed in water.

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.

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 40^0C (~110^0F). Do not open individual foil packages prematurely as the material will cure due to ambient humidity. Do not reuse containers.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

Control Parameters

Occupational Exposure Limits

Ingredient	CAS#	Exposure Limits (ACGIH-TWA or ACGIH-STEL)
Fiberglass Cloth	65997-17-3	No data available.
Polyisocyanate (based on MDI)	67815-87-6	TWA: 0.05 mg/m^3 (8 hours). IDLH Level: 10 mg/m^3. Mean MDI exposures of less than 0.003 ppm appear to have no chronic or acute effect on pulmonary function.
Diphenylmethane- diisocyanate, isomers and homologues	9016-87-9	STEL: 0.07 mg/m^3 (as NCO, 15 minutes) TWA: 0.05 mg/m^3 (as NCO, 8 hours)
Chopped Fiberglass	65997-17-3	OSHA PEL: 15 mg/m^3 ACGIH-TWA: 5 mg/m^3
Titanium Dioxide	13463-67-7	15 mg/m^3

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 complying with an approved standard or SCBA should be used.

Hand Protection

Chemical-resistant(impervious) gloves (such as nitrile rubber 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 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.

Eye/Face Protection
Safety eyewear and face shields appropriate for the work being performed should be used. Ordinarily, this means a minimum of safety eyewear or splash goggles.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Physical State/Color:	Buff white pre-impregnated fiberglass cloth composite		
Odor:	Slight	**Odor Threshold:**	0.39 ppm
pH	N/A	**Melting/Freezing Points:**	N/A
Boiling Point:	200^{0}C (392^{0}F)	**Flash Point:**	N/A
Evaporation Rate:	N/A	**Vapor Pressure/Density:**	N/A
Relative Density	1.14	**Viscosity:**	N/A
Auto-Ignition Temp.	N/A	**Decomposition Temp.**	N/A
Solubility: Insoluble, material cures when exposed to water, sea water, forming inert solid.			
VOC Content: N/A-none.			

SECTION 10: STABILITY AND REACTIVITY

Reactivity: Exothermic reactions can occur with amines or alcohols. Reacts with water, forming $C0_2$, which risks bursting closed containers.

Chemical Stability: This product is stable under normal conditions.

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

Conditions to Avoid: High temperatures.

Incompatible Materials: Strong amines and alcohols.

Hazardous Decomposition Products: None, when handled properly. Thermal decomposition may produce smoke, oxides of carbon and nitrogen, isocyanate vapors and traces of hydrogen cyanide.

SECTION 11: TOXICOLOGICAL INFORMATION

Acute Toxicity

Product/Ingredient	LC_{50} Inhalation	LD_{50} Oral (Rat)	LD_{50} Dermal (Rabbit)
Fiberglass Fabric	N/A	N/A	N/A
Polyisocyanate	1.5 mg/l*	>2,000mg/kg	>9,400mg/kg
Diphenylmethane-diisocyanate, isomers and homologues	0.31 mg/l (4 hours)*	>10,000 mg/kg	>9,400mg/kg
Chopped Fiberglass	N/A	N/A	N/A
Titanium Dioxide	N/A	10,000 mg/kg	N/A

***Note:** Substance was tested in a particle size distribution different than as offered on the market and in which it can be reasonably expected to be used in this application. A reduced classification for acute inhalation toxicity is therefore appropriate.

Skin Corrosion/Irritation: Skin Irritation-Category 2

Serious Eye Damage/Irritation: Eye Irritation-Category 2

Respiratory or Skin Sensitization: Unlikely to cause skin sensitization. May cause respiratory sensitization.

Mutagenicity: No specific data. **Carcinogenicity:** No specific data.

Reproductive Toxicity: No effects shown. **Teratogenicity:** No effects shown.

Aspiration Hazard: No specific data. **Genotoxicity:** No effects shown.

Specific Target Organ Toxicity (Single Exposure): May cause respiratory irritation.

Specific Target Organ Toxicity (Repeated Exposure): May cause damage to organs.

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 inhalation or skin contact and may exhibit reactions when exposed.

SECTION 12: ECOLOGICAL INFORMATION

Toxicity, Persistence and Degradability: Material is not inherently degradable and hydrolyzes rapidly in water. Material does not meet the criteria of acute aquatic toxicity and has there is no evidence of chronic aquatic toxicity.

Product / Ingredient	LC_{50} 96 Hours (Fish)	EC_{50} 24 Hours (Daphnia)	IC_{50} 96 Hours (Bacteria)
Fiberglass Fabric	N/A	N/A	N/A
Polyisocyanate	>100 mg/l	83 mg/l	N/A
Diphenylmethane-diisocyanate, isomers and homologues	24 mg/l	75 mg/L	N/A
Chopped Fiberglass	N/A	N/A	N/A
Titanium Dioxide	N/A	N/A	N/A

Bioaccumulative Potential: Bioaccumulation is not expected as material hydrolyzes rapidly in water.

Ingredient	$LogP_{ow}$	BCF	Potential
Polyisocyanate	N/A	N/A	N/A
Diphenylmethane- diisocyanate, isomers and homologues	N/A	<14	Low

Mobility in Soil (soil / water partition coefficient-K_{OC}):
Material is not expected to be mobile in soil. Material hydrolyzes rapidly with any exposure to water/humidity and becomes non-hazardous after curing.

Other Adverse Effects: Other information is not available. No ingredients meet the classification criteria as PBT or vPvB.

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: N/A IMDG: N/A ICAO: N/A

DOT/TDG Proper Shipping Name:
LIQUID, CONTAINS ISOCYANATES, N.O.S. Not regulated in shipments of less than 33,750 kg (74,500 lbs.)

Hazard Classes: DOT, TDG, IMDG, IATA and ICAO: Not Regulated.

Hazard Labels: Not regulated in normal shipments.

Pack Groups: Not regulated in normal shipments.

Environmental Hazards: Marine Pollutant: No. **Hazardous Substance (USA):** No.

Transport in Bulk according to Annex II of MARPOL 73/78 and the IBC Code: Not applicable.

Label for Conveyance:

None, in normal shipments.

SECTION 15: REGULATORY INFORMATION

INTERNATIONAL REGULATIONS:

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.		
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.

US State Right to Know Regulations:
Titanium Dioxide is on "right to know" listings of the following states: MA, NJ, PA, RI and CA. Titanium Dioxide is a CA Proposition 65 chemical if airborne and respirable. It is not listed if not airborne and remains bound in a product matrix, as in this application.

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
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.

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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 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

An ISO 9001:2015
Certified Manufacturer

PRODUCT TECHNICAL DATA SHEET

Aquawrap® G-03 & G-05

Highly Conformable Tape and Woven Roving Fabric Constructions

The Aquawrap® -BP-1 is a low cost composite system for use in repair and reinforcement of existing mechanical systems, structures and piping. Furnished factory-impregnated fabric with the proprietary 22-77 resin system and the unique BP-1 urethane primer. It is odorless and solvent-free. Cured Aquawrap® is a very durable, high long-term strength material, impervious to fuels, most chemicals and solvents. It permanently bonds to a wide variety of surfaces such as metals, composites, concrete, plastics and wood. This product meets the requirements of the ASME PCC-2 standard and is certified to ANSI/NSF Standard 61 when the BP-1 primer is used. The Aquawrap® fabric is ready to apply, right out of the bag and cures by way of a chemical reaction with field-applied water. This offers considerable advantages over conventional cloth-resin systems in that there is no resin measuring, mixing, spreading, solvents, or dripping polymer mess.

PRODUCT PROPERTIES			
Working Time:	30-40 min. at 25°C (77°F)	**Mix Ratio:**	No mixing required
Application Temps:	4-93°C (40-200°F)	**Service Temps:**	-50 - 121°C (-60 - 250°F)
Cure Time (dry to touch)**:**	30-60 minutes at 25°C (77°F)	**Full Cure:**	1 day at 25°C (77°F)
Usual Packaging:	Pre-Packaged Rolls	**Shelf Life:**	6 months G-03, 1 year G-05
Chemical Resistance:	MEK, oil, toluene, gasoline, ethyl alcohol and many others	**Nominal Hardness:**	85-95 Shore D - ASTM D-2240

COMPOSITE PROPERTIES		
TEST	G-03 FABRIC	G-05 FABRIC
Tensile Strength (warp direction). psi	39,808	45,400
Tensile Strength (fill direction), psi	19904	45,400
Tensile Modulus (warp direction), msi	3.2	2.28
Tensile Modulus (fill direction), msi	1.6	2.28
Tensile load per ply (warp direction), pounds per inch of width	575	1299
Tensile load per ply (fill direction), pounds per inch of width	288	1299
Thickness, mils	147	28.5
HDT, ^{O}F	325	325
CTE, in/in ^{O}F	5.5 e^{-6}	8.2 e^{-6}
Maximum operating temperature when used with BP-1 primer, ^{O}F	265	265
Bond strength to steel when used with BP-1 primer, psi	1360	989

ATTENTION: All of the preceding data are based on laboratory conditions, at room temperature. Field conditions can radically change the characteristics of this product. Higher temperatures may lessen the working life of the product. Allow adequate time for application. Field testing is strongly recommended prior to application.

Design and Application Instructions

Design guidelines, application notes and wrap calculations for various applications are available from the factory.

Storage

Store at 60-90° F in a dry place. Do not allow the product to freeze prior to installation and cure. Dispose of any leftover material.

Handling

Aquawrap® is shipped in a sealed protective bag to protect it from atmospheric moisture. Because it cures with the application of water (and air humidity), care must be taken in handling the sealed bags to prevent puncturing or scuffing, which would cause the product to cure in the bag. Once the bag is opened and the Aquawrap® is exposed to the humidity in the air, it will begin to cure and will gel within about 60 minutes. Therefore, work must be well planned prior to opening the bag. Aquawrap® requires no other special handling or application procedures. This resin is slightly irritating to certain sensitive people; it will give off a small amount of carbon dioxide vapor while curing; and the cured resin is permanent and very difficult to remove, so gloves, safety glasses and other personnel protection equipment appropriate for the task must be used.

Shelf Life

G-03 6 months from date of sale 1 year G-05, in an unopened package, stored in cool warehouse conditions.

Caution – Read SDS prior to use. Some persons may be irritated by this product. Use caution and PPE. This product is for industrial use by professionally trained personnel only. Please read and understand all application instructions prior to using.

Warranty

The manufacturer warrants that the goods delivered hereunder shall be free from defects in material and workmanship. The WARRANTY shall extend for a period of six months after date of delivery of such goods to customer. This warranty is void in the event that the protective pouch has been damaged. THE MANUFACTURER MAKES NO WARRANTY EXPRESS, IMPLIED, (INCLUDING BUT NOT LIMITED TO WARRANTIES OF MERCHANTABILITY AND FITNESS FOR INTENDED PURPOSE), OR STATUTORY, OTHER THAN THE FOREGOING EXPRESS WARRANTY. Failure of customer to submit any claim hereunder within the Warranty Period after receipt of such goods shall be an admission by customer and conclusive proof that such articles are in every respect as warranted and shall release the manufacturer from any and all claims for damage or loss sustained by customer. In the event customer submits a claim for defective material within the required Warranty Period, the parties agree that customer's sole and exclusive remedy shall be the replacement of such defective goods or a refund of the price of the defective goods. To the greatest extent practical defective goods shall be returned to the manufacturer for analysis. IN NO EVENT SHALL THE MANUFACTURER BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES OR SPECIAL, INDIRECT OR INCIDENTAL DAMAGES ARISING OUT OF, OR AS THE RESULT OF, THE SALE, DELIVERY, NON-DELIVERY, LOSS OF USE OF GOODS OR ANY PART THEREOF, EVEN THOUGH THE MANUFACTURER HAS BEEN NEGLIGENT OR HAS BEEN INFORMED OF CIRCUMSTANCES WHICH MIGHT GIVE RISE TO SUCH DAMAGES.

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