

HydraTech High-Temperature HydraWrap®

Structural Composite Repair System for High-Temperature Applications

Issue 10.14

The HydraWrap system is a performance driven product that provides a chemical and corrosion resistant structural repair. The HydraWrap system is backed by our engineering staff that services each application with assessment and technical support. It offers a low cost, long term solution to the most challenging demands of the industry.

PRODUCT DESCRIPTION

- HydraWrap is Carbon Fiber Reinforced Polymer (CFRP) repair system engineered to restore or enhance the structural integrity of pipe and infrastructure.
- Each HydraWrap product is a uniquely designed high performance system that consists of a 100% solids high build epoxy Primer, a 100% solids epoxy Wet-Out resin, and carbon fiber fabric.
- The Primer provides excellent adhesion to a variety of substrates while allowing a sag free application at high film builds.
- The Wet-Out resin is designed to thoroughly wet out the fiber forming a composite matrix with a very high tensile and flexural properties.
- The High-Temperature HydraWrap System is designed to provide a structural repair that will withstand elevated temperatures with minimal post-cure.

Advantages

- High Temperature resistance with minimal post-cure
- Chemical and Corrosion Resistant Structural Repair
- High Tensile / Flexural Modulus and Strength
- 100% Solvent-Free, Zero V.O.C.
- Restores Maximum Allowable Operating Pressure (MAOP)
- Installed by fully trained application specialists
- Full contract support services available

PHYSICAL PROPERTIES

	<u>Primer</u>	<u>Wet-Out</u>
Color	Steel Red	Clear
Working Life – 200°F (93°C)	60 minutes	60 minutes
Dry Times – 68°F (20°C)	>24 Hours	>24 Hours
% Vol Solids (ASTM 2369)	100	100
Shore D Hardness (ASTM D2240)	75	80
Mix Ratio	Pre-measured 1:1	
Flash Point	> 200°F (93°C)	
Storage Life	Twelve months when stored in original sealed containers, between 50-77°F (10-25°C)	

PERFORMANCE DATA

CHEMICAL RESISTANCE ASTM D543 (30 day immersion)

Water	No effect
Sodium Hydroxide 5%	No effect
Ammonium Hydroxide 5%	No effect
Sodium Hypochlorite (bleach)	No effect
Ferric Chloride 1%	No effect
Sulfuric Acid 20%	No effect
Nitric Acid 1%	No effect
Detergent Solution	No effect
Gasoline	No effect
Toluene	No effect

ADHESION ASTM D4541 (psi)

Cold Rolled Steel	>2,000
Hot Rolled Steel	>2,000
Cast Iron	>2,000
304 Stainless Steel	>2,000
316 Stainless Steel	>2,000
Concrete	Concrete Failure

(Testing reflects results after 24 hour cure)

Composite System
(two ply bidirectional)

Tensile Strength

ASTM D3039 (ksi)

	Hoop 200C	Hoop 300C	Axial 300C
Tensile Strength ASTM D3039 (ksi)	41.08	88.3	13.79
Tensile Modulus ASTM D3039 (msi)	4.48	8.44	2.32
% Elongation ASTM D3039	0.95	1.03	0.68
Flexural Strength ASTM D790 (ksi)	64.4	106	19
Flexural Modulus ASTM D-790 (msi)	3.16	4.18	0.98
CTE ASTM E831 (x10-6/°F)		16.8	
Maximum Operating Temperature (°F) Continuous / Intermittent	350 / 400		

Tensile Modulus

ASTM D3039 (msi)

% Elongation

ASTM D3039

Flexural Strength

ASTM D790 (ksi)

Flexural Modulus

ASTM D-790 (msi)

CTE

ASTM E831 (x10-6/°F)

Maximum Operating

Temperature (°F)

Continuous / Intermittent

Conforms to DOT regulations • PCC-2 Art 4.1,
4.2 ASME B31.1•3•4•8 • API 570 • ISO15649
ISO13623 • ACI 440.2R08

For details regarding the testing associated with the provided data refer to the HydraWrap Testing and Design Sheet.

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APPLICATION RECOMMENDATIONS

Minimum Application Temp	40°F (4.4°C)
Maximum Relative Humidity	85%
Substrate Temperature	5°F (3°C) above dew point
Thinning	Do not thin
Cleaning Fluid	Universal Equipment Cleaner

To aid application at low temperatures, both components should be warmed to 60-68°F (15.5-20°C) prior to mixing.

SUBSTRATE PREPARATION

Substrate preparation dictates the adhesion performance of any coatings system. A properly prepped surface will ensure maximum life and performance of the system.

Concrete:	NACE No.6*	/	SSPC-SP 13*
Steel:	NACE No.2*	/	SSPC-SP 10*
	NACE No.3	/	SSPC-SP 6
	NACE No.5	/	SSPC-SP 12

*indicates recommended method

NOTE

The HydraTech High Temperature HydraWrap System is intended for short-term repairs in critical applications and some long-term applications. The High Temperature HydraWrap system is not intended for applications with exposure to strong acids, organic acids, strong solvents (MEK, Acetone, Alcohol) or temperatures exceeding 350°F. To be applied by certified personnel only. See MSDS for safety information.

INSTALLATION PROCEDURE

- Prep substrate according to NACE / SSPC spec.
- Measure fabric around pipe to ensure proper length.
- Mechanically mix together both primer components until uniform.
- Apply primer to prepared substrate via brush or spreader.
- Mix both Wet-Out components for two minutes.
- Apply Wet-Out to fabric via spreader or impregnator ensuring complete wet out of fabric.
- Apply saturated fabric to wet primer ensuring a consistent, smooth wrap free of voids.
- System must be post-cured @ 350°F for 2 hours minimum, for best results a total of 6 hours.
- If exposed to sunlight, top coat the wrap with a light stable top coat.

For details regarding application refer to the HydraWrap Installation Procedure

COVERAGE

	UNIT SIZE	COVERAGE
PRIMER	Pt	4.5 sqft
	Qt	9 sqft
	Hg	23.5 sqft
WET-OUT	Pt	4 sqft of fabric
	Qt	8 sqft of fabric

Primer coverage based on 32mil film build.

Wet-Out coverage based on 99.36gg/sqft of 300C fabric.

ORDER INFORMATION

Part No. for standard kits consist of: **System Code – Pipe Size – Pipe Style**

ex. **SH-12-W** (Standard HydraWrap for 12" Weld Repair)

SYSTEM CODE	PIPE SIZE		PIPE STYLE
SH = Standard	2 = will wrap up to one 2" pipe	14 = will wrap up to one 14" pipe	W = Weld
A = Acid	4 = will wrap up to one 4" pipe	16 = will wrap up to one 16" pipe	E = Elbow
M = Mid-Temperature	6 = will wrap up to one 6" pipe	20 = will wrap up to one 20" pipe	T = Tee
H = High Temperature	10 = will wrap up to one 10" pipe	22 = will wrap up to one 22" pipe	SS = Spiral
SS = SubSea	12 = will wrap up to one 12" pipe	24 = will wrap up to one 24" pipe	U = Universal

*** **NOTE:** Custom kits are available to accommodate nearly any installation. ***

Add an **M** for the Marine Kit Option. Marine Kits includes tools for mixing and applying the HydraWrap System. ex. SH-12-W-M

