CFFS LEVEL-HARD™ EPOXY HYBRID

Product Description

CFFS Level-Hard is a two-component, 100% solids, VOC Compliant, Epoxy Hybrid that was developed for use as a high build primer, basecoat for broadcasting and/or clear topcoat. This coating has exceptional abrasion and chemical resistance and performs well in a wide variety of applications. Level-Hard exhibits superior self leveling characteristics that maximize the hiding power of the coating.

Product Features

- Displays excellent adhesion characteristics to a variety of substrates / coatings.
- Long pot life increases the workability of the coating, providing consistent aggregate broadcasts.
- Can be spray or roll applied at temperatures ranging from 50-100ºF.
- Will provide a glossy smooth finish when cured.
- 100% solids coating displays excellent chemical and abrasion resistance.
- Emits virtually no odors and can be applied indoors with minimal disturbance to surrounding activities.
- Versatile, crystal clear topcoat for use on both horizontal and vertical applications.
- High build primer/ basecoat allows for two-coat broadcast flooring systems.
- Easy to mix 2:1 ratio.

Primary Applications

- High build basecoat
- High gloss top coat
- Aircraft hangar floors
- Maintenance facilities
- Offshore platforms
- Industrial shop floors
- Commercial Kitchens
- Breweries
- High heat environments
- Wastewater treatment applications
- Bar, Table and Countertop sealer

Product is sold CLEAR.

Typical Physical Properties

Tensile Strength	ASTM C307	2500
Compressive Strength (psi Mpa)	ASTM D579	12,500
*W/ Quartz		14,600
*W/ Chip		13,100
Flexural Strength (psi)	ASTM C580	4,000
Hardness, Shore D	ASTM D2240	>80
Abrasive Resistance	ASTM C501	<40 mg
Tabor Abrasion mg loss	ASTM D4060	30
Thermal Coefficient of Linear Expansion	ASTM D696	20 x 10-6 in/in/°F
Viscosity B side 75ºC	CPS 600-900	
Viscosity A side 75ºC	CPS 400-700	
Gloss	ASTMD-523	91+
Resistance to Elevated Temp.	MIL-3134f	No slip, flow, or softening

Typical Processing Properties

2:1 Ratio
Relativity Humidity-72ºF-54%

Surface dry-8-12 hours
Hard dry-8-12 hours
Mar free-14-16 hours
Foot Traffic-24 hours

Coverage: 1,600 square feet, per gallon, per mil.

Recommended Coverage

Base Over Concrete	**100-250 sf/gal**	**@9.1 mils DFT**
Topcoat Over Quartz	**80-120 sf/gal**	**@16.0 mils DFT**
Topcoat Over Chip	**100-150 sf/gal**	**@12.8 mils DFT**

VOC compliant in all 50 states and Canada

Adhesion Results

ASTM D-4541 Elcometer

Concrete-no primer	concrete failure	>400psi
Concrete-primer	concrete failure	>550psi
Steel-epoxy primer	primer failure	>2000psi
Wood-no primer	wood failure/shear	>400psi

Surface Preparation

Concrete

Old concrete - Sandblasting, shot blasting, diamond grinder w/30 grit or coarser, or water blasting is highly recommended to remove surface contaminants. Any oils or fats must be removed prior to product application. Acid etching may be required (followed by a thorough rinsing) to open the pores of the concrete to accept a primer. Do not apply to wet substrates. Chloride, moisture and pH levels should be checked prior to application.

New Concrete – The concrete should be allowed to cure for a minimum of 30 days unless using CFFS Ultra-Hydro Stop Primer™. Shot blasting, sand blasting, diamond grinder w/30 grit or coarser or acid etching is required to remove the surface laitance that appeared during the curing process. Sealers, Silicates, and failed coatings must be removed via mechanical abrasion. A primer can be used to reduce out gassing and promote adhesion.

Aluminum, Galvanized Steel, Non-Ferrous Metals

All metals must be prepared to a near white surface that is equivalent to SSPC 10 or NACE 2. For immersion service, a 3 mil blast profile is recommended. A 2 mil profile is generally accepted. Contact CFFS for primer recommendations.

Fiberglass

The gel coat must be abraded to allow a mechanical bond of the coating. Sanding using 40-60 grit sandpaper is generally acceptable. Remove all latent dust and clean the surface to be coated using a solvent such as acetone. No primer is necessary prior to applying CFFS Level-Hard.

Wood

Sand entire surface to remove any burs or rough spots that may affect the finish of the coatings. Make sure all nail/screw holes and joints are detailed using either RSP Fast Patch or CFFS Fortification Formula prior to coating. Cotton mesh may be used to help bridge joints in moving substrates. In this case it will be embedded in PR-511 while still tacky. Pre-coating primer can be either CFFS Polyurea-350 or CFFS Level-Hard depending on the desired finish.

Substrate Repairs

All spalls and cracks should be chased out and repaired to ICRI standards using CFFS-Fortification Formula. Expansion joints should be honored. Horizontal saw-cut control joints can be filled with CFFS Polyflex-93. Custom coloring of repair materials is available upon request. Contact CFFS for available colors and finishes.

Primer Requirements

Please consult your product supplier for job specific recommendations. In most cases the acceptable primers will be CFFS Polyurea-350, CFFS RG-50, or CFFS Level-Hard. Do not install Level-Hard over PR-511 Primer.

Installation Recommendations

CFFS Level-Hard adheres well to several sound substrates and coatings including but not limited to; concrete, steel, fiberglass, wood, epoxy, and polyureas. All surfaces should be free of loose particles, rust, voids, and spalls. It is recommended that this product be applied in a multi-directional (north, south, east and west) motion to help ensure proper coating thickness.

Application Information

Mixing

Material should be pre-conditioned to a minimum of 50°F (10°C) prior to use. Thoroughly mix both the A and B side components using separate paddle mixers and a drill for a minimum of 2 minutes to place the solids content evenly in suspension. This should be done prior to every use before combining the two components. Following the mix ratio of 2A:1B, combine the two components in a calibrated mixing container and blend together with a paddle style mixer and drill for at least 1 minute. Always transfer the mixed material to another clean container and blend for an additional 1 minute prior to use. CFFS recommends a maximum batch size of 1-2 gallons, however larger quantities can be mixed depending on the scope of the project. Never mix more material than can be placed and finished in 20-25 minutes.

Roller

Use only phenolic core, solvent resistant, natural or synthetic fiber roller covers. ¼" to 3/8" nap are acceptable, thicker nap may cause bubbling of the coating. A spiked roller can be used to release any entrapped air in the coating if required.

Brush

Inexpensive natural fiber chip brushes are suggested – 2" to 4" width depending on the application. These will be one-time use items.

Spray or Squeegee Application

Contact a CFFS representative for recommendations.

Thinner

CFFS Level-Hard should NOT be thinned using any type of solvent. Use alternate coatings if a thinner material is required.

Clean Up

Use Acetone or before product cures.

Application Conditions

Temperature
50°F - 100°F (10°C - 38°C)
Colder temperature applications should not be attempted with this material. It is possible to condition the environment to allow for application via heaters and enclosures.

Shelf Life and Storage
Twelve months in factory delivered unopened drums and buckets. Keep away from extreme heat, cold and moisture. Maintain at a proper storage temperature of 60-90° F. Keep out of direct sunlight and away from fire hazards.

Repairs and Maintenance
Small repairs to cuts in the coating can be made with CFFS RG-80, PG-100, or Level-Hard. This material can be caulked or brushed on the surface after scuffing. Re-application of the product after 12 hours of initial application requires the use of a primer and/or sanding and solvent wiping to achieve optimum adhesion. Contact CFFS for site specific recommendations.

Safety and Handling
See MSDS sheets

Packaging
Available in 4.5 gallon kits (3A, 1.5B) and 55 gallon drums.

Compatible Coatings

Primers

CFFS Ultra-Hydro Stop	(Epoxy MVT Primer)
CFFS Polyurea-350	(Polyurea)
CFFS RG-50	(Aliphatic Polyaspartic Polyurea)
CFFS Level-Hard	(Epoxy Hybrid)

Intermediates

CFFS RG-50	(Aliphatic Polyaspartic Polyurea)
CFFS RG-80	(Aliphatic Polyaspartic Polyurea)
CFFS PG-100	(Aliphatic Polyaspartic Polyurea)
CFFS Polyurea-350	(Polyurea)
CFFS Level-Hard	(Epoxy Hybrid)

Clear Finish Topcoats

CFFS RG-50	(Aliphatic Polyaspartic Polyurea)
CFFS RG-80	(Aliphatic Polyaspartic Polyurea)
CFFS PG-100	(Aliphatic Polyaspartic Polyurea)
CFFS Poly-One	(Single Component Aliphatic Polyurea)

Accelerator
No additional catalyst is required or available to reduce cure time.

Recommended Systems

Ferrous Metals

CFFS Primer (contact CFFS)	2.0-4.0 mils DFT
CFFS Level-Hard	6.4-16.0 mils DFT
Optional:	
Decorative Media Broadcast	10.0-15.0 mils DFT
CFFS RG-80	6.4-12.8 mils DFT
Total System Thickness	24.8-47.8 mils DFT

Concrete

CFFS Level-Hard	6.4-16.0 mils DFT
Optional:	
Decorative Media Broadcast	10.0-15.0 mils DFT
CFFS RG-80	6.4-12.8 mils DFT
Total System Thickness	22.8-43.8 mils DFT

CFFS Level-Hard	6.4-16.0 mils DFT
CFFS Poly-One	2.7-5.2 mils DFT
Total System Thickness	9.1-21.2 mils DFT

CFFS Level-Hard	6.4-16.0 mils DFT
CFFS RG-80	3.2-5.2 mils DFT
Total System Thickness	9.6-21.2 mils DFT

CFFS Level-Hard	6.4-16.0 mils DFT
CFFS PG-100	4.6-16.0 mils DFT
Total System Thickness	11.0-32.0 mils DFT

Wood

CFFS Level-Hard	6.4-16.0 mils DFT
Optional:	
Decorative Media Broadcast	10.0-15.0 mils DFT
CFFS RG-80	6.4-12.8 mils DFT
Total System Thickness	22.8-43.8 mils DFT

CFFS Level-Hard	6.4-16.0 mils DFT
CFFS RG-80	3.2-5.2 mils DFT
CFFS RG-80	3.2-5.2 mils DFT
Total System Thickness	12.8-26.4 mils DFT

Fiberglass

CFFS Level-Hard	6.4-16.0 mils DFT
CFFS RG-80	3.2-5.2 mils DFT
Total System Thickness	9.6-21.2 mils DFT

***Multiple other systems available upon request.**

Chemical Resistance

Chemical	Result (25°C)
Acetic Acid 100%	C
Acetone	C
Ammonium Hydroxide 50%	RC
Benzene	RC
Brine saturated H2O	R
Chlorinated H2O	R
Clorox(10%) H2O	R
Diesel fuel	R
Gasoline	RC
Gasoline/5% MTBE	R
Gasoline/5% Methanol	RC
Hydrochloric Acid 20%	R
Hydrofluoric Acid 10%	NR
Hydraulic fluid (oil)	RC
Isopropyl Alcohol	R
Lactic Acid	RC
MEK	RC
Methanol	R
Methylene Chloride	C
Mineral Spirits	RC
Motor Oil	R
MTBE	C
Muriatic Acid 10%	R
NaCl/H2O 10%	R
Nitric Acid 20%	NR
Phosphoric Acid 10%	R
Phosphoric Acid 50%	NR
Potassium Hydroxide 10%	R
Potassium Hydroxide 20%	R, Dis
Propylene Carbonate	RC
Skydrol	C
Sodium Hydroxide 25%	R
Sodium Hydroxide 50%	R, Dis
Sodium Hypchlorite 10%	R
Sodium Bicarbonate	R
Stearic Acid	R
Sugar/H2O	R
Sulfuric Acid 10%	R
Sulfuric Acid >50%	RC
Toluene	R
1, 1,1-Trichlorethane	C
Trisodium Phosphate	R
Vinegar/H2O 5%	R
H2O	R
H2O 14 days at 82° C	R
Xylene	R

Chemical Resistance: Chart Key

R=recommended/little or no visible damage
RC=recommended conditional/some effect, swelling or discoloration
C=Conditional/Cracking-wash within one hour of spillage to avoid affects
NR=Not recommended
Dis=discolorative

LEED Credits

Most CFFS products contribute to LEED Credits. See our LEED Credit Bulletin for more information.

Coverage Calculations

General Coating Thickness (@100% Solids)	Sq.Ft/gal
1 mils	1600
5 mils	320
10 mils	160

Certifications

VOC Compliant in all 50 states, Canada, Australia and Various Countries in Europe (National Standards – IMC)
USDA and FDA certified food safe for incidental food contact.

Safety Precautions

DANGER!! Vapor and Atomized liquids are harmful. Overexposure may cause lung damage, allergic skin reactions, or respiratory reactions. Effects may be permanent, may affect the brain or nervous system causing dizziness, headaches, or nausea. Use only in well ventilated areas, wear approved respirators when necessary. Keep out of reach of children. See MSDS for First Aid recommendations.

Shipping Information

Flash Point:	130°C (266°F)
Weight/Gallon:	10.2 ±1.0 lbs.
DOT HAZARD CLASS	8
DOT PACKAGING GROUP	II
DOT LABEL	Corrosive (Part B)
DOT SHIPPING NAME	Amine, Liquid, Corrosive
UN / NA NUMBER	2735

Warranty

The technical data and any other printed information furnished by CFFS are true and accurate to the best of our knowledge. CFFS Level-Hard™ conforms to in house quality control procedures and should be considered free of defects. The data provided is believed to be reliable and is offered solely for evaluation. The use of this product is beyond the control of the seller, therefore the buyer assumes all risks of use and handling whether done in a matter that is in accordance with the provided posted directions or not. CFFS makes no warranty; expressed or implied, of its products and shall not be liable for indirect or consequential damage in any event.