



# HYBRID COATING TECHNOLOGIES

ZERO ISOCYANATES

## GREEN POLYURETHANE™


The first hybrid polyurethane coatings, foam and adhesives that eliminate the use of all toxic isocyanates and VOCs from the entire production process

- Replaces 2-3 coat epoxy + urethane system with 1 coat
- Zero isocyanates, ~Zero VOC, 100% solids, minimal odor
- Superior wear resistance, adhesion & chemical resistance
- Cost competitive with application cost savings of 30-60%
- Superior gloss & color retention, self-priming – achieve any thickness in 1 coat (up to 3mm)
- Patent protected



[HYBRIDCOATINGTECH.COM](http://HYBRIDCOATINGTECH.COM)





"The product was easy to apply. The finish was exactly what we wanted and completed with one coat."

- C. Rinker, Easy Coat LLC

"This product was effortless to use and had excellent body - not too thick and not too thin. Its self-leveling viscosity allowed it to cover tiny voids and obstructions, even on uneven surfaces. We couldn't smell anything while applying, including in closed spaces, and didn't use any solvents to clean. It's by far one of the easiest and cleanest products we've worked with."

- RP Coatings

"After 30 years in the construction industry as an applicator, this is the best coating product that I've ever used. The adhesion, durability, ease of application, lack of nauseating and offensive odor, combined with its cost effectiveness and decorative finished look, will undoubtedly make it a leader in the industry."

- Leon Zigelman, President, EFM Paint Products

"I think the floor I did was great. It applied very easily following protocol. Even walking on it in stocking feet to remove the masking tape the following day I was surprised at how hard it was - just like the surface of the samples I was given. With the "0" VOCs it was real nice to work with."

- Patina Concrete

Green Polyurethane™ is eligible for the following credits (partial list):

- USGBC LEED for Schools, 2009
- USGBC LEED Version 4, BD&C, ID&C, 2013
- Collaborative for High Performance Schools (CHPS), National Core Criteria, 2013
- ANSI/GBI 01-2010, Green Building Assessment Protocol



## HYBRID COATING TECHNOLOGIES (HCT)

Hybrid Coating Technologies (HCTI-OTC BB) is a San Francisco-based innovator focused on improving the quality and safety of coatings, foam and adhesives.

We are the exclusive licensee of Green Polyurethane™ – the world's first-ever hybrid polyurethane products that eliminate VOCs and toxic isocyanates from the entire production process. Green Polyurethane™ is licensed by Nanotech Industries, Inc. and was developed by the distinguished scientific institute, Polymate, Ltd. - INRC.

### THE PROBLEM OF CONVENTIONAL COATINGS/PAINT AND TOXIC ISOCYANATES

Conventional polyurethane (PU) coatings and paint have many disadvantages: they are porous, permeable and maintain poor hydrolytic stability. This makes the material highly vulnerable to environmental degradation and ultimately leads to their chemical decomposition, especially when in contact with water. Even worse, the manufacture of conventional polyurethanes involves highly toxic components such as VOCs and isocyanates, which can cause irritation of skin and mucous membranes, chest tightness, difficult breathing, upset stomach, fevers and prolonged exposure has been known to cause severe asthma and even death. Furthermore, strict and costly health & safety measures have to be implemented in the manufacture and application of conventional polyurethane due to the toxicity of isocyanates. This is why regulatory bodies around the world are now looking toward phasing out the use of isocyanates.

For more information on the dangers of isocyanates, go to [www.hybridcoatingtech.com/isocyanates](http://www.hybridcoatingtech.com/isocyanates)

### THE GREEN POLYURETHANE™ SOLUTION

Green Polyurethane™ (also referred to as "HNIPU" - hybrid non-isocyanate polyurethane) is a patented "hybrid" material, which combines the high chemical resistance properties of epoxy and advanced durability and wear resistance properties of polyurethane, making it the perfect solution for protecting high traffic and corrosive surface areas, especially those with higher safety and sanitary application requirements. One coat of Green Polyurethane™ can replace 2-3 coats of an epoxy + urethane system, providing a welcome cost-saving substitute to currently used multi-layered flooring applications. Green Polyurethane™ also provides the best solution to the environmental and health hazards associated with VOCs and isocyanates in polyurethane.

Its zero isocyanate, zero VOC safety features, allow it to be applied without the interruption of business due to public exposure, creating 30-60% savings on application costs for customers.



## SAMPLE COATING COVERAGE/THICKNESS

- **Flooring:** 10 – 120 mils of thickness will provide coverage of 160 – 14 ft<sup>2</sup> per 1 gallon  
(Metric: 0.25 – 3 mm of thickness will provide coverage of 3.3 – 0.3 m<sup>2</sup> per 1 liter)
- **Paint:** 2 – 10 mils of thickness will provide coverage of 800 - 160 ft.<sup>2</sup> per 1 gallon  
(Metric: .05 – .25 mm of thickness will provide coverage of 20 – 4.15 m<sup>2</sup> per 1 liter)

## SAMPLE CURING TIMES

- **Flooring:** Dry to touch 4 hours, walk on 24 hours at 77°F (25°C), full cure 7 days
- **Fast cure flooring:** Dry to touch 3 hours, walk on 12 hours at 77°F (25°C), full cure 4 days
- **Paint:** Dry to touch 4 hours at 77°F (25°C), 8 hours at 60°F (15°C), full cure 7 days

## PROVEN EFFECTIVENESS

Green Polyurethane™ has undergone rigorous testing by the Polymer Institute (Germany) and Assured Testing Services, PA, USA, confirming the product's properties. Green Polyurethane™ was also reviewed by Board-Certified Toxicologist Michael J. Norvell, Ph.D., Diplomate, American Board of Toxicology, Inc. who reported that, "***This product contains no ingredients that are considered to be carcinogens or reproductive toxicants*** as defined in the State of California's Safe Drinking Water and Toxic Enforcement Act of 1986 (SDWTEA). Therefore, it is the toxicologist's opinion that ***Green Polyurethane™ requires no precautionary labeling under the SDWTEA Regulations.***"



## GREEN POLYURETHANE™ APPLICATIONS

Green Polyurethane™ coatings and paint can be applied to many surfaces including metal, concrete, gypsum, ceramic tiles and VCT and is particularly useful on applications requiring higher safety and sanitation standards, and in heavy traffic and corrosive surface areas. Typical applications include:

- Food & beverage processing facilities
- Medical and pharmaceutical clean rooms
- Schools & hospitals
- Industrial and commercial buildings
- Private and public garages
- Chemical plants
- Marine & military applications
- Equipment for liquid fertilizer delivery
- Protective coatings inside pipes



# FEATURES AND ADVANTAGES OF GREEN POLYURETHANE™ COATING & PAINT

## Replaces 2-3 coat epoxy + urethane with 1 coat

- Green Polyurethane™ can replace an epoxy basecoat and urethane top coat with just 1 coat
- Green Polyurethane™ has excellent body, can be laid as thick as 3mm and can also be used as a primer (some substrates may need a water vapor primer)

## Zero Toxic Isocyanates, ~Zero VOCs, 100% Solids, Minimal Odor

- First-ever hybrid polyurethane coatings and paint that completely eliminate the use of toxic isocyanates throughout the manufacturing and application process
- Zero isocyanates, ~zero VOC, and minimal odor reduce costly application safety measures such as:
  - HVAC shut down & ventilation equipment
  - Shutdown of business operations adjacent to application zone and corresponding costs to pay facilities management, movers, Health & Safety for weekend work
  - Scheduling changes, emergency evac. assessment, displacing workers, students, etc.
  - Security for late evening and/or weekend work
  - Creating 30-60% in application savings as compared to other PU & epoxy brands

## Superior Wear Resistance & Excellent Adhesion

- Wear resistance is 25-30 (mgs./1000 cycles) or 2 times better than most premium PU coatings
- Adhesion - 10-30% higher (depending on substrate)

## Increased Resistance to Chemical Degradation & Corrosion

- Maintains an extended period of corrosion protection, more reliability due to its non-porous coating structure, and better durability than conventional coatings
- Assures more effective protection against aggressive media
- Unlike conventional polyurethanes, Green Polyurethane™ is indifferent to moisture and does not require special moisture controlled conditions in the manufacturing or curing process

## Safe & Easy curing in Cold, Hot or Sunny Conditions

- Hardens at ambient temperatures
- UV cured and low temperature curing applications available (36-77 °F) (2-25 °C)

## Increased Hydrolytic Stability

- Maintains stability against chemical decomposition upon contact with water through an extra intramolecular hydrogen bond formed during its curing, thereby improving hydrolytic stability well above that of conventional polyurethanes

## GREEN POLYURETHANE™ PROPERTY COMPARISON CHART

PROPERTY	UNIT	AVERAGE VALUE OF COMPETING PREMIUM PU PRODUCTS	AVERAGE VALUE OF GREEN PU	GREEN PU ADVANTAGE
<b>VOC Content</b>	%	17 17 24 27 17 23 37 25	.5 -1	~ 30 times
Avg. VOC Content		~23	.75	
<b>Tensile Strength</b>	kg/mm2	0.35 1.35 0.63 2 0.7 1.2	~ 2.9 to 6	~ 4 times
Avg. Tensile Strength		~1	4.45	
<b>Hardness</b>	Shore D	55 65 30 87.5 62	75 - 80	~30%
Avg. Hardness		~60	77.5	
<b>Abrasive Wear</b> (TABER, wheel CS17 1000g loss of mass)	mgs /1000 cycles	57.5 137.5 34 80 62 70 25 30 60.2	25 -30	~2 times
Avg. Abrasive Wear		~62	27.5	

Key Properties of Green Polyurethane™ products are confirmed by independent tests executed at "Assured Testing Services," PA, USA (Report 7046) and "Polymer Institut," Germany (Report P 5075)

### PRODUCT LIST

Use the charts on the next page to determine which of our Green Polyurethane™ coatings or paint is best for your application. All coatings and paints are available in a wide range of colors and can be customized for your needs (according to RAL color chart and customer requirements).

*Green Polyurethane™ is protected by patents: 7,989,553, 7,820,779 and 20120208967.*

# FLOORING

PRODUCT NAME	INDOOR/OUTDOOR	SUBSTRATE	SPECIFIC PROPERTY	RECOMMENDED APPLICATIONS
FLI4W	Indoor Application	<ul style="list-style-type: none"> <li>• Concrete</li> <li>• Cement Cover</li> <li>• Some Types of Wood</li> </ul>	<ul style="list-style-type: none"> <li>• Increased chemical, wearing, light and humidity resistance plus high sanitary-hygeinic properties.</li> <li>Application temperature: 50-68 °F (10-20 °C)</li> </ul>	<ul style="list-style-type: none"> <li>• Industrial &amp; Commercial Buildings</li> <li>• Chemical Plants</li> <li>• Warehouses &amp; Garages</li> <li>• Monolithic Flooring for Civil, Industrial and Military Engineering, Marine Apps, etc.</li> </ul>
FLI4W-FC	Indoor Application	• Same as FLI4W	• Same as FLI4W but shorter curing time and pot life (10-30 minutes)	• Same as FLI4W
FLI4LP	Indoor Application	• Same as FLI4W	• Same as FLI4W but longer pot life (2-3 hours)	• Same as FLI4W
FLI4-LP4	Indoor Application	• Same as FLI4W	• Same as FLI4W but longer pot life (up to 4 hours)	• Same as FLI4W
FLI4M (matte)	Indoor Application	• Same as FLI4W	• Same as FLI4W	• Same as FLI4W
FLI4-ASBO (soybean oil based)	Indoor Application	• Same as FLI4W	• Same as FLI4W	• Same as FLI4W
FLIO6GL	Indoor/Outdoor Application	• Same as FLI4W	• Higher light resistance. Application temperature: 50-68 °F (10-20 °C)	• Same as FLI4W
<b>SPECIALTY FLOORING APPLICATION</b>				
FLI3	Indoor Application	• Same as FLI4W	• Low application temperature: 36-77 °F (2-25 °C), fast curing, high sanitary-hygeinic properties	<ul style="list-style-type: none"> <li>• Refrigeration Rooms</li> <li>• Food Processing Facilities or Other Extreme Cold Curing Conditions</li> </ul>

**NOTE:** All Flooring products can be customized according to customer requests, i.e., for varying substrates (plastic, wood, ceramic, metal and concrete) or application temperatures. Anti-corrosive primer should be used with metal substrates.

# PAINT

PRODUCT NAME	INDOOR/OUTDOOR	SUBSTRATE	SPECIFIC PROPERTY	RECOMMENDED APPLICATIONS
PI9W	Indoor Application	<ul style="list-style-type: none"> <li>• Metal</li> <li>• Concrete</li> <li>• Cement Cover</li> <li>• Gypsum</li> <li>• Plaster Walls</li> <li>• Some Types of Wood</li> </ul>	<ul style="list-style-type: none"> <li>• Paint for indoor light stable and chemical resistant applications.</li> <li>Application temperature: 50-68 °F (10-20 °C)</li> </ul>	<ul style="list-style-type: none"> <li>• Industrial &amp; Commercial Buildings</li> <li>• Chemical Plants</li> <li>• Marine Apps</li> <li>• Protective Coatings Inside Pipes</li> <li>• Equipment for Liquid Fertilizer Delivery, Military Equip., etc.</li> </ul>
PIO15W	Indoor/Outdoor Application	• Same as PI9W	• Increased light resistance and high decorative properties. Application temperature: 50-68 °F (10-20 °C)	• Same as PI9W
PIO15S	Indoor/Outdoor Application	• Same as PI9W	• Same as PIO15 but increased ultra UV resistance	• Same as PI9W

**NOTE:** All Paint products can be customized according to customer requests, i.e., for varying substrates (plastic, wood, ceramic, metal and concrete) or application temperatures. Anti-corrosive primer should be used with metal substrates.

# HNIPU HARDENERS

Urethane hardeners that provide faster curing, improved gloss and abrasive resistance to coatings

Uramine 5851: for indoor floorings and paints	Uramine 4761: for indoor/outdoor floorings and paints	Uramine-FC: for shorter curing time for indoor floorings and paints	Uramine-LP: for longer pot life – 2-3 h for indoor floorings and paints	Uramine-LP4: for 4 h pot life for indoor floorings and paints	Uramine-S: for higher UV stability for indoor/outdoor floorings and paints
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## HOW TO ORDER

To order Green Polyurethane™ coatings and paint or to learn more about Hybrid Coating Technologies go to [www.hybridcoatingtech.com](http://www.hybridcoatingtech.com) or call (650) 491-3449.

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