



Sustainability Simplified.™  
Very Simple.



# Efficient Factories | Efficient Buildings with Syneffex™ Energy Saving & Protective Coatings



Ready to Lower Energy Costs  
and Protect Your Valuable Assets  
from Corrosion, CUI and Weathering?



# About Syneffex™



We fund and participate in research with the world's brightest scientists and leading laboratories. It's not just talk and it's not just theory...it's amazing technologies.

No one can afford to ignore the dramatic developments that nanotechnology is producing in materials and the manner in which materials are designed and manufactured. We provide sustainable solutions to challenging problems that result in competitive marketplace opportunities and advantages.

**Syneffex™** specializes in developing sustainable nanoscience-based solutions that are easy-to-use and designed to save energy, protect assets, and reduce carbon footprints. The Syneffex™ and Heat Shield™ brands are durable and simple to use insulation coatings that significantly reduce energy costs and can be used across multiple market sectors.



# About Syneffex<sup>™</sup> Coatings

**Syneffex<sup>™</sup> coatings** are based on a patented technology that utilizes a nanomaterial with an extremely low thermal conductivity and hydrophobic (water repellent) nature. This material allows the coatings to effectively **inhibit heat transfer with a thin layer**, while also providing other performance benefits such as:

- ✓ Corrosion prevention
- ✓ Moisture resistance
- ✓ Surface Temperature Reduction
- ✓ Chemical resistance
- ✓ Lead encapsulation
- ✓ Mold resistance
- ✓ Durability in extreme environments

## **WE MAKE A DIFFERENCE. DAILY!**

We have been providing sustainable solutions around the globe, in over 60+ countries, for well over a decade. Here's why:

These insulating products have helped industrial companies reduce their overall energy costs related to heat producing processes by a reported range of 10%-25% and helped residential and commercial building customers reduce heating and cooling costs by a reported range of 20%-40% or more.

*Note: The information given in this document is deemed to be accurate, however is not guaranteed. No warranty, express or implied is given regarding the accuracy of this information. Each application is unique, and findings may be different due to environmental conditions. In no event is Syneffex<sup>™</sup> responsible for any damages whatsoever in connection with the use of or reliance on this information.*



All our coatings are manufactured in a facility that is certified to the ISO 9001:2008 Quality Management System



# Put Syneffex<sup>™</sup> Technology to Work for You



Thermal Insulation  
Energy Savings



Corrosion/CUI  
Prevention



Asset Protection/  
Longevity



Reduce Carbon  
Footprint



Easy, In Service  
Application



Safe Touch  
Solutions



Protects from  
Salt Air & Spray



Mold and Mildew  
Resistant



Resistant to UV  
and Color Fade



Sustainable &  
Eco Friendly

# Example Projects Gallery



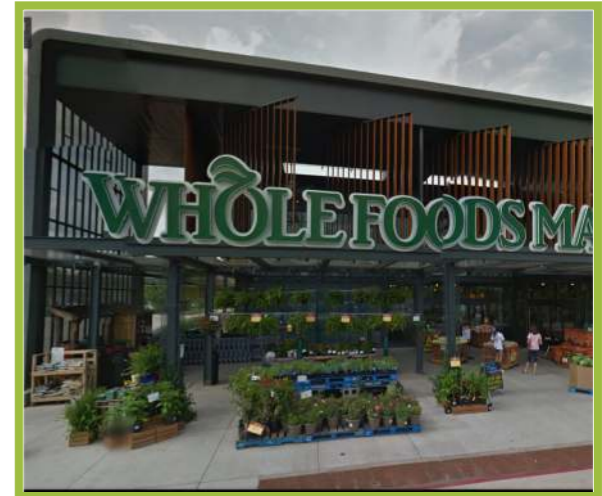
**Mold/Mildew Resistance**  
**Residential Palace**  
Brunei



**Energy Savings & Sustainability**  
**International Airport**  
Bangkok, Thailand



**Data Center Roof Insulation**  
**Mexican Govt. - IMSS**  
Monterrey, Mexico



**Skylight Insulation**  
**Whole Foods Market**  
Oklahoma City, OK, USA



**Insulation & Corrosion Control**  
**Grupo Modelo (Corona Beer)**  
Guadalajara, Mexico



**Tank Insulation**  
**Weyerhaeuser Pulp/Paper**  
Savannah, Georgia, USA



**Pipeline & Storage Tank Insulation**  
**Galp Energia**  
Portugal



**Insulation and Energy Savings**  
**Erenko Textile**  
Turkey



# How it Works

Nanotechnology is the engineering of functional systems at the molecular scale.

In its original sense, 'nanotechnology' refers to the projected ability to construct items from the bottom up, using techniques and tools being developed today to make complete, high performance products and materials with new and unique performance qualities.

**Nanocomposite with low thermal conductivity**

**High quality, low VOC, water-based coating system**

**Patented liquid insulation that insulates, plus has protective qualities**

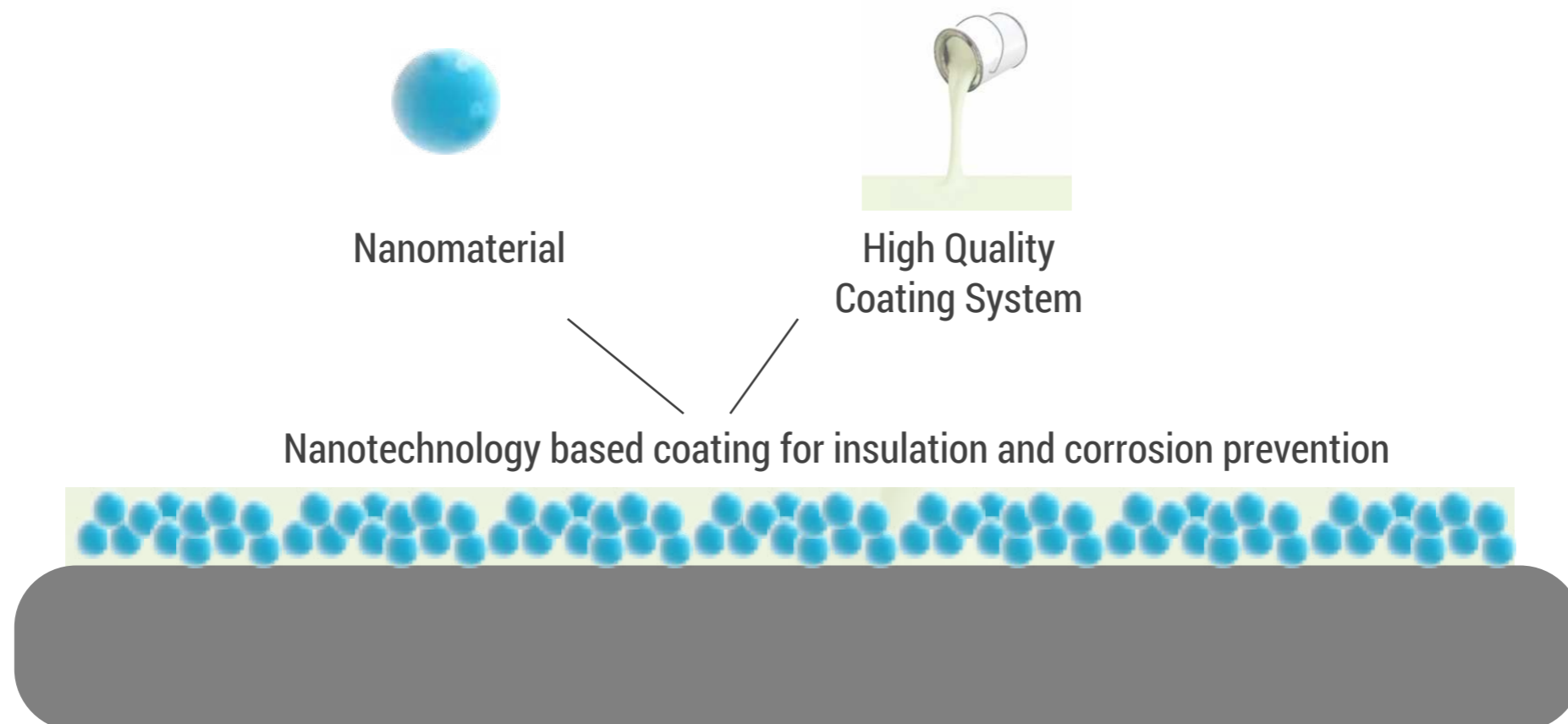




# How it Works

Hydro-NM-Oxide is a nanomaterial that is used in our patented water-based coating that has key qualities that make it perfect for corrosion prevention and eliminating CUI:

- ✓ Hydrophobic (water repelling)
- ✓ Low thermal conductivity
- ✓ Excellent adhesion strength
- ✓ Long-term durability in extreme environments





Forms tight bond with surface | Prevents corrosion and CUI



Water repellent, moisture does not infiltrate between coating and surface



Additional UV resistance, increases lifespan in outdoor environments



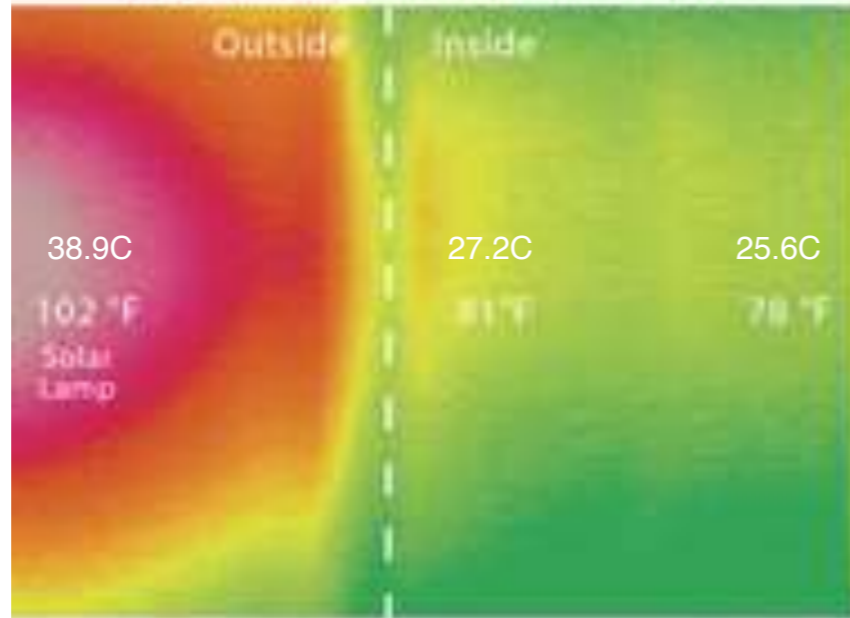
Acts as a thermal barrier, eliminates need for most other types of older insulation



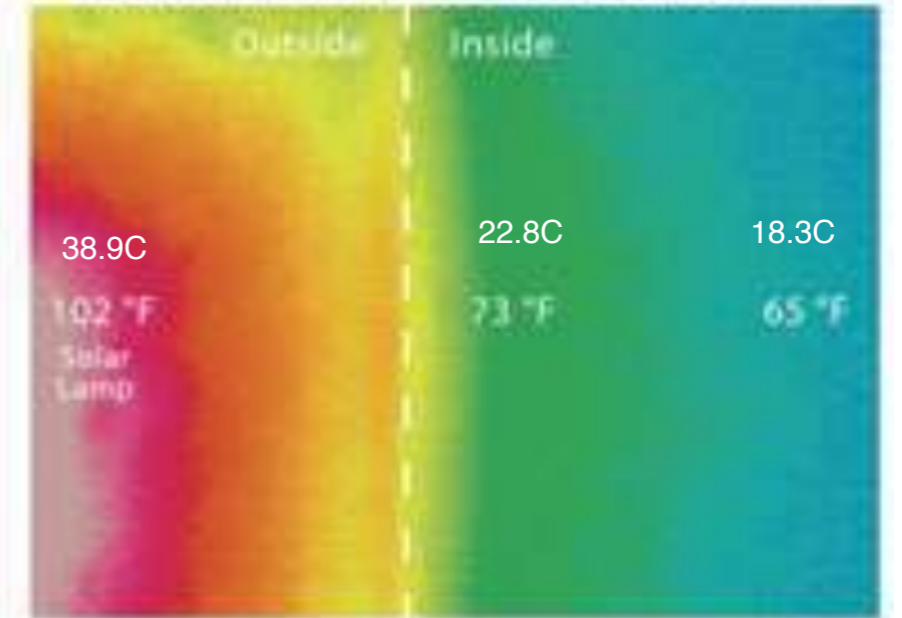


# Thermal Imaging - Glass

Summer  
Simulation

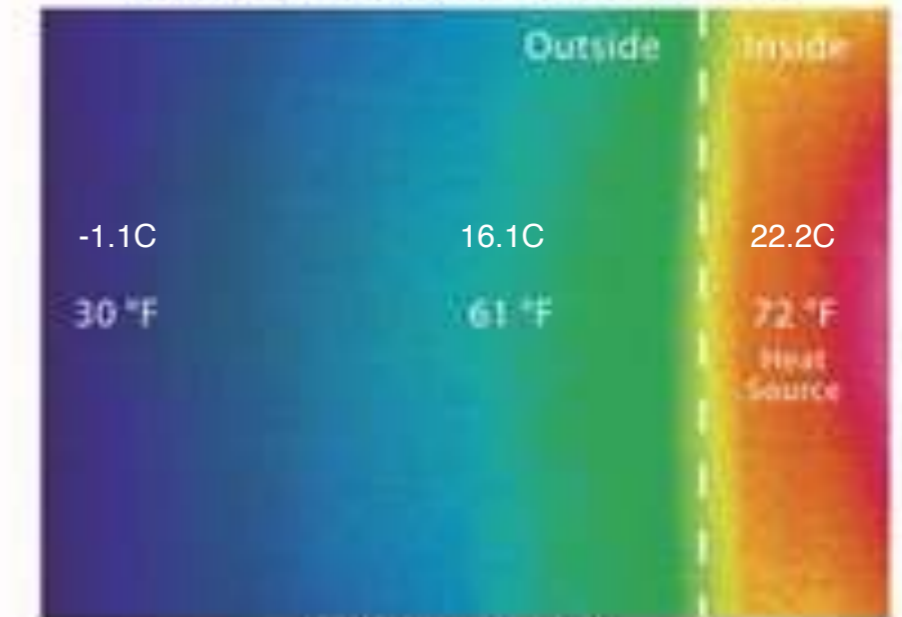
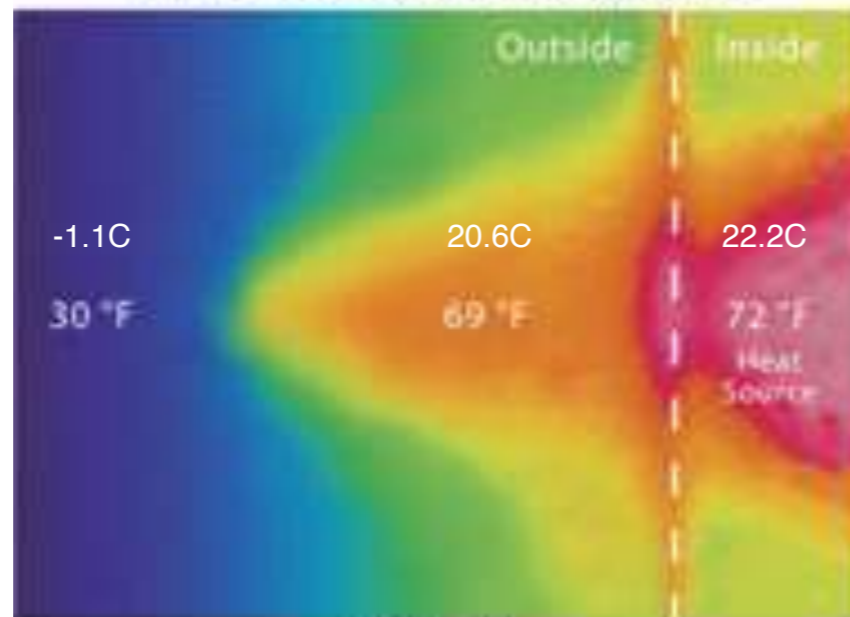


Uncoated glass



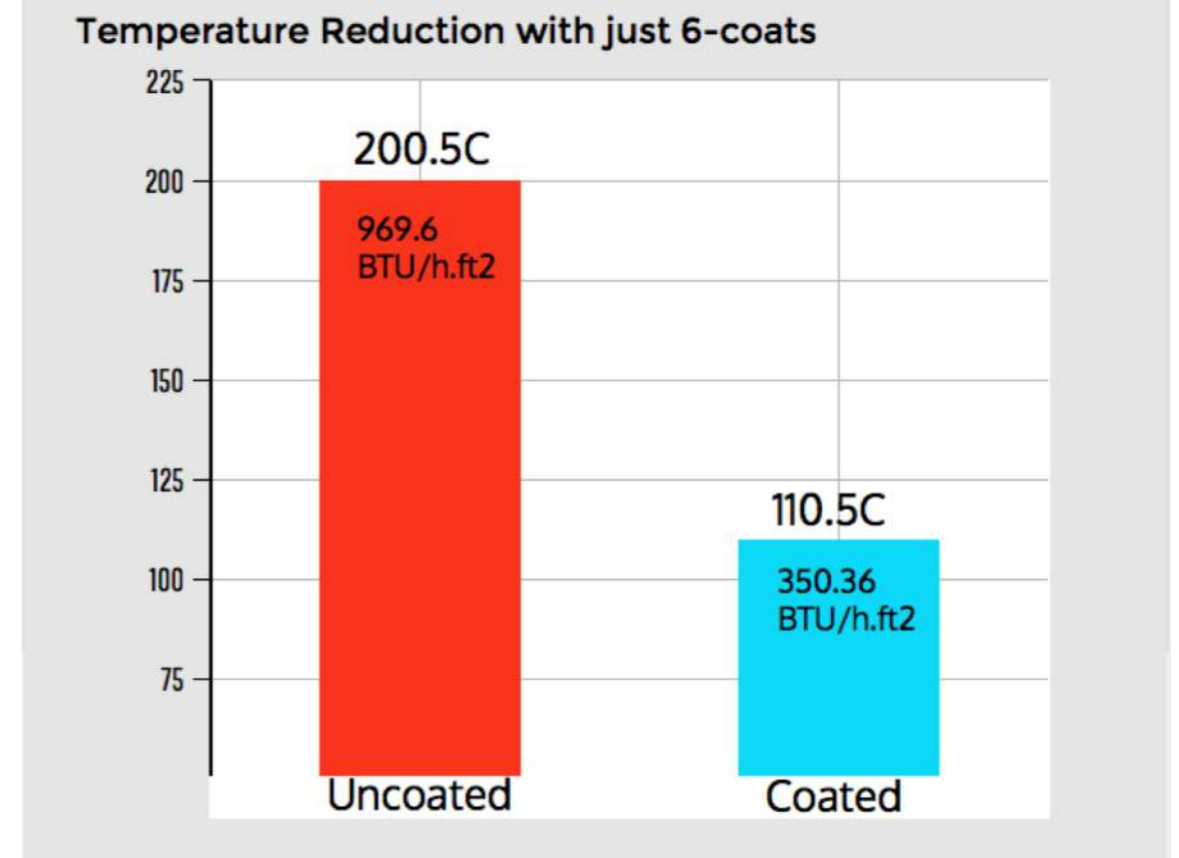
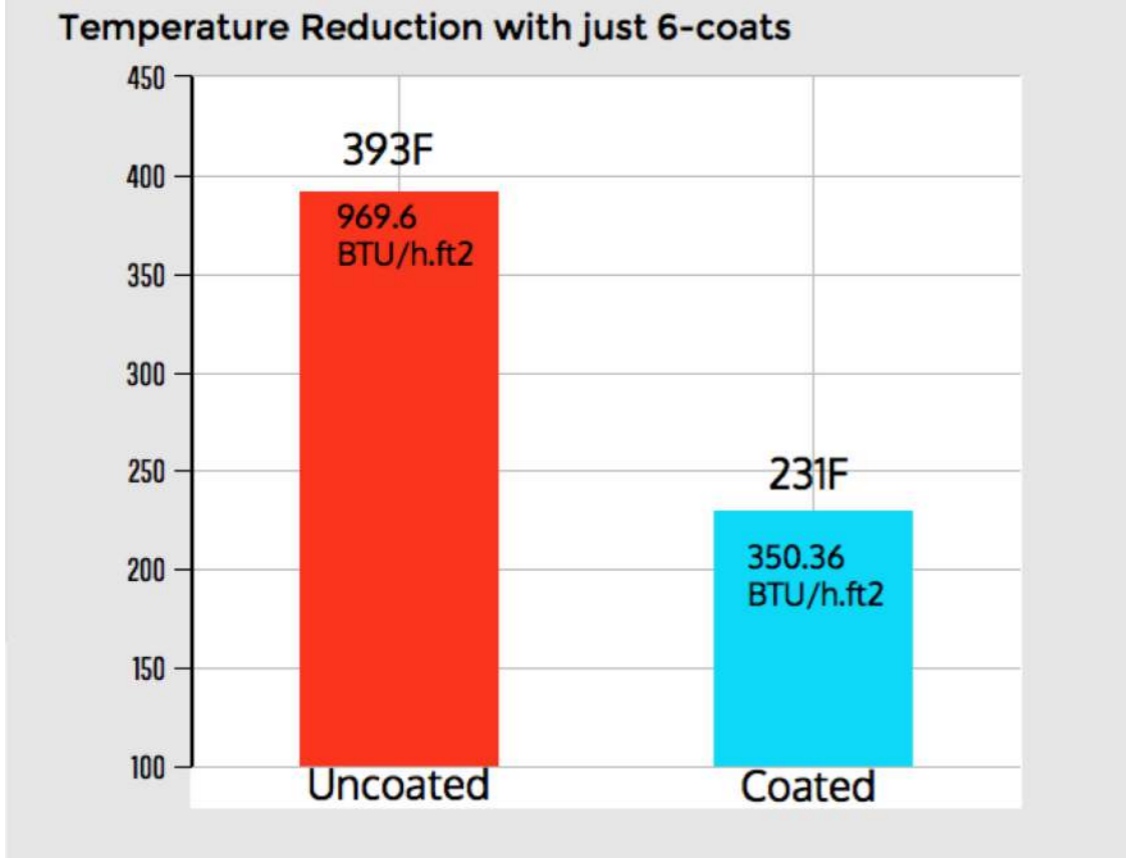
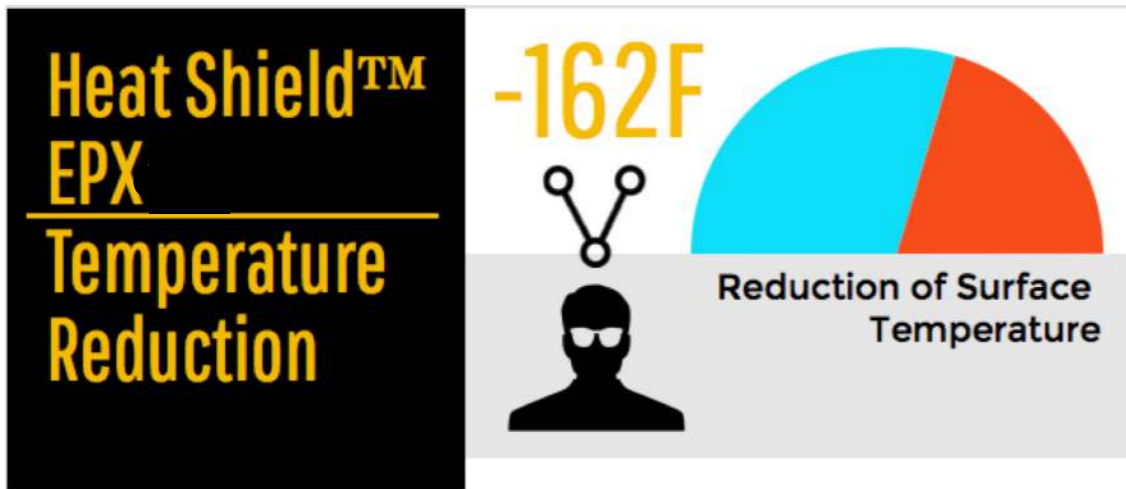
Energy Protect<sup>TM</sup> coated glass

Winter  
Simulation





# Temperature Reduction





# Syneffex<sup>™</sup> Coating Benefits

## 20% Average Energy Savings

Customers who insulate their equipment with Syneffex<sup>™</sup> liquid insulation coatings report savings on average of 20%.

## Proven In Industry

Syneffex<sup>™</sup> coating technology has been used in multiple industries since 2004 for innovative insulation, energy savings and protective surface solutions.

## Short Return on Investment

Industrial customers typically report ROI in 6-18 months.

Building customers typically report ROI in 3-5 years

## Easy, Versatile Application

Spray, roll, or brush applied, the coatings can also be applied in-service. Direct to metal, and no cladding is required.

## Extended Lifespan

Syneffex<sup>™</sup> coatings have a lifespan of approximately 5-10 years or more in industrial and outdoor environments, and of 10+ years in interior building environments.

## Multiple Benefits

In addition to thermal insulation, Syneffex<sup>™</sup> coatings are used for rust prevention, mold resistance, UV resistance, lead encapsulation, and surface protection.

# Industrial Equipment Applications

## Equipment

- ✓ Steam Pipes
- ✓ Hot Water Pipes
- ✓ Processing Tanks
- ✓ Cookers
- ✓ Ovens
- ✓ Boilers
- ✓ Storage Tanks
- ✓ Heat Exchangers
- ✓ Valves
- ✓ Dyeing Machines
- ✓ Bottle Washers
- ✓ and more...

## Short Return on Investment

- ✓ Reduce energy consumption
- ✓ Prevent corrosion under insulation (CUI)
- ✓ Lower carbon emissions
- ✓ Reduce heat loss or gain
- ✓ Moisture and UV resistant
- ✓ Non-toxic, low VOC
- ✓ Long-term, consistent performance
- ✓ No exterior cladding needed
- ✓ 5-10+ year lifespan
- ✓ Chemical Resistant (EPX)
- ✓ Fast curing, fast results (EPX)



# Building Envelope Applications

## Building Energy Savings

- ✓ Walls (interior or exterior)
- ✓ Roof
- ✓ Ceilings
- ✓ Skylights/Windows
- ✓ Subfloors
- ✓ Ductwork
- ✓ Metal Structures
- ✓ Railings
- ✓ and more...

## Surface Protection

- ✓ Mold/Mildew Resistant
- ✓ Lead Remediation
- ✓ Corrosion Prevention
- ✓ "Stay Cleaner" Surfaces
- ✓ UV Resistance
- ✓ Moisture Resistance
- ✓ Weathering Resistance



# Worker Health and Safety

## Employee Safety Applications

- ✓ Lower hot surface temperatures to safe touch
- ✓ Reduce worker burns
- ✓ Cool working environment by reducing heat from equipment
- ✓ Remediate lead contamination
- ✓ Provide mold and mildew resistance
- ✓ Improved air quality by using mold resistant coatings
- ✓ Non-flammable insulation
- ✓ Non-toxic, low VOC





# Industrial Products Overview

## Heat Shield<sup>™</sup> EPX-H20 | 2-part Insulation & Corrosion Prevention Coating

Our #1 Industrial Coating – Up to 400F/204C

Uses: Steam pipes, boilers, valves, processing tanks, both heat and cold process applications.  
Fast cure. White or Grey, pebbled finish



## Heat Shield<sup>™</sup> High Heat | 1-part Insulation & Corrosion Prevention Coating

When a smooth finish is needed – Up to 400F/204C

Uses: Steam pipes, boilers, valves, processing tanks, and other heat process applications.  
Opaque if applied 170F and above, clear if applied less than 170F, smooth finish



## Heat Shield<sup>™</sup> PT | 1-part Insulation & Corrosion Prevention Coating

Lower Temperature Solution – Up to 256F/125C

Uses: Hot water pipes, storage tanks, bottle washers, railings, metal buildings, and other metal surface applications. Opaque if applied 170F and above, clear if applied less than 170F, smooth finish





# Building Products Overview

## Energy Protect<sup>™</sup> | 1-part Insulation & Mold/UV Resistant Coating

Walls – Ceilings – Skylights - Ductwork  
Interior or exterior use. Clear with a smooth matte finish.  
(Has frosted look over glass)



## Crystal Roof Coating | 1-part Insulation & Mold/UV Resistant Coating

Roofs (tile, shingle, wood, metal)  
Clear with a smooth matte finish



## LeadX<sup>™</sup> | 1-part Clear Lead Encapsulation Coating

Encapsulation of Lead Contamination  
Interior or exterior use. Clear with smooth matte finish.  
Use over brick, concrete, wood, lead-based paint, metal





# Customer Case Studies

*“Because of global warming, our duty is to make use of energy as efficiently as possible; wasted energy is wasted national wealth. This is why I highly recommend this Syneffex<sup>™</sup> technology to all of textile industry and other heat using industries.”*

*-Eyüp Sözdinler, General Manager, Henateks A.S.  
(manufacturer for Nike, Adidas, and Tommy Hilfiger)*



# Customer Case Studies

## Client

Elasteks Textile  
Istanbul, Turkey

## Project

Heat Shield<sup>™</sup> EPX-H20 coating used  
to insulate dyeing machines and  
associated heat process equipment

## Details

Following application and cure time, they used a hot water meter to measure condensed steam to measure energy use, and their data showed a reduction in energy consumption of 51% as compared to before using EPX.

The steam consumption in kg per dyeing process cycle was measured over a period of 3 months, comparing before and after application steam consumption per each process cycle:

**Before EPX-H20: 1,326 kg steam**

**After EPX-H20: 651 kg steam**

## Reduction Of Energy Use By 51%



# Customer Case Studies

## Client

Data Center – Mexican Government (IMSS)

## Project

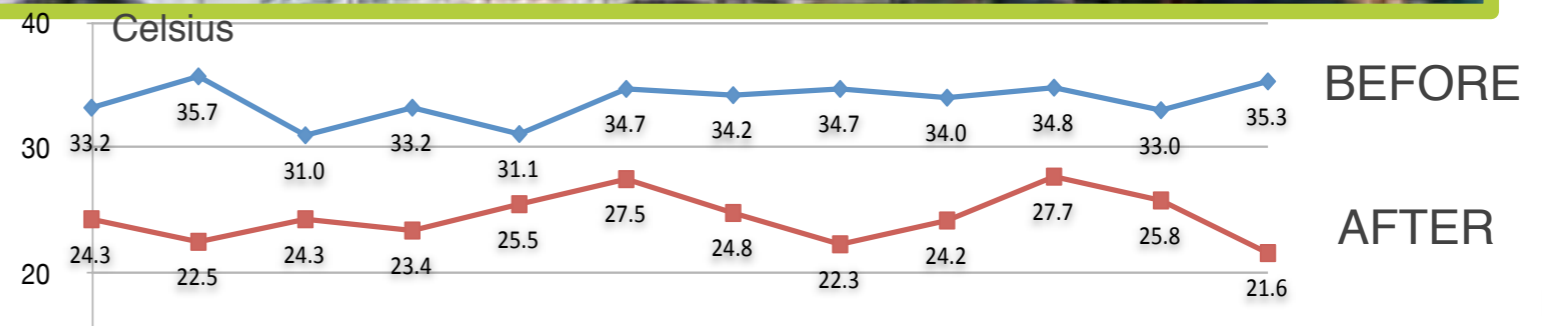
Crystal roof coating used to insulate the roof of their main data center to stop server heat related shut down.

## Details

Reduced interior ambient temperature by an average of 27%.

Temperatures were measured at the ceiling of the data center in July 2009, prior to application of Crystal roof coating, and again in July 2010 for comparison. The measurements showed a reduction of internal temperatures by an average of 27%. The issue with server shut down due to heat during the summer was solved.

## Reduction Of Interior Temperature By 27%



# Customer Case Studies

## Client

Large Paper Manufacturer

## Project

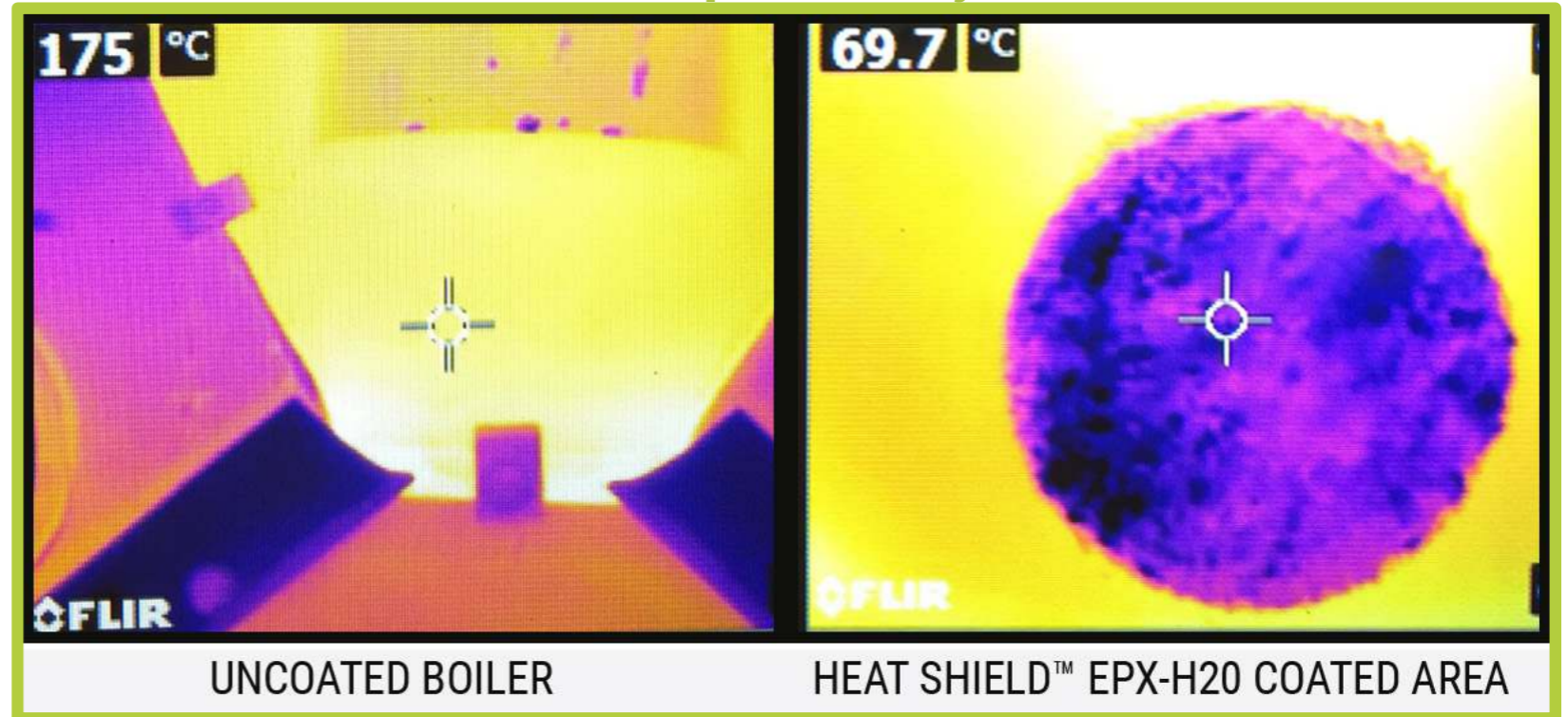
Insulation trial for Heat Shield<sup>™</sup> EPX-H20 for surface temperature reduction.

## Details

Reduced the surface temperature by -189.5F (-105.3C).

During a recent boiler trial at a large paper mill, we showed the plant manager just how powerful our technology works. Even through heat was radiating around the small test patch where our EPX-H20 coating was applied on the end caps, which of course reduces the overall results, the thermal images below show that our coating resulted in a clear and substantial difference.

## Reduction of Surface Temperature By -189.5F/-105.3C



# Customer Case Studies

## Client

Yang Ming Marine  
(3,725 TEU Container Vessel)

## Project

Heat Shield<sup>™</sup> High Heat was applied to the tubular system and tanks of the HFO (Heavy Fuel Oil) system for insulation and corrosion prevention

## Details

The coating reduced the diesel fuel used to heat the HFO system by 30%, reducing the daily diesel fuel use by 360 liters per 24 hours, which equates to more than 7,500 liters of diesel fuel saved during a typical 21 day round trip Asia/US/Asia journey, equivalent to approximately \$3,525 USD in cost savings. The High Heat insulating and anti-corrosion coating was applied at a coverage of 6-coats, totaling a 200 micron dry film thickness. The cost of application and materials used to insulate the HFO tanks and tubular systems was \$16,100 USD. Payback was achieved after 95 days of sailing.

**30% Fuel Savings | Payback In 95 Sailing Days**



# Customer Case Studies

## Client

Major Soft Drink Manufacturer  
Eastern Europe

## Project

Syneffex<sup>™</sup> GP (now PT) coating was used to insulate an industrial bottle washing machine.

## Details

Estimated Savings and Payback based upon their measured results from just the Bottle Washing Machine Insulation:

Energy Savings: 398.52 MMBtu/year

Cost Savings: \$3,682 USD (2,908 Euro) per year

Product & shipping: \$3,814 USD

Payback: 13 months

**Energy Savings Of \$3,682/Year – Payback In 13 Months**



# Customer Case Studies

## Client

Large Textile Manufacturer  
Mexico

## Project

The manufacturer had an issue with heat from 6 process ovens transferring through a large metal wall into a mezzanine area.

## Details

Heat Shield<sup>™</sup> Translucent PT was applied at a 3-coat coverage to a 3x3 meter section of the wall to illustrate the insulation performance. Even before the coating was fully cured measurements showed a reduction of wall surface temperature from 39.9C (103.8F) to 24.8C (76.6F).

A reduction of 15.1C / 27.2F.

With further reduction expected after the coating cures fully.

## Surface Temperature Reduction Of 27.2F/15.1C



# Customer Case Studies

## Client

Weyerhaeuser Paper Mill  
Savannah, GA

## Project

Black liquor tank insulation and  
corrosion prevention

## Details

Heat Shield<sup>™</sup> Translucent PT was applied at a 6-coat coverage to insulate and reduce the exterior temperature from 200F to approximately 138F.

Two PT tank projects have been completed to date at their Savannah, Georgia facility.

## Effective Outdoor Insulation And Corrosion Prevention





# Customer Case Studies

## Client

Frost Art Museum  
Miami, Florida

## Project

Insulation of skylights with Energy Protect<sup>™</sup> coating for energy savings and to stop UV damage to artwork.

## Details

Energy Protect<sup>™</sup> was used to reduced heat transfer through glass, while also allowing in natural light, which was an important museum design element, while protecting the artwork from harmful UV rays.

“Art conservation researchers over the past 40 years have studied the sensitivity of artworks to light. In Weymouth’s designs, a crucial element is using materials and coatings that block out both ultraviolet rays and heat.”

-2008 Article in Florida Trend Magazine

## Stopped UV Damage Of Artwork In Museum



# Customer Case Studies

## Client

Sinopec (China's oil & gas co.)  
East China Sea

## Project

High Heat coating was used as a significantly better replacement for their older rock wool with cladding system.

## Details

Sinopec successfully completed a winter study trial from October 2012 to March 2013. Heat Shield<sup>™</sup> High

Heat provided them a better solution than the formerly used rock wool with cladding over their fuel oil storage tank on an offshore platform.

Their final analysis showed that Syneffex's<sup>™</sup> High Heat coating at a 12-layer coverage insulated within 3 deg. C of the 8cm rock wool with cladding, plus it prevented corrosion, which the rock wool was causing. Additionally, the coating lasts much longer, which greatly reduced replacement/maintenance

## Effective Offshore Environment Insulation And Corrosion Prevention



罐体整体外观

拆除岩棉下的锈蚀

# Customer Case Studies

## Client

Suvarnabhumi International Airport  
Bangkok, Thailand

## Project

Long-term protection of aluminum panels used in the ceilings of the air link bridge at a new state of the art international airport in Thailand.

## Details

Heat Shield<sup>™</sup> Translucent PT was used to coat hundreds of aluminum sandwich panels, which were used as roof and soffit claddings for the terminal building's aerobridges, including the double-decker aerobridges, providing them with long-term corrosion protection and a sustainable insulation for energy savings.

The new Terminal Complex, in Nong Ngu Hao, Samut Prakarn Province, has a total floor area of 500,000m<sup>2</sup>, making it the largest airport in the world at the time it was built.

## Sustainable Building Insulation For New Airport





# Testing Data | Thermal

- 1) UNI EN ISO 8990:1999, “Standard Test Method Thermal Performance of Building Assemblies”  
3-coats over 8cm cement wall sections

Heat transmission reduced by 34.8%  
Thermal resistance (1/U) increased by 28.98%

- 2) ASTM E1530, “Resistance to Thermal Transmission”  
2-coats over concrete roof tiles

Heat transmission reduced by 29.7%

- 3) ASTM C518 / ISO 8301, “Thermal Conductivity” – At cold temperatures, 0 deg. C/32 deg. F  
4-coats and 8-coats over glass

4-coats at 32F - Heat transmission reduced by 10%  
8 coats at 32F – Heat transmission reduced by 33%



# Testing Data | Mold

In industry standard tests for multiple types of mold, our coatings prove themselves resistant for 5-10+ without the use of any harmful biocides.

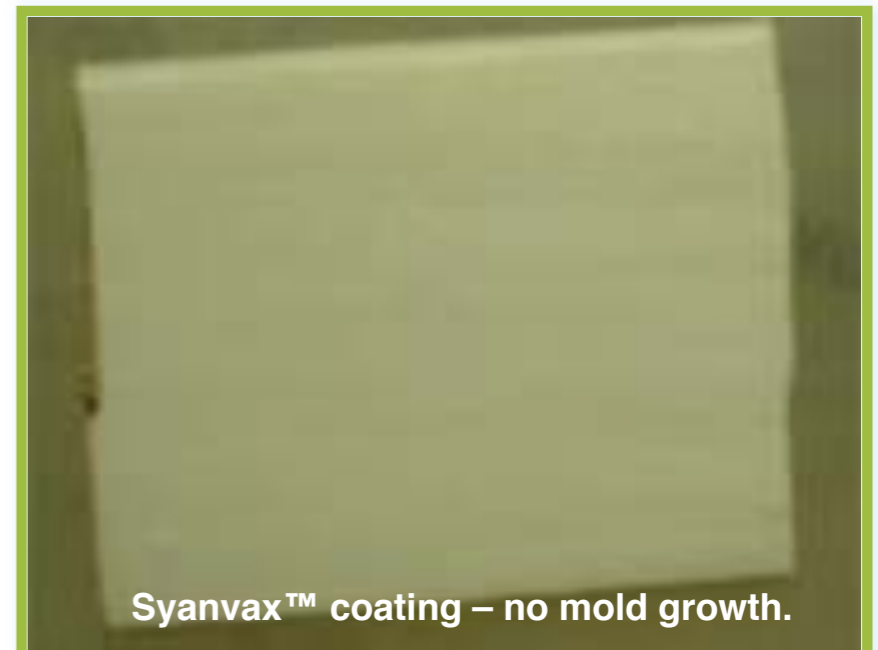
**Independent 3rd Party Testing:**  
By the AIHA accredited laboratory EMSL Analytical, Inc.

ASTM D 5590 & ASTM G21: Zero to minimal mold growth

All were exposed to spore-producing bacteria, including *Pencillium funiculosum*, *Aspergillus niger*, *Aureobasidium pullulans*, *Chaetomium globosum*, and *Trichoderma virens*. After four weeks, the Syneffex<sup>™</sup> coatings exhibited zero or minimal mold growths, whereas the uncoated surfaces showed extreme to 100 percent mold coverage.



Uncoated control – covered with mold.



Syanvax<sup>™</sup> coating – no mold growth.

# Testing Data | Corrosion

Exceptional corrosion and CUI resistance even in the harshest of offshore or factory environments. Meets the toughest oil & gas and industry corrosion standards.

## Independent 3rd Party Testing:

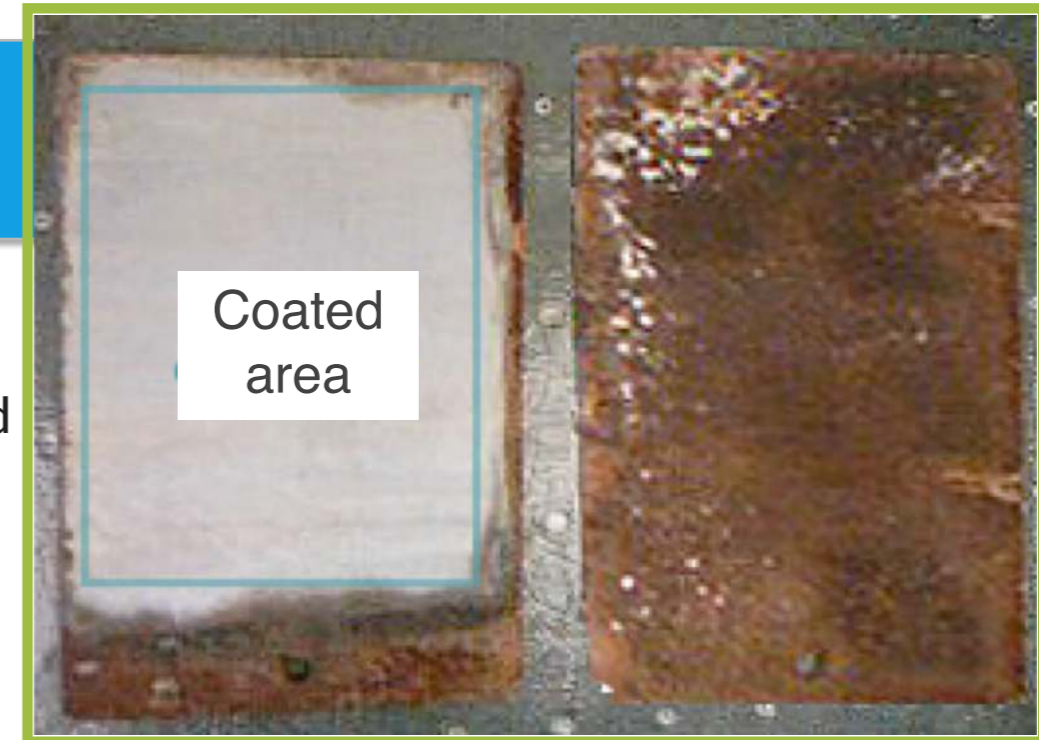
By the NADCAP accredited laboratory Assured Testing Services

The GM9540P Accelerated Salt Fog Corrosion Test is an advanced cyclic method originally developed by General Motors and now the corrosion test preferred by the US Navy and many industries.

GM9540P replicates many of the worst-case environments. The popularity of cyclic testing comes from the improved reliability of results that can be correlated with actual use. Cyclic refers to the repeated changes in test conditions, ideally to replicate the changing environments where the product will be used.

## Our Results:

Testing was done simultaneously on a steel control (uncoated) panel and panels coated with Syneffex<sup>™</sup> coatings. The results show that after 1 cycle of the test, the steel control (uncoated) panel failed with 100% red rust present, and that after 24 cycles of the test, the Syneffex<sup>™</sup> coated panel passed with no red rust present. Passing 8 cycles is considered the standard for an anticorrosion coating.





# Moisture Resistance

Syneffex<sup>™</sup> coatings are highly moisture repellent helping to protect your surfaces from moisture penetration. But they are also breathable, which means they will not cause moisture vapor

trapping issues that can cause severe damage to buildings over time.

Syneffex<sup>™</sup> Coated Concrete Tile  
Water Beads – Doesn't Soak In  
Dries Significantly Faster

Uncoated Concrete Tile  
Water Soaks Into Surface  
Takes Much Longer to Dry



# Skylights/Windows

Energy Protect<sup>™</sup> is used widely by museums, municipalities, grocery stores, restaurants, retail stores, factories and more to insulate skylights and windows that don't require complete clarity. The coating frosts the glass, which can be a bonus for security, while still allowing through approximately 92% of the visible light and reducing harmful UV rays by approximately 80%.

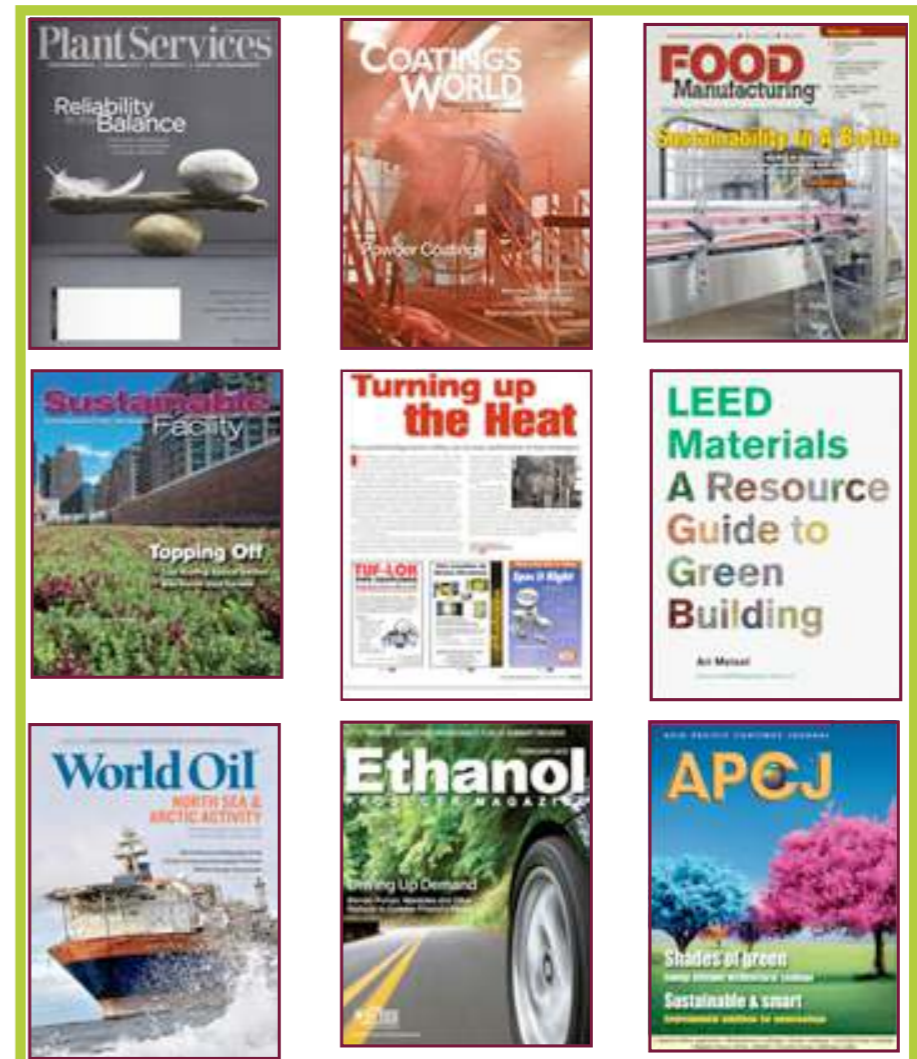




# Awards and Press



A sample of some places you may have read about our coatings



- ✓ *BUILDINGS* Magazine Top Money-Saving Products 2012
- ✓ BUILDERnews Magazine Best Product of 2008 in Energy Efficiency category
- ✓ Listed in the top 100 products of 2008 by Qualified Remodeler Magazine
- ✓ Top 100 Award for 2008 by Building Products Magazine
- ✓ Project at the Suvarnabhumi International Airport chosen by the Journal of Architectural Coatings as a Top Green Project Pick in 2009



Sustainability Simplified.™  
Very Simple.



# Be Bold! Join Other Sustainable Leaders.

**We Pride Ourselves On Extreme Customer Support**

*Please contact us for your complimentary Sustainable Specification Today!*

*Francesca Crolley*

V.P. Training & Specifications

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