

# PolyPhyll™

## Thermally conductive anti-corrosive and anti-fouling coating

### PolyPhyll™ Heat Exchanger Coatings

Using proprietary nanotechnology, Nanophyll has developed and formulated long lasting, corrosion resistant, cost effective, and environmentally friendly fluoropolymer composite nanocoatings for a wide range of applications such as heat exchangers, pipelines, and storage tanks. Our PolyPhyll™ product can be applied to the following heat exchanger metallic surfaces:

- Stainless steel and carbon steel
- Aluminum and copper

### Advantages

Nanophyll's PolyPhyll™ coating is engineered to have superior corrosion resistance, thermal conductivity, and adhesion strength, making it an excellent material coating for condensing heat exchangers.

### Corrosion Resistance

Protects metals from corrosion while maintaining good thermal transfer efficiency. Increases lifespan and reduces maintenance costs and downtime.

### Anti-Fouling

The coating has excellent surface smoothness (without pinholes) and slipperiness, which resists fouling formation on heat exchanger elements and enables increased production run times.

### Excellent Adhesion Strength

Standardized adhesion tests show excellent adhesion strength of the coating to the substrate providing a high durability long-lasting solution.

### Elevated Temperature Performance

The composite coating can be continuously used at temperatures up to 260°C.



### About Us

Nanophyll develops and manufactures smart nanocoatings that reduce maintenance cost and materials and labor expenses. Our range of coatings improve the physical properties of glass, metal, concrete, cementitious, and ceramic materials. Nanophyll harnesses the power of nanotechnology into a range of durable, reliable and safe products that are designed specifically for almost all surfaces.

Our environmentally friendly solutions extend the life of your assets and are optimized for a wide range of commercial and industrial applications. Enhanced durability, scratch resistance and easy cleaning are some of the key features that our multi-functional surface nanocoating solutions offer. These specialized cutting-edge technology coatings are the ultimate solution to protect both small and large-scale structures, ranging from heat exchangers to oil & gas equipment.



**NANOPHYLL™**

Extend the Life of Your Assets

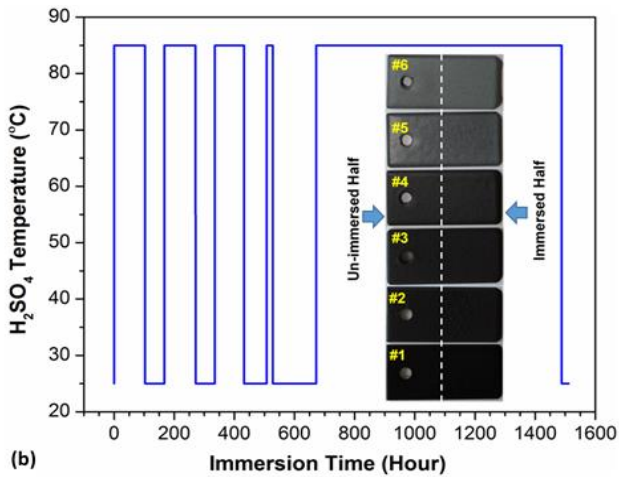
[www.nanophyll.com](http://www.nanophyll.com)

Advanced multi-functional  
nanocoating solutions

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## Corrosion Test Results



After submerging the coated substrate in 80% sulfuric acid at 85°C for 1500+ hours no corrosion was induced (no weight change was detected).

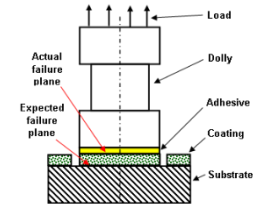
## Adhesion Test Results

ASTM D3359:  
Tape Test



|                                                                                          |      |   |   |   |   |   |                  |
|------------------------------------------------------------------------------------------|------|---|---|---|---|---|------------------|
| Surface of cross-cut area from which flaking has occurred. (Example for 6 parallel cuts) | None |   |   |   |   |   | Greater than 65% |
| Classification                                                                           | 5    | 4 | 3 | 2 | 1 | 0 |                  |

ASTM D4541:  
Pull-off Test



All coated substrates passed the highest classification (#5) of tape test. None of the coating was removed from the substrate during the pull-off test

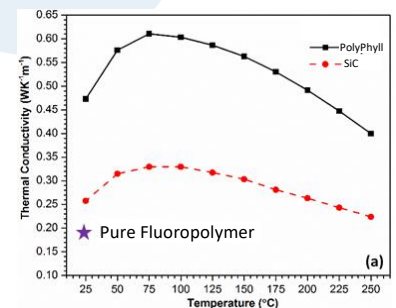
## Thermal Fatigue Test Results

All samples were subjected to cyclic heating/cooling testing for more than 10,000 cycles (~9 months). No delamination or damage occurred.



## Thermal Conductivity Performance

The nanocomposite polymer coating significantly improved the thermal conductivity compared to the pure fluoropolymer



## Surface Preparation and Coating Application

Clean and degrease the substrate as follows:

- Apply primer base coat and bake at 380°C for 30 mins, and then at 325°C for another 60 mins.
- Apply PolyPhyll™ (powder coat) and bake at 345°C for 25 mins, and then at 320°C for another 120 mins.
- Apply additional topcoats and individually bake to achieve desired thickness
- Normally, one coat of primer is 50 µm thick, and one coat of topcoat is 45-60 µm thick. Apply one coat of primer and 2-4 coats of topcoat



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