SUPERHYDROPHOBIC COATING FOR POLYMER INSULATORS
DEVELOPED BY NEETRAC / GEORGIA TECH

MISSISSIPPI CHEMICAL – MOSS POINT EAST 115 KV T.L.

IEEE Insulators WG

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Lotus Effect Surfaces:
Avoid water sheeting – drops stay as drops
Self Cleaning – remove dust / contamination
Superhydrophobic Surface Coating

• Contact angle $\geq 150^\circ$

• Water droplets bead up, no “sheeting action”

• Prevents electrical tracking

• Improves insulator performance, especially in contaminated areas.
Lotus Effect Surface for Insulators Developed by Georgia Tech / NEETRAC
Lab Results

- Works on all polymer insulations
- Lasts at least 2000 hours in energized salt fog testing
- Increases the endurance in accelerated tests

![Bar chart showing 28% improvement in endurance between UnTreated and Treated samples.](chart.png)
SUPERHYDROPHOBIC COATING

• Gives insulators superior performance in contaminated environments.
• Coating can be applied in several ways:
  – Sprayed on in field
  – Painted on with brush in field
  – Can be dipped in solution
• Treatment can also be applied to glass and porcelain insulators, but they must be pre-treated to ensure the solution adheres to the surface.
• Both US and Foreign Patents Filed.
Field Test Participants

- Ohio Brass Polymer Silicone Insulators
- Southern Company Transmission Lines
- Test Site at Mississippi Power
- Miss. Chemical – Moss Point 115kv line
Southern Company Transmission

Insulator Installation Site

MISSISSIPPI CHEMICAL
MOSS POINT EAST
115 KV T.L.
STR#: 54
Wooden H-Frame

STR#: 55
Wooden H-Frame

STR#: 56
Wooden 3PDDE
STR# 54

- Replaced three Suspension Insulators installed in 2005 with three new Polymer Suspension Insulators.
- Insulators were new and NOT Coated with the new solution.

STR# 55

- Replaced three Suspension Insulators installed in 2005 with three new Polymer Suspension Insulators.
- Insulators were treated with the new coating solution.
Superhydrophobic solution applied to the new Quadri*sil™ Insulators
Superhydrophobic solution on new Quadri*sil™ Insulator
Installing new uncoated Insulator at Str.# 54
Severe Pin Corrosion was found on all of the Porcelain Insulators which were removed. These insulators had been in service approximately three years.
This guy grip had been in service for six weeks. Notice that the loop that wraps around the anchor attachment point has corroded out of the guy grip.
This guy wire had been in service for six weeks. Notice that the individual strands have necked down much like you would expect to see from a tensile failure.