

REV. 2021-08

RTV COATING – COMPOSITE & POLYMER INSULATORS PROS & CONS
LEAKAGE CURRENTS, SHORT CIRCUITS & CURRENT INTERRUPTIONS
ARE FREQUENTLY CAUSED BY POLLUTED INSULATORS

Technical considerations on polymer Insulators & Bushings RTV Silicone Coatings
for T&D Power Line, outdoor Substations & Gantries

COMPOSITE - POLYMER INSULATORS

RTV COATING

Everyone involved in power utilities sees leakage currents power outages on its transmission and distribution lines caused by polluted insulators.

Outdoor insulators are subject to surface dirt deposits to some degree and in all operational areas. Most encountered contaminants have little effect on insulator performance as long as the surface is dry.

The pollutants gradually build up on the insulators but do not decrease the insulation strength when the insulators are dry.

In coastal and inland Utilities with climatic areas subject to dry weather period followed by fog, mist, light rain and in the proximity of contaminants sources, e.g., coal, cement factories, industrial/agricultural, dust, cooling towers effluents pollutants, the polluted insulators become wet, and a conductive layer forms on the contaminated insulator surface.

COMPOSITE - POLYMER INSULATORS

Composite & Polymer insulators for overhead power lines are sold, emphasizing hydrophobicity as one of the main features, and claiming that (the hydrophobic feature) is a crucial factor in limiting leakage currents.

Moreover, preventive maintenance is often emphasized as minimal and ultimately unnecessary.

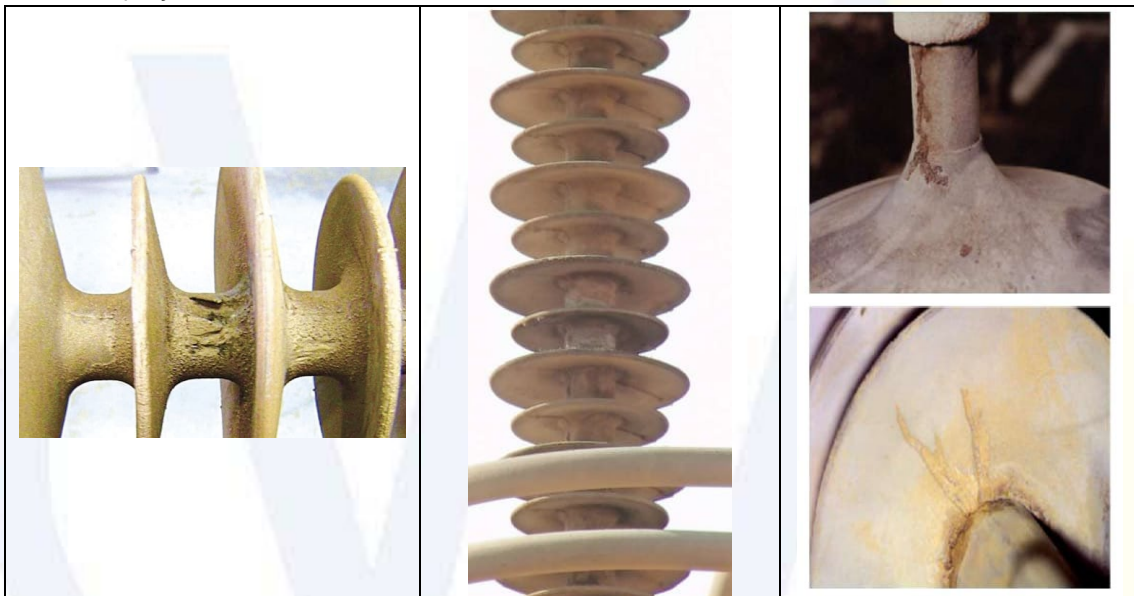


Because contaminants settle in dry periods, the pollutant layer covers the hydrophobicity feature; therefore, the paramount quality of being hydrophobic is voided.

The polluted insulators become wet in coastal and inland Utilities located in climatic areas subjected to dry and hot weather followed by mist, fog, and light rain. A conductive layer forms on the contaminated insulator surface, initiating leakage current.

With all due respect to the claim that composite & polymer insulators require minimal and ultimately unnecessary maintenance, sooner or later, they must be washed. (In climatic areas as above stated).

Polymeric insulators sold as MAINTENANCE FREE AND installed on Transco (Transmission Line Company UAE). Here below few pics taken by the Transco maintenance team, clearly showing the failure of such polymeric insulators.



RTV COATING

RTV silicone coatings are being sold, emphasizing hydrophobicity as the main feature, and claiming that (hydrophobic quality) is crucial in limiting leakage currents. These coatings are designed to replace silicone grease and water washing and, it is claimed, to eliminate the maintenance cost.



As happens for the Polymeric insulators, the polluted insulators become wet in coastal and inland Utilities located in climatic areas subjected to dry and hot weather followed by mist, fog, and light rain.

Within a variable in length period (time depends on the climatic conditions), RTV coatings degrade with coating peeling off, forcing a power outage to resolve issues.



400 kV Power Transformer – RTV coated **Polluted Bushings/Insulators**
(Location: Ras Girtas Power Co., – Ras Laffan C IWPP - Qatar).

Also, in this case, with all due respect to the claim that RTV coatings require minimal and ultimately unnecessary maintenance, sooner or later, they (the bushings/insulators) must be washed. (In climatic areas as above stated).

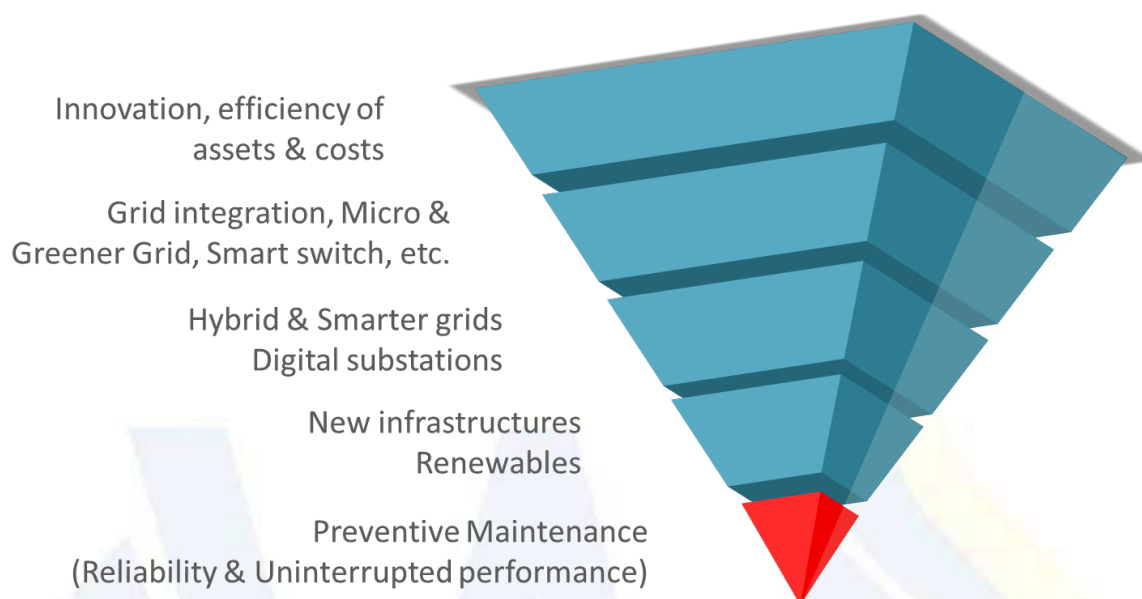
When properly selected and applied, these coatings will reduce the maintenance. Because they are an advanced technology engineering material, their application at the site requires rigorous attention to detail and expertise, which is quite challenging to achieve in the field.

The RTV coatings manufacturers (e.g., XIAMETER® ECE-3650 Sylgard HVIC from Dow Corning) state on their documents that the main benefits and features are:

- Flashover's protection
- Long term hydrophobicity
- Imparts arc resistance and hydrophobicity
- Exhibits a unique ability to recover water repellency after contaminants are deposited on its surface
- Minimizes surface damage from electrical activity during extreme weather events

This article aims to bring your attention to the importance of preventive maintenance of energized polluted insulators that are one of the main factors causing leakage currents, power outages, and ultimately flashovers.

The Preventive Maintenance plans are chronically suffering a shortage in funds with limited budgets allocation and often mistakenly squeezed to the minimum.



THE PREVENTIVE MAINTENANCE IS THE FOUNDATION OF THE PYRAMID

A seasonally adjusted maintenance program focused on washing POLLUTED insulators WITHOUT POWER OUTAGE prevents leakage currents, flashovers, and cold washing and RTV coating repair costs.



Watch live line (energized) substation and power line insulators washing at our YouTube channel

<https://youtu.be/Dlw9Vglzkns>

Follow Insulators Washing Systems LinkedIn showcase page to consult and download technical articles,

Preventive Maintenance of T&D Energized Polluted Insulators WITHOUT POWER OUTAGE.

Prevent Substation and T&D power interruption with Automated, Hybrid, and mobile Washing Systems, attain operational excellence, reduce downtime risk, ensure Personnel safety, achieve financial efficiency by optimizing maintenance budget.

In some geographical areas and highly contaminated areas, we recommend T&D Users implement a preventive maintenance plan with the SCOPE of:

P r e v e n t i n g

- Voltage drops - Leakage current
- Short circuit trips - Relay operation
- Flashovers - Power supply interruption
- Line outage events - Substation outage risk
- Several hours to remediate - Power supply failures

I n c r e a s i n g

- Uninterrupted substation performance
- Overall system reliability
- Assets efficiency

R e d u c i n g

- Maintenance budget
- Operating cost
- Management cost

If interested in getting a free-of-charge Automated, Hybrid, or mobile Washing Systems case and cost study, send relevant layout & section drawings of your Substation, Gantries, or Transmission lines with details, e.g., kV rating, insulator's type, etc.

E-mail our Customer Service & Support office (CSS) css@wilorton.info specifying in the subject: CASE STUDY.

We accept challenges & questions.

Thanks for your attention



Wilorton Holding Inc.