

The very Best.



PPC INSULATORS

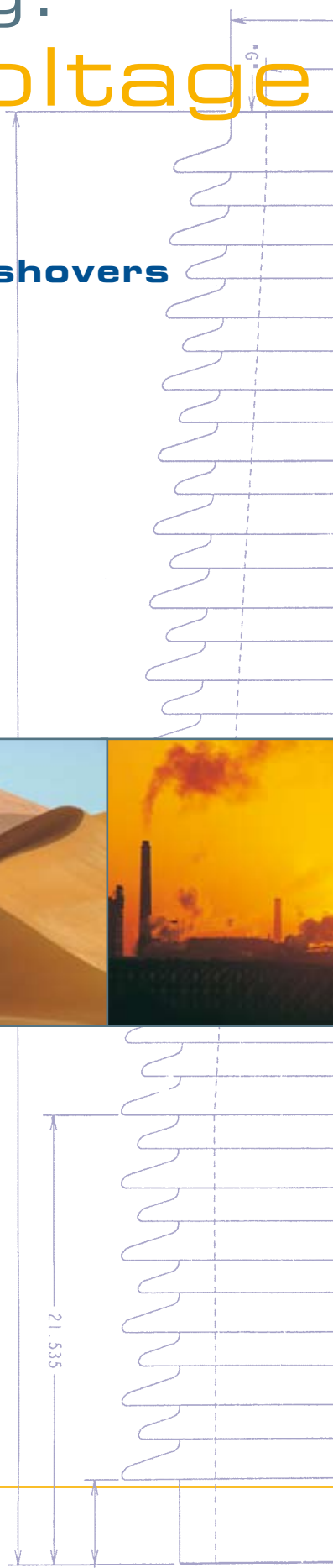
# RTV Silicone Coating. High Voltage

## Contamination leads to flashovers

Extreme environmental conditions and high pollution areas such as industrial, desert and coastal regions cause excessive leakage currents. The surface condition of an insulator in such areas will subsequently lead to a pollution flashover and power system outages. To avoid the electrically conductive layer, resulting from an accumulation of pollutants in combination with moisture, frequent washing or greasing of the insulators is necessary to ensure safe operation. The consequences are high maintenance cost and profit losses because of regular station shut downs and interruptions in electricity supply.



The need for reliable power networks, the avoidance of blackouts, and substation shutdowns due to frequent maintenance procedures led the insulation industry to react. Starting in the early 90's, PPC's research on room temperature vulcanized silicone rubber coatings, RTV, was initiated by the group's production facility in Sonneberg, Germany. POWERSIL® rubber emerged as the perfect material for use with PPC porcelain insulators due to its long-lasting hydrophobic property. A special spray coating technique was developed to evenly apply the POWERSIL® material on the porcelain in a layer thickness of 0.5 mm [19 mils].



# Insulator Coating.

PPC high voltage insulator coatings work on the principle of providing a hydrophobic surface limiting the leakage current to harmless levels in the presence of moisture and contamination.

## Benefits of RTV-Coating

- › Excellent self cleaning characteristics and long-term resistance to weathering and difficult environments
- › Long-term hydrophobicity due to the migration of low molecular weight (LMW) siloxanes into the pollution layer
  - › Suppression of leakage current, discharges and pollution flashover
    - › Reduced maintenance expenditures, as in washing, compared to conventional insulator surfaces
    - › Facilitated cleaning in case of extreme pollution deposition (e.g. cement); even most difficult pollutants can be wiped off by cloth
- › RTV coated surfaces withstand high pressure jet washing up to 90 bar (normal application, 25cm distance)
- › The best of both worlds, mechanical strength of porcelain and pollution performance of silicone rubber
  - › Long-term RTV stability makes repeated application of grease unnecessary
    - › Minimum 15 years as experienced and reported by STRI
    - › Non toxic and environmental friendly material
  - › Transmission reliability as well as environmental and resource conservation by efficiently utilizing generated power

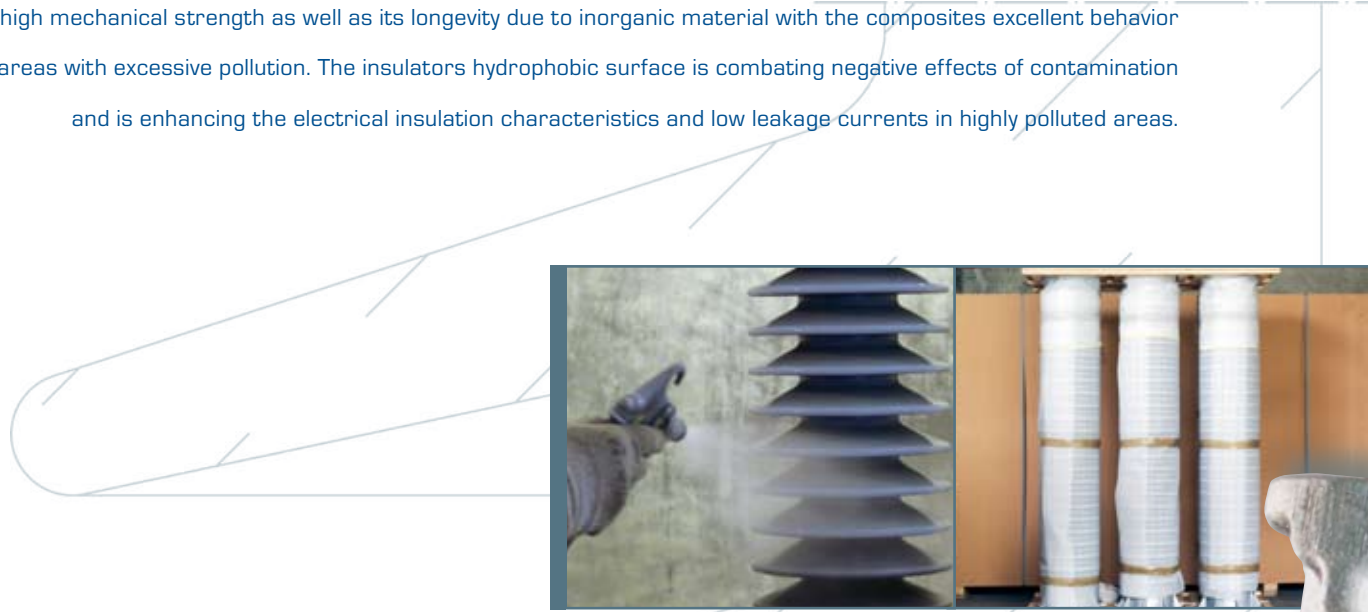


RTV silicone coating can also be applied in normal contaminated areas, thus reducing maintenance expenditures and revenue losses because of required station shut downs for insulator washing.

# PPC Solutions.

# Porcelain strength

RTV covering **PPC** manufactured insulators with a silicone layer will combine the porcelains undisputed superiority of high mechanical strength as well as its longevity due to inorganic material with the composites excellent behavior in areas with excessive pollution. The insulators hydrophobic surface is combating negative effects of contamination and is enhancing the electrical insulation characteristics and low leakage currents in highly polluted areas.

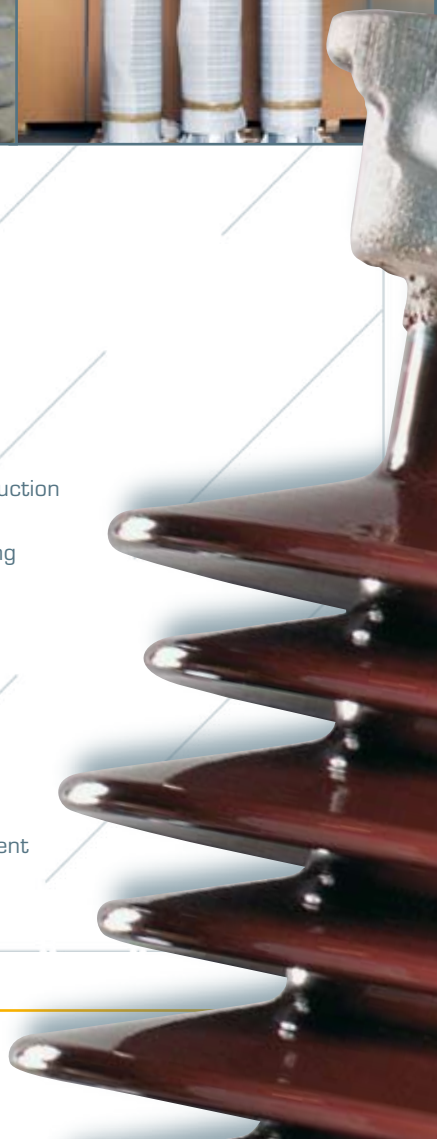


## Solution 1: In-House Coating

In-house coating is especially advantageous for projects using new insulators. No preparation for coating is needed and new, clean insulators are coated within the controlled environment of **PPC** production facilities – where as outside weather conditions or the surface conditions of the insulator need to be addressed when coating insulators „On-Site“. A product ready to be installed is delivered.

### PROCESS

- › Porcelain insulator production
- › Insulator surface cleaning and masking
- › Surface RTV coating
- › Coating Inspection
- › Hydrophobicity check
- › Suitable packing to prevent handling damage





# meets hydrophobicity.

## Solution 2: On-Site Coating

Upgrading existing substation equipment is possible by on-site coating. A trained and experienced coating team is sent to the de-energized substation. Before applying the silicone layer, preparation and cleaning of the insulator needs to be done. **PPC** On-site coating is environmentally friendly – no dangerous or hazardous materials are used.



### PROCESS

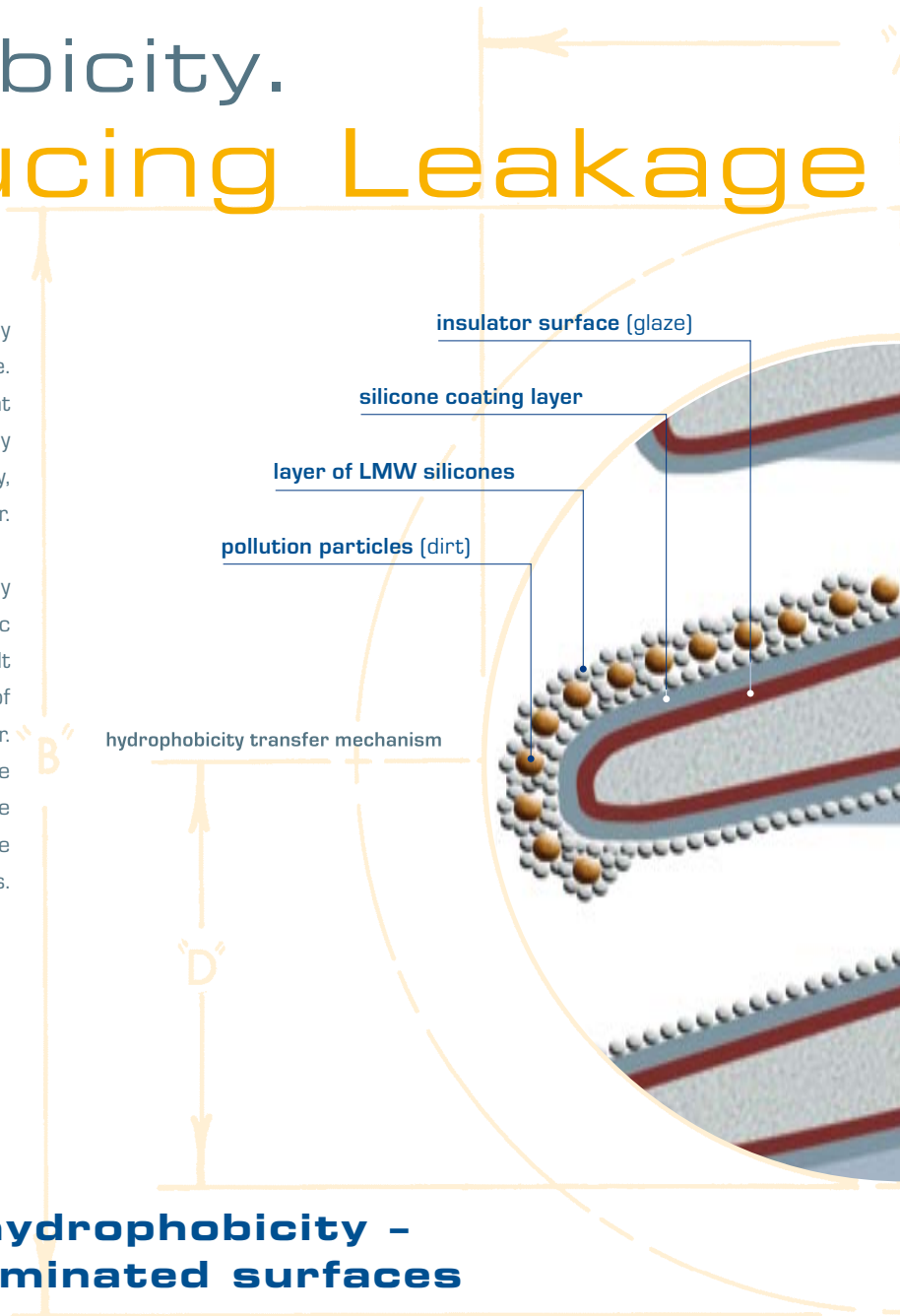
- › Substation de-energizing
- › Wind/dust protection platform
- › Insulator surface cleaning and masking
- › Surface coating
- › Coating Inspection
- › Hydrophobicity check
- › Substation re-energizing

**PPC** is one of the very few insulator manufacturers able to offer both solutions of RTV coating directly to our customers without involving an external company for this service.

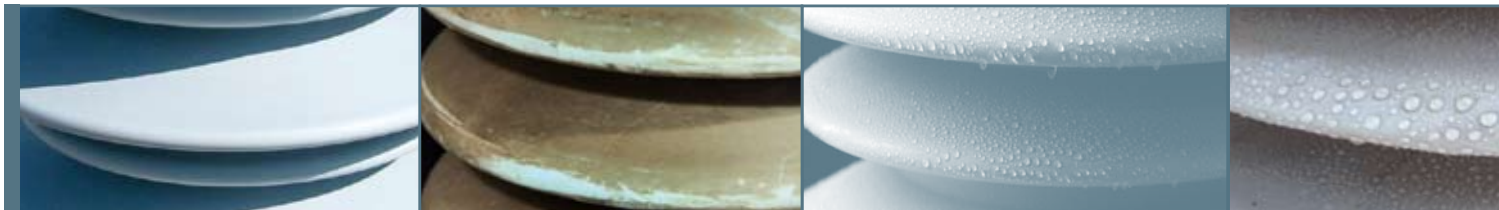
# Hydrophobicity. Reducing Leakage

Porcelain insulators show high surface energy with polar molecule groups that are highly wettable. When contaminated and wetted, leakage current develops on the porcelain insulator which may lead to flashover and consequently, power system outages may occur.

The substitution of polar molecule groups by non-polar molecule groups ensures that hydrophilic surfaces become hydrophobic. This is the result when coating the porcelain insulator with a layer of room temperature vulcanizing (RTV) silicone rubber. Low molecular weight (LMW) components are responsible for the hydrophobic surface of the coating. Water repellency and a low surface energy will be obtained on hydrophobic surfaces.



## Long lasting hydrophobicity - even on contaminated surfaces



Permanent hydrophobicity is possible due to the hydrophobicity transfer to the pollution layer. In the case of pollution particle deposition on the coating layer, the LMW will spread from the silicone bulk material to the pollution layer and encapsulates these particles within a short time period. Now the surface of the insulator is hydrophobic once again.

# Current.

## Substation 110kV Germany

Flashover problems caused by salt fog contamination of the nearby highway during wet seasons on post insulator, bushings, surge arresters, current transformers and hollow insulators.



# PPC experience.

## In-House & On-Site

With almost two decades of experience and customers satisfaction, it is evidence of the premium quality and long lasting hydrophobic properties of the material used and the excellent coating technique developed within PPC. Even in heavy polluted areas, two decades after the first coating, no re-coating is needed. The very Best. That's what we deliver.

## Substation 380kV Spain

Coating of post insulators for disconnectors because of corona discharges on insulators close to Mediterranean Sea  
Severe contaminated layer on the surface of insulators caused by salt fog and industrial pollution.



## Substation 380kV Netherlands

Corona discharges on circuit breakers were observed on the insulators surfaces during operation because of industrial pollution (sea port area) and salt fog pollution (close to North Sea).



# The very Best.



## That's what we deliver.

Only a company that develops, produces and delivers products worldwide can provide the optimal solution for your requirements.

The specialists of **PPC** Insulators are dedicated to supplying you with superior advice and global support.

**PPC** Insulators quality products and service provide time-tested value to fulfill your needs!

Please visit us on the web at [www.ppcinsulators.com](http://www.ppcinsulators.com)



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