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**Surface treatment on electrical conductors to reduce losses due to the corona effect.**

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Effective electric power transmission requires minimization of losses, some of whom are caused by the corona discharge around the conductors, especially on high voltage lines. Corona discharge is a process by which a current flows from the high voltage potential of the conductor into air, by ionizing it and creating a region of plasma around it. Additionally to power loss, the corona effect generates in the process gases, such as ozone and nitrogen oxides, noise, electromagnetic interference, risk of insulation damage, etc.

Among other factors, environmental conditions (e.g. humidity) and the surface condition of the electrical conductor affect the occurrence and intensity of the corona effect.

In this study, different surface treatments were applied on (flat) test samples manufactured on aluminum alloy and on real intertwined (cylindrical) aluminum electrical conductors. The induced surface roughness was measured as well as its effect on the wettability of the conductors. This was assessed by different techniques: contact angle measurements, drop tests and spray tests.

As a result, the more interesting surface conditions on aluminum to minimize their wettability, i.e. corona effect, were identified. It was also found that the correlation between the performance of the flat surfaces and those of the cylindrical cables was actually quite poor.

**Keywords**

corona discharge

aluminium

surface treatment

wettability

power transmission