

# Estimation of paint thickness from measured surface potential charged by corona discharge

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*Abstract*—Estimation method of paint thickness have been investigated using measured surface potential of the painted layer charged by corona discharge. A needle-to-cylinder corona electrodes and surface voltmeter were placed above the grounded metal plate covered with various thickness of water based paint less than 250  $\mu\text{m}$ . The painted surface was charged by the corona electrode along with the measurement of the surface potential around the charge area. An equivalent circuit model including volume resistance of the painted layer was proposed to show the principle of measuring thickness of the painted layer. The measured surface potential was linearly increased with the thickness of the painted layer less than 100  $\mu\text{m}$  as predicted by the model. It was found that this method was significantly effective for estimating paint thickness from wet to dry conditions without contacting.