C.10.1.4.

Effect of ageing on volume resistivity of different kinds of polyethylene cables insulation

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Resistivity of dielectric material is very important electrical parameter, characterising quality of insulation system. For cable insulation the most significant is volume resistivity rather than surface resistivity. This parameter is especially important in HVDC installations due to strict dependence of electric field intensity distribution on properties of dielectric material.

Laboratory test were carried out on several kinds of crosslinked polyethylene. Samples and parts of real cables were examined during tests. Influences of temperature, electric field and humidity were also considered, having greatest importance on values of measured volume resistivity. Values recorded for new and aged samples can differ significantly. Measurements on aged polyethylene insulation were performed to verify changes of volume resistivity. Polyethylene samples and parts of real MV cables were aged in different conditions, trying to simulate real service. Ageing factors were voltage, high or low temperature and water. Influence of water treeing presence and water content in polyethylene insulation on changes of volume resistivity were tested, too.

The resistivity shown on figure are the exemplary results of measures of volume resistivity for two kind of samples – standard and prepared especially for DC applications.

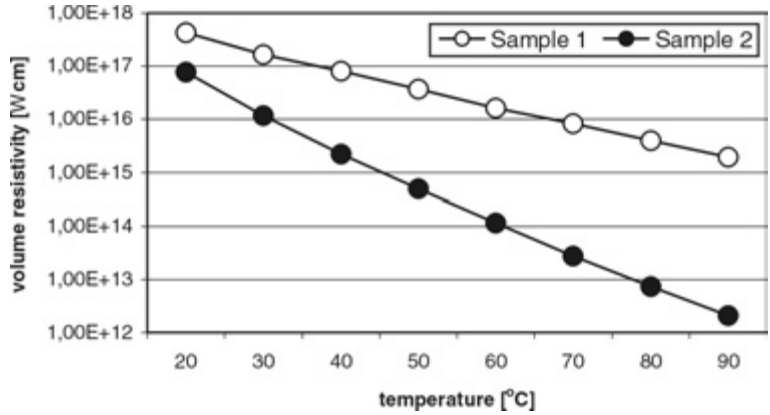

Fig. 1. Resistivity of different exemplary cable insulation samples