

EFFECT OF THE DIELECTRIC STRENGTH TEST ON DIELECTRIC PROPERTIES



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ABSTRACT

After manufacturing high voltage equipment are usually examined by dielectric strength test. The conditions of the test (e.g.: shape, magnitude and duration of the test voltage) are specified by international standards. For the magnitude of the test voltage is always higher than the nominal voltage, the equipment are always exposed to voltage stress. The negative effect of the voltage stress is a well known problem. The voltage stress changes the physical properties of the material (mainly the electric strength) so the voltage stress cause degradation of the insulation. Reliable methods are needed by the manufacturers of the high voltage equipment to estimate the degree of degradation caused by the dielectric strength test. These methods should be based on the measurement of dielectric properties like most of non-destructive insulation diagnostic methods.

The aim of the present investigation was to determine the effect of the voltage stress on the dielectric properties of the insulating materials. The samples for the examination were taken from a brand new low voltage PVC insulated cable. The first step of the examination: the samples were put through the dielectric strength test using relatively high voltage. Second step: the dielectric properties (leakage current, voltage response and $\tan \delta$) were measured. These steps were cyclically repeated until the electric breakdown of the sample.

The detailed examination and the results are discussed in this paper.