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Partial discharge measurements and IEC standards: Justification of the use for their inclusion in afterlaying test for extruded cable systems

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Partial discharges, as their name states, only partialy bridge a small portion of electrical insulation in the form of a tiny electrical arcs, which burn inside the defects that could appear in insulation system. Because of the fact that extruded cable system insulation is very sensitive on partial discharge activities detection vise, partial discharge measurements could be used as a powerful diagnostic tool in evaluating the actual condition of cable system through measuring procedures during afterlaying tests. If such procedures would be included in standards, they would provide an effective way to identify and detect the defects that might appear during the cable system installation and to forestall their appearance during exploitation, ultimately reducing the probability of failure. Very first aim of this paper is to address some shortcomings of current IEC standards related to analyses of cable systems with polymer insulation (IEC 60840 and IEC 62067). In order to justify these statements, a review of a recent alignment between IEC 60840 and IEC 62067, simulation support, using the contemporary software tool (COMSOL Mph), backed up with experimental results for two artificially induced defects in cable accessories, are provided in this paper.

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