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Tip Of The Week

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Testing Insulation With DC Voltage

Generally speaking the use of a high voltage DC test signal on motor insulation is considered less risky than the equivalent AC test. However, when you are testing the motor and power cables together as we often are in the field, some additional considerations are important. Over many years of testing insulation systems, a growing concern developed that a large number of cable failures were occurring shortly following the performance of DC Hipot testing. This resulted in significant research just before the turn of the 21st century into the possible role of the DC testing. What they found was that not all distribution cables responded the same. The polyethylene (PE/XLPE) insulation was found to be far more susceptible due to the space charges that developed in localized areas of the PE resin. This charge gets stored and adds to the peak stress voltage seen by the insulation during a surge or the next AC motor start. Additionally, these cables are often run underground in potentially wet environments. This can create water trees to form in the insulation further weakening the insulation system against the elevated peak starting voltages.

Tip: If you're going to install cables underground in a potentially wet environment, consider Ethylene Propylene Rubber (EPR) cables. EPR cables also develop a space charge, but it dissipates very quickly and does not add to the peak stress voltage.

You are invited to submit an Electric Motor Testing Tip of your own and receive a free PdMA® mug or hat if we publish it! Contact Lou at 813-621-6463 ext. 126 or lou@pdma.com.