HIOKI

Application Note

Hioki IR4056-21 For Insulation Resistance Testing

What is Insulation Resistance?

Wires and cables are electrically conductive materials. The external layer surrounding the wires, however, is made of insulating material that prevents accidental touching of other conductive material and protects them from environment threats[1]. This non-conductive insulating material has a high resistance value which enables only very low-value current to flow. Figure 1.0 shows a typical cable assembly with the conductive and insulation parts.

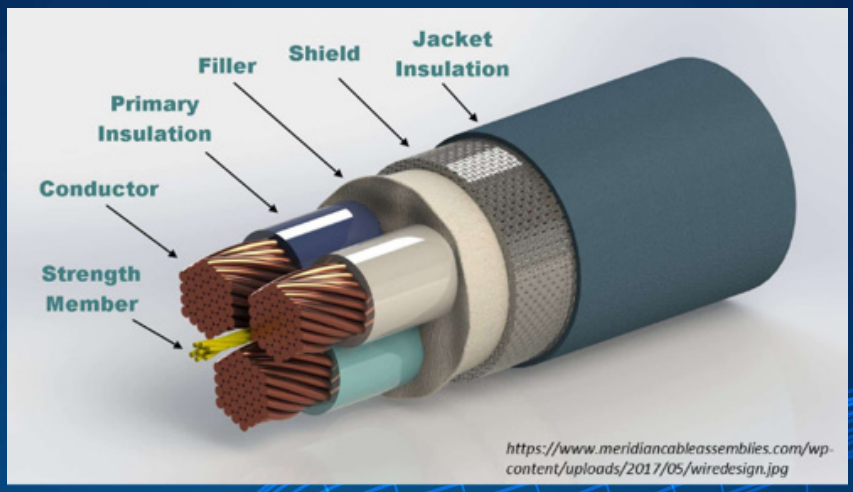

Figure 1.0 Parts In A Typical Cable Assembly

Insulation Resistance Testing

The insulating material of wires and cables degrades with time, leading to decrement in its electrical resistivity [2]. This result in electrical leakages which poses a hazard to personnel safety and could damage equipment. Hence insulation resistance testing is needed to identify any insulation deterioration before any untoward incidents occur. Figure 2.0 identifies some of the common factors that lead to insulation degradation.

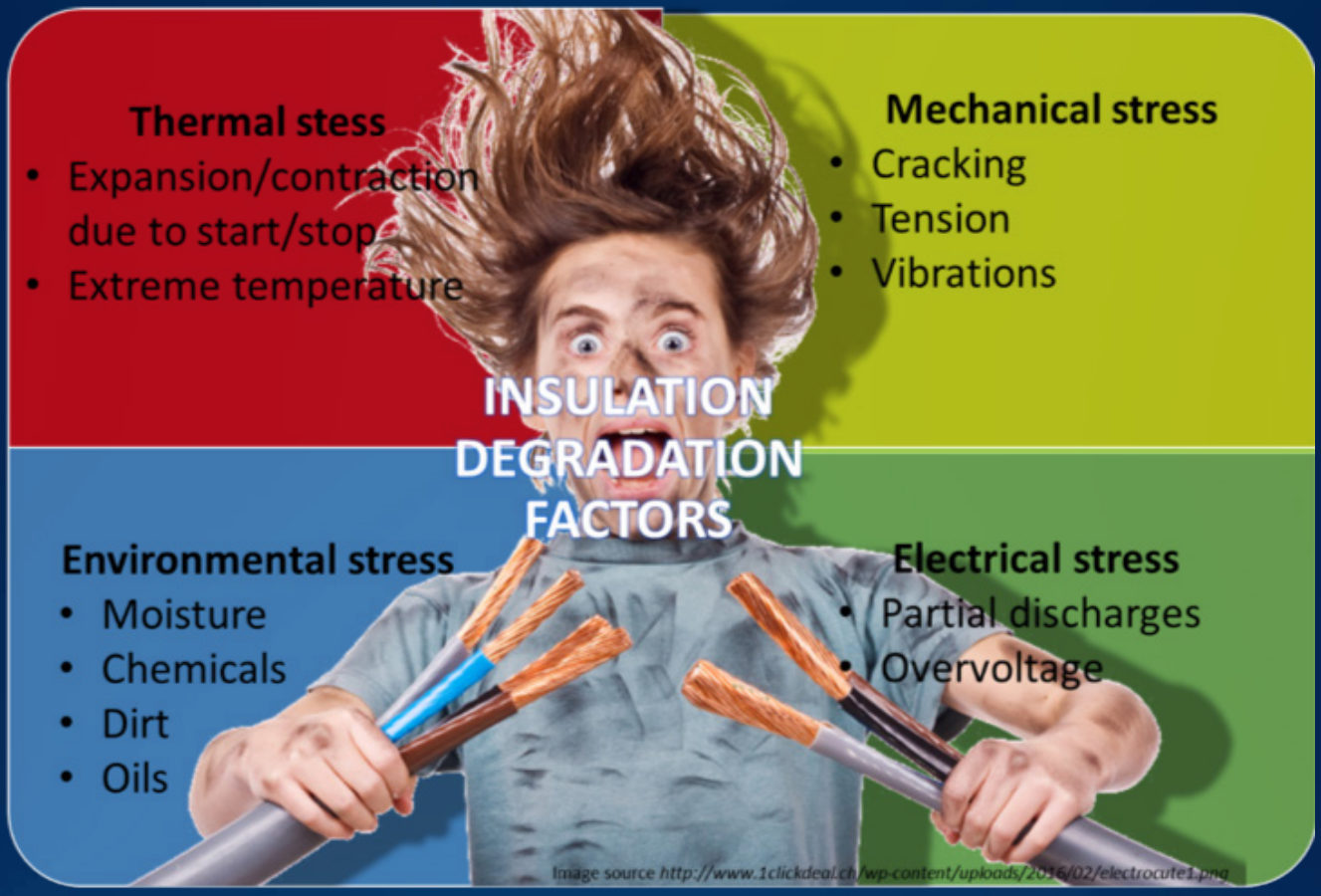

Figure 2.0 Insulation Degradation Factors [3]

An insulation resistance tester detects the current leakages during the insulation resistance testing. The tester applies a known high DC voltage on the measurement target, which results in a current flow around the surface of the insulation. This current is measured and the equivalent resistance, expressed in megohms (MΩ), is automatically calculated and displayed. The resistance value is then compared with a pre-determined baseline value to determine its validity. Figure 3.0 illustrates a general set-up for insulation resistance testing using an insulation resistance tester.

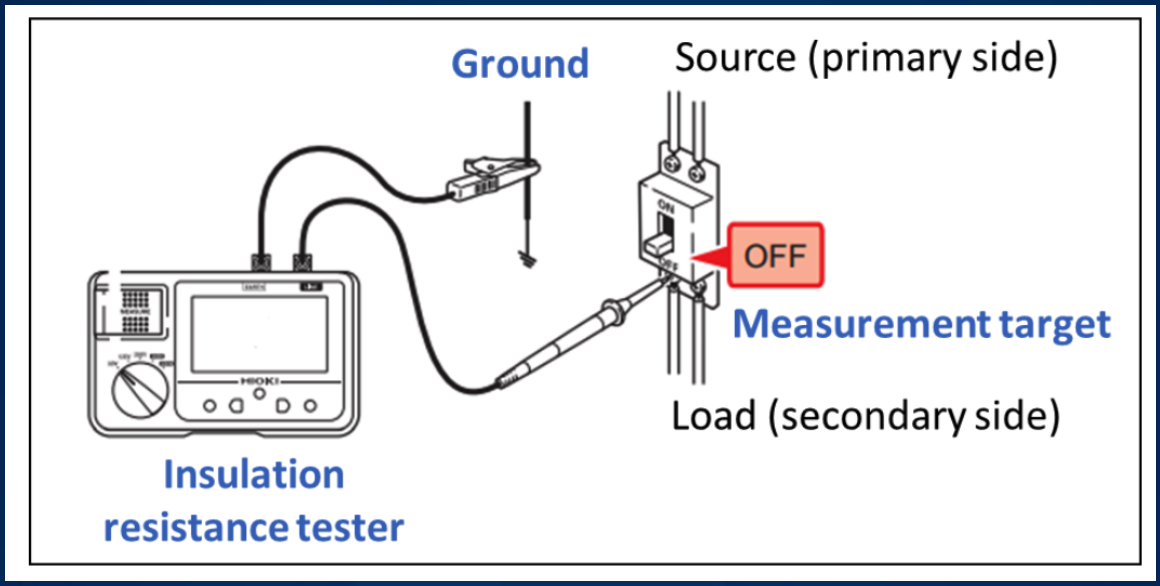

Figure 3.0 Typical insulation resistance testing set-up

Hioki IR4056-21 for Insulation Resistance Testing

Hioki IR4056-21 is a value-for-money product to cater to customers' need for a versatile insulation resistance tester. A competitive price accompanies the following advantages to assist a speedy and accurate insulation resistance testing.

All of the above IR4056-21 features allow users to execute safe and quick insulation resistance testing. The audio and visual result indication based on a pre-set value enhances user experience and error-proof the testing result. Among the insulation resistance testers available in the market within the same price range, Hioki IR4056-21 offers more advantageous multi-features compared to others, making it a value-for-money choice tester for users.

References
1. https://www.performancewire.com/insulated-wire-protection/
2. https://carelabz.com/learn-how-insulation-resistance-test-done/
3. https://www.industrial-electronics.com/epemt_1f.html

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