Application Note

Shelf Life and Cable Life of Cables

How Many Years?

Shelf Life

Southwire® Industrial Power Cable products do not have a defined shelf life. These products are composed of hard goods (metal, polymer, etc., ...) that are designed for many years of service once installed. As long as the products are not damaged during storage/handling and they are stored in a facility that protects against exposure to weather (sunlight and precipitation), there should be no degradation to the electrical and mechanical performance of the products and no reduction in service life. When storing cable the following precautions should be considered:

1. Unloading equipment should not come in contact with the cable or its protective covering.
2. If a crane is used to unload the cable a shaft through both arbor holes should be used along with the proper spreader length.
3. If a forklift is used to unload the cable the forklift must lift the reel by contacting both flanges.
4. Store reels up-right on hard surface so that the flanges will not sink and allow reel weight to rest on cable.
5. Reels should be stored out of harm's way. Consider both physical and environmental hazards.
6. Cable ends must always be sealed to prevent the entrance of moisture, etc.
7. For indoor storage dry location:
   i. Consideration should be taken to use steel reels if the cable weighs more than 11,000 Lbs.
   ii. Wooden reels can be used if the cable weights less than 11,000 Lbs. Visual inspection of the wooden reel should be performed before use of cable.

   For outdoor storage dry/wet location:
   i. Consideration should be taken to use steel reels if the cable weights more than 11,000 Lbs. Reel should be tarped and on a hard surface.
   ii. Wooden reels can be used if the cable is to be stored for less than six months and weights less than 11,000 Lbs. Reel should be tarped and on a hard surface. Visual inspection of the wooden reel should be performed before use of cable.
8. Shrink wrap over the products should be left in place until product installation.

Cable Life

A question that the cable engineering community often gets is how long will my cable last? While there is no scientific test method or study to determine the life expectancy of a cable due to the many variables that can affect it's life, the industry generally feels based on field data that cables made in the 80's and later have a life expectancy of 40 years or more. Advancements in polymers and manufacturing methods has contributed to improved cable systems and longevity.

2011
09/10/2018

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Variables that can shorten the life expectancy of a cable include but are not limited to operating temperature above cable design, the environment the cable is exposed to such as sunlight, snow and rain, damage during installation, animals, transients, oil and chemical spills, excessive overload hours and manufacturing defect.

What are signs the cable should be replaced? Cable failures of two or more on the same cable or on feeders with multiple circuits that have the same voltage and age is a good indicator that further failures are likely to happen because it's highly likely the cables were all made at the same factory, same polymer, same production run, same operator, experienced the same operating cycle, etc.

There are no diagnostic tests that can predict remaining cable life, however, there are mainly three different tests that can evaluate the cable's overall condition.

1. Hi-Pot Testing: This test is a "go, no-go" test. The system is required to withstand the specified dc voltage for the specified time duration. The test normally reveals gross imperfections resulting from improper field handling such as excessive bending or air gaps between the insulation and shield interfaces. It has limited ability to discover high impedance defects such as voids and cuts. Refer to IEEE 400 for more detail

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2. Very Low Frequency Testing (VLF): In a VLF ac withstand test, the cable must survive a specified voltage applied across the insulation for a specified period of time without breakdown of the insulation. This is a "go, no-go" test. A diagnostic test using VLF tan delta allows for the determination of the relative amount of degradation of a cable system section and indicates, by comparison with historical figures whether the cable is likely to continue to perform properly in service. Refer to IEEE 400.2 for more detail.

3. Partial Discharge (PD): Partial discharge is a diagnostic test that allows for the determination of insulation degradation by detecting PD from defects and damage in shielded power cables. It can be carried out on-line or by means of an external voltage source. Refer to IEEE 400.3 for more detail.