



UL Medium Voltage Cable Inspection Program Requirements

Medium Voltage cables, are a subset of the wire and cable industry that serves utilities, independent power producers, commercial and industrial users. The medium voltage cable inspection program offers a method of validation of manufacture and testing of these cable types. UL qualified personnel perform inspections to determine if the inspected products meet the requirements of recognized industry standards.

Purchasers of medium voltage cable may specify UL medium voltage cable inspections as part of their technical purchase specifications to manufacturers and suppliers of these cable types. The specification shall inform the supplier of the requirement to have cable inspected by UL as part of this program and if a Certificate Of Inspection is required by the purchaser as evidence of such inspections. Inspections are to take place at the required frequency as requested.

This document provides requirements applicable to the inspection program for medium voltage cables produced to recognized industry standards. This service is carried out under the terms of the Medium Voltage Cable Inspection Program (MVCIP) Service terms found at: www.ul.com/contracts.

REQUIREMENTS

Inspection Requirements

Utilities, independent power producers, commercial and industrial users of medium voltage cables may elect to specify this program as part of their specifications or purchase orders to manufacturers of medium voltage cable. The manufacturer shall notify UL of the requirement to have the cable lot inspected at the requested frequency. A sample from the lot may be selected for further testing by UL as a comparison to results of testing witnessed during the inspection. Results from the inspection and selected sample testing are reviewed by UL Wire and Cable engineers for compliance with required standards to which the cable was manufactured. Upon completion of the engineering review the manufacturer would be eligible to receive a Certificate of Inspection or a non-compliance report dependent upon the results of inspection and testing.

Inspection Frequency

Those users of medium voltage cable specifying to have UL inspect their cable under this program are responsible for selecting the inspection frequency and required sampling plan that best meets their specific needs and conveying this to the manufacturer either through purchase order or specification for supply of cable. Users who specify this program are encouraged to request a copy of Certificates of Inspection and inspection and test report documents as applicable from their cable supplier to help ensure the supplier is meeting the inspection requirements.

Customers may arrange to have UL conduct multiple inspections in a single visit whenever possible. Customers requesting inspection should provide a minimum of two weeks' notice to UL prior to required cable lot inspections. Certain tests may be required to be witnessed by UL during the time of inspection, regardless if those tests will be performed on other cables in the same run/lot not intended for that purchaser requesting inspection. The manufacturer is responsible for conveying these details as part of the inspection request to UL.

Inspections of products tested at more than one location (multi-plant products) may be accommodated, provided UL is made aware of these requirements in advance. Such circumstances are handled on a case by case basis. This may alter the fee associated with such inspections.

Relevant Standards for Reference

Under this program manufacturers locations where inspections will occur are required to have copies of the most up to date versions of specific standards which the product is manufactured and tested in accordance with and are required to maintain

1 For more information, please contact your local UL Wire and Cable Representative



these documents. These standards shall be made available to UL Personnel upon request.

Standards which may be referenced include, but may not be limited to, those listed.

ASTM

ASTM D412: Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers—Tension

ASTM D1693: Standard Test Method for Environmental Stress-Cracking of Ethylene Plastics

ASTM D3349: Standard Test Method for Absorption Coefficient of Ethylene Polymer Material Pigmented with Carbon Black

ASTM G-153: Standard Practice for Operating Enclosed Carbon Arc Light Apparatus for Exposure of Nonmetallic Materials

ASTM G-155: Standard Practice for Operating Xenon Arc Light Apparatus for Exposure of Non-Metallic Materials

ASTM D746: Standard Test Method for Brittleness Temperature of Plastics and Elastomers by Impact

ASTM D2275: Standard Test Method for Voltage Endurance of Solid Electrical Insulating Materials Subjected to Partial Discharges (Corona) on the Surface

AEIC/ICEA/NEMA

AEIC CS8: Specification for Extruded Dielectric, shielded power cables rated 5 through 46 kV

AEIC CS9: Specification for Extruded Insulation Power Cables and their accessories rated above 46 kV through 345 kV ac

ICEA S-108-720: Standard for Extruded Insulation Power Cables rated above 46 through 345 kV

ICEA S-94-649: Standard for Concentric Neutral Cables rated 5 through 46 kV

ICEA S-97-682: Standard for Utility Shielded Power Cables rated 5 through 46 kV

ICEA T-24-380: Standard for Partial Discharge Test Procedure

ICEA T-28-562: Test Method for Measurement of Hot Creep of Polymeric Insulations

ICEA T-34-664: Test Method for conducting longitudinal water penetration resistance tests on longitudinal water blocked cables

NEMA WC 74/ ICEA S-93-639: 5-46 kV Shielded power cable for use in the transmission and distribution of electric energy

NEMA WC 53/ICEA T-27-581: Standard test methods for extruded dielectric Power, Control, Instrumentation, and portable cables for test

NEMA WC 54/ ICEA T-26-465: Guide for frequency of sampling extruded dielectric Power, Control, instrumentation, and portable cables for test

IEC

IEC 60228: Conductors of insulated cables

IEC 60229: Electric cables- Test on extruded oversheaths with a special protective function

IEC 60270: High-voltage test techniques- Partial discharge measurements

IEC 60502-1: Power cables with extruded insulation and their accessories for rated voltages from 1 kV ($U_m = 1,2kV$) up to 30 kV ($U_m=36$ kV) – Part 1: Cables for rated voltages of 1 kV ($U_m = 1,2$ kV) and 3 kV ($U_m = 3,6$ kV)

IEC 60502-2: Power cables with extruded insulation and their accessories for rated voltages from 1 kV ($U_m = 1,2kV$) up to 30 kV ($U_m=36$ kV) – Part 2: Cables for rated voltages of 6 kV ($U_m = 7,2$ kV) up to 30 kV ($U_m = 36$ kV)

IEC 60811-201: Electric and optical fibre cables – Test methods for non-metallic materials –Part 201: General tests – Measurement of insulation thickness

IEC 60811-202: Electric and optical fibre cables – Test methods for non-metallic materials –Part 202: General tests – Measurement of thickness of non-metallic sheath

IEC 60811-203: Electric and optical fibre cables – Test methods for non-metallic materials –Part 203: General tests – Measurement of overall dimensions

IEC 60811-507: Electric and optical fibre cables – Test methods for non-metallic materials –Part 507: Mechanical tests – Hot set test for cross-linked materials

2 For more information, please contact your local UL Wire and Cable Representative



IEC 60885-3: Electrical test methods for electric cables – Part 3: Test methods for partial discharge measurements on lengths of extruded power cables

Sample Testing

When required UL personnel will select random samples during the inspection visit for additional testing at a UL Laboratory to the standards by which the cable is manufactured as a countercheck to those tests of the manufacturer. This test data is reviewed by UL engineering prior to issuing a Certificate of Inspection or non-compliance report.

Sample testing may be specified by parties requesting inspection to work in conjunction with witness testing and inspections.

UL may perform the following tests to verify compliance of the product with relevant Medium Voltage cable standards:

Conductor

DC resistance
Dimension check

Conductor Shield

Thickness

Insulation

Unaged tensile and elongation
Hot creep
Diameter

Thickness

Insulation Shield

Thickness
Diameter

Jacket

Dimension Check

Certificate Issuance

Product lots found to be in compliance with the standard(s) and inspection requirements will be issued a Certificate of Inspection.

Cables found not to be in compliance with the standard(s) and

inspection requirements will result in the customer receiving a report of non-compliance(s). Customers may choose to re-schedule an inspection to receive a Certificate of Inspection.

Inspection Criteria

As part of the overall inspection UL qualified personnel may inspect for the following related to recognized standards. A comprehensive document may be obtained by request.

- Electrical Testing
 - Partial Discharge
 - AC Withstand
 - Others
- Non-Electrical Testing
 - Hot Creep
 - Tensile and Elongation
 - Water Penetration
 - Others
- Record Keeping
- Marking
- Packaging

UL Engineering Review


UL Wire and Cable Engineering will review the results of the inspection from the manufacturer's production location and results of sample testing by UL. Where there is a discrepancy or non-compliance, UL will notify the manufacturer's representative of the non-compliance or discrepancy for further clarification or resolution prior to issuance of a non-compliance report or Certificate of Inspection.

Records

All inspection records are stored on secured UL Databases unless otherwise indicated. Standard inspection records include the Inspection Report, the resulting inspection documentation. Records are stored for a minimum of five years from the inspection.



Sample Certificate of Inspection



Certificate of Inspection Medium Voltage Cable

UL Certificate/Project Number: Click or tap here to enter text. **Issue Date:** Click or tap to enter a date.

Manufacturer Name: Click or tap here to enter text.

Inspection Address
Street: Click or tap here to enter text.
City: Click or tap here to enter text. **State/Province:** Click or tap here to enter text.
Zip/Postal code: Click or tap here to enter text. **Country:** Click or tap here to enter text.
Date of Inspection: Click or tap to enter a date.
Date of Sample Tests: Click or tap to enter a date.
Standards Manufactured to: Click or tap here to enter text.
Specifications Manufactured to: Click or tap here to enter text.
Inspection Report Number: Click or tap here to enter text.

The product(s) and lot(s) as described below have been inspected by UL LLC and conforms to the above standard requirements as detailed in the inspection report.

Product Details:
Batch or lot numbers of Product Inspected and/or Tested: Click or tap here to enter text.
Number of Reels Inspected: Click or tap here to enter text.
Number of Lots Inspected: Click or tap here to enter text.
Information related to length and other details of the inspected lots is contained in the inspection report
Conductor Type: Copper **Conductor Size:** Click or tap here to enter text. kcmil mm²
Insulation Type: XLPE **Insulation Thickness:** Click or tap here to enter text. mils mm
Jacket Type: MDPE **Jacket Thickness:** Click or tap here to enter text. mils mm
Water Blocked Conductor: Yes No
Product Designation or Model: Click or tap here to enter text.

Signature: _____
Program Owner
Paul Knapp

Inspection Body:
UL LLC
333 Pflingsten Rd., Northbrook, IL 60062, USA
Tel. +1 847-272-8800
www.ul.com

This certificate, inspection report and test results obtained are only valid for those cables or lots of cable inspected. UL has not established Follow-Up Service or other surveillance of the product. The Applicant/ Manufacturer is solely and fully responsible for conformity of all products to all applicable Standard(s), specifications or requirements. The UL Mark may not be applied to any product, advertising or promotional material. Clients may provide this certificate to other parties provided reproduction is in full and does not violate UL LLC policies for use of the UL Mark.

4 For more information, please contact your local UL Wire and Cable Representative