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Summary

# Definitions

1- Manufacturing length: non finished cable where teh outer semi-conductor is finished and other layers are applied over it.

2- Delivery length: Finished Cable.

# Design (IEC 63026:2019)

1- Lead sheath is not mentioned in IEC 63026:2019.

2- Oversheath is not mentioned also. However, outer serving is mentioned. The outer serving should be compatible with cable material that is in physical contact with. such as metal sheath, armour, oversheath or other material).

# Water Blocking (EDC Specs)

1- Swelling powder is added to the conductor.

2- Swelling tapes:

a-are added before and after any metallic layer without adding two tapes over each other.

b-Swelling tapes are added before and after any metallic layer except for the conductor.

# Testing

1- Type tests on cable systems are required. These tests are not included in IEC 60502-2.

"Apart from a type test for a land cable system according to IEC 60502-2 or IEC 60840 which

includes electrical and non-electrical tests, the submarine cable system type test includes a

more extensive mechanical type test programme prior to electrical testing."

## Routine Tests (IEC 63026:2019)

### Partial discharge

Partial discharge is carried out on manufacturing lengths in addition to delivery lengths.

### Voltage test

Voltage test is carried out on manufacturing lengths in addition to delivery lengths.

## Sample Tests

Tests not included in IEC 60502-2 are highlighted in yellow.

|  |  |
| --- | --- |
| **IEC 63026:2019** | **IEC 60502-2** |
| a) conductor examination; | a) conductor examination (see 17.4); |
| b) measurement of electrical resistance of conductor and of metal screen; | b) check of dimensions (see 17.5 to 17.8); |
| c) measurement of thickness of insulation; | c) voltage test for cables of rated voltage above 3,6/6 (7,2) kV (see 17.9); |
| d) measurement of thickness of oversheath, where present; | d) hot set test for EPR, HEPR and XLPE insulations and elastomeric sheaths (see 17.10). |
| e) measurement of thickness of metal sheath, where present; | - |
| f) measurement of diameters, if required; | - |
| g) hot set test for XLPE and EPR insulations; | - |
| h) measurement of capacitance; | - |
| i) tests on components of cables with longitudinally applied metal tape or foil, bonded to the oversheath; | - |
| j) examination of cable. | - |

## Type Tests (Clause 12 Type tests on cable systems)

1. The tests specified in Clause 12 shall be carried out on the cable system to demonstrate satisfactory performance.
2. Apart from (In addition to) a type test for a land cable system according to IEC 60502-2 or IEC 60840 which includes electrical and non-electrical tests, the submarine cable system type test includes a more extensive mechanical type test programme prior to electrical testing.

### Mechanical type tests (not included in IEC 60502-2)

1. Coiling Test. (Not applicable to cables on drums or cables on turntables).
2. Tensile Bending Test.

(Applicable for cables which are intended to be installed, recovered or repaired with a method that comprises bending under tension, for example laying over lay wheels, lay chutes or around capstan wheels.)

1. Tensile Test.

(The tensile test shall be performed if a rigid joint is included in the cable system. A separate tensile test is not required, if the rigid joint is included in the tensile bending test but not passed around the wheel).

### Electrical type tests

1. The insulation thickness shall be measured as shown in IEC 63026:2019 Clause 12.5.1. The test voltage will be increased if the thickness is higher than the nominal thickness.
2. The same sample used for the mechanical tests shall be used.

|  |  |
| --- | --- |
| **IEC 63026:2019** | **IEC 60502-2** |
| a) partial discharge test at ambient temperature (see 12.5.3); | a) bending test, followed by a partial discharge test (see 18.2.4 and 18.2.5); |
| b) tan δ measurement (see 12.5.4);₯₯  this test may be carried out on a different sample, with special test terminations, from that used for the remainder of the sequence of tests; Test is carried out at (rated temp+ 5k to 10k) and nominal voltage  **tan δ < 10x10-4** | b) tan δ measurement (see 18.2.3 and 18.2.6); Test is carried out at (rated temp and voltage ≥ 2 kV **tan δ < 40x10-4** |
| c) heating cycle voltage test (see12.5.5); **Natural Cooling time is 16 h** | c) heating cycle test, followed by a partial discharge test (see 18.2.7); **Natural Cooling time is 3 h** |
| d) partial discharge tests (see 12.5.3) – at ambient temperature and  – at high temperature;  The tests shall be carried out after the final cycle of item c) above or, alternatively, after the tests in item e) below. | d) impulse test, followed by a voltage test (see 18.2.8); |
| e) lightning impulse voltage test followed by a power frequency voltage test (see 12.5.6);  **The conductor temperature shall be maintained within the stated temperature limits for at least 2 h.** | e) voltage test for 4 h (see 18.2.9). |
| f) partial discharge tests, if not previously carried out in item d) above (see 12.5.3); | - |
| g) examination of the cable system with cable and accessories on completion of the above tests; | - |
| h) the resistivity of the cable semi-conducting screens shall be measured on a separate sample. | - |

### Longitudinal/Radial water penetration test

**60502-2 © IEC:2014**: The test is designed to meet the requirements for buried cables and is not intended to apply to cables which are constructed for use as submarine cables.

### Non-Electrical type tests