

Water Immersion Test

Water resistance test is made to tell if a cable material is suitable for submersion in water. It can also be referred to as a test to determine mechanical properties of a cable sheath after water immersion. Performed toward the European standard EN 60811-50.

The test method for water resistance testing describes that four sets of three samples, dumbbell shaped, must be taken from the sheath of the chosen cable. They must be conditioned for a period of seven days at a temperature of $(20 \pm 2)^{\circ}\text{C}$ and at a relative humidity of $(50 \pm 5)\%$.

Once conditioned, one set is weighed and recorded to an accuracy of 0.1mg and immersed in potable water at $(50 \pm 2)^{\circ}\text{C}$ for 100 days. After removal from the bath of potable water, surface water is removed and the samples conditioned for a further 16 hours at a temperature of $(20 \pm 5)^{\circ}\text{C}$ and a relative humidity of $(50 \pm 5)\%$. The samples are then reweighed, and the weights again determined to the nearest 0.1mg.

The increase of mass after immersion shall not be greater than 40% of the mass of the sample prior to immersion.

The further three remaining sets of samples are then used to determine the tensile and elongation at break for the cable:

- i) Without immersion
- ii) After immersion in potable water at $(50 \pm 2)^{\circ}\text{C}$ for 28 days
- iii) After immersion in potable water at $(50 \pm 2)^{\circ}\text{C}$ for 100 days

The tensile and elongation at break, and the variation between 28 days immersion and 100 days immersion, are calculated and the results must be greater than or equal to the values given below:

Tensile Strength N/mm^2 – ≥ 7
Elongation at break – $\geq 200\%$

