

Testing methods for Fire resistant cables



The most critical cables must be fire resistant. Fire resistance means that the cable is guaranteed to work even during a fire. This is made possible by special insulation material, which is merely altered rather than destroyed by fire. This means the cable keeps its shape, the conductors are kept separate and the cable continues to work.

Fire resistant cables are recommended for use in installations where you have to ensure integrity of function during a fire. Using fire resistant cables in critical alarm, control, signal and power supply systems enables the security systems to continue functioning for a certain time after the fire has started.

Fire-resistant cables are also flame resistant, which means that they are difficult to ignite and is self-extinguishing. These characteristics limit the spread of a fire. Nexans fire safety cables emit no corrosive gases, and only small amounts of smoke in case of fire.

There are several different standardized tests to check fire resistance for cables. In this document some of the most common test procedures are described.

Standard	Description
IEC 60 331	A 1.4 meter cable is placed in a test rig. The cable is energized with a rated voltage and a burner is placed below with an angle and aimed towards the cable. The flame from the burner has a temperature of 750 °C and keeps on burning for 90 minutes. The cable must not short circuit during the test.
EN 50 200	This test is especially designed for cables with a cross-section equal to or less than 2,5 mm ² and a outer diameter of less than 20 mm. A defined piece of cable is mounted against a wall fixture with grounded metal clips shaped in an u-form. A burner is placed below with an angle and aimed towards the cable. Every five minutes a metal rod hits the wall fixture to simulate vibrations. The flame from the burner keeps on burning for 90 minutes. The cable must not short circuit during the test and the cores has to remain intact.
Swedish National Board of Housing, Building and Planning (BBR) EI30, EI60 and EI90	This fire test simulates a fire in a cable tray where the temperature increases with time according to a standardized temperature curve (EN 1363-1). The cables are mounted horizontally on a cable ladder across the burners and energized with a rated voltage before the burners are ignited. EI 30, EI 60 and EI 90 are tests for 30, 60 and 90 minutes. The temperature is about 840 °C after 30 minutes, 940 °C for 60 minutes and 1010 °C after 90 minutes. According to this test standard the electrical circuit is maintained even during a very heavy fire.
DIN 4102-12	The main difference between BBR and DIN 4102-12 (German standard) is that for DIN 4102-12 the cables are mounted with bends on the cable ladder. Except the way the cables are mounted there is only very small differences between the testing methods for BBR and DIN 4102-12.