

Circuit integrity maintenance according to DIN 4102 Part 12

DIN 4102-12 plays an important role in the area of structural fire protection. It describes in detail the test requirements for cable management systems for circuit integrity. According to this standard, cable management systems with circuit integrity are a system consisting of cable laying systems and cables for circuit integrity. Testing in accordance with DIN 4102-12 ensures that these remain functional for a period of 30 (E30), 60 (E60) or 90 minutes (E90), which are responsible for supplying life-saving current collectors in the event of a fire. The background to this is to ensure the safe evacuation of people from the building and to minimise material damage. The scope of application is limited to cables with rated voltages of up to 1 kV.

Fire protection requirements for cables for circuit integrity

In accordance with DIN 4102-12, the cables used for the cable management systems must fulfil certain requirements in order to ensure circuit integrity in the event of fire. These include:

Toxicity	Cables for circuit integrity are halogen-free and therefore reduce possible damage to health and consequential fire damage to the building.
Flame resistance	Cables for circuit integrity are made of flame-retardant materials and are self-extinguishing.
Fire propagation	Cables for circuit integrity have practically no fire propagation, i.e. the fire is not expected to spread beyond the ignition source.
Flue gas density	In the event of a fire, smoke gas development is reduced compared to other cables and conduits, so that visibility in escape routes and attack routes for the fire brigade is not impaired.
Insulation maintenance	Cables for circuit integrity retain their insulation properties when exposed to a constant 840°C flame for 180 minutes (FE 180). However, circuit integrity maintenance is not absolutely necessary.

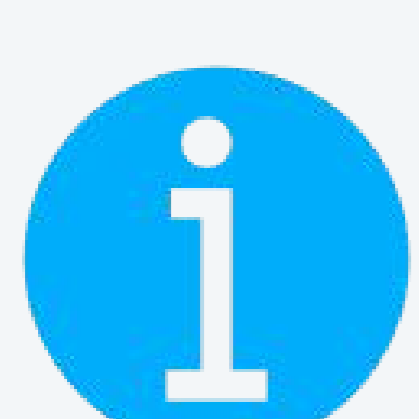
Test methods for cable management systems

DIN 4102-12 specifies detailed test procedures for checking compliance with the requirements for circuit integrity. The circuit integrity of a cable management system must be verified by a fire test in an accredited materials testing centre. The cable management system must have a test length of at least 3,000 mm and is installed in a special oven. For cable management systems in which there was no short circuit and/or interruption during the required test duration, a general building authority test certificate (abP) can be issued in which the achieved fire resistance classification (E30, E60, E90) are documented. Only with an abP can the building law requirements for a cable management system for circuit integrity be verified.

Fire resistance classification

E30, E60 or E90 fire resistance cables and correspondingly classified cable laying systems guarantee the function of the cable system over the defined period. The following functional integrity must be ensured for the following equipment:

E30/E60: functional integrity of ≥ 30 minutes or ≥ 60 minutes	<ul style="list-style-type: none">· Passenger lifts· Fire alarm systems· Systems for issuing instructions· Alarm systems· Smoke extractors· Safety lighting systems
E90: ≥ 90 minutes	<ul style="list-style-type: none">· Fire brigade lifts· Bed lifts in hospitals, care facilities, etc.· Automatic extinguishing systems· Pressurised smoke protection systems· Mechanical smoke extraction systems· Water pressure booster systems



The requirements for cable management systems for circuit integrity are anchored in the state building regulations of the respective federal states on the basis of the model building regulations. Due to the possibility of different amendments by the federal states, the legal situation of the respective federal states may vary.