Valdinox

THE CABLE TRAY COMPANY

Resistance and Reaction to fire

EASYCONNECT®
BASKET TRAY

EASYCONNECT trays

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1. Introduction

Here at VALDINOX safety is one of the most important concerns, and that is why we have responded to the need for minimising the consequences of fire by putting our products through thorough tests and trials which ensure their fire resistance.

This is because certain electrical systems need to continue working during fires, such as emergency lights, fire alarms or smoke extraction fans. The ability to keep these types of electrical systems operating becomes even more important in public gathering areas, where there is normally a large amount of people and evacuation times are longer.

Besides the system's own fire resistance, it is also very important to know how the product's materials will react during a fire; for example, the danger of smoke emissions this poses related to evacuation of a closed space, as well as the ability to stop the fire spreading via the product's surface.

2. EASYCONNECT® tray system fire resistance

All cable trays are made according to the latest edition of the UNE-EN 61537 standard (Cable tray systems and cable ladder systems for cable management).

This standard takes into account fire hazards, both fire reaction and fire resistance, but currently the standard needs to develop this point further.

In the absence of a more applicable standard, VALDINOX has used as a reference point the German DIN 4102-12 standard, "Fire behaviour of building materials and elements. Fire resistance of electric cable systems required to maintain circuit integrity"; with the goal being to study how EASYCONNECT trays behave during a fire.
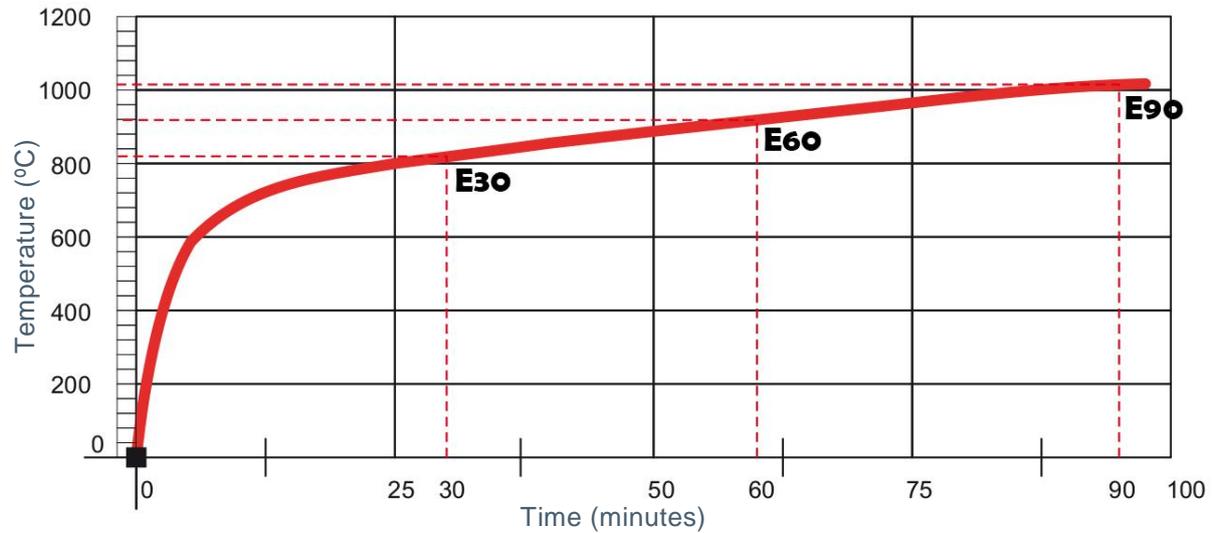
This standard tests system behaviour, reliability and usability. That is to say, cable tray systems, accessories and necessary supports, and fire-resistant cables all together; it does not test these items in isolation.

2.1. What does a test consist of according to the DIN 4102-12 standard?

This standard examines complete system behaviour, made up of 3 metres of cable trays, supports, connecting and/or fixing pieces, and fire resistance cables connected to an electrical signal.

The system is placed inside an oven with a predetermined temperature-time curve. All tests have been carried out in duly accredited external laboratories, in which care was taken to ensure that the conditions set out in the standard were met.

Supports were placed 1.2 metres apart and the tray supported a 10kg/m load during the whole test, which was administered by a chain that applied this distributed weight value.

As minutes passed the trays began to deform because of the high temperatures, but they continued to be able to support cables sending an electrical signal. Depending on how many minutes the electrical system can maintain this electrical signal will determine how the system is classified: E30, E60, and E90.

Certification	E30	E60	E90
Time (minutes)	30	60	90
Temperature (ºC)	840	950	1000

Choosing the right cable is crucial, seeing as the estimated evacuation time for the place it is installed in will be put into one of the different certifications: E30, E60, and E90. This is because EASYCONNECT trays will withstand the most extreme conditions, but it goes without saying that cables are what maintain the electrical signal.

The certification that this test offers allows us to ensure that basic and crucial systems function properly during the estimated time that an evacuation would last.

2.2. Test results

As the photos show, the structure of the EASYCONNECT trays that were tested, as well as the supports, did not collapse and they did not fully or partially come apart in any instance.

In the most adverse conditions the system supported the following assembly features:

- Supports 1.2 metres apart without reinforcement.

- Minimum 10kg/m load.

The supports can be fixed to the wall or ceiling, and a rod can be used on the end of the support to reinforce the set-up by holding it to the wall and ceiling simultaneously.

VALDINOX certifies that the system tested in accordance with the DIN 4102-12 standard has been carried out with standard catalogue trays and supports, which means they are regularly supplied.

The trays were installed with Omega type supports fixed to wall **without any type of reinforcement or protective fireproof blanket**, together with a system of Ø10mm and Ø12mm cables. This system has been certified with the following result: 65 minutes at 900ºC with an electrical signal being sent throughout the whole time period.

When installed and **reinforced to the ceiling** as well as with **protective fireproof blankets**, together with a system of Ø16mm y Ø35mm cables, this system has been certified with the result: 90 minutes at a temperature of 1000ºC.

It must be said that choosing the right cable to install is important, seeing as the test does not score the cable tray system by itself, rather EASYCONNECT trays together with highly safe halogen-free cables. It is of no use to equip the system with highly safe items if they do not receive a proper electricity supply before having carried out their tasks.

3. EASYCONNECT® tray system reaction to fire

To make comparing fire classification between specific materials easier, the EU adopted a union-wide standard, UNE-EN 13501, with the current edition being the following:

UNE-EN 13501-1:2007+A1: *Fire classification of construction products and building elements. Part 1: Classification using data from reaction to fire tests.*

The new labelling system, beside unifying EU criteria, is also more thorough and its symbols provide more knowledge about product properties during a fire and their combustibility, as well as information about smoke opacity and flaming droplets during combustion. Until it became effective each country had its own distinct system and they were incompatible with one other.

Euroclasses form a harmonised system of test methods and parameters, as well as threshold values for classifications.

It is mainly the amount of time during which a construction element maintains one or multiple features operational within a building in the event of a fire that is measured, keeping in mind the type of material or product, its use, location, usability, etc.

Euroclasses A1, A2 and B correspond to non-combustible and not very combustible product classes. They are construction products with the highest fire safety properties.

Euroclasses C, D and E correspond to products classified as combustible. Products classified as Euroclass F are not evaluated in any way due to their zero fire resistance.

Class	Performance
A1	Non-combustible. No contribution to fire
A2	Non-combustible. No contribution to fire
B	Combustible. Very limited contribution to fire
C	Combustible. Limited contribution to fire
D	Combustible. Acceptable contribution to fire
E	Combustible. High contribution to fire
F	Unclassified. Undetermined behaviour

EASYCONNECT trays and the whole set of supports and accessories available in the catalogue are classified as Class A1, which means they are in the safest class available, and that at no time during a fire will they contribute to it.

This labelling system also includes additional information about smoke opacity and flaming droplets during combustion, and it separates these two characteristics just as it is shown in the following tables.

Class	Performance
s1	Little smoke produced
s2	Average smoke produced
s3	High smoke produced

Additional classification for smoke opacity.

Class	Performance
d0	No drops/particles are produced
d1	Non-flaming droplets/particles
d2	Flaming droplets/particles

Additional classification for flaming droplets/particles.

All VALDINOX products belong to Class A1, and that is why they will not contribute to a fire at any time even during a fully developed fire. They are automatically capable of meeting all requirements for all lower classes. The **complete absence of smoke emission**, as well as **zero droplets or particles produced** must be added to this.

VALDINOX certifies that all EASYCONNECT trays, as well as all products available in the catalogue, ensure fire safety, and are in the safest class for all tested features.

- DOES NOT spread fire.

- DOES NOT emit smoke.

- DOES NOT emit toxic gases.

- DOES NOT emit corrosive gases.

- DOES NOT produce droplets or particles.

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