Dätwyler Cables

White Paper

European Test Procedures for the Functionality of Cables under Effects of Fire

Since the year 2000 there is a European test procedure regarding the functionality of cables in case of fire - EN 50200. This test procedure in its latest version of 2006 is leading to the fire protection classifications PH 15, PH 30, PH 60, PH 90 and PH 120. But for the practice this test procedure is insufficient.

The European standard EN 50200 is applied for cables with a diameter of up to 20 millimetre. For larger cable diameters a similar test procedure had been developed in parallel to the EN 50200. This procedure is called EN 50362:2003.

All Dätwyler pyrofil® Keram security cables E30 / E60 / E90 with functional integrity according to DIN 4102-12 have passed the EN 50200 classification PH 120. The same applies for the pyrofil® Keram security cables with large cable diameters which have passed the test according to EN 50362 during 120 minutes.

Trade-mark	DAETWYLER pyrofil ®
Type/Model	KERAM (N)HXH FE180 E30-60; KERAM (N)HXH FE180 E90 KERAM (N)HXCH FE180 E30-60; KERAM (N)HXCH FE180 E90
Ratings, characteristics	0.6/1kV 1 and more x 1.5 … 240mm²
Normative documents safety	Ø ≤20mm : EN 50200:2006; IEC 60331-2:2009 Ø>20mm : EN 50362:2003; IEC 60331-1:2009
Normative documents EMC	---
Other normative documents	VDE 0482 - 200 is similar EN 50200 VDE 0482 - 362 is similar EN 50362
Technical features	Circuit integrity tested for fire with shock at ≥830°C. Complies with the requirements of EN 50200 class PH120 and 120minutes for EN 50362 SMT procedure

Attention: The EN 50200/ EN 50362 do not replace the functional integrity according to DIN 4102-12!

In order to fulfil the requirements of the European Building Products Guideline (see Council Directive 89/106/EEC, Annex 1, dated December 21st, 1988) the EC standards EN 50200 / EN 50362 are not sufficient. Only extended functional integrity according to DIN 4102-12 guarantees a practice-oriented test procedure and thus fulfils the minimum requirements according to the European Building Products Guideline.

Building Products Guideline 2nd Sentence:
(1989 L0106 — DE — 02.08.1993 — 001.001 — 15)

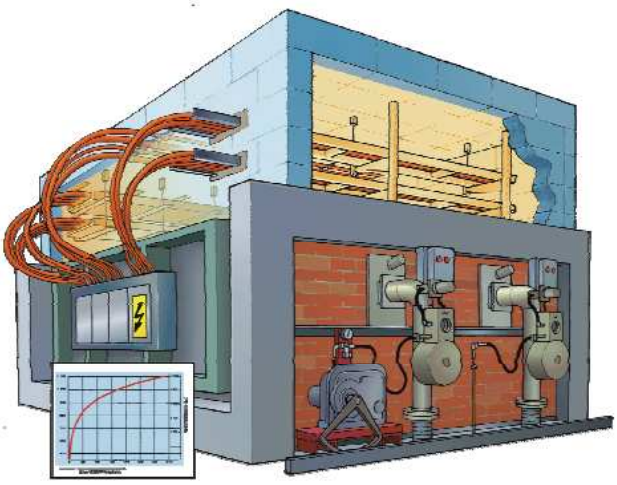
2. Safety in case of a fire
The construction works must be designed and built in such a way that in the event of an outbreak of fire:
- the load-bearing capacity of the construction can be assumed for a specific period of time,
- the generation and spread of fire and smoke within the works are limited,
- the spread of the fire to neighbouring construction works is limited,
- occupants can leave the works or be rescued by other means,
- the safety of rescue teams is taken into consideration.

Already since 1989 the DIN VDE (DIN VDE 0108-1, Annex 1) warns that the test procedure for the functional integrity (DIN 4102-12) is not identical to the test procedure for the circuit integrity of cables in case of flame propagation (e.g. EN 50200 / EN 50362) since these tests are not performed under building practice important boundary conditions. ►

Up to now – and also in the near future –there is no replacement for the DIN 4102-12!

Therefore the status of DIN 4102-12 dated November 1998 still applies:

DIN 4102-12:11/1998 (Foreword / preface)
„It is intended to bring in this standard as German proposal for a European standard (EN) into the works of CEN. The present publication is intended as a national vote."
(translated from the German-language original)

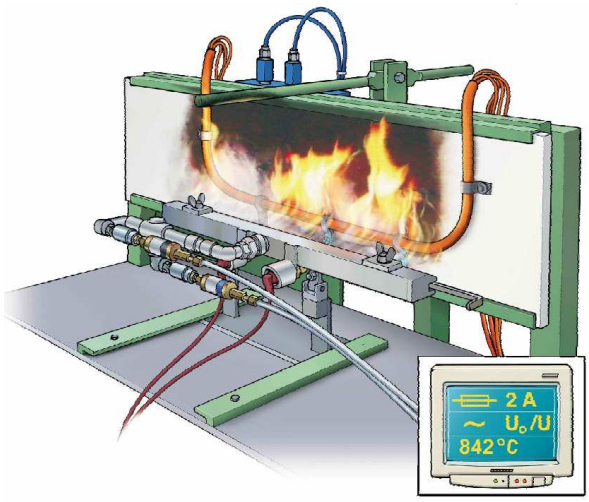


Test procedure according to DIN 4102-12

Expensive installations
If it is consequently applied the sole fulfilment of the EN 50200 is even considerably more expensive than consequently following the DIN 4102-12:

8.2 Sample mounting
The cable shall be bent to form an approximate 'U' shape. The internal radius of each bend shall be the manufacturer's declared minimum bending radius and the overall distance between the vertical proportions of the cable shall be approximately 475 mm as shown in Figure 8.
The cable shall be mounted centrally on the wall using metal clips, as recommended by the manufacturer for the cable under test, for example, copper P clips. The clips, which shall be earthed, shall support the cable at either end of the radius section and in the centre as shown in Figure 8.
The type of clips used shall be detailed in the Test Report. [= 5 clips on 50 cm, comment by Dätwyler Cables]

(quotation from EN 50200:2006, English version)



Laboratory test according to EN 50200:2006

Thus, considering the fixing systems, for the practice it is only possible to apply single cables using tested single clamps ("clips") with a fixing distance of about 10 cm!

Due to the multitude of installation techniques in the field of functional integrity the total cost for an EN 50200 compatible cable laying including clamps are at an average at least twice as high as the extended functional integrity cable laying according to DIN 4102-12.

PH 120 cables: short circuit after 10 minutes
Recently Dätwyler Cables submitted BS cables (British Standard) with the approval PH 120 to a test of extended functional integrity according to DIN 4102-12. Most cables failed due to short circuit already after 10 minutes.

Conclusions
For the future safe installation it is imperatively necessary that the cable systems fulfil the important requirements according to DIN 4102-12 functional integrity E30 / E60 / E90.

Using pyrofil® Keram safety cables NHXH / NHXCH / JE-H(St)H / JE-H(St)HRH E30 / E30-E60 / E30-E90 / E90 and certified pyrosys® system components by Dätwyler Cables you have additionally the guarantee to be able to also comply with any possible further or higher demands such as e.g. of insurance companies.

►

If you only fulfil the minimum requirements today you will tomorrow pay a hundred times the money which you have saved – or you might even pay with people´s lifes.

Example: Deutsche Bank

Deutsche Bank
Headquarters
Frankfurt am Main
(Source: Wikipedia)

Refurbishment

In 2006 it became known that it is necessary to refurbish the towers due to the changed fire protection regulations. For this reason the Deutsche Bank has decided to perform a comprehensive modernisation after 22 years of usage which had been started in December 2007 and which will take about two and a half years.

During the refurbishment not only the fire protection equipment had been improved but also the whole air conditioning, water and light technology had been replaced. This way the energy consumption as well as the CO_2 emissions in the building will be reduced by at least 50%. A re-glazing including opening windows will further improve the energy balance. It is the aim to refurbish the building as *Green Building* according to the American standard LEED with the highest certification *Platinum* for the existing buildings as well as according to the German seal of quality of the DGNB. If the aim *LEED Platinum* is being achieved the towers will be the first skyscrapers which obtain this certification by the USGBC.

For the interior architecture the bank has chosen the draft of the Milan architect Mario Bellini. During the construction measures about 2,500 employees will be relocated to three other sites in the near surrounding of the towers, among others to the Investment Banking Center nearby the fairground.

Note on our own behalf:
The fire protection regulations had already been tightened in 1989.
Thus, in the Deutsche Bank headquarters the fire protection regulations had not been fulfilled for 18 years!

