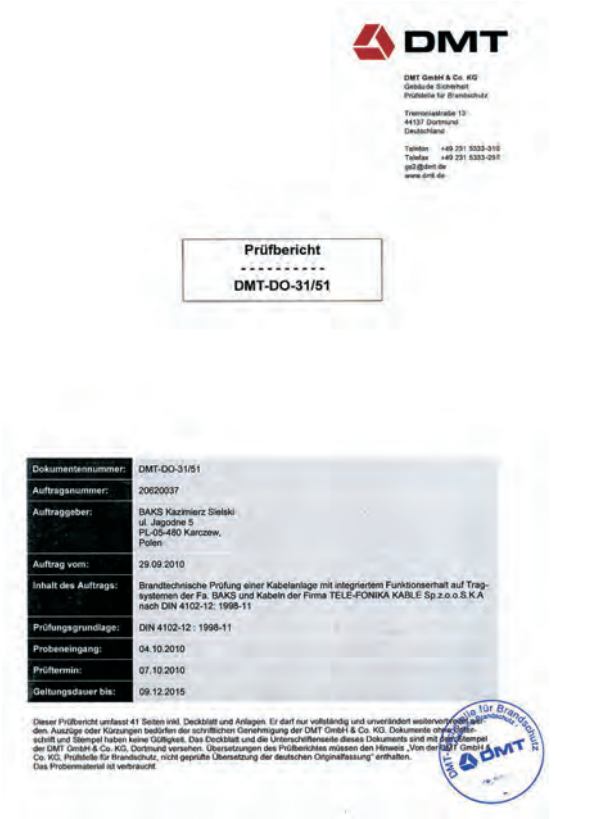
E30, E90 Systems acc. to DIN4102-12

Important Notice

In Europe there is no harmonized norm or regulation regarding Integrated Function Maintnance (fire protection system). Each country couldhave its own norm or regulation, however the most commonly used one is German standard DIN4102-12. DIN 4102-12 has been introduced by approved testing and certification organisations in Germany, as the effect of years of experience and numerous tests to maintain electric systems circuit integrity in the event of fire.

Among fundamental assumptions of the DIN 4102-12 standard is testing carefully if all systems of cables and conduits, including mounting elements, effectively provide power supply to human life saving devices in the event of fire.

BAKS has carried out more than sixty product tests together with the following cable manufactures: Bitner, Dätwyler, Elkond, Elpar, Eupen, Facab Lynen, Kabtek, Madex, Nexans, NKT, Prakab, Studer, Technokabel, TELE-FONIKA. All tests were conducted at the three accredited institutes, i.e. DMT Dortmund, Fires Baltizovce, and ITB Fire Testing Laboratory in Warsaw, and confirmed by applicable certificates.



DMT

DMT GmbH & Co. KG
Gebäude Sicherheit
Prüfstelle für Brandschutz

Tremoniastraße 13
44137 Dortmund
Deutschland

Telefon +49 231 9383-316
Telefax +49 231 9383-297
gs2@dmt.de
www.dmt.de

Prüfbericht

DMT-DO-31/51

Dokumentennummer:	DMT-DO-31/51
Auftragsnummer:	20620037
Auftraggeber:	BAKS Kazimierz Sielski ul. Jagodne 5 PL-05-480 Karczew, Polen
Auftrag vom:	29.09.2010
Inhalt des Auftrags:	Brandtechnische Prüfung einer Kabelanlage mit integriertem Funktionserhalt auf Tragsystemen der Fa. BAKS und Kabeln der Firma TELE-FONIKA KABLE Sp.z.o.o.S.K.A nach DIN 4102-12: 1998-11
Prüfungsgrundlage:	DIN 4102-12 : 1998-11
Probeneingang:	04.10.2010
Prüftermin:	07.10.2010
Geltungsdauer bis:	09.12.2015

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DMT GmbH & Co. KG
Prüfstelle für Brandschutz
Allgemeines bauaufsichtliches Prüfzeugnis
P-1010 DMT DO vom 07.08.2013

DMT

Allgemeines bauaufsichtliches Prüfzeugnis

Prüfzeugnis Nummer:	P – 1010 DMT DO
Antragsteller:	ZAKŁADY KABLOWE BITNER, ul. Friedleina 3/3 PL-30-009 Kraków
Gegenstand:	Kabelanlage mit integriertem Funktionserhalt mit Tragsystemen der Fa. BAKS und Kabeln der Fa. BITNER der Funktionserhaltsklassen E 60 bzw. E 90 nach DIN 4102-12 : 1998 - 11
Ausstellungsdatum:	07.08.2013
Geltungsdauer:	31.01.2018

DMT Prüfstelle für Brandschutz DMT

Dieses allgemeine bauaufsichtliche Prüfzeugnis umfasst 19 Seiten und 16 Anlagen.

Dieses allgemeine bauaufsichtliche Prüfzeugnis ersetzt das allgemeine bauaufsichtliche Prüfzeugnis mit dem Datum vom 31.01.2013

Aufgrund dieses allgemeinen bauaufsichtlichen Prüfzeugnisses ist der obengenannte Gegenstand im Sinne der Landesbauordnung des jeweiligen Bundeslandes anwendbar.

Important! Up until now BAKS has carried out flaming tests with the following cable producers: Bitner, Dätwyler, Elkond, Eupen, Facab Lynen, Kabtek, Madex, NKT, Nexans, Studer, Technokabel, and Telefonika. For information whether the applied system has gone through all appropriate fire testing and research, turn your inquiry directly to its producer.

System Circuit Integrity in the Event of Fire – E30, E90 Systems

Particular emphasis has been recently placed on maintaining human safety in public utility buildings and commercial and industrial occupancies in fire conditions. Therefore, it is of vital importance that the fire emergency and signalling systems are reliable. To comply with the new safety requirements BAKS decided to carry out tests in order to implement a new and modified cable tray and ladder system, in conformity with DIN 102 part 12. Therefore, a cable management system together with all the cables must be inspected to ensure that during a fire all electricity receivers are incessantly supplied with electric energy for the required period of time.

Uninterrupted functioning of electrical installation in accordance with existing regulations is understood as continuous supply of electric power in a facility in fire conditions. The above requirements do not refer to the whole electrical supply system in the facility but to its particular circuit groups only, which are relevant for special safety protection of a large number of people gathered therein.
Typical examples of such circuits include emergency lighting, sound alarms, ventilation devices in hotels, hospitals, and in any other public utility and commercial occupancies where large groups of people frequently gather.

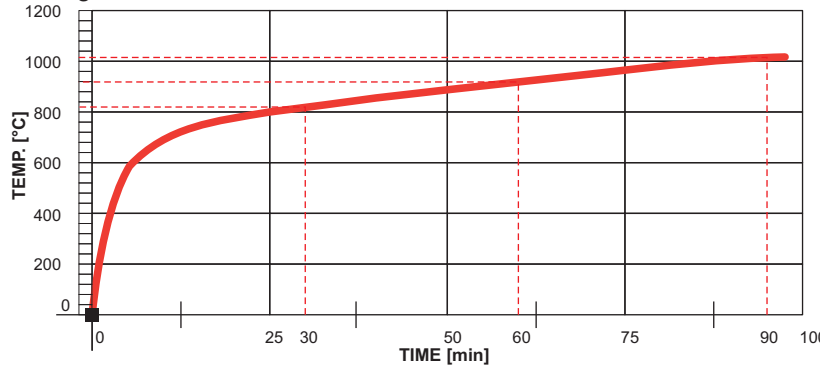
The standard is obligatory for low voltage that does not exceed 1kV. System Circuit Integrity in the Event of Fire in the facility is classified within two different emergency running time groups: E30 and E90 Systems.

Example:

Marking E30 means that the requirement for maintaining circuit integrity of emergency machinery and equipment to continue functioning in the building structure in the event of fire must not be shorter than 30 minutes. This standard is designed for fire signalling, monitoring devices, and evacuation lighting, where water sprinkling system is installed.

Marking E90 means that the requirement for maintaining circuit integrity of emergency machinery and equipment to continue functioning in the building structure in the event of fire must be 90 minutes or longer. It has been designed for ventilation devices of stairways and emergency exits, lift shafts, raising of fire water pressure, and for devices that evacuate smoke and combustion gases.

BAKS has carried out repeated special tests in the accredited fire testing laboratories in Germany and Slovakia. They were made on ceilings of cell and B20 class of concrete.
The base of research conducted according to the DIN 4102 norm were standard tests with products placed in a fire test furnace. The process of preheating was conducted according to an internationally accepted time-temperature curve diagram.



The support systems offered by BAKS comply with DIN 4102 part 12.
Accordingly, cable ladders may be suspended from ceilings, cable trays mounted to walls, fire resistant cables attached to ceilings both in the vertical and horizontal plane, fixed to walls with a single support or ladder length. For all systems several manufacturing and finishing methods are available for installers to select the most appropriate option to suit onsite conditions.

Each Certificate of Conformity is issued by BAKS upon inspecting the completed electrical installation.

BAKS SUPPORTING SYSTEMS - REPORTS FROM TESTS WITH THE E30, E90 INTEGRATED FUNCTION MAINTANANCE CLASS

Producers	Report Classification
BITNER ZAKŁADY KABLOWE Zakłady Kablowe BITNER ul. Freiedleina 3/3 30-009 Kraków, Poland	1. FIRES Slovakia: Test report no. FR-054-06-AUNE of 23.06.2006 2. FIRES Slovakia: Test report no. FR-086-07-AUNE of 19.06.2007 3. FIRES Slovakia: Test report no. FR-109-06-AUNE of 09.10.2006 4. FIRES Slovakia: Test report no. FR-162-07-AUNE of 20.09.2007 5. FIRES Slovakia: Test report no. FR-202-07-AUNE of 22.11.2007 6. FIRES Slovakia: Test report no. FR-234-07-AUNE of 07.01.2008 7. FIRES Slovakia: Test report no. FR-129-07-AUNE of 03.08.2007 8. FIRES Slovakia: Test report no. FR-256-08-AUNE of 29.10.2008 9. FIRES Slovakia: Test report no. FR-090-10-AUNE of 24.05.2010 10. FIRES Slovakia: Test report no. FR-171-10-AUNE of 14.10.2010 11. FIRES Slovakia: Test report no. FR-044-11-AUNE of 20.05.2011 12. FIRES Slovakia: Test report no. FR-0030-13-AUNE of 28.02.2013 13. DMT Germany: Test report no. 31/55 of 01.03.2012 14. FIRES Slovakia: Test report no. FR-0060-13-AUNE of 19.04.2013 15. FIRES Slovakia: Test report no. FR-030-13-AUNE of 28.02.2013 16. DMT Germany: Test report no. 31/58 of 07.08.2013 17. FIRES Slovakia: Test report no. FR-066-14-AUNE of 23.05.2014 18. FIRES Slovakia: Test report no. FR-129-14-AUNE of 17.07.2014
Dätwyler Cables Datwyler Kabel-Systeme Reprezentant w Polsce Dariusz Czarnecki ul. Poniatowskiego 9a 05-870 Błonie, Poland	1. DMT Germany: Test report no. 31/24 of 30.11.2006 2. DMT Germany: Test report no. 31/25 of 30.11.2006 3. DMT Germany: Test report no. 31/27 of 30.11.2006 4. ITB Zakład Badań Ogniowych, Poland: Test report no. LP-1369/06 of 18.12.2007 5. FIRES Slovakia: Test report no. FR-061-08-AUNE of 27.05.2008 6. DMT Germany: Test report no. 31/53 of 19.12.2013 7. DMT Germany: Test report no. 31/59 of 25.04.2014
ELKOND HHK fabrika káblov Oravická 1228 Trstená 028 01 Slovenská republika	FIRES Slovakia: Test report no. FR-063-08-AUNE of 27.05.2008 r Test report no. FIRES-FR-225-14-AUNE2 of 22.12.2014 r.
EL PAR Fabryka kabli ELPAR SP z o.o. ul.Laskowska 1, 21-200 Parczew, Poland	1. FIRES Slovakia: Test report no. FR-143-14-AUNE3 of 22.08.2014 r. 2. FIRES Slovakia: Test report no. FR-156-14-AUNE2 of 28.08.2014 r.
EUPEN KABELWERK Eupen AG Malmedyer Strasse 9 4700 Eupen, Belgium	1. DMT Germany: Test report no. 31/13 of 28.07.2004 – BAKS + EUPEN + TELE-FONIKA Kable S.A. 2. DMT Germany: Test report no. 31/15 of 31.08.2005 – BAKS + EUPEN + TELE-FONIKA Kable S.A 3. DMT Germany: Test report no.31/49 of 15.04.2010 4. DMT Germany: Test report no.31/50 of 23.08.2010 5. DMT Germany: Test report no.31/57 of 19.12.2013 6. DMT Germany: Test report no.31/60 of 15.01.2014
FACAB LYNEN FACAB LYNEN Dürener Straße 340, 52249 Eschweiler, Germany	1. DMT Germany: Test report no. 31/20 of 21.04.2006 2. DMT Germany: Test report no. 31/22 of 31.07.2006
KABTEK Alipaşa mevkii Sanayi 12 Sokak No:7 , Silivri - İstanbul / TURKEY	1. FIRES Slovakia: Test report no. FR-217-13-AUNE of 27.09.2012
FABRYKA KABLI MADEX ul. Żurawia 96, 05-462 Wiązowna, Stefanówka, Poland	1. FIRES Slovakia: Test report no. FR-102-12-AUNE of 18.05.2012 2. FIRES Slovakia: Test report no. FR-245-12-AUNE of 13.12.2012
Nexans NEXANS Deutschland Industries Einersbergstraße 1 36404 Vacha, Germany	1. DMT Germany: Test report no. 31/43 of 30.10.2009 2. DMT Germany: Test report no. 31/44 of 12.02.2009
nkt cables nkt cables S.A. ul. Gajowa 3 43-254 Warszowice, Poland	1. FIRES Slovakia: Test report no. FR-108-13-AUNE of 11.07.2013 2. FIRES Slovakia: Test report no. FR-224-13-AUNE of 02.12.2014 3. FIRES Slovakia: Test report no. FR-098-14-AUNE of 17.07.2014
PRAKAB PRAKAB Ke Kablu 278 102 09 Praha - Hostivař, Česká Republika	1. FIRES Slovakia: Test report no. FR-257-08-AUNE of 17.12.2008 2. Test to the Czech norm ZP27-2008 3. FIRES Slovakia: Test report no. FR-098-14-AUNE of 17.07.2014
STUDER CABLES Studer Cables Switzerland Herrenmattstrasse 20 CH-4658 Daniken, Switrerland	1. DMT Germany: Test report no. 31/29 of 31.01.2007 2. DMT Germany: Test report no. 31/30 of 31.01.2007 3. DMT Germany: Test report no. 31/34 of 22.08.2007 4. DMT Germany: Test report no. 31/70 of 04.08.2014
TECHNOKABEL TECHNOKABEL S.A. ul. Nasielska 55 04-343 Warszawa, Poland	1. FIRES Slovakia: Test report no. FR-040-07-AUNE of 19.03.2007 2. FIRES Slovakia: Test report no. FR-102-07-AUNE of 12.07.2007 3. FIRES Slovakia: Test report no. FR-160-06-AUNE of 08.12.2006 4. FIRES Slovakia: Test report no. FR-235-07-AUNE of 09.01.2008 5. FIRES Slovakia: Test report no. FR-012-08-AUNE of 07.02.2008 6. FIRES Slovakia: Test report no. FR-151-08-AUNE of 27.08.2008 7. FIRES Slovakia: Test report no. FR-198-08-AUNE of 29.10.2008 8. FIRES Slovakia: Test report no. FR-004-09-AUNE of 25.02.2009 9. FIRES Slovakia: Test report no. FR-057-09-AUNE of 09.06.2009 10. FIRES Slovakia: Test report no. FR-094-09-AUNE of 17.07.2009 11. FIRES Slovakia: Test report no. FR-121-10-AUNE of 25.06.2010 12. FIRES Slovakia: Test report no. FR-086-11-AUNE of 21.05.2011 13. FIRES Slovakia: Test report no. FR-266-11-AUNE of 23.02.2012 14. FIRES Slovakia: Test report no. FR-020-12-AUNE of 29. 02. 2012 15. FIRES Slovakia: Test report no. FR-0135-12-AUNE of 19. 07. 2012 16. FIRES Slovakia: Test report no. FR-079-13-AUNE of 06. 06. 2013 17. FIRES Slovakia: Test report no. FR-160-13-AUNE of 26.09.2013 18. FIRES Slovakia: Test report no. FR-204-13-AUNE of 19.11.2013 19. FIRES Slovakia: Test report no. FR-049-14-AUNE of 04.04.2014 20. FIRES Slovakia: Test report no. FR-174-14-AUNE2 of 21.11.2014 21. FIRES Slovakia: Test report no. FR-243-14-AUNE2 of 26.01.2015
TF Kable TELE FONIKA Kable S.A. TELE-FONIKA Kable S.A. ul. Składowa 2 41-902 Bytom, Poland	1. DMT Germany: Test report no. 31/13 of 28.07.2004 2. DMT Germany: Test report no. 31/15 of 31.08.2005 3. DMT Germany: Test report no. 31/44 of 30.10.2009 4. FIRES Slovakia: Test report no. FR-201-09-AUNE of 14.01.2010 5. DMT Germany: Test report no. DMT-DO-31/51 of 29.09.2010 6. DMT Germany: Test report no. DMT-DO-31/52 of 02.12.2010 7. FIRES Slovakia: Test report no. FR-126-11-AUNE of 27.06.2011 8. FIRES Slovakia: Test report no. FR-196-11-AUNE of 26.10.2011 9. DMT Germany: Test report no. 31/51 of 07.10.2012 10. FIRES Slovakia: Test report no. FR-005-13-AUNE of 24.01.2013 11. FIRES Slovakia: Test report no. FR-183-13-AUNE of 25.10.2013 12. FIRES Slovakia: Test report no. FR-016-14-AUNE of 11.07.2014

ATTENTION! Due to the introduction of innovative technologies In material and construction design, BAKS has done several examinations of new solutions in fire resistance system (extending the rules and standards of DIN4102-12)

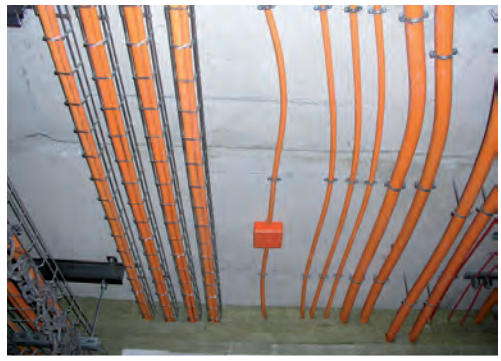
In the near future we plan to perform following examinations in this system:

- Examination of support channel CMD40H22 + WC40 5kg/m/ 1.5m
- Examination of KSA Cable clip with 3 cables
- Examination of Vertical Cable ladders DSH + NKH + PSDH
- Examination of KSA and UDF Cable clips with bundle of 10 cables
- Examination of KSG…H60/3 Wire Mesh Cable Trays assembled to the Wall and Ceiling
- Examination of KGS…H60/3 Wire Mesh Cable Trays assembled to the Wall and Ceiling
- Examination of KCS…H60/3 Wire Mesh Cable Trays assembled to the Wall and Ceiling
- Examination of KDSZ…H60/3 Wire Mesh Cable Trays assembled to the Wall and Ceiling
- Examination of Wire Mesh Cable Trays with Snap-in connectors ZLS and UZS
- Examination of Wire Mesh Cable Trays together with fittings (Bends, Tees)
- Examination of brackets WFMLS…, WFMCS…, WFLS…, WFCS…, WWKS…, WSKS…
- Examination of UDF clip assembled to sandwich panel
- Examination of cable trays and ladders assembled to the consruction made from hollow structural section

There is possibility to perform special fire examination with construction designed for a specific project

Flaming Testing of BAKS E90 Systems Carried out with Cables from BITNER

View before and after the inspection



View before and after the inspection

Flaming Testing of BAKS E90 Systems Carried out with Cables from DÄTWYLER

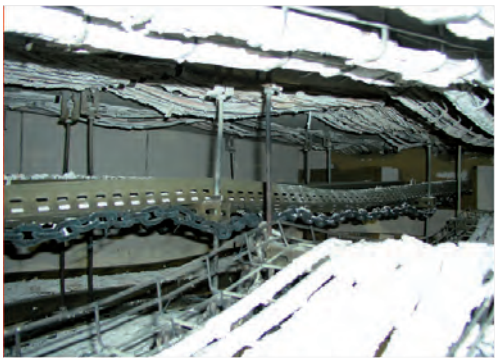
View before and after the inspection

View before and after the inspection

Flaming Testing of BAKS E90 Systems Carried out with Cables from ELKOND

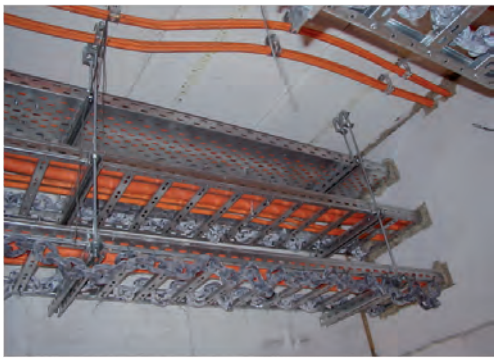
View before and after the inspection

View before and after the inspection



Flaming Testing of BAKS E90 Systems Carried out with Cables from EUPEN

View before and after the inspection



View before and after the inspection

Flaming Testing of BAKS E90 Systems Carried out with Cables from TELEFONIKA

View before and after the inspection

View before and after the inspection

Flaming Testing of BAKS E90 Systems Carried out with Cables from FACAB

View before and after the inspection

View before and after the inspection

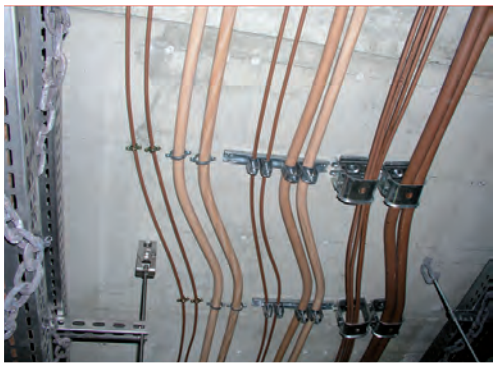
Flaming Testing of BAKS E90 Systems Carried out with Cables from NEXANS

View before and after the inspection

View before and after the inspection

Flaming Testing of BAKS E90 Systems Carried out with Cables from PRAKAB

View before and after the inspection



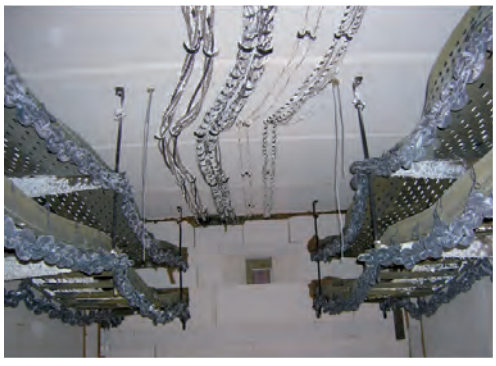
View before and after the inspection

Flaming Testing of BAKS E90 Systems Carried out with Cables from STUDER

STUDER CABLES

View before and after the inspection

View before and after the inspection



Flaming Testing of BAKS E90 Systems Carried out with Cables from TECHNOKABEL

TECHNOKABEL

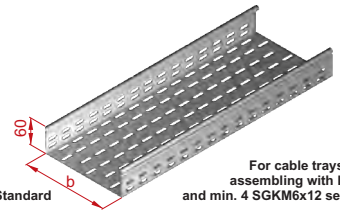
View before and after the inspection

View before and after the inspection

Basic Technical Data for the Installation of Fire Circuit Integrity Systems

1. Technical specifications for cable trays, ladders and and mesh trays

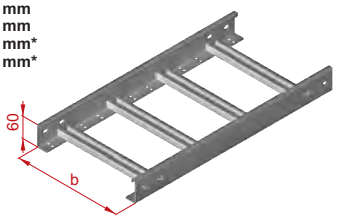
Safe working load for cable trays - 10 kg/m, 20 kg/m.*
Cable trays width:
b- 100 mm
b- 150 mm
b- 200 mm
b- 300 mm
b- 400 mm*
b- 500 mm*
b- 600 mm*



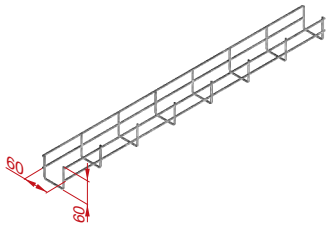
For cable trays of 1.5 mm steel thickness, assembling with LPP/LPOPH60N connectors and min. 4 SGKM6x12 sets of screws per connector.

*** Upgraded Testing Standard**

Safe working load for ladders - 20 kg/m.
Ladders width:
b- 100 mm
b- 200 mm
b- 300 mm
b- 400 mm
b- 500 mm*
b- 600 mm*

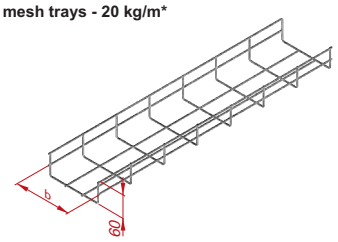


Safe working load for mesh trays - 2,0 kg/m*



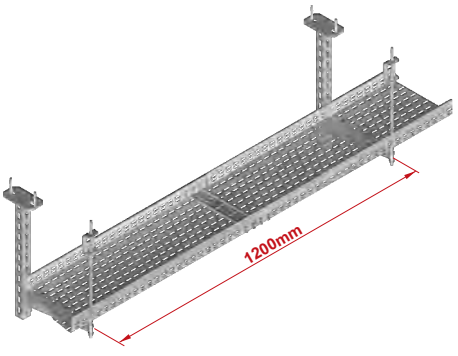
*** Upgraded Testing Standard**

Safe working load for mesh trays - 20 kg/m*
Mesh trays width:
b- 100 mm*
b- 150 mm*
b- 200 mm*
b- 300 mm*
b- 400 mm*
b- 500 mm*
b- 600 mm*

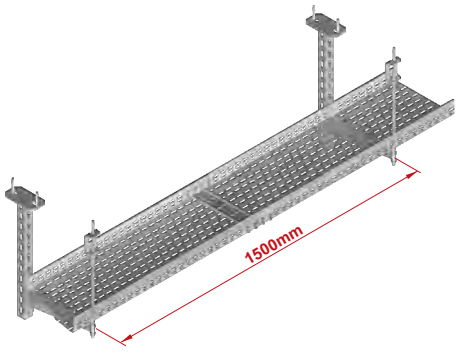


2. Maximum distance between supports

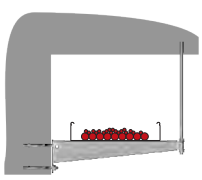
Assembly that is standard

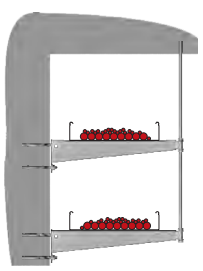


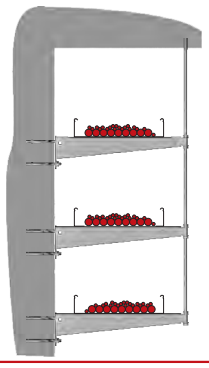
Assembly that exceeds standard



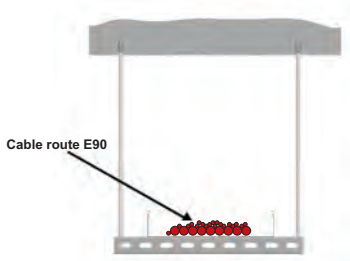
3. Maximum number of cable run levels (multi-tiers) per single rod



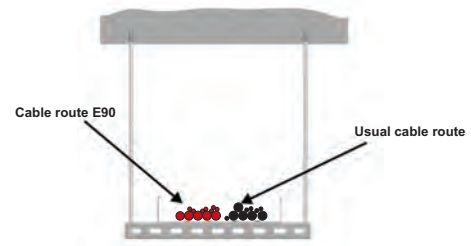




4. In E30 and E90 Systems cables that do not comply with the above CI fire resistance standards may not be distributed

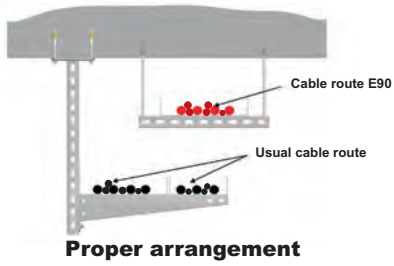


Proper arrangement



Improper arrangement

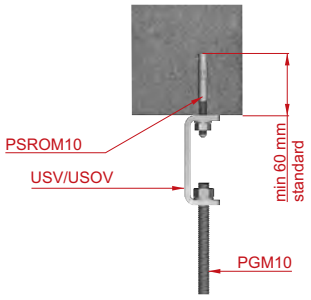
5. No cables that will not guarantee maintaining system circuit integrity are allowed above E30, E90 Systems, nor fastening components other than those of E30, E90 Systems is allowed



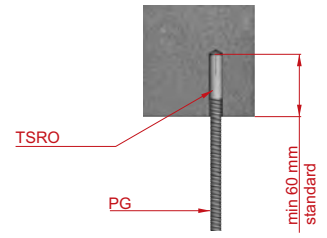
Proper arrangement

Improper arrangement

6. Mounting threaded rod onto ceiling



Indirectly through the use of Rod Hanger USOV and Bolt Anchor PSROM10



Directly onto ceiling with Drop-In Anchor - Steels TRSO M10, on condition that the anchor is concrete-sank 60mm min.

7. Routing cables in the vertical plane is possible only on mesh trays, ladder and rungs