



# **FIRE ALARM CABLES**

FOR HIGHEST SAFETY REQUIREMENTS

2019

# CABLE TECHNOLOGY FOR HIGHEST SAFETY REQUIREMENTS

## DATWYLER

Datwyler Cabling Solutions is a leading provider of high-quality system solutions, products and services for electrical and IT infrastructures in public and commercial buildings and data centres as well as for Fibre to the X (FTTx) networks. We enable organizations around the world to run their IT infrastructures seamlessly and scale their business with ease.

## MILESTONES

1915	Adolf Dätwyler founded the company and began producing electrical conductors using aluminium.	2005	Datwyler significantly expanded its international distribution network, e.g. in Eastern and Southern Europe and in the Middle East.
1926	The production of telephone cables began.	2008	Datwyler introduced pre-assembled trunk (multiple) cables and high-density systems that specifically address the demand for efficient data centre cabling.
1944	The production of high-frequency cables began.	2009	Datwyler offered complete turnkey solutions for data networks, data centres and FTTx networks.
1973	Kaved Ltd. was acquired. The value chain was extended by adding cable harnessing. Datwyler produced the first flat cable for lifts with up to 400 metre shaft height.	2010	Datwyler became full service main contractor for several FTTx projects in Switzerland.
1986	The production of fibre optic cables began.	2011	Datwyler opened a branch in Dubai.
1987	"Uninet" (today: "Datwyler CU") data cables and the future-proof concept for structured building cabling were introduced.	2012	Renaming to "Datwyler Cabling Solutions" in Switzerland (1 Nov 2012).
1991	Datwyler safety cable became the first fire safety cable in the world to successfully pass E90 System Circuit Integrity testing as per DIN 4102-12.	2013	Acquisition by Pema Holding AG. Datwyler developed the first Cat.8 cable "CU 8203 4P".
1998	International expansion: Datwyler entered the Chinese market.	2015	Datwyler introduced "FO Outdoor wbKT Micro Combi", the first mini hybrid cable for NGN and NGA networks.
2002	Optofil Safety (today: "Datwyler FO Universal ... Safety") became the first metal-free fibre optic cable with E30 System Circuit Integrity as per DIN 4102-12.	2016	The Cat.7 data cable "CU 7000 4P Home" with a diameter of only 5.8 mm and the "FO Outdoor wbKT S-Micro 12x24" with a diameter of only 10.4 mm were introduced.

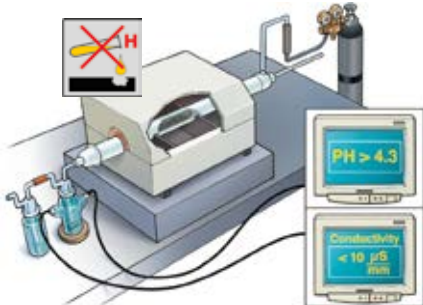
# CABLE TECHNOLOGY FOR HIGHEST SAFETY REQUIREMENTS

Datwyler offer electrical cable systems for all safety needs. Our product line includes halogen-free, low smoke emission and flame retardant fire safety cables, support systems, mounting components and accessories. For more information please see [www.cabling.datwyler.com](http://www.cabling.datwyler.com)

CABLES	APPLICATIONS	PRODUCT RANGE / STANDARDS
<b>Safety cables with intrinsic fire resistance</b>		
<b>Low voltage cables up to 0.6 / 1 kV</b> <b>E30-E90; BS 6387 CWZ; PH30-120, Rf-1 1 1/2</b> <p>with mechanical protection</p>	Safety cables with circuit integrity, intrinsic fire resistance and System Circuit Integrity to maintain power supplies to sprinkler systems, emergency lighting, smoke and heat extraction systems, emergency lift supplies and fire fighting lifts.	Single core cables from 1.5 to 630 mm <sup>2</sup> , multi-core cables from 1.5 to 300 mm <sup>2</sup> , also available with mechanical protection  <b>Standards / Approvals</b> IEC, EN, CENELEC, BS, DIN VDE, SEV, NBN, VKF/AEAI, VdS, GOST-R
<b>Wiring and fire alarm cables up to 225 V</b> <b>E30-E90; FE180; BS 6387 CWZ; PH30-120, Rf-1 1 1/2</b> <p>with mechanical protection</p>	Safety cables with circuit integrity, intrinsic fire resistance and System Circuit Integrity to maintain power supplies and data transmission to fire alarm systems, public address and voice alarm systems.	Single pair or multi-pair cables, individually or collectively screened, also available as fire alarm cables and with mechanical protection.  <b>Standards / Approvals</b> IEC, EN, CENELEC, DIN VDE, SEV, NBN
<b>Fibre-optic cables</b> <b>with reference to DIN 4102-12, 30 minutes (E30); IEC 60331-25</b> <p>with rodent protection</p>	FO Universal Safety cables for indoor and outdoor applications.	Loose tube construction with up to 60 single-mode or multimode fibres, with non-metallic rodent protection.  <b>Standards / Approvals</b> IEC, EN, CENELEC, DIN VDE
<b>Safety cables with circuit integrity</b>		
<b>Fire alarm cables 300 / 500 V</b> <b>BS 6387 CWZ; FE180; BS 8434-2, EN 50200 (PH 30-120) and Annex E</b> <p>with mechanical protection</p>	Safety cables with circuit integrity to maintain power supplies and data transmission to fire alarm systems, emergency lighting, public address and voice alarm systems.	Screened multi-core cables from 1.0 to 4 mm <sup>2</sup> , also available with mechanical protection.  <b>Standards / Approvals</b> BS, EN, CENELEC, GOST-R, BASEC, LPCB, VKF/AEAI
<b>Safety cables with improved characteristics in case of fire</b>		
<b>Low voltage cables up to 0.6 / 1 kV</b>	Safety cables with improved characteristics in case of fire – an alternative to traditional PVC cables, where no circuit integrity is required.	Single core cables from 1.5 to 630 mm <sup>2</sup> , multi-core cables from 1.5 to 300 mm <sup>2</sup> , also available with mechanical protection and as flexible, oil resistant version.  <b>Standards / Approvals</b> IEC, EN, CENELEC, DIN VDE, SEV, GOST-R



# THE MOST IMPORTANT TEST PROCEDURES AND THEIR FUNCTIONS



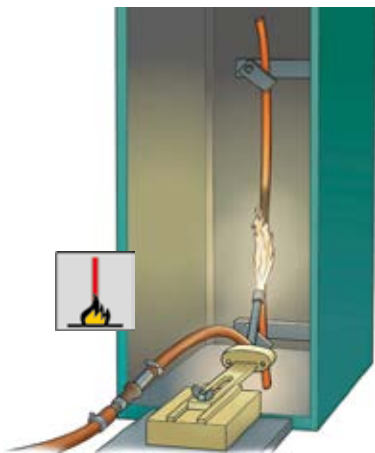
## Test on gases evolved during combustion

This test procedure provides information if the insulation material of the cable sheath creates corrosive gases in the event of fire.

Halogen parts or other material in small quantities can be easily identified with this test due to the strong change of pH and conductivity. The conductivity is < 10mS/mm

### Standards

- IEC 60754-1 and IEC 60754-2
- VDE 0482-267 part 2-1, 2-2 and 2-3



## Test for vertical flame propagation (single insulated wire or cable)

This test method tests a cable sample (length: 60 cm) for burning behaviour.

The flame must extinguish itself, and the burn damage must not reach the upper end of the cable sample.

### Standards

- IEC 60332-1-2
- EN 60332-1-2
- VDE 0482-332-1-2

## Test for vertical flame spread (bunched wires or cables)

This test method tests a cable bundle (length: 360 cm) with regard to fire propagation.

The flames must extinguish themselves, and burn damage must not exceed a defined height.

### Standards

- IEC 60332-3-22 up to 25 Cat A-D
- EN 60332-3-22 up to 25 Cat. A-D
- VDE 0482-332-3-22 up to 25 Cat. A-D



## Measurement of smoke density

This test checks smoke development when burning the cable or the impairment of the visibility by burning cables.

The reduction in light transparency is measured in a standard chamber.

### Standards

- IEC 61034-1 and IEC 61034-2
- EN 61034-1 and EN 61034-2
- VDE 0482-1034 part 1 and 2

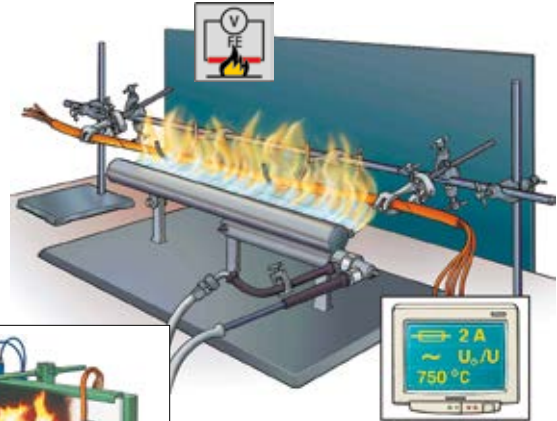
## Test of circuit integrity (FE/PH)

This test establishes whether a single cable can maintain circuit integrity during and after exposure to a fire for a time period of at least 180 minutes. Cables which fulfil the requirements of this test are marked with "FE180" after their type designation.

There is no obligation to test the cable for System Circuit Integrity (functional integrity) beyond the designated period.

### Remark:

**This test is not equivalent to the test for extended functional integrity (System Circuit Integrity) in accordance with DIN 4102-12.**

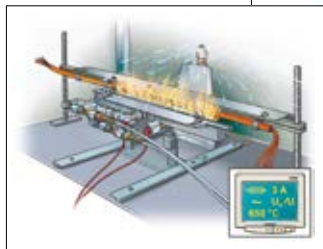


### Test of circuit integrity (fire only)

- IEC 60331-11/-21/-23/-25 (>750 °C)
- BS 6387 (Category C) (950 °C)
- VDE 0472-814 (>750 °C)

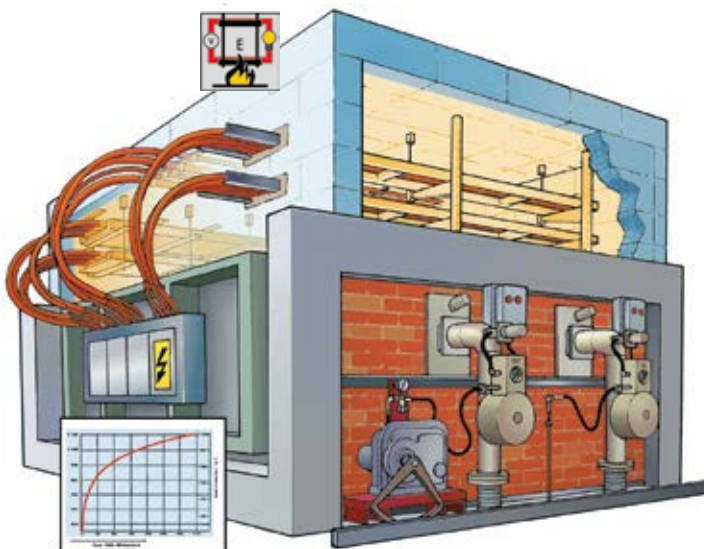
### Test of circuit integrity (fire and water)

- BS 6387 (Category W) (650 °C, 3A)
- VdS 3423 (>830 °C, 3A)
- EN 50200 Annex E (>830 °C, 2A)



### Test of circuit integrity (fire and mechanical shock)

- IEC 60331-1/-2 (>830 °C, 2A)
- EN 50200 (PH) (>830 °C, 2A)
- EN 50362 (> 830 °C, 2A)
- BS 6387 (Category Z) (950 °C, 3A)



## Test of System Circuit Integrity of electrical cable installations

DIN 4102-12 describes the requirements and the actions to achieve enhanced circuit integrity of the complete electrical cable installation in the event of fire. While the circuit integrity test (FE/PH) is only for single cables, in this test cables are tested together and in connection with practical fixing systems.

It is important to note that there is no connection between the two standards, circuit integrity (FE/PH) and enhanced functional or System Circuit Integrity (E).

The test is carried out and certified from state recognised institutes.

### Standards

- DIN 4102 part 12 (E30-E90)

### Better than the standard!

This test (E30-E90) is now the only worldwide standard for guaranteeing the functional integrity of the complete electrical cable installation, including the fixing components, under normal operating conditions.

# PRODUCT FEATURES

The following pictograms show the essential features of our products and give an easy reference. They are allocated to the articles on the data sheets and provide you with a quick overview



## **Zero halogen, non corrosive gases**

These Datwyler cables are halogen-free and reduce possible damage to health or material to a minimum.

IEC 60754-1 and IEC 60754-2,  
VDE 0482-267 part 2-1, 2-2 and 2-3



## **Flame propagation**

These Datwyler cables use a high-performance, flame retardant material that is self-extinguishing.

IEC 60332-1-2,  
EN 60332-1-2,  
VDE 0482-332-1-2



## **Flame spread**

These Datwyler cables are flame resistant and prevent the propagation of a fire from one location to another

IEC 60332-3-22 to 25 cat. A-D,  
EN 60332-3-22 bis 25 cat. A-D,  
VDE 0482-332-3-22 to 25 cat. A-D



## **Smoke density**

These Datwyler cables emit minimum smoke in the event of fire. Exit routes and fire brigade access are not restricted.

IEC 61034-1 and IEC 61034-2,  
EN 61034-1 and EN 61034-2,  
VDE 0482-1034 part 1 and 2



## **Circuit integrity (FE/PH)**

These Datwyler cables with circuit integrity guarantee the function of a single cable for a defined duration. (FE = flame time and influence time)

IEC 60331-1, IEC 60331-2 and part 21,23, 25,  
EN 50200 with Annex E, EN 50362,  
VDE 0472 part 814, VDE 0482-200,  
VDE 0482-362,  
BS 8434-2, BS 6387 (Categories C, W & Z)



## **System Circuit Integrity (E30-E90)**

These Datwyler cables together with certified Datwyler fixing systems guarantee enhanced circuit integrity of the complete electrical cable installation for a defined time.  
(E30=30 minutes, E60=60 minutes,  
E90=90 minutes)

DIN 4102 part 12 (E30-E90)

## STATEMENT FROM DATWYLER

As an environmentally conscious manufacturer and supplier of cabling solutions it is our concern not to use any environmentally harmful substances in our products.

Based on current information, the hereinmentioned regulations and directives for substances are fully complied with wherever applicable.

### ROHS

DIRECTIVE 2011/65/EU

OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 8 June 2011  
on the restriction of the use of certain hazardous substances  
in electrical and electronic equipment

### WEEE

DIRECTIVE 2012/19/EU

OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 4 July 2012  
on waste electrical and electronic equipment (WEEE)

### REACH

REGULATION (EC) No 1907/2006

OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 18 December 2006  
concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals  
(REACH), establishing a European Chemicals Agency, amending Directive 1999/45/EC  
and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC)  
No 1488/94 as well as Council Directive 76/769/EEC Commission Directives 91/155/  
EEC, 93/67/EEC, 93/105/EC and 200/21/EC



# HALOGEN-FREE SAFETY CABLES

BS EN 50200 + ANNEX E 30 MIN., PH30 TO PH120, AND BS 6387 CWZ



BS 6387:2013 (Category CWZ)  
LPCB Ref. No.  
172e/01

## DFS ME

### Fire alarm cable 300/500 V

halogen-free, with improved fire characteristics,  
BS EN 50200 + Annex E 30 min., PH30 to PH120, and BS 6387 CWZ



#### APPLICATION

Cable for fire alarm systems and emergency lighting (where no protective earth is necessary).

For permanent installation in buildings. Suitable for use in Hazardous Areas Zones 1 and 2.

Optimized for fast termination: The aluminium foil is bonded to the inside of the sheath by a copolymer backing. So it is removed together with the sheath when terminating.

Permitted operating temperature at conductor of +90° C.

#### CONSTRUCTION

Conductor:	Solid copper or stranded copper <sup>[1]</sup> , IEC 60228 and EN 60228
Insulation:	Silicon compound, BS EN 50363-5
Core colours:	HD 308 S2
Shielding:	Aluminium foil with a copolymer backing and tinned copper drain wire (0.5 mm <sup>2</sup> ), EN 60228
Sheath:	Polyolefin compound, low smoke, halogene-free, flame-retardant
Sheath colour(s):	Red or white

#### ELECTRICAL PROPERTIES

Nominal voltage:	300/500 V
Test voltage:	2000 V, 50 Hz

#### GENERAL PROPERTIES

Minimum bending radius	during and permanent installation: 6 x D (D = outer diameter)
Operating temperature	permanent installation: -40 °C to +90 °C during installation: 0 °C to +70 °C

Zero halogen, non corrosive gases:	EN 60754-1/-2:2014
Flame propagation:	EN 60332-1-2
Flame spread:	EN 60332-3-24 (cable diameter > 12 mm), EN 60332-3-25 (cable diameter ≤ 12 mm)
Smoke density:	EN 61034-1/-2:2005 + A1:2013
Circuit integrity (FE/PH):	BS 6387 (Categories C, W & Z) <sup>[2]</sup> , BS EN 50200 Annex E (30 minutes), BS EN 50200 (PH120), VDE 0482-200 (PH120)

<sup>[1]</sup> 1.00 mm<sup>2</sup> to 3.00 mm<sup>2</sup> cores constructed with solid copper conductors,  
4.00 mm<sup>2</sup> cores constructed with stranded copper conductors.  
1.5 mm<sup>2</sup> and 2.5 mm<sup>2</sup> cores available as stranded versions upon request.

<sup>[2]</sup> BS 6387 (CWZ):  
C = 180 minutes with a flame at 950 °C,  
W = 15 minutes with a flame at 650 °C plus additional 15 minutes  
of direct water spray simulating a sprinkle system  
Z = 15 minutes with a flame at 950 °C with indirect application  
of mechanical shock.

Article No.	Product	Sheath colour	Dimensions n x [mm <sup>2</sup> ]	Sheath Ø [mm]	Weight [kg/km]	Cu rate [kg/km]
18804400Z...	DFS ME	white	2 x 1	7.35	80	29
18804500Z...	DFS ME	red	2 x 1	7.35	80	29
18804600Z...	DFS ME	white	2 x 1.5	7.6	95	43
18804700Z...	DFS ME	red	2 x 1.5	7.6	95	43
18804800Z...	DFS ME	white	2 x 2.5	9.0	141	72
18804900Z...	DFS ME	red	2 x 2.5	9.0	141	72
18805300Z...	DFS ME	white	3 x 2.5	9.5	191	96
18805200Z...	DFS ME	red	3 x 2.5	9.5	191	96
18805000Z...	DFS ME	white	4 x 1.5	9.0	145	72
18805100Z...	DFS ME	red	4 x 1.5	9.0	145	72

Other dimensions available on request.

All dimensions in 100, 200 or 500 m length on drum.

Please complete the 9-digit number with ..N for 100 m, ..M for 200 m or ..L for 500 m when ordering.





BS 7629-1:2015  
LPCB Ref. No.  
172g/01



License No.  
218/001/001

# HALOGEN-FREE SAFETY CABLES

## BS 7629-1 AND BS 5839-1:2013 CLAUSE 26.2D

## DFS STANDARD 60

### Fire alarm cable, 300/500 V, flex

halogen-free, with improved fire characteristics,  
BS 7629-1 and BS 5839-1:2013 Clause 26.2d



#### APPLICATION

Cable for fire alarm systems and emergency lighting.  
For permanent installation in buildings. Suitable for use in Hazardous Areas Zones 1 and 2.  
Optimized for fast termination: The aluminium foil is bonded to the inside of the sheath by a copolymer backing. So it is removed together with the sheath when terminating.  
Permitted operating temperature at conductor of +90° C.

#### CONSTRUCTION

Conductor: Solid copper or stranded copper <sup>[1]</sup>,  
IEC 60228 and EN 60228  
Insulation: Special compound, BS EN 50363-5  
Core colours: HD 308 S2, BS 7629-1  
Shielding: Aluminium foil and tinned copper circuit  
protection conductor (earth wire),  
IEC 60228, EN 60228  
Sheath: Polyolefin compound, BS 7655-6.1, LTS3,  
flame-retardant  
Sheath colour: Red or white

#### ELECTRICAL PROPERTIES

Nominal voltage: 300 / 500 V  
Test voltage: 2000 V, 50 Hz

#### GENERAL PROPERTIES

Minimum bending radius during and permanent installation:  
6 x D (D = outer diameter)  
Operating temperature permanent installation:  
-40°C to +90°C  
during installation:  
-0°C to +70°C

- Zero halogen, IIEC 60754-1/-2, EN 60754-1/-2,  
non corrosive gases: VDE 0482-754-1/-2
- Flame propagation: IEC 60332-1-2, EN 60332-1-2,  
VDE 0482-332-1-2
- Flame spread: IEC 60332-3-24/-25 Cat.C/D,  
EN 60332-3-24/-25 Cat.C/D,  
VDE 0482-332-3-24/-25 Cat.C/D
- Smoke density: IIEC 61034-1/-2, EN 61034-1/-2,  
VDE 0482-1034-1/-2
- Circuit integrity (FE/PH): BS 6387 (Categories C, W & Z) <sup>[2]</sup>,  
BS EN 50200 Annex E (30 minutes),  
BS EN 50200 (PH120),  
VDE 0482-200 (H120)

<sup>[1]</sup> 1.00 mm<sup>2</sup> to 3.00 mm<sup>2</sup> cores constructed with solid copper conductors,  
4.00 mm<sup>2</sup> cores constructed with stranded copper conductors.  
1.5 mm<sup>2</sup> and 2.5 mm<sup>2</sup> cores available as stranded versions upon request.

<sup>[2]</sup> BS 6387 (CWZ):  
C = 180 minutes with a flame at 950 °C,  
W = 15 minutes with a flame at 650 °C plus additional 15 minutes  
of direct water spray simulating a sprinkle system  
Z = 15 minutes with a flame at 950 °C with indirect application  
of mechanical shock.

Article No.	Product	Sheath colour	Dimensions n x [mm <sup>2</sup> ]	Sheath Ø [mm]	Weight [kg/km]	Cu rate [kg/km]	Fire load [kWh/m]
18720400Z...	DFS Standard 60	red	2 x 1	7.35	80	29	0.17
18720500Z...	DFS Standard 60	white	2 x 1	7.35	80	29	0.17
18720900Z...	DFS Standard 60	red	2 x 1.5	7.6	95	43	0.19
18716100Z...	DFS Standard 60	white	2 x 1.5	7.6	95	43	0.19
18721400Z...	DFS Standard 60	red	2 x 2.5	9.0	141	72	0.26
18716200Z...	DFS Standard 60	white	2 x 2.5	9.0	141	72	0.26
18721000Z...	DFS Standard 60	red	3 x 1.5	8.7	129	58	0.23
18721100Z...	DFS Standard 60	white	3 x 1.5	8.7	129	58	0.23
18721500Z...	DFS Standard 60	red	3 x 2.5	9.5	191	96	0.31
18721600Z...	DFS Standard 60	white	3 x 2.5	9.5	191	96	0.31
18721200Z...	DFS Standard 60	red	4 x 1.5	9.0	145	72	0.28
18721300Z...	DFS Standard 60	white	4 x 1.5	9.0	145	72	0.28
18721700Z...	DFS Standard 60	red	4 x 2.5	11.4	222	120	0.39
18815500Z...	DFS Standard 60	white	4 x 2.5	11.4	222	120	0.39

Other dimensions available on request.

All dimensions in 100, 200 or 500 m length on drum.

Please complete the 9-digit number with ..N for 100 m, ..M for 200 m or ..L for 500 m when ordering.

Subject to technical modification.

# HALOGEN-FREE SAFETY CABLES

## BS 7629-1 AND BS 5839-1:2013 CLAUSE 26.2E



## DFS ENHANCED 120

### Fire alarm cable 300/500 V

halogen-free, with improved fire characteristics,  
BS 7629-1 and BS 5839-1:2013 Clause 26.2e



#### APPLICATION

Cable for fire alarm systems and emergency lighting.  
For permanent installation in buildings. Suitable for use in Hazardous Areas Zones 1 and 2.  
Optimized for fast termination: The aluminium foil is bonded to the inside of the sheath by a copolymer backing. So it is removed together with the sheath when terminating.  
Permitted operating temperature at conductor of +90° C.

#### CONSTRUCTION

Conductor: Solid copper or stranded copper <sup>[1]</sup>,  
IEC 60228 and EN 60228  
Insulation: Special compound, BS EN 50363-5  
Core colours: HD 308 S2 and BS 7629-1  
Shielding: Aluminium foil and tinned copper circuit protection conductor (earth wire),  
IEC 60228, EN 60228  
Sheath: Polyolefin compound, BS 7655-6.1, LTS3  
Sheath colour: Red or white

#### ELECTRICAL PROPERTIES

Nominal voltage: 300 / 500 V  
Test voltage: 2000 V, 50 Hz

#### GENERAL PROPERTIES

Minimum bending radius during and permanent installation:  
6 x D (D = outer diameter)  
Operating temperature permanent installation:  
-40 °C to +90 °C  
during installation:  
0 °C to +70 °C

Zero halogen, non corrosive gases: IEC 60754-1/-2, EN 60754-1/-2,  
VDE 0482-754-1/-2  
Flame propagation: IEC 60332-1-2, EN 60332-1-2,  
VDE 0482-332-1-2  
Flame spread: IEC 60332-3-24/-25 Cat.C/D,  
EN 60332-3-24/-25 Cat.C/D,  
VDE 0482-332-3-24/-25 Cat.C/D  
Smoke density: IEC 61034-1/-2, EN 61034-1/-2,  
VDE 0482-1034-1/-2  
Circuit integrity (FE/PH): BS 6387 (Categories C, W & Z) <sup>[2]</sup>,  
BS 8434 + amendment 2  
(120 minutes + water final 60 minutes),  
BS EN 50200 Annex E (30 minutes),  
BS EN 50200 (PH120), VDE 0482-200 (PH120)

<sup>[1]</sup> 1.00 mm<sup>2</sup> to 3.00 mm<sup>2</sup> cores constructed with solid copper conductors,  
4.00 mm<sup>2</sup> cores constructed with stranded copper conductors.  
1.5 mm<sup>2</sup> and 2.5 mm<sup>2</sup> cores available as stranded versions upon request.

<sup>[2]</sup> BS 6387 (CWZ):  
C = 180 minutes with a flame at 950 °C,  
W = 15 minutes with a flame at 650 °C plus additional 15 minutes  
of direct water spray simulating a sprinkler system  
Z = 15 minutes with a flame at 950 °C with indirect application  
of mechanical shock.

Article No.	Product	Sheath colour	Dimensions n x [mm <sup>2</sup> ]	Sheath Ø [mm]	Weight [kg/km]	Cu rate [kg/km]	Fire load [kWh/m]
18836800Z...	DFS Enhanced 120	red	2 x 1.5	8.2	97	43	0.19
18836900Z...	DFS Enhanced 120	white	2 x 1.5	8.2	97	43	0.19
18837000Z...	DFS Enhanced 120	red	2 x 2.5	8.8	144	72	0.26
18837100Z...	DFS Enhanced 120	white	2 x 2.5	8.8	144	72	0.26
18726100Z...	DFS Enhanced 120	red	3 x 1.5	9.9	132		
19167900Z...	DFS Enhanced 120	red	4 x 1.5	11.1	148	72	0.28

Other dimensions available on request.

All dimensions are available in 100, 200 or 500 m lengths on drum.

Please complete the 9-digit number with ..N for 100 m, ..M for 200 m or ..L for 500 m when ordering.

# HALOGEN-FREE FIRE SAFETY CABLES

## E30 SYSTEM CIRCUIT INTEGRITY

### FIBRE OPTIC UNIVERSAL CABLES

#### FO Universal ZGGFR Safety / U-DQ(ZN)BH

Safety cable E30 for indoor and outdoor use, up to 12 fibres

#### FO Universal wbGGFR Safety / U-DQ(ZN)BH

Safety cable E30 for indoor and outdoor use, up to 60 fibres

metal-free, water resistant, rodent protection,  
in accordance with IEC 60332-1-2 and IEC 60332-3-24

**30 minutes System Circuit Integrity according to DIN 4102-12\***

#### FEATURES

Non-metallic fibre optic safety cable with one central loose tube,  
up to 60 fibres.  
The optimal combination of flame retardant fibre coating  
and flame-inhibiting stabilizing elements ensures enhanced circuit  
integrity (System Circuit Integrity\*) in case of fire for 30 minutes.

#### APPLICATION

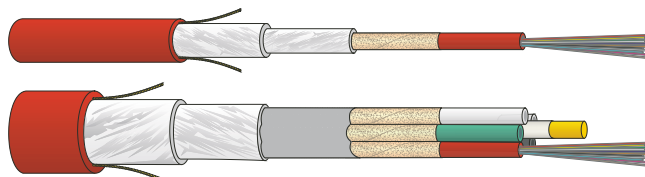
Safety applications in tunnels, underground railways, banks,  
insurance companies, large-scale industry.  
LAN backbones.  
Indoor and outdoor cabling.  
Can be installed in cable platforms, trays, ducts and vertical shafts.  
Can be spliced in FO distributors.

#### OPTICAL CHARACTERISTICS

The cables are available with different types of optical fibre  
(see Datwyler's fibre data sheets).

#### MECHANICAL CHARACTERISTICS

Temperature range  
storage: -25 / +70 °C IEC 60794-1-22 F1  
during installation: -10 / +50 °C  
in operation: -25 / +60 °C



Tensile performance: IEC 60794-1-21 E1  
Crush resistance: IEC 60794-1-21 E3  
Impact: IEC 60794-1-21 E4  
Repeated bending: IEC 60794-1-21 E6  
Torsion: IEC 60794-1-21 E7  
Bend: IEC 60794-1-21 E11  
Water penetration: IEC 60794-1-21 F5

#### GENERAL PROPERTIES

Imprint: DATWYLER «cable type» «Datwyler designation» «DIN designation»  
«number of fibres» «fibre type»  
«additional text» «batch number»  
~ ~ «meter marks» ~ ~

Zero halogen, non corrosive gases: IEC 60754-1/-2, EN 60754-1/-2, VDE 0482-754-1/-2  
Flame propagation: IEC 60332-1-2, EN 60332-1-2, VDE 0482-332-1-2  
Flame spread: IEC 60332-3-24, EN 50266-2-4, VDE 0482-266-2-4  
Smoke density: IEC 61034-1/-2, EN 61034-1/-2, VDE 0482-1034-1/-2  
Circuit integrity (FE180): IEC 60331-11, IEC 60331-25 (FE90), EN 50200 PH90, VDE 0482-200  
System Circuit Integrity E30\* according to DIN 4102 part 12, VKF Fire Safety Application No. 24176

U-DQ(ZN)BH 1 x m	Fibres	Article No.	Article No.	Article No.	Article No.	
Description	number	E9/125 G.652.D	G50/125 OM2	G50/125 OM3	G50/125 OM4	
FO Universal ZGGFR Safety / U-DQ(ZN)BH						
ZGGFR Safety	1 x 4	4	187288	186363	190604	193447
ZGGFR Safety	1 x 6	6	191867	186639	191851	193448
ZGGFR Safety	1 x 8	8	on request	190621	on request	193449
ZGGFR Safety	1 x 12	12	190719	187293	191796	193450
FO Universal wbGGFR Safety / U-DQ(ZN)BH						
wbGGFR Safety	2 x 12	24	190223	187294	187360	193454
wbGGFR Safety	3 x 12	36	190224	on request	on request	193455
wbGGFR Safety	4 x 12	48	190225	192119	191191	193456
wbGGFR Safety	5 x 12	60	190226	on request	190605	193457

\* System Circuit Integrity is dependent on installation method. To realize System Circuit Integrity E30, tested and certified fire safety system components are necessary.  
See [www.cabling.datwyler.com](http://www.cabling.datwyler.com) for certified components.

# HALOGEN-FREE FIRE SAFETY CABLES FROM DATWYLER

Halogen-free safety cables with improved characteristics in case of fire replace traditional PVC cables wherever people and property could be at risk due to fire and smoke. They do not emit corrosive gases in case of fire, do not burn easily, possess a low fire propagation factor, and there is a little production of smoke.

Datwyler also produces halogen-free safety cables with circuit integrity, intrinsic fire resistance and System Circuit Integrity E30-E90 in accordance with DIN 4102-12 installation and laying techniques, the latter being the strictest fire safety cabling standard worldwide which also comprise support systems and mounting components. These are used for applications where cables supply voltage not exceeding 1 kV continuously provide electrical power to emergency circuits, machinery and equipment in the event and presence of fire.

**E30 designation** must meet the requirement for maintaining circuit integrity of emergency machinery and equipment, enabling it to continue functioning within the building structure in the event of fire for a minimum of 30 minutes. E30 standards are designed for fire signalling, monitoring devices, and evacuation lighting, where water sprinkling system is installed.



**Datwyler Keram (N)HXH FE180 E30-E60**

(all dimensions)



**Datwyler Keram (N)HXCH FE180 E30-E60**

(all dimensions)

**E90 designation** must meet the requirement for maintaining circuit integrity of emergency machinery and equipment, enabling it to continue functioning within the building structure in the event of fire for a minimum of 90 minutes. E90 standards are 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.



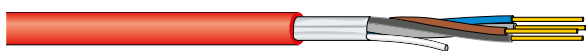
**Datwyler Keram (N)HXH FE180 E90**

(all dimensions)



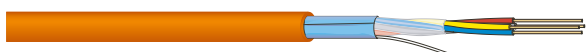
**Datwyler Keram (N)HXCH FE180 E90**

(all dimensions)



**Datwyler Keram JE-H(ST)H...Bd FE180 E30 L**  
**Datwyler Keram JE-H(ST)H...Bd FE180 E30-E90**

Colour: red, with inscription for fire alarm cable



**Datwyler Keram JE-H(ST)H...Bd FE180 E30 L**  
**Datwyler Keram JE-H(ST)H...Bd FE180 E30-E90**

Colour: orange



**Datwyler Keram JE-H(ST)HRH...Bd FE180 E30-E90**

Colour: red, with inscription for fire alarm cable

These cables are the result of many years of intensive development in coordination with the relevant European standardization bodies. Selected raw materials and special compounds in combination with unique installation methods are what give a Datwyler product or system its high quality and maximum guaranty of safety in the event of fire.

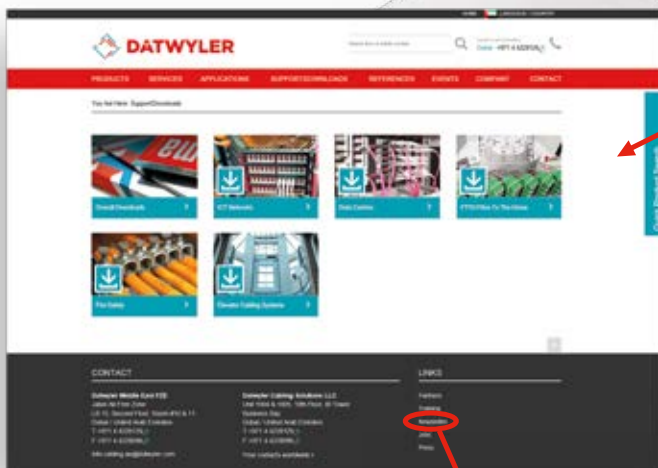


# FURTHER DATWYLER PRODUCT LINES

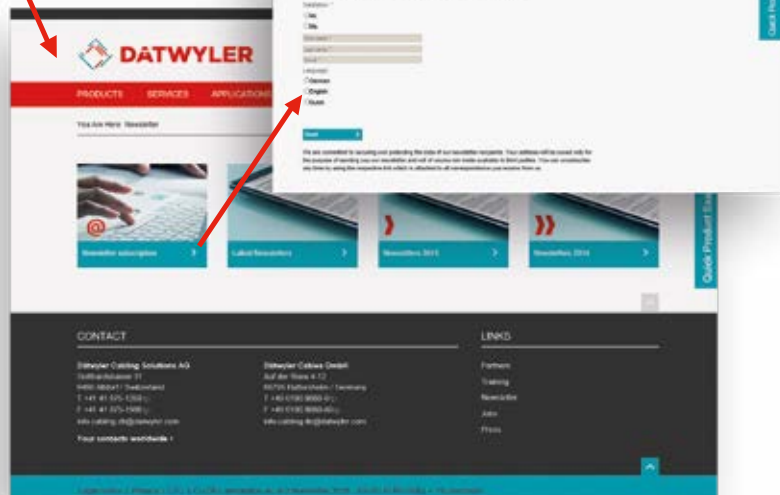
## ARE YOU INTERESTED IN DATWYLER'S HIGH-QUALITY PRODUCTS AND SOLUTIONS?

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IEC	International Electrotechnical Commission
IEC 60228	Conductors of insulated cables
IEC 60331-1	Tests for electric cables under fire conditions - Circuit integrity - Part 1: Test method for fire with shock at a temperature of at least 830 °C for cables of rated voltage up to and including 0,6/1,0 kV and with an overall diameter exceeding 20 mm
IEC 60331-11	Tests for electric cables under fire conditions - Circuit integrity - Part 11: Apparatus - Fire alone at a flame temperature of at least 750 °C
IEC 60331-2	Tests for electric cables under fire conditions - Circuit integrity - Part 2: Test method for fire with shock at a temperature of at least 830 °C for cables of rated voltage up to and including 0,6/1,0 kV and with an overall diameter not exceeding 20 mm
IEC 60331-21	Tests for electric cables under fire conditions - Circuit integrity - Part 21: Procedures and requirements - Cables of rated voltage up to and including 0,6/1,0 kV
IEC 60331-23	Tests for electric cables under fire conditions - Circuit integrity - Part 23: Procedures and requirements - Electric data cables
IEC 60331-25	Tests for electric cables under fire conditions - Circuit integrity - Part 25: Procedures and requirements - Optical fibre cables
IEC 60332-1-1	Test on electric and optical fibre cables under fire conditions. Part 1-1 Test for vertical flame propagation for a single insulated wire or cable - Apparatus
IEC 60332-1-2	Test on electric and optical fibre cables under fire conditions. Part 1-2 Test for vertical flame propagation for a single insulated wire or cable – Procedure for 1 kW pre-mixed flame
IEC 60332-3-10	Tests on electric cables under fire conditions - Part 3-10: Test for vertical flame spread of vertically-mounted bunched wires or cables - Apparatus
IEC 60332-3-22	Tests on electric and optical fibre cables under fire conditions – Part 3-22: Test for vertical flame spread of vertically-mounted bunched wires or cables – Category A
IEC 60332-3-23	Tests on electric and optical fibre cables under fire conditions - Part 3-23: Test for vertical flame spread of vertically-mounted bunched wires or cables - Category B
IEC 60332-3-24	Tests on electric and optical fibre cables under fire conditions - Part 3-24: Test for vertical flame spread of vertically-mounted bunched wires or cables - Category C
IEC 60332-3-25	Tests on electric and optical fibre cables under fire conditions - Part 3-25: Test for vertical flame spread of vertically-mounted bunched wires or cables - Category D
IEC 60754-1	Test on gases evolved during combustion of materials from cables - Part 1: Determination of the amount of halogen acid gas
IEC 60794-1-2	Optical fibre cables - Part 1-2: Generic specification - Basic optical cable test procedures
IEC 61034-2	Measurement of smoke density of cables burning under defined conditions - Part 2: Test procedure and requirements
EN	European Standard
EN 50200	Method of test for resistance to fire of unprotected small cables for use in emergency circuits
EN 50362	Method of test for resistance to fire of larger unprotected power and control cables for use in emergency circuits
EN 50363-5	Insulating, sheathing and covering materials for low voltage energy cables - Part 5: Halogen-free, cross-linked insulating compounds
EN 60228	Conductors of insulated cables
EN 60332-1-1	Tests on electric and optical fibre cables under fire conditions - Part 1-1: Test for vertical flame propagation for a single insulated wire or cable - Apparatus
EN 60332-1-2	Tests on electric and optical fibre cables under fire conditions - Part 1-2: Test for vertical flame propagation for a single insulated wire or cable - Procedure for 1 kW pre-mixed flame
EN 61034-1	Measurement of smoke density of cables burning under defined conditions. Test apparatus
EN 61034-1	Measurement of smoke density of cables burning under defined conditions. Test apparatus
EN 61034-2	Measurement of smoke density of cables burning under defined conditions. Test procedure and requirements
EN 60754-1	Test on gases evolved during combustion of materials from cables - Part 1: Determination of the amount of halogen acid gas

**BS British Standard**

BS 5839-1+A2	Fire detection and fire alarm systems for buildings. Code of practice for system design, installation, commissioning and maintenance
BS 6387	Specification for performance requirements for cables required to maintain circuit integrity under fire conditions. Protocol C subjects the cable under test to a flame via direct impingement corresponding to a temperature attack of 950 °C +/- 40 °C (180 minutes). Protocol W subjects the cable under test to a flame via direct impingement corresponding to a temperature attack of 650 °C +/- 40 °C with direct application of water simulating a sprinkler system (30 minutes). Protocol Z subjects the cable under test to a flame via direct impingement corresponding to a temperature attack of 950 °C +/- 40 °C with indirect application of mechanical shock (15 minutes).
BS 7629-1	Electric cables. Specification for 300/500 V fire resistant screened cables having low emission of smoke and corrosive gases when affected by fire. Multicore and multipair cables
BS 7655-0	Specification for insulating and sheathing materials for cables. General introduction
BS EN 60228	Conductors of insulated cables
BS 8434-2 +A2	Test for unprotected small cable for use in emergency circuits BS EN 50200 with a 930 °C flame and with water spray

**VDE German Association for Electro-Technics, Electronics & Information Technologies**

VDE 0472-814	Testing of cables, wires and flexible cords; continuance of isolation effect under fire conditions
VDE 0482-200	Method of test for resistance to fire of unprotected small cables for use in emergency circuits
VDE 0482-332-1-1	Test on electric and optical fibre cables under fire conditions. Part 1-1 Test for vertical flame propagation for a single insulated wire or cable - Apparatus
VDE 0482-332-1-2	Test on electric and optical fibre cables under fire conditions. Part 1-2 Test for vertical flame propagation for a single insulated wire or cable – Procedure for 1 kW pre-mixed flame
VDE 0482-362	Method of test for resistance to fire of larger unprotected power and control cables for use in emergency circuits
VDE 0482-1034-1	Measurement of smoke density of cables burning under defined conditions - Part 1: Test apparatus
VDE 0482-1034-2	Measurement of smoke density of cables burning under defined conditions - Part 2: Test procedure and requirements

**DIN German Institute for Standardization**

DIN 4102-12	Fire behaviour of building materials and building components - Part 12: Circuit integrity maintenance of electric cable systems; requirements and testing (= enhanced or System Circuit Integrity)
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**VdS Inspected. Approved. Safe.**

VdS 3423	E90 cable for water extinguishing system with additional circuit integrity against water penetration, requirements and test methods (draft)
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**NBN Belgian Standard**

NBN 713-020	Fire fighting - Fire performance of building materials and products - Fire resistance of building materials
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