

# Safe cables lead the way.

Our Afumex N2XH and NA2XH cables save lives.



**Afumex®**  
LSOH cables



**Prysmian**  
Group

Linking  
the Future



*Afumex cables protect  
people and property.*





# Our Afumex N2XH and NA2XH cables save lives.

In case of a fire in crowded constructions such as hospitals, high-rise municipal buildings and schools, it's crucial to have cables with low toxic gas emission and smoke density in order to facilitate the evacuation process. Our Low Smoke Zero Halogen N2XH and NA2XH cables are B2<sub>ca</sub> classified in accordance with the EU Construction Products Regulation (CPR). Hence, a safe choice that won't add fuel to the fire.

## N2XH AND NA2XH

### Application

N2XH with copper conductors and NA2XH with aluminium conductors are both Low Smoke Zero Halogen (LSOH) cables. These flame-retardant cables develop much less and lighter smoke than traditional PVC-cables. And the smoke developed is a lot less toxic. Owing to the fact that the cables have improved properties under fire, they are recommended for fixed installations in public buildings frequented by large amounts of people, for industrial complexes, electric power plants, transformer stations, municipal facilities, hotels, shopping malls, hospitals, schools, airports as well as underground railways.

## MAIN FEATURES

- ✓ CPR class B2<sub>ca</sub>
- ✓ Low Fire Hazard Cable – limited flame spread and less heat
- ✓ Low Smoke Zero Halogen – less toxic smoke and corrosive acids
- ✓ Approved for high and medium risk facilities
- ✓ Contains our own reliable flame-retardant compound Afumex

## LSOH-cables

Reduced smoke formation.  
Light smoke, easy to find exits.  
Fewer toxic gases, easier to evacuate.  
Creates a white harmless powder, spare metals and electronic devices.  
Easier to sanitise, shorter production interruption.  
Better for the environment, contain no phthalates and dioxin.

## PVC-cables

Heavy smoke formation.  
Black smoke, hard to find exits.  
Lots of toxic gases, obstruct evacuation.  
Creates hydrochloric acid that destroys electronics and corrodes metals.  
Inhibits sanitation, longer break.  
Harmful to the environment, contain phthalates and dioxin.

## A SAFE AND SOUND CHOICE

In case of a fire there are three critical factors that will influence the possibility to find an escape way: smoke development, visibility and the amount of toxic substances in the air. LSOH flame retardant cables develop much less and lighter smoke than traditional PVC-cables. And the smoke developed is a lot less toxic. All in all, you'll have better visibility and more time to find an escape way in a burning area with LSOH-cables installed – and thus increase the chance of surviving.

A fire often means large economical losses due to damages on electronic devices, machines and buildings. When PVC is burning it develops hydrochloric acid, which penetrates surrounding materials and cause metals to corrode. The acid penetrates and ruin electrical equipment, computers, and machines – including alarms and safety systems. And, the corrosion continues after the fire, causing reinforcement bars in walls, stairs and elevator shafts to disintegrate and collapse long after the fire has been extinguished. Burning LSOH-cables on the other hand create a white harmless powder that minimizes the damages. In addition, the scene of fire will be much easier and less expensive to sanitise, which in turn means that the production can be resumed much faster.

## CPR – REGULATES FIRE PERFORMANCE

Since 2017, cables designed for fixed installation within domestic, residential and commercial buildings are subject to the Construction Products Regulation (CPR), covered by the standard EN 50575. All cables sold on the European market must be CE marked and comprise a Declaration of Performance (DoP) including a CPR classification regarding the cables' performance during a fire.

The main goal with the regulation is to increase people's safety inside buildings in case of a fire – and a cables behaviour during a blaze can be pivotal, as they run between rooms and floors as well as above ceilings.

You can always count on the fact that our cables are fully compliant with European CPR requirements. Each cable that we produce comes with a Declaration of Performance (DoP) and carries the CE marking confirming compliance with fire resistance regulations set out in the EN 50575 standard.

## Classifications

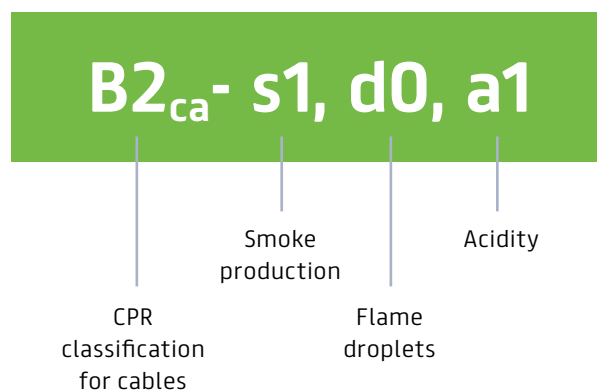
There are seven different classes of fire performance where heat release and flame spread are the main classification criteria:



A<sub>ca</sub> class defines non-flammable cables (no reaction), whereas F<sub>ca</sub> class contains cables not fulfilling E<sub>ca</sub> class requirements (i.e. with undetermined performance).

In addition to how much heat the cable releases and how much flames it spreads, three supplementary classification criteria for classes B1<sub>ca</sub>, B2<sub>ca</sub>, C<sub>ca</sub> and D<sub>ca</sub>: smoke emissions, flame droplets and acidity.

Overview using the CPR classification for our N2XH/NA2XH as an example:



### SMOKE EMISSIONS (EN 61034-2)

- s1** Low smoke emission
- s1a** s1 with > 80 % emission
- s1b** s1 with > 60 % < 80 % emission
- s2** Medium smoke emission
- s3** None of the above

### FLAME DROPLETS (EN 50399)

- d0** No flammable drops/particles
- d1** 10 sec. flammable drops/particles
- d2** None of the above

### ACIDITY (EN 60754-2)

- a1** Low acidity < 2.5 µS/mm, pH > 4.3
- a2** Acidity < 10 µS/mm, pH > 4.3
- a3** None of the above

## EUROPACABLE RECOMMENDATIONS

Taking into consideration many concerns that arose, Europacable letter to the European Commission and Directorate-General for Mobility and Transport, highlights three important criteria for cables used in railway tunnels and other high-risk buildings:

- 1) Cables of class D<sub>ca</sub> shall not be used, as they – equal to class F<sub>ca</sub> and E<sub>ca</sub> – do not meet the requirement for “low fire spread”.
- 2) Cables need to comply with additional classifications s1a, s1b, s1 or s2 to meet the agreed requirement for “low smoke density”.
- 3) Cables need to comply with additional classification a1 or a2 to meet the agreed requirement for “low toxicity”.

You will find more information at:

<https://www.prysmiangroup.com/en/markets/construction-and-infrastructures/construction-products-regulation>



## WHAT CABLE GOES WHERE

Buildings can be sorted by usage groups, for which the associated fire risks are the basis for the cable selections. The higher the category to the right is, the higher classification the cable should have:

- occupants' density
- difficulty of escape routes
- complexity for rescue teams to intervene
- vulnerability of the population
- relevance of heritage preservation

Choose the right cable		
Construction	Characteristics	Criterion/Classifications
Railway, metro stations, airports and high-rise buildings	Crowded premises lodging people from all over the world speaking different languages who are not familiar with the fire alarms and escape routes.	High risk B2 <sub>ca</sub>
Health, rehab and long-term care facilities	Buildings where speed of evacuation is critical, housing people that need assistance and activities that cannot be interrupted (e.g. surgical operations).	Medium risk B2 <sub>ca</sub> and C <sub>ca</sub>
Cultural and entertainment facilities	Crowded and often older, buildings not built to enable a quick escape of people. Many times including valuable artefacts needed to be protected from smoke and acid gases.	Medium risk B2 <sub>ca</sub> and C <sub>ca</sub>
Offices, schools and recreational premises	Commonly crowded with people with limited knowledge of fire precautions and alarms.	Medium risk B2 <sub>ca</sub> and C <sub>ca</sub>
Accommodation facilities	Hotels, motels, tourist villages or B&Bs tending to be crowded with people who are not familiar with the exit ways.	Medium risk B2 <sub>ca</sub> and C <sub>ca</sub>
Shopping centres	Buildings designed to hold large numbers of people, often families, who are not familiar with the building's fire alarms and escape routes.	Medium risk B2 <sub>ca</sub> and C <sub>ca</sub>
Residential buildings, small markets, shops and restaurants	Facilities harbouring people who lives there and know the escape routes and/or smaller establishments with easy-to-find emergency exits.	Low risk D <sub>ca</sub>

As recommended by Europacable and in other various European descriptions.  
More details on [www.europacable.eu](http://www.europacable.eu)

## TECHNICAL DATA

	Afumex N2XH	Afumex NA2XH
<b>Global data</b>		
Brand	Afumex	Afumex
Type designation	N2XH-0(J)	NA2XH-0(J)
Standard	VDE 0276-604 (5G-A3)	VDE 0276-603 (5G-2) / VDE 0276-604 (5G-A3)
<b>Construction parameters</b>		
Conductor	Copper	Aluminium
Conductor shape	R (RE – round single wire or RM – round stranded) S (SE – sector single wire or SM – sector stranded)	R (RE – round single wire or RM – round stranded) S (SE – sector single wire or SM – sector stranded)
Insulation	XLPE	XLPE
Core identification	Colours of cores acc. to VDE 0276-604	Colours of cores acc. to VDE 0276-603 / VDE 0276-604
Inner covering (filling)	Extruded halogen free polymer	Extruded halogen free polymer
Outer sheath	Halogen-free (LSOH), flame-retardant compound Afumex	Halogen-free (LSOH), flame-retardant compound Afumex
Outer sheath colour	Black	Black
<b>Electrical parameters</b>		
Rated voltage	0.6/1 kV	0.6/1 kV
Max. permissible operating voltage AC	1.2 kV	1.2 kV
Max. permissible operating voltage DC	1.8 kV	1.8 kV
AC test voltage	3.5 kV	3.5 kV
<b>Cable characteristics</b>		
Cable flexibility	Rigid	Rigid
Min bending radius at inst.	12xD (multicore), 15xD (single core)	12xD (multicore), 15xD (single core)
Silicone free	Yes	Yes
Lead free	Yes	Yes
Chemical resistance	No	No
UV resistance	Yes	Yes
Max. operating temperature	90 °C	90 °C
CPR class	B2 <sub>ca</sub>	B2 <sub>ca</sub>
RoHS/REACH compliant	Yes	Yes
Weather resistance	Yes	Yes
<b>Properties under fire</b>		
Flame propagation in single insulated wire or cable +A38:A43	EN 60332-1-1, 1-2	EN 60332-1-1, 1-2
Flame propagation in bunched wires or cables	EN 50399	EN 50399
Smoke density	EN 61034-2, EN 50268	EN 61034-2, EN 50268
Combustion gases		
– halogen-free	EN 60754-1	EN 60754-1
– corrosively of fumes	EN 60754-2, EN 50267-2-2	EN 60754-2, EN 50267-2-2
<b>Thermal parameters</b>		
Max. permissible temp. at conductor	90 °C	90 °C
Max. short circuit temperature	250 °C	250 °C
Min. temperature at installation	-5 °C	-5 °C
<b>Types of installation</b>		
In air (indoor and outdoor)	Yes	Yes
In channels	Permitted – where there is no water penetration	Permitted – where there is no water penetration
In tubes	Permitted – where there is no water penetration	Permitted – where there is no water penetration



Afumex N2XH			
No. of phases × cross-section (mm <sup>2</sup> )	Art. Des. O/J	Cable diam. approx. (mm)	Cable weight approx. (kg/km)
Round single core			
1×25 R	-0	15.4	485
1×35 R	-0	16.4	594
1×50 R	-J	17.8	737
1×50 R	-0	17.8	737
1×70 R	-J	19.6	972
1×70 R	-0	19.6	972
1×95 R	-J	21.2	1231
1×120 R	-0	22.9	1482
1×150 R	-0	24.7	1770
1×185 R	-0	26.7	2155
Round multicores			
3×16 R	-J	20.8	916
3×25 R / 16 R	-J	25.2	1467
3×35 R / 16 R	-J	27.2	1803
4×16 R	-0	22.3	1096
4×25 R	-J	26.1	1586
4×25 R	-0	26.1	1586
4×35 R	-J	28.6	2028
4×50 R	-0	32	2623
4×70 R	-0	36.2	3613
5×16 R	-J	24	1307
5×25 R	-J	28.3	1908

Afumex N2XH			
No. of phases × cross-section (mm <sup>2</sup> )	Art. Des. O/J	Cable diam. approx. (mm)	Cable weight approx. (kg/km)
5×35 R	-J	31.1	2454
5×50 R	-J	34.9	3186
5×70 R	-J	39.5	4411
5×95 R	-J	44.1	5755
5×120 R	-J	48.7	7071
Sector + Round multicores			
3×50 S / 25 R	-J	28.9	2221
Sector multicores			
3×70 S / 35 S	-J	32.9	2906
3×95 S / 50 S	-J	35.2	3787
3×120 S / 70 S	-J	38.1	4716
3×150 S / 70 S	-J	41.5	5573
4×35 S	-J	26.4	1837
4×35 S	-0	26.4	1837
4×50 S	-J	28.9	2352
4×50 S	-0	28.9	2352
4×70 S	-0	32.9	3218
4×70 S	-J	32.9	3218
4×95 S	-J	35.2	4222
4×95 S	-0	35.2	4222
4×120 S	-J	38.1	5181
4×150 S	-J	41.5	6304
4×185 S	-J	46.5	7788

Other configurations available. Cables also available in CPR classification E<sub>ca</sub>. Contact us for details.



Afumex NA2XH			
No. of phases × cross-section (mm <sup>2</sup> )	Art. Des. O/J	Cable diam. approx. (mm)	Cable weight approx. (kg/km)
Round single core			
1×25 R	-0	15.5	339
1×35 R	-0	16.6	389
1×50 R	-0	17.9	454
1×70 R	-0	19.7	556
1×95 R	-0	21.1	657
1×120 R	-0	22.8	764
1×150 R	-0	24.7	887
1×185 R	-0	26.7	1045
1×240 R	-0	29.3	1261

Afumex NA2XH			
No. of phases × cross-section (mm <sup>2</sup> )	Art. Des. O/J	Cable diam. approx. (mm)	Cable weight approx. (kg/km)
Sector + Round multicores			
3×25 S / 16 R	-0	24.3	836
3×35 S / 16 R	-J	26.2	989
3×50 S / 25 R	-J	28.7	1196
3×70 S / 35 R	-J	33	1600
3×95 S / 50 R	-J	36.1	1939
3×120 S / 70 R	-J	39.2	2316
3×150 S / 70 R	-J	42.5	2715
3×185 S / 95 R	-J	46.3	3286
3×185 S / 95 R	-0	49.2	3428

Other configurations available. Cables also available in CPR classification E<sub>ca</sub>. Contact us for details.

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