

# In safe hands.

Our complete nuclear cable offer keeps the power in check.



**Prysmian**  
Group

Linking  
the Future

## Linking the future

As the worldwide leader in the cable industry, Prysmian Group believes in the effective, efficient and sustainable supply of energy and information as a primary driver in the development of communities.

With this in mind, we provide major global organisations in many industries with best-in-class cable solutions, based on state-of-the-art technology. Through three renowned commercial brands – Prysmian, Draka and General Cable – based in almost 50 countries, we're constantly close to our customers, enabling them to further develop the world's energy and telecoms infrastructures, and achieve sustainable, profitable growth.

In our energy business, we design, produce, distribute and install cables and systems for the transmission and distribution of power at low, medium and high voltage.

In telecoms, the Group is a leading manufacturer of all types of copper and fibre cables, systems and accessories – covering voice, video and data transmission.

Drawing on over 130 years' experience and continuously investing in R&D, we apply excellence, understanding and integrity to everything we do, meeting and exceeding the precise needs of our customers across all continents, at the same time shaping the evolution of our industry.

## Our complete nuclear cable offer keeps the power in check.

Nuclear power plants demand nothing short of flawless technological excellence. Together with our colleagues in Germany and France, Prysmian Hungary develop state-of-the-art cable solutions using special raw materials verified by independent third-party certification institutes. Our portfolio covers every kind of cable used inside a plant, from MV and instrumentation cables to fibre optics. Every component works perfectly and consistently, to guarantee continuous and safe power generation in harsh and challenging environments.

### What we offer

In order to tackle the technical challenges that a nuclear plant demands, Prysmian Group offers the highest standards of reliability and safety, developed over more than 50 years of expertise in designing and manufacturing nuclear cables both in the USA and in Europe and R&D centres specifically dedicated to nuclear cable development.

Prysmian delivers a complete portfolio of superior nuclear cables for systems and components involved in the production of nuclear energy, including MV and LV power cables, instrumentation, control, communication, fibre optic and cables for special radiation-monitoring equipment.

All our nuclear cables have been specially developed to withstand every stress that comes with environments inside nuclear power plants and are designed to work flawlessly at temperatures up to 90°C for at least 60 years.

All cables are designed and third party approved solutions in accordance to all relevant quality standards and certifications in order to live up to the high expectations for safety and reliability demanded by the worldwide market.

One part of our nuclear portfolio are cables suitable for EPR reactors and compliant to RCCE/CST74C068 Nuclear Standard and listed in all three relevant safety classes K1, K2 and K3.

A second part of the portfolio are cables suitable for AP1000 reactors and compliant to the requirements of the quality systems 10CFR50, Appendix B and 10CFR21 as well as ASME NQA-1 and 10CFR50, Appendix B. They are all certified according to standard IEC323/383 1974.

A third part consists of cables suitable for VVER reactors. These cables are compliant to classification groups according to NP 001-15 (OPB 88/15).

Cables for EPR and VVER reactors are also compliant to REACH and ROHS European regulation.

### Our complete portfolio includes cables for:

- SEALED PENETRATION SYSTEMS
- CABLES FOR SENSING DEVICES
- POWER & DATA CABLES
- POLAR CRANE
- THERMOCOUPLE
- COMPOSITE CABLE
- FIRE DETECTION & FIRE ALARM SYSTEM
- IN-CORE INSTRUMENTATION SYSTEMS (RIC)
- ROD BARS SYSTEMS FOR MOTION & CONTROL OF NEUTRONIC CHAIN REACTION
- VIDEO SURVEILLANCE
- TELECOMMUNICATION





# Safety zones in nuclear power plants.

All our nuclear cables have a longevity of at least 60 years.

NUCLEAR ZONE

SENSITIVE ZONE

BOP

# NUCLEAR ZONE

Inside the nuclear containment.

## Cable criteria:

- Thermal ageing resilient (IEC 60216) proven for a life time of 60 years under a permanent environmental temperature of 70 °C
- Radiology ageing resilient to gamma rays
- SLBA (Steam Line Break Accident) proven
- DBA (Design Basis Accident) proven

## Must comply with:

### 1. Nuclear protocol NP 001-15 (OPB 88/15)

Nuclear safety cable family:

- Class 2 (Safety systems cables (fire resistance design))

Cable types:

- ng-HF (Gamma radiation + LOCA proven)
- ng-FRHF (Gamma radiation + LOCA proven + Fire resistant properties)

### 2. Nuclear protocol RCCE

Nuclear safety cables:

- CST74C068 (Nuclear classified cables)

Cable types:

- K1 (Gamma radiation + LOCA proven)
- K2 (Gamma radiation proven)

# SENSITIVE ZONE

Auxiliary facilities critical for the functioning and safety of the NPP + turbine island.

## Cables criteria:

- Thermal ageing resilience (IEC 60216) proven for a life time of 60 years under a permanent environmental temperature of 70 °C
- Vertical flame spread resilience
- Halogen free content
- Low smoke fume density
- Low toxicity index of products of combustion
- Ageing – immersion in oil

Cables installed inside the sensitive zone do not have to be radiological resilient proven.

## Must comply with:

### 1. Nuclear protocol NP 001-15 (OPB 88/15)

Nuclear safety cable family:

- Class 3 (safety-relevant cables of normal operation systems)

Cable types:

- ng-LS (thermal resilient IEC 60216)
- ng-FRLS (thermal resilient IEC 60216 + Fire resistant properties)

### 2. Nuclear protocol RCCE

Nuclear safety cables:

- CST74C068 (nuclear classified cables)

Cable types:

- K3 (thermal resilient IEC 60216)

# BOP

Balance Of Plant.

## Cable criteria:

- Vertical flame spread resilience
- Halogen free content
- Low smoke fume density
- Low toxicity index of products of combustion

Cables installed inside the BOP-zone are not requested to be resilient to thermal and radiological aging.

## Must comply with:

National standards and regulations applicable to Civil Buildings & Infrastructures.



# Our products and brands.

## SIENOPYR KO / SIENOPYR XA

The brand name identifies products developed by Prysmian Group's excellence centre located in Germany. The cables have been originally developed in cooperation with AREVA/Framatome to serve Germany's domestic nuclear market. Subsequently, the application of the cable family has been extended to the VVER Nuclear Protocol P 001-15 NP 001-15 for safety category FRHF-HF Class 2 & 3, following extensive test sessions at the Chemistry and Radio Chemistry AREVA/Framatome labs of Erlagen.

SIENOPYR KO identifies Fire Resistant cables 60 years life-time big leaks 215 °C.

SIENOPYR XA is the KO equivalent version without fire resistance performances.

## AFUMEX TECNUC

The historical brand of Prysmian Group developed in the Group's excellence centre for nuclear cables in France and identifying the whole family of cables for nuclear power plants.

Originally designed for RCC-E Nuclear Protocol and addressed to Nuclear power plants by AREVA/Framatome/EDF, AFUMEX TECNUC has extended its reach to VVER Reactors and the relevant P 001-15 NP 001-15 Nuclear Protocol according to safety class HF Class 3.

Thermodynamic performances of AFUMEX TECNUC have been verified and approved respectively by EDF SEPTEN labs for the RCC-E Nuclear Protocol and by the AREVA/Framatome laboratory for P 001-15 NP 001-15 Nuclear Protocol safety Class HF class 3 (60 years life-time big leaks 150 °C) .

## ULTROL 60+

The well-known General Cable US legacy brand name and the latest evolution of the ULTROL cable family, serving the US nuclear market for more than 40 years.

ULTROL 60+ cables have been designed in compliance with Nuclear Protocol IEEE 323/383 ver. 1974/2003, pursuant to all US Nuclear Regulatory Commission recommendations and to the environmental protocol of reactors installation designed by Westinghouse, GE-Hitachi, Mitsubishi and KEPCO. Cables are approved and certified both for 1E Class and 1E Non-Class Safety Level, by independent IEEE-related certification bodies.

## SAFENUC

The latest Prysmian Group's cable family released, offering a viable, reliable and proven technical solution for nuclear environment safety classified as type 1E Non-Class, K3 Class and, above all, HF-FRHF class 4 and LS FRLS class 2-3-4 in compliance with Nuclear Protocol P 001-15 NP 001-15 (VVER Reactors).

SAFENUC cables use special compounds developed internally by Prysmian Group and offer local production sourcing opportunities while complying with the strict requisites of reliability and performance imposed by the safety requirements of the relevant zone of installation.

On the following pages we will present SAFENUC cables, manufactured in Hungary.



## Centres for Nuclear Development and Manufacturing

Neustadt, Germany

Paron, France

Heidoven, Holland

Claremont, USA

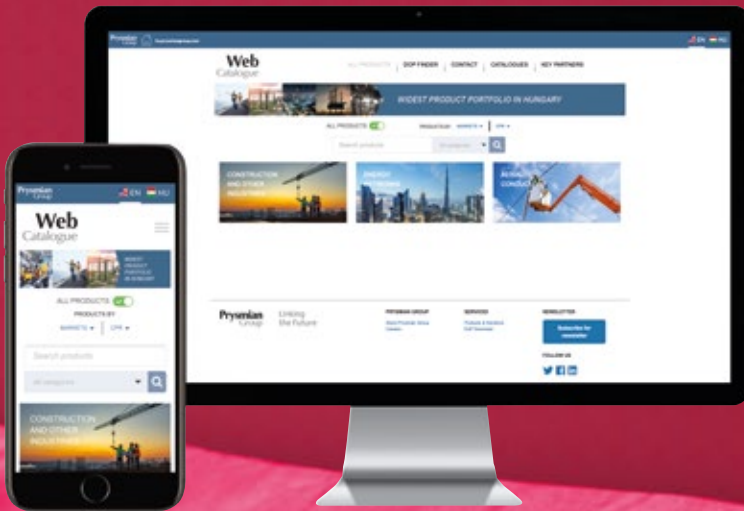
Balassagyarmat, Hungary





# Lay back and indulge.

See our complete nuclear portfolio in the new online catalogue. Unlimited access to our cables 24/7.



- Product information
- Search filters
- Cable comparison
- Data sheets
- DoP generator



<https://hu-catalogue.prysmiangroup.com>



## SAFENUC 2XH 0.6/1 kV



RoHS



Nuclear power cables with copper conductor and LSOH sheath.



### Description

SAFENUC type is halogen free, flame retardant, non-corrosive with LSOH inner covering. Cables are intended for use inside the Sensitive zone/Turbine Island of VVER Type Nuclear reactors. SAFENUC 2XH is used in internal and external places where safety regulations

must be taken against fire such as control rooms, NPP safety-related premises, living rooms, escaping corridors etc. Especially designed for type 1E Non safety / K3 nuclear classification with 60 years proven service life at 90 °C for insulation and 70 °C for outer sheath.

SAFENUC 2XH	
Global data	
Brand	Prysmian
Application	Industrial installations, internal and external
Standard	Reach RoHS General: IEC 60502-1 Life cycle: IEC 60216
Design features	
Conductor material	Copper
Conductor surface	Bare
Core insulation material	XLPE
Material outer sheath	Low smoke zero halogen
Cable shape	Round
Electrical parameters	
Rated voltage	0.6/1 kV
Test voltage	4 kV

SAFENUC 2XH	
Chemical parameters	
Silicon free	Yes
Lead free	Yes
Flame retardant	In acc. with EN/IEC 60332-3-22
Halogen free	Yes (acc. EN 60754-1/2)
Low smoke	Yes (acc. EN 61034-2)
Oil resistant	Acc. IEC/EN 60811-404
UV resistant	Yes
Thermal parameters	
Max. operating temperature of the conductor	90 °C
Max. short circuit temperature of the conductor	250 °C
Temp. for fixed installation	min. -5 °C, max. +60 °C
Mechanical parameters	
Bending radius (rule)	15 x D (single core cables) 12 x D (multi core cables)

SAFENUC 2XH						
Basic construction	Conductor category	Shape of conductor	SAP code	Nominal outer diameter [mm]	Cable weight [kg/km]	Short circuit current conductor (1 sec) [kA]
1x2,5	Class 1 = solid	Round	20309202	11.1	167	0.41
1x4	Class 1 = solid	Round	20376765	11.5	187	0.64
1x6	Class 1 = solid	Round	20376764	12	214	0.94
1x10	Class 1 = solid	Round	20309200	12.8	267	1.53
1x10	Class 2 = stranded	Round	20376747	15.1	355	1.53
1x16	Class 2 = stranded	Round	20309201	16	431	2.41
1x25	Class 2 = stranded	Round	20376749	17.6	560	3.73
1x35	Class 2 = stranded	Round	20376748	18.6	669	5.19
1x50	Class 2 = stranded	Round	20376752	20.1	822	21.83
1x70	Class 2 = stranded	Round	20376757	21.9	1,057	10.27
1x95	Class 2 = stranded	Round	20309203	23.6	1,331	13.88
1x120	Class 2 = stranded	Round	20376750	27.2	1,745	17.5
1x150	Class 2 = stranded	Round	20376751	29	2,051	21.83



SAFENUC 2XH

Basic construction	Conductor category	Shape of conductor	SAP code	Nominal outer diameter [mm]	Cable weight [kg/km]	Short circuit current conductor (1 sec) [kA]
1x185	Class 2 = stranded	Round	20376755	31.1	2,456	26.88
1x240	Class 2 = stranded	Round	20376753	33.7	3,061	34.8
1x300	Class 2 = stranded	Round	20376759	36.1	3,684	43.44
1x400	Class 2 = stranded	Round	20376754	39.3	4,570	57.83
1x500	Class 2 = stranded	Round	20376756	42.9	5,678	72.2
1x630	Class 2 = stranded	Round	20309193	46.9	7,133	90.88
1x800	Class 2 = stranded	Round	20309194	54.3	9,166	115.3
3x2,5	Class 1 = solid	Round	20376770	14.8	320	0.41
3x4	Class 1 = solid	Round	20376772	15.8	389	0.64
3x6	Class 1 = solid	Round	20376655	18.9	572	0.94
3x10	Class 1 = solid	Round	20376656	20.5	737	1.53
3x16	Class 2 = stranded	Round	20376660	25.1	1,142	2.41
3x25	Class 2 = stranded	Round	20376713	28.7	1,570	3.73
3x35	Class 2 = stranded	Round	20376712	30.8	1,932	5.19
3x50	Class 2 = stranded	Round	20376715	33.9	2,443	7.37
3x70	Class 2 = stranded	Round	20376716	37.9	3,236	10.27
3x95	Class 2 = stranded	Round	20376768	41.5	4,149	13.88
3x120	Class 2 = stranded	Round	20376717	45.1	5,044	17.5
3x150	Class 2 = stranded	Round	20376714	48.9	6,058	21.83
3x185	Class 2 = stranded	Round	20376718	53.3	7,400	26.88
3x240	Class 2 = stranded	Round	20376739	59	9,409	34.8
4x2,5	Class 1 = solid	Round	20376773	15.7	363	0.41
4x4	Class 1 = solid	Round	20376771	16.8	448	0.64
4x6	Class 1 = solid	Round	20376659	20	659	0.94
4x10	Class 1 = solid	Round	20376658	21.8	865	1.53
4x16	Class 2 = stranded	Round	20376720	26.7	1,349	2.41
4x25	Class 2 = stranded	Round	20376719	30.7	1,883	3.73
4x35	Class 2 = stranded	Sector-shaped	20309191	32.2	2,174	5.19
4x35	Class 2 = stranded	Round	20376722	33.1	2,340	5.19
4x50	Class 2 = stranded	Round	20376721	36.5	2,985	7.37
4x50	Class 2 = stranded	Sector-shaped	20376736	35.1	2,729	7.37
4x70	Class 2 = stranded	Round	20376724	41.1	3,990	10.27
4x70	Class 2 = stranded	Sector-shaped	20376738	39.3	3,648	10.27
4x95	Class 2 = stranded	Round	20376723	45	5,160	13.88
4x95	Class 2 = stranded	Sector-shaped	20309192	42.9	4,709	13.88
4x120	Class 2 = stranded	Round	20376729	49.1	6,300	17.5
4x120	Class 2 = stranded	Sector-shaped	20376737	46.5	5,727	17.5
4x150	Class 2 = stranded	Round	20376725	53.4	7,592	21.83
4x150	Class 2 = stranded	Sector-shaped	20376740	50.5	6,903	21.83
4x185	Class 2 = stranded	Round	20376726	58.3	9,307	26.88
4x185	Class 2 = stranded	Sector-shaped	20376741	54.9	8,410	26.88
4x240	Class 2 = stranded	Sector-shaped	20309190	60.6	10,731	34.8
4x240	Class 2 = stranded	Round	20376728	64.6	11,885	34.8
5x2,5	Class 1 = solid	Round	20309197	16.6	407	0.41
5x4	Class 1 = solid	Round	20376657	17.9	510	0.64
5x6	Class 1 = solid	Round	20376711	21.2	752	0.94
5x10	Class 1 = solid	Round	20309195	23.3	1,001	1.53
5x16	Class 2 = stranded	Round	20309196	28.5	1,571	2.41
5x25	Class 2 = stranded	Round	20376730	32.9	2,218	3.73
5x35	Class 2 = stranded	Round	20376732	35.7	2,776	5.19
5x50	Class 2 = stranded	Round	20376727	39.5	3,563	7.37
5x70	Class 2 = stranded	Round	20376731	44.5	4,792	10.27
5x95	Class 2 = stranded	Round	20309199	49	6,229	13.88
5x120	Class 2 = stranded	Round	20376733	53.5	7,628	17.5
5x150	Class 2 = stranded	Round	20376735	58.3	9,213	21.83
5x185	Class 2 = stranded	Round	20376734	63.8	11,322	26.88
5x240	Class 2 = stranded	Round	20309198	70.9	14,497	34.8

## SAFENUC 2XCH 0.6/1 kV



RoHS



Nuclear power cables with copper conductor and LSOH sheath.

### Description

SAFENUC type is halogen free, flame retardant, non-corrosive with LSOH inner covering and copper wire or copper tape screen. Cables are intended for use inside the Sensitive zone/Turbine Island of VVER Type Nuclear reactors. SAFENUC 2XCH is used in internal and external places where safety regulations must



be taken against fire such as control rooms, NPP safety-related premises, living rooms, escaping corridors etc. Especially designed for type 1E Non safety / K3 nuclear classification with 60 years proven service life at 90 °C for insulation and 70 °C for outer sheath.

SAFENUC 2XCH	
Global data	
Brand	Prysmian
Application	Industrial installations, internal and external
Standard	Reach RoHS General: IEC 60502-1 Life cycle: IEC 60216
Design features	
Conductor material	Copper
Conductor surface	Bare
Core identification	Acc. HD 308 S2
Core insulation material	XLPE
Screen construction	Wire screen and counter helix tape
Screen material	Copper, bare
Material outer sheath	Low smoke zero halogen
Cable shape	Round
Electrical parameters	
Rated voltage	0.6/1 kV
Test voltage	4 kV

SAFENUC 2XCH	
Chemical parameters	
Silicon free	Yes
Lead free	Yes
Flame retardant	In acc. with EN/IEC 60332-3-22
Halogen free	Yes (acc. EN 60754-1/2)
Low smoke	Yes (acc. EN 61034-2)
Oil resistant	Acc. IEC/EN 60811-404
UV resistant	Yes
Thermal parameters	
Max. operating temperature of the conductor	90 °C
Max. short circuit temperature of the conductor	250 °C
Temp. for fixed installation	min. -5 °C, max. +60 °C
Mechanical parameters	
Bending radius (rule)	12 x D

SAFENUC 2XCH				
Basic construction	SAP code	Nominal outer diameter [mm]	Cable weight [kg/km]	Short circuit current conductor (1 sec) [kA]
4x35	20309188	33.8	2,377	5.19
4x50	20376742	37.2	3,034	7.37
4x70	20376744	41.6	4,071	10.27
4x95	20309189	45.6	5,273	13.88
4x120	20376743	49.7	6,537	17.5
4x150	20376745	53.7	7,728	21.83
4x185	20309187	58.6	9,522	26.88
4x240	20376746	64.7	12,094	34.8



## SAFENUC 2XSH 6/10 kV



RoHS



Nuclear power cables with copper conductor and LSOH sheath.

### Description

SAFENUC type is halogen free, flame retardant, non-corrosive with LSOH inner covering and copper wire or copper tape screen. Cables are intended for use inside the Sensitive zone/Turbine Island of VVER Type Nuclear reactors. SAFENUC 2XSH is used in internal and external places where safety regulations must



be taken against fire such as control rooms, NPP safety-related premises, living rooms, escaping corridors etc. Especially designed for type 1E Non safety / K3 nuclear classification with 60 years proven service life at 90 °C for insulation and 70 °C for outer sheath.

SAFENUC 2XSH	
Global data	
Brand	Prysmian
Application	Industrial installations, internal and external
Standard	Reach RoHS General: IEC 60502-1 Life cycle: IEC 60216
Design features	
Conductor material	Copper
Conductor surface	Bare
Core insulation material	XLPE
Screen construction	Metal tape and wire
Screen material	Copper, bare
Material outer sheath	Low smoke zero halogen
Cable shape	Round
Electrical parameters	
Rated voltage	6/10 kV
Test voltage	21 kV

SAFENUC 2XSH	
Chemical parameters	
Silicon free	Yes
Lead free	Yes
Flame retardant	In acc. with EN/IEC 60332-3-22
Halogen free	Yes (acc. EN 60754-1/2)
Low smoke	Yes (acc. EN 61034-2)
Oil resistant	Acc. IEC/EN 60811-404
UV resistant	Yes
Thermal parameters	
Max. operating temperature of the conductor	90 °C
Max. short circuit temperature of the conductor	250 °C
Temp. for fixed installation	min. -5 °C, max. +60 °C
Mechanical parameters	
Bending radius (rule)	15 x D

SAFENUC 2XSH				
Basic construction	SAP code	Nominal outer diameter [mm]	Cable weight [kg/km]	Short circuit current conductor (1 sec) [kA]
1x50	20309205	31.5	1,552	7.37
1x70	20376758	33.1	1,817	10.27
1x95	20376760	34.8	2,124	13.88
1x120	20376761	36.2	2,410	17.5
1x150	20309204	37.6	2,795	21.83
1x185	20376762	39.2	3,191	26.88
1x240	20376763	41.6	3,810	34.8
1x300	20376766	44.1	4,470	43.44
1x400	20376767	47	5,466	57.83
1x500	20376769	50.2	6,579	72.2
1x630	20309206	53.7	8,037	90.88

### PRYSMIAN GROUP

Prysmian MKM Kft.  
Phone: +36 1 382 2222

[infocables-hu@prysmiangroup.com](mailto:infocables-hu@prysmiangroup.com)



[prysmiangroup.hu](http://prysmiangroup.hu)

© All rights reserved by Prysmian Group 2021-12 | Version 1.

Technical data, dimensions and weights are subject to change. All sizes and values without tolerances are reference values. Specifications are for product as supplied by Prysmian Group: any modification or alteration afterwards of product may give different result. The information contained within this document must not be copied, reprinted or reproduced in any form, either wholly or in part, without the written consent of Prysmian Group. The information is believed to be correct at the time of issue. Prysmian Group reserves the right to amend this specification without prior notice. This specification is not contractually valid unless specifically authorised by Prysmian Group.

Follow us

