EM-CABLE

PRODUCT CATALOG

emcable.ru

The company's youtube channel

Dear partners!

In your hands is the catalog of the company EM-CABLE - one of the leading manufacturers of cable and wire products in Russia.

EM-CABLE is a modern, actively developing enterprise. Starting our history with the implementation of innovative programs in the energy sector, for 9 years we have significantly expanded our product range through new projects for the manufacturing of cable and wire products.

Being in constant development, our team has not only the right, but also the obligation to set the most ambitious goals. So, 2017 was marked for us by opening the production of power cables with cross-linked polyethylene insulation, and currently plant is in the process of new equipment installation, with the launch of which we will not just increase production volumes, but also new types with improved properties and characteristics will appear.

A balanced development strategy, high efficiency, professionalism and employee involvement allow EM-CABLE to look ahead with confidence.

We are proud of the company's success and fully realize that they have become possible thanks to the contribution of our entire team, which includes not only the plant employees, but also our partners and suppliers.

Best regards,
General Director EM-CABLE Ltd
Yuri Badin

ABOUT US

EM-CABLE Ltd. is a new modern plant for production of cable and wire products, which is one of the leading enterprises of the Republic of Mordovia.

Today EM-CABLE is:

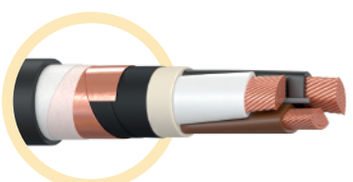
5 More than **BILLION RUBLES**
OF ANNUAL COMMERCIAL OUTPUT

415
EMPLOYEES

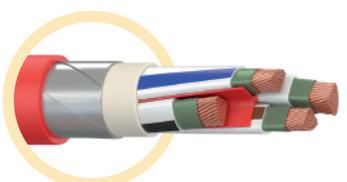
10 More than **THOUSAND**
KINDS OF PRODUCTS

20 More than **THOUSAND M²**
OF PRODUCTION FACILITIES

The story of EM-CABLE Ltd. begins on March 25th, 2010, and it began with production of unique corrosion-resistant overhead ground wires and uninsulated wires, which had no analogues in Russia. The range of the products has expanded significantly for 8 years and today it includes:

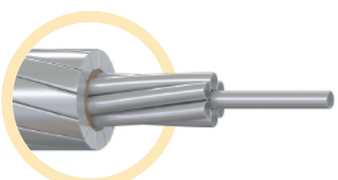


POWER CABLES
plastic-insulated, for voltages of up to 6 kV

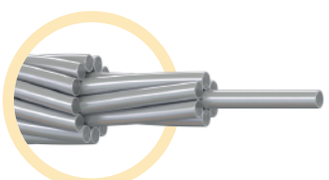


POWER CABLES
improved reliability, for voltages of up to 1 kV

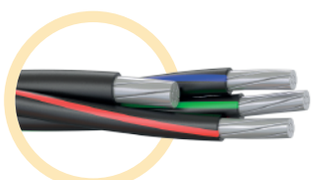
POWER CABLES
XLPE-insulated, for voltages of up to 110 kV



UNINSULATED WIRES
including innovative types **ASP, ASPk, ASPT, ASPTk, ASPTz,** etc.



CORROSION-RESISTANT OVERHEAD GROUND WIRES
with a core of aluminum-clad steel wires **(GTK)**



SELF-SUPPORTING INSULATED WIRES
including innovative flame-retardant wires **(SIPn)**

EM-CABLE, Ltd. is a part of Opticenergo Corporate Group

Opticenergo Corporate Group is one of the biggest cable and wire products manufacturers according to Elektrokabel Association, and today the group includes 19 successful dynamically developing companies. The annual volume of sales is 10 billion rubles, and the number of staff is 1400 people.
Due to the combined potential of the companies of the Corporate Group, EM-CABLE Ltd. has a full cycle production process starting from the manufacture of wire rod to the finished cable.

Our main work principle is HONEST TERMS and GUARANTEED HIGH QUALITY!

The most modern machinery produced by the world's leading manufacturers is installed and commissioned in EM-CABLE: such as "Queins" and "Eurodraw" (Germany), "Mario Frigerio" and "Cortinovis Machinery SpA" (Italy), "Proton" and "Threesixty Parkegate Technology" (UK), "Caballe S.A." (Spain), "Maillefer" (Switzerland), "Rosendahl" (Austria) and others.

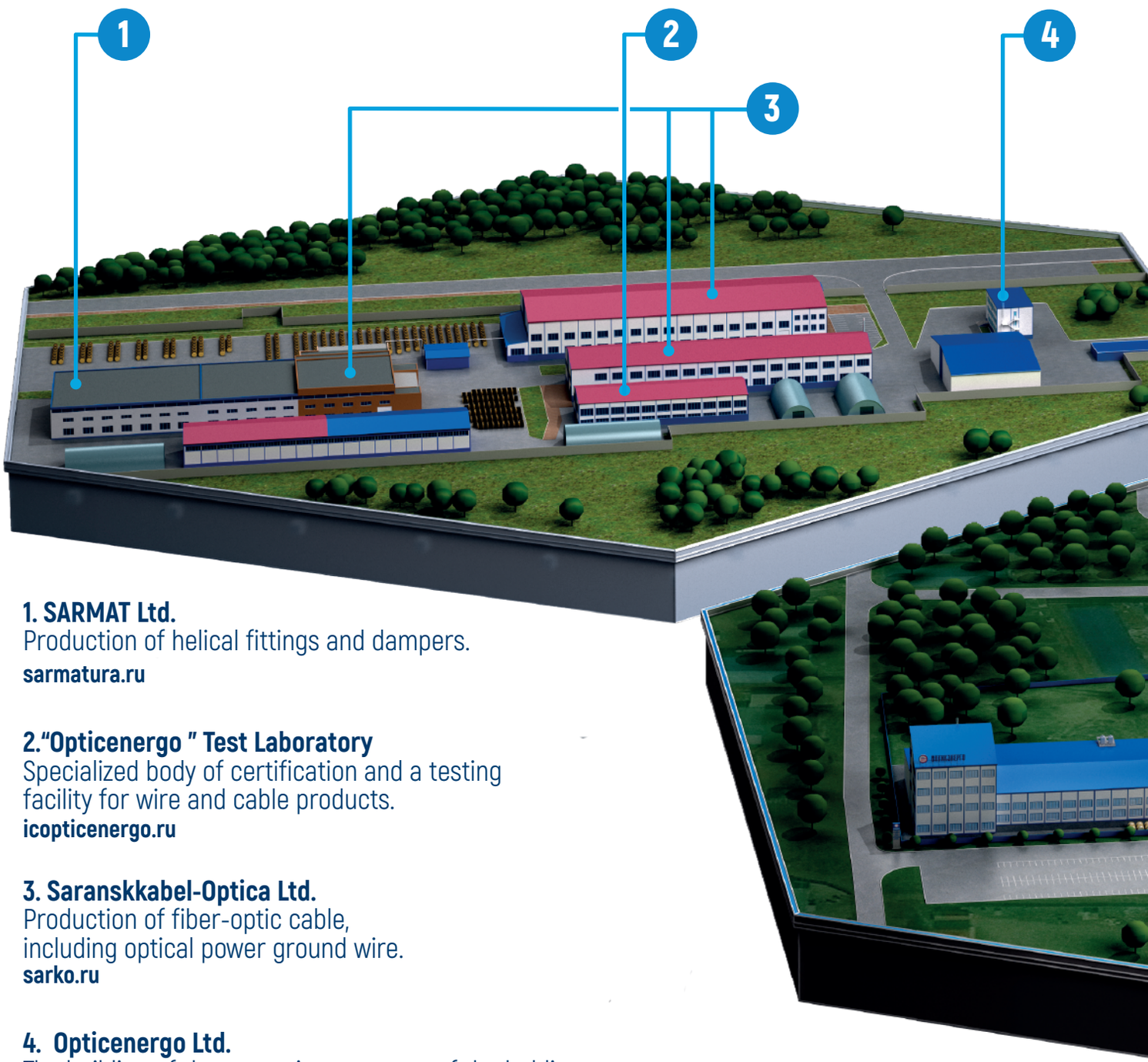
The quality of EM-CABLE, Ltd. production is confirmed by a number of reports and certificates including GOST ISO 9001-2001 quality management system certificates, "MILITARY REGISTER" and "GAZPROMCERT" certificates of conformity, the license of the Federal Service for Ecological, Technological and Atomic supervision, permissions of "MUEGC" and "LENENERGO", certificates of approval of products by "Rosseti", etc.

EM-CABLE is a RELIABLE SUPPLIER

Thanks to the convenient geographical location of the company (600 km from Moscow, on a major railway line and 100 km away from the "Moscow-Chelyabinsk" federal level motorway), our products can be delivered anywhere in Russia and CIS countries by road or rail transport in the shortest possible time.

In addition, there are successfully-operating Trade House in Moscow and the official representative office with a finished goods warehouse in St. Petersburg.

PRODUCTION FACILITIES OF OPTICENERGO GROUP OF COMPANIES



1. SARMAT Ltd.
Production of helical fittings and dampers.
sarmatura.ru

2.“Opticenergo ” Test Laboratory
Specialized body of certification and a testing facility for wire and cable products.
icopticenergo.ru

3. Saranskkabel-Optica Ltd.
Production of fiber-optic cable, including optical power ground wire.
sarko.ru

4. Opticenergo Ltd.
The building of the managing company of the holding.
opticenergo.ru

5. EM-CABLE Ltd., Workshop No. 7
Production of power cable for voltages of up to 110 kV.

6. EM-CABLE Ltd.
Administrative building.

7. EM-CABLE Ltd., Workshops No. 1 and No. 2
Production of overhead ground wires, high-temperature uninsulated wires and power cables for voltages of up to 6 kV.

8. EM-PLAST Ltd.
Production of environmentally-friendly packing film and stretch film.
emplast.ru

9. EM-CABLE Ltd., Workshop No. 3
Production of self-supporting insulated wires.

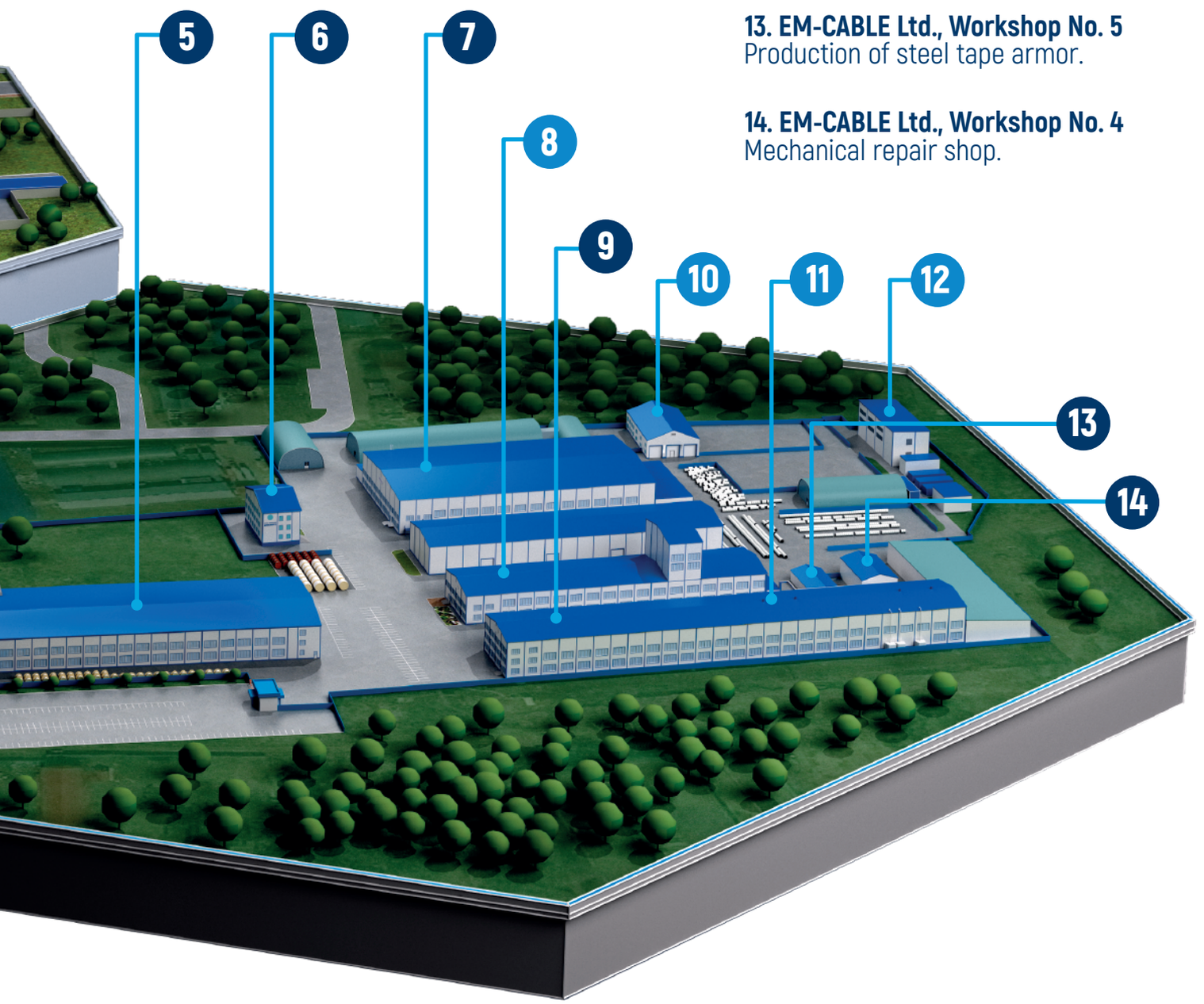
10. Avtotrans-Saransk Ltd.
Transport-forwarding services and logistics outsourcing.
opticenergo.ru/avtotrans-saransk

11. EM-KAT Ltd.
Production of aluminum- and aluminum alloy rod.
em-kat.ru

12. EM-ENERGO Ltd.
Generation of power for the companies of the holding.

13. EM-CABLE Ltd., Workshop No. 5
Production of steel tape armor.

14. EM-CABLE Ltd., Workshop No. 4
Mechanical repair shop.



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IMPROVED RELIABILITY POWER CABLES

XLPE-INSULATED POWER CABLES

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POWER CABLES

plastic-insulated

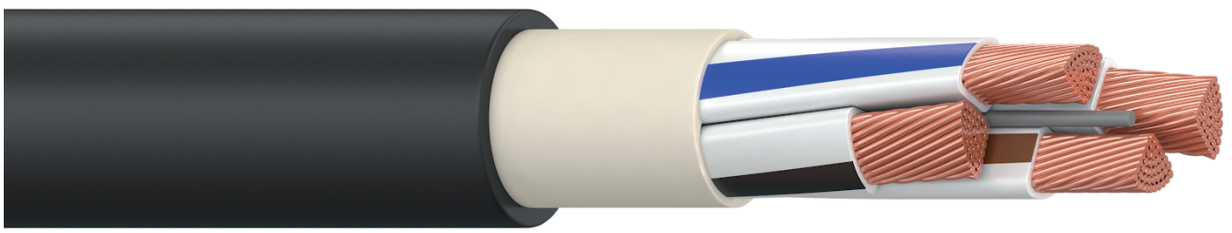
rated voltages: 0.66, 1, 3 and 6 kV

VVG, VVGE, AVVG, AVVGE

rated for 0.66, 1 and 3 kV

TU 16-705.499-2010
GOST 31996-2012

Non-armored PVC-insulated and PVC-sheathed power cables.



APPLICATION

The cables are intended for transmission and distribution of electrical energy in stationary electrical installations for a rated AC voltage of 0.66, 1, and 3 kV with a rated frequency of 50 Hz.

Cables are designed for operation in AC electrical networks with either grounded or isolated neutral, where the operation time in an event of a single-phase short circuit to the ground does not exceed 8 hours, and the total operation time in a condition of a single-phase short circuit to the ground does not exceed 125 hours per year.

Cables are designed for installation of single cable lines in cable structures and premises.

OPERATION GUIDELINES

Ambient operating temperature (C^0)	-50 to +50
Relative air humidity (at +35 C^0)	98%
Installation temperature, not lower than (C^0)	-15
Bending radius, not smaller than (OD) single wire stranded	10 7.5
Service life (yrs)	30
Guaranty period (yrs)	5

CONSTRUCTION

No. of cores	Cross section (mm^2)
1-5	6-1000

Core – copper or aluminum, stranded or solid, round or sector-shaped, compacted.
Insulation – polyvinyl chloride compound. Insulated conductors are stranded around an insulating cord.
Inner sheath – polyvinyl chloride compound.
Screen (for "**E**" cable types) – copper tape or copper wire.
Sheath – polyvinyl chloride compound.

CERTIFICATES

Declaration of compliance.
Certificate of compliance.
Fire safety certificate.

FIRE HAZARD CLASS

01.8.2.5.4.

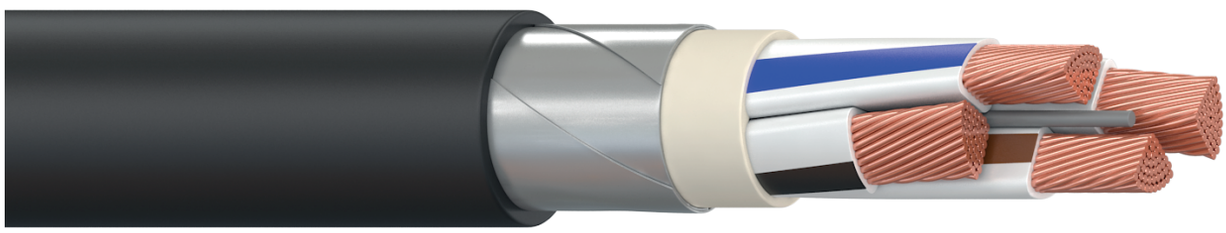
Analogues of NYY, NYCY, NAY, and NAYCY respectively.

VBSHv, AVBSHv

rated for 0.66, 1 and 3 kV

TU 16-705.499-2010
GOST 31996-2012

Armored with galvanized steel tapes PVC-insulated power cables with a protective sheath made of a PVC compound.



APPLICATION

The cables are designed for transmission and distribution of electrical energy in stationary electrical installations for rated AC voltages of 0.66, 1 and 3 kV with a rated frequency of 50 Hz.
Cables are designed for operation in AC electrical networks with either grounded or isolated neutral, where the operation time in an event of a single-phase short circuit to the ground does not exceed 8 hours, and the total operation time in a condition of a single-phase short circuit to the ground does not exceed 125 hours per year.
It is allowed to bury cables in the ground (in trenches).
The cables are designed for laying in cable runs with no limits to elevation differences, including vertical cable runs.

OPERATION GUIDELINES

Ambient operating temperature (C^0)	-50 to +50
Relative air humidity (at +35 C^0)	98%
Installation temperature, not lower than (C^0)	-15
Bending radius, not smaller than (OD) single wire stranded	 10 7.5
Service life (yrs)	30
Guaranty period (yrs)	5

CONSTRUCTION

No. of cores	**Cross section (mm^2)**
1-5	6-1000

Core – copper or aluminum, solid or stranded, round or sector-shaped, compacted.
Insulation – polyvinyl chloride compound. Insulated conductors are stranded around an insulating cord.
Inner sheath – polyvinyl chloride compound.
Armor – two galvanized steel tapes.
Protective sheath – polyvinyl chloride compound.

CERTIFICATES

Declaration of compliance.
Certificate of compliance.
Fire safety certificate.

FIRE HAZARD CLASS

01.8.2.5.4.

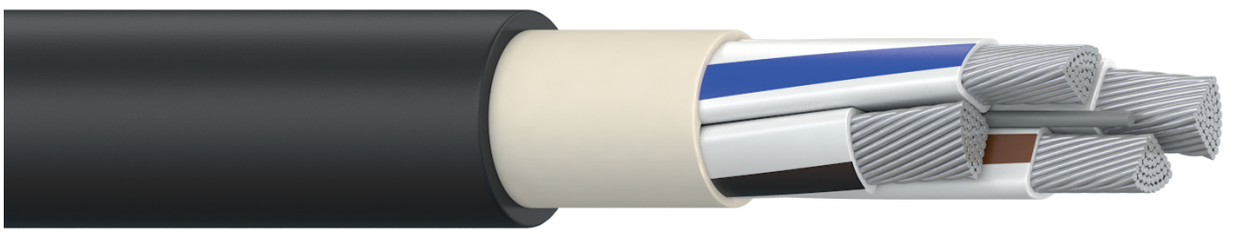
Analogues of NYBY and NAYBY, respectively.

VVGng(A), VVGEng(A), AVVGng(A), AVVGEng(A)

TU 16-705.499-2010
GOST 31996-2012

rated for 0.66, 1 and 3 kV

Non-armored PVC-insulated and fire-resistant PVC-sheathed power cables.



APPLICATION

The cables are designed for transmission and distribution of electrical energy in stationary electrical installations for a rated AC voltage of 0.66, 1 and 3 kV with a rated frequency of 50 Hz.
Cables are designed for operation in AC electrical networks with either grounded or isolated neutral, where the operation time in an event of a single-phase short circuit to the ground does not exceed 8 hours, and the total operation time in a condition of a single-phase short circuit to the ground does not exceed 125 hours per year.
Cables are designed for installation of bunched cable lines in outdoor cable structures and premises.

CERTIFICATES

Declaration of compliance.
Certificate of compliance.
Fire safety certificate.

FIRE HAZARD CLASS

P1b.8.2.5.4.

CONSTRUCTION

No. of cores	Cross section (mm^2)
1-5	6-1000

Core – copper or aluminum, solid or stranded, round or sector-shaped, compacted.
Insulation – polyvinyl chloride compound. Insulated conductors are stranded around an insulating cord.
Inner sheath – fire-resistant polyvinyl chloride compound.
Screen (for "**E**" cable types) – copper tape or copper wire.
Sheath – fire-resistant polyvinyl chloride compound.

OPERATION GUIDELINES

Ambient operating temperature (C^0)	-50 to +50
Relative air humidity (at +35 C^0)	98%
Installation temperature, not lower than (C^0)	-15
Bending radius, not smaller than (OD) single wire stranded	 10 7.5
Service life (yrs)	30
Guaranty period (yrs)	5

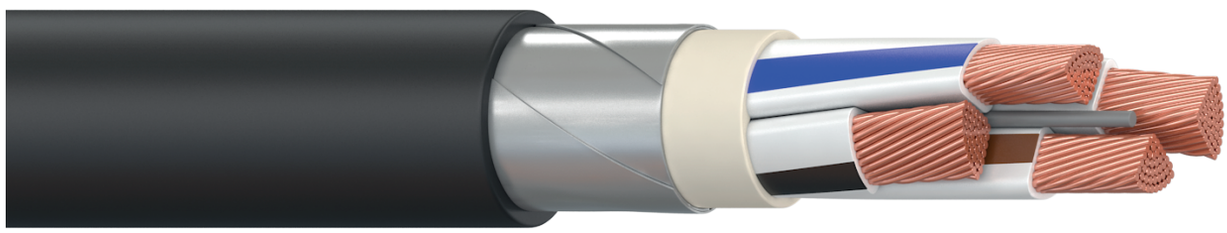
Analogues of flame-retardant NYY, NYCY, NAY, and NAYCY, respectively.

VBSHvng(A), AVBSHvng(A)

TU 16-705.499-2010
GOST 31996-2012

rated for 0.66, 1 and 3 kV

Armored with galvanized steel tapes PVC-insulated power cables with a jacket made of a reduced combustibility PVC compound.



APPLICATION

The cables are designed for transmission and distribution of electrical energy in stationary electrical installations for a rated AC voltage of 0.66, 1 and 3 kV with a rated frequency of 50 Hz.

Cables are designed for operation in AC electrical networks with either grounded or isolated neutral, where the operation time in an event of a single-phase short circuit to the ground does not exceed 8 hours, and the total operation time in a condition of a single-phase short circuit to the ground does not exceed 125 hours per year.

It is allowed to bury cables in the ground (in trenches).

The cables are designed for laying in cable runs with no limits to elevation differences, including vertical cable runs.

OPERATION GUIDELINES

Ambient operating temperature (C^0)	-50 to +50
Relative air humidity (at +35 C^0)	98%
Installation temperature, not lower than (C^0)	-15
Bending radius, not smaller than (OD) single wire stranded	 10 7.5
Service life (yrs)	30
Guaranty period (yrs)	5

CONSTRUCTION

No. of cores	Cross section (mm^2)
1-5	6-400

Core – copper or aluminum, solid or stranded, round or sector-shaped, compacted.
Insulation – polyvinyl chloride compound. Insulated conductors are stranded around an insulating cord.
Inner sheath – polyvinyl chloride compound.
Armor – two galvanized steel tapes.
Jacket – fire-resistant polyvinyl chloride compound.

CERTIFICATES

Declaration of compliance.
Certificate of compliance.
Fire safety certificate.

FIRE HAZARD CLASS

01.8.2.5.4.

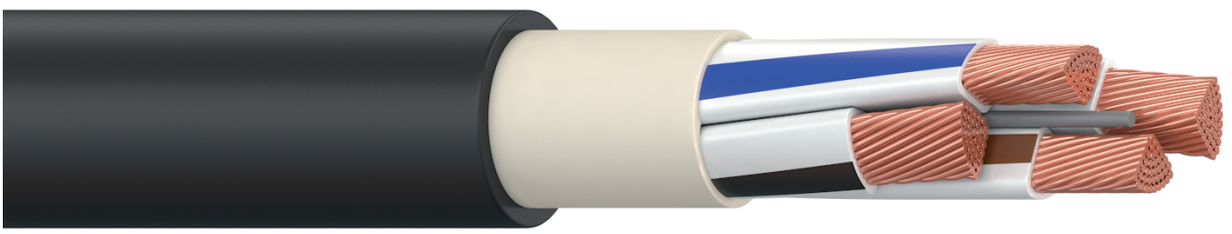
Analogues of flame-retardant NYBY and NAYBY, respectively.

VVGng(A)-LS, VVGEng(A)-LS, AVVGng(A)-LS, AVVGEng(A)-LS

TU 16.K71-310-2001
GOST 31996-2012

rated for 0.66, 1 and 3 kV

Power cables insulated and sheathed with a reduced fire-risk PVC-compound.



APPLICATION

The cables are designed for transmission and distribution of electrical energy and electric signals in stationary electrical installations for rated AC voltages of 0.66, 1 and 3 kV.
The cables are intended for general purpose industrial use and for use in nuclear power plants.
The cables are designed for installation in cable structures and premises, including atomic energy objects and classes 3 and 4 nuclear power plant systems according to the classification of NP-001-2015.

OPERATION GUIDELINES

Ambient operating temperature (C^0)	-50 to +50
Relative air humidity (at +35 C^0)	98%
Installation temperature, not lower than (C^0)	-15
Bending radius, not smaller than (OD) single wire stranded	 10 7.5
Service life (yrs)	30
Guaranty period (yrs)	5

CONSTRUCTION

No. of cores	Cross section (mm^2)
1-5	6-1000

Core – copper or aluminum, solid or stranded, round or sector-shaped, compacted.
Insulation – fire-resistant polyvinyl chloride compound. Insulated conductors are stranded around an insulating cord made of a fire-resistant PVC compound.
Inner sheath – fire-resistant PVC compound.
Screen (for "**E**" cable types) – copper tape or copper wire.
Sheath – reduced fire risk polyvinyl chloride compound.

CERTIFICATES

Certificate of compliance.
Nuclear supervision license.

FIRE HAZARD CLASS

P1b.8.2.2.2.

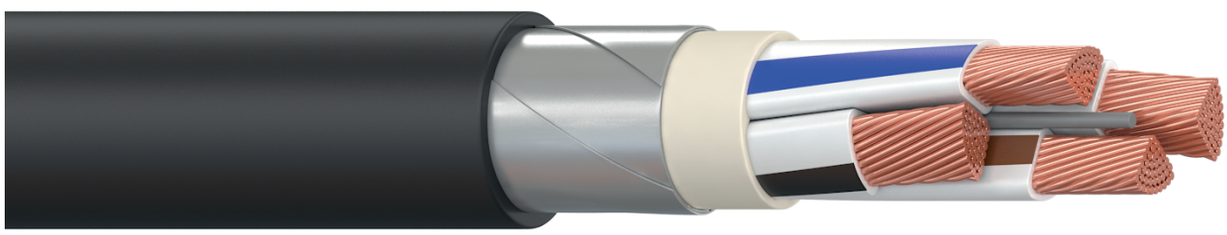
Analogues of flame-retardant low-smoke NYY, NYCY, NAYY, and NAYCY, respectively.

VBSHvng(A)-LS, AVBSHvng(A)-LS

TU 16.K71-310-2001
GOST 31996-2012

rated for 0.66, 1 and 3 kV

Armored with galvanized steel tapes power cables insulated and sheathed with a reduced fire risk PVC compound.



APPLICATION

The cables are designed for transmission and distribution of electrical energy in stationary electrical installations for a rated AC voltage of 0.66, 1, and 3 kV with a rated frequency of 50 Hz.
The cables are intended for general purpose industrial use and for use in nuclear power plants.
The cables are designed for installation in cable structures and premises, including atomic energy objects and classes 3 and 4 nuclear power plant systems according to the classification of NP-001-2015.
It is allowed to bury cables in the ground (in trenches).

OPERATION GUIDELINES

Ambient operating temperature (C^0)	-50 to +50
Relative air humidity (at +35 C^0)	98%
Installation temperature, not lower than (C^0)	-15
Bending radius, not smaller than (OD) single wire stranded	10 7.5
Service life (yrs)	30
Guaranty period (yrs)	5

CONSTRUCTION

No. of cores	Cross section (mm^2)
1-5	6-1000

Core – copper or aluminum, solid or stranded, round or sector-shaped, compacted.
Insulation – reduced fire risk polyvinyl chloride compound. Insulated conductors are stranded around an insulating cord.
Inner sheath – reduced fire risk polyvinyl chloride compound.
Armor – two galvanized steel tapes.
Protective sheath – reduced fire risk polyvinyl chloride compound.

CERTIFICATES

Certificate of compliance.
Nuclear supervision license.

FIRE HAZARD CLASS

P1b.8.2.2.2.

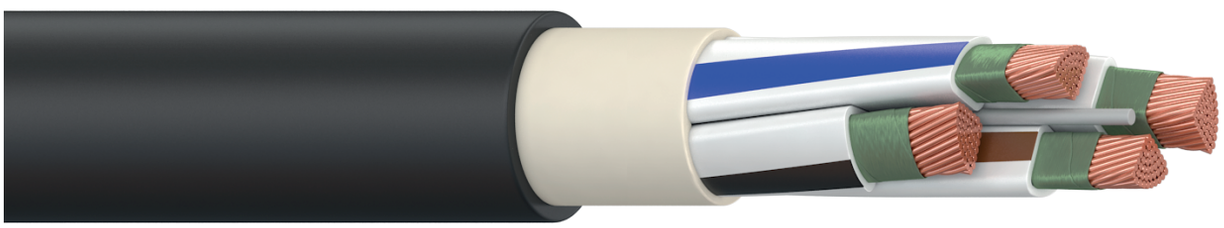
Analogues of flame-retardant low-smoke NYBY and NAYBY, respectively.

VVGng(A)-FRLS, VVGEng(A)-FRLS

TU 16.K71-337-2004
GOST 31996-2012

rated for 0.66 and 1 kV

Fire-proof power cables insulated and sheathed with a reduced fire risk polyvinyl chloride compound, with a mica tape thermal barrier.



APPLICATION

The cables are designed for transmission and distribution of electrical energy and electric signals in stationary electrical installations for rated AC voltages of 0.66 and 1 kV with a rated frequency of up to 100 Hz.

The cables are intended for general purpose industrial use and for use in nuclear power plants (outside of containment areas), including atomic energy objects and class 2 nuclear power plant systems according to the classification of NP-001-2015.

The cables are designed for use in power lines of nuclear power plants' safety systems, fire safety systems' wiring (fire alarm circuits, fire extinguishing pump power supply circuits, lighting of emergency exits and evacuation routes, smoke removal and ventilation systems, evacuation elevators), including hazardous areas of all classes (except class V1 explosive areas), wiring of operating rooms in hospitals, emergency power supply circuits and to power machinery (current collectors) to function in an event of fire.

CERTIFICATES

Certificate of compliance.
Nuclear supervision license.

FIRE HAZARD CLASS

P1b.1.2.2.2.

CONSTRUCTION

No. of cores	Cross section (mm²)
1-5	6-240

Core – copper, solid or stranded, round or sector-shaped, compacted.
Thermal barrier – mica tape wrap.
Insulation – fire-resistant polyvinyl chloride compound. Insulated conductors are stranded around an insulating cord made of a fire-resistant PVC compound.
Inner sheath – fire-resistant PVC compound.
Screen (for "**E**" cable types) – copper tape or copper wire.
Sheath – reduced fire risk polyvinyl chloride compound.

OPERATION GUIDELINES

Ambient operating temperature (C⁰)	-50 to +50
Relative air humidity (at +35 C⁰)	98%
Installation temperature, not lower than (C⁰)	-15
Bending radius, not smaller than (OD) single wire stranded	10 7.5
Service life (yrs)	30
Guaranty period (yrs)	5

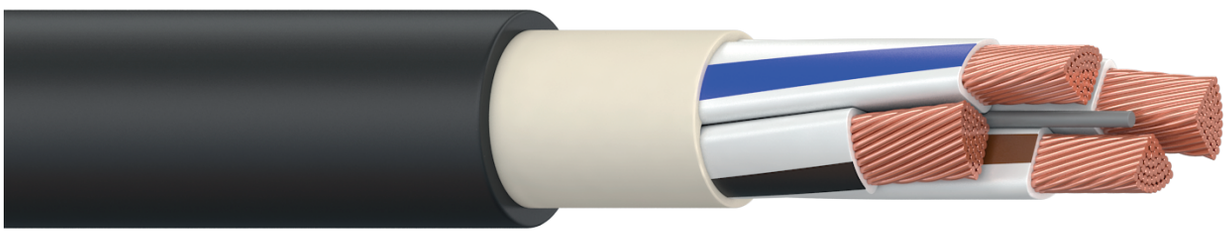
Analogues of fire-resistant low-smoke NYY and NYCY, respectively.

PPGng(A)-HF, PPGEng(A)-HF, PBPng(A)-HF

TU 16.K71-304-2001
GOST 31996-2012

rated for 0.66 and 1 kV

Power cables insulated and sheathed with a halogen-free compound.



APPLICATION

The cables are designed for transmission and distribution of electrical energy in stationary electrical installations for a rated AC voltage of 0.66, and 1 kV with a rated frequency of 50 Hz, including nuclear power plants' systems (outside of containment areas).

The cables are designed for laying in cable runs with no limits to elevation differences, including vertical cable runs.

The **PPGng(A)-HF** and **PPGEng(A)-HF** cables are intended for installation in cable structures and premises where there is no risk of mechanical damage to a cable.

The **PBPng(A)-FH** cable is intended for installation in cable structures and premises where there is a risk of mechanical damage to a cable.

The cables are intended for use in power- and control circuits of nuclear power plants, office buildings equipped with computers and micro-controller appliances, kindergartens, schools, hospitals, sports- and social centers.

CERTIFICATES

Certificate of compliance.
Nuclear supervision license.

FIRE HAZARD CLASS

P1b.8.1.2.1.

CONSTRUCTION

No. of cores	Cross section (mm^2)
1-5	6 - 1000
	6 - 400 **(armored)**

Core – copper, solid or stranded, round or sector-shaped, compacted.
Insulation – halogen-free compound. Insulated conductors are stranded around an insulating cord.
Inner sheath – halogen-free compound.
Screen (for "E" cable types) – copper tape or copper wire.
Armor – (for "B" cable types) – two galvanized steel tapes.
Sheath – halogen-free compound.

OPERATION GUIDELINES

Ambient operating temperature (C^0)	-50 to +50
Relative air humidity (at +35 C^0)	98%
Installation temperature, not lower than (C^0)	-15
Bending radius, not smaller than (OD) single wire stranded	10 7,.5
Service life (yrs)	30
Guaranty period (yrs)	5

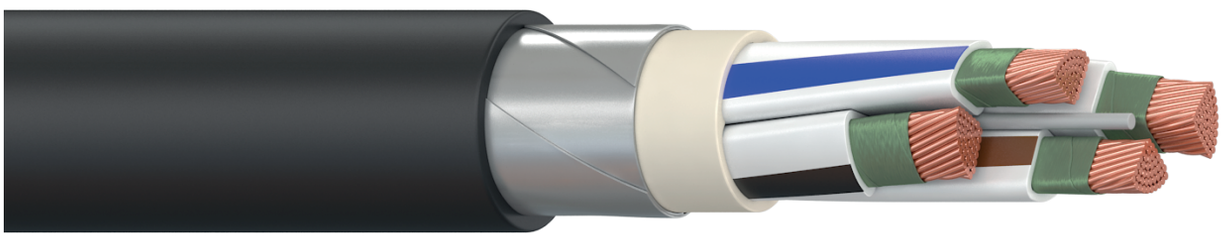
Analogues of NHXH, NHXCH, and NHXBH.

PPGng(A)-FRHF, PPGEng(A)-FRHF, PBPng(A)-FRHF

TU 16.K71-339-2006
GOST 31996-2012

rated for 0.66 and 1 kV

Fire-proof power cables insulated and sheathed with a halogen-free compound, with a mica tape thermal barrier.



APPLICATION

KThe cables are designed for transmission and distribution of electrical energy and electric signals in stationary electrical installations for rated AC voltages of 0.66 and 1 kV with a rated frequency of up to 100 Hz.

The cables are intended for general purpose industrial use and for use in nuclear power plants, including atomic energy objects and class 2 nuclear power plant systems according to the classification of OPB-88/97 (PNAE G-01-011).

The cables are designed for laying in cable runs with no limits to elevation differences, including vertical cable runs.

The cables are intended for installation in cable structures and premises where there is no risk of mechanical damage to a cable.

OPERATION GUIDELINES

Ambient operating temperature (C^0)	-50 to +50
Relative air humidity (at +35 C^0)	98%
Installation temperature, not lower than (C^0)	-15
Bending radius, not smaller than (OD) single wire stranded	 10 7.5
Service life (yrs)	30
Guaranty period (yrs)	5

CONSTRUCTION

No. of cores	Cross section (mm^2)
1-5	6-1000

Core – copper, solid or stranded, round or sector-shaped, compacted.
Thermal barrier – mica tape wrap.
Insulation – halogen-free compound. Insulated conductors are stranded around an insulating cord.
Inner sheath – halogen-free compound.
Screen (for "E" cable types) – copper tape or copper wire.
Sheath – halogen-free compound.

CERTIFICATES

Certificate of compliance.
Nuclear supervision license.

FIRE HAZARD CLASS

P1b.1.1.2.1.

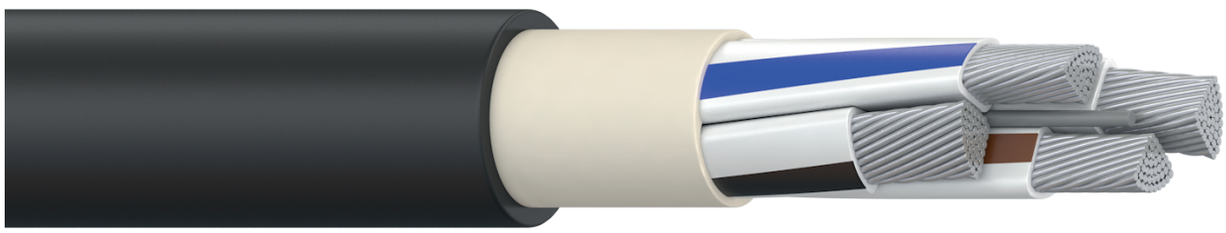
Analogue of fire-resistant NHXH, and NHXCH, respectively.

AVVGng(A)-LSLTx, VVGng(A)-LSLTx, AVVGEng(A)-LSLTx, VVGEng(A)-LSLTx

TU 3520-013-63976268-2014
GOST 31565-2012

rated for 0.66 and 1 kV

Power cables insulated and sheathed with a reduced fire risk, low toxic combustion polyvinyl chloride compound.



APPLICATION

The cables are designed for transmission and distribution of electrical energy in stationary electrical installations for rated AC voltages of 0.66 and 1 kV with a rated frequency of 50 Hz.

The cables are intended for installation in buildings classes F1 to F3 of fire risk, including preschool educational institutions, specialized care centers for elderly and disabled people, hospitals, dormitories of residential institutions and children's institutions, hotels, hostels, sanatoriums and rest homes, camping, motels, boarding houses, as well as for entertainment, club, sports facilities, buildings of public service organizations, subway, and for nuclear power plants' systems outside of containment zones.

The **AVVGng(A)-LSLTx** and **AVVGEng(A)-LSLTx** cables are intended for use in classes V-1g and V-II explosive areas, and the **VVGng(A)-LSLTx** and **VVGEng(A)-LSLTx** cables are intended for use in class V-1a explosive areas.

CERTIFICATES

Certificate of compliance

FIRE HAZARD CLASS

P1b.8.2.1.2.

CONSTRUCTION

No. of cores	Cross section (mm^2)
1-5	16-1000

Core – copper or aluminum, solid or stranded, round or sector-shaped, compacted.

Insulation – reduced fire risk, low toxic combustion PVC compound. Insulated conductors are stranded around an insulating cord.

Inner sheath – reduced fire risk, low toxic combustion PVC compound.

Screen (for "**E**" cable types) – copper tape or copper wire.

Sheath – reduced fire risk, low toxic combustion PVC compound.

OPERATION GUIDELINES

Ambient operating temperature (C^0)	-50 to +50
Relative air humidity (at +35 C^0)	98%
Installation temperature, not lower than (C^0)	-15
Bending radius, not smaller than (OD) single wire stranded	 10 7.5
Service life (yrs)	30
Guaranty period (yrs)	5

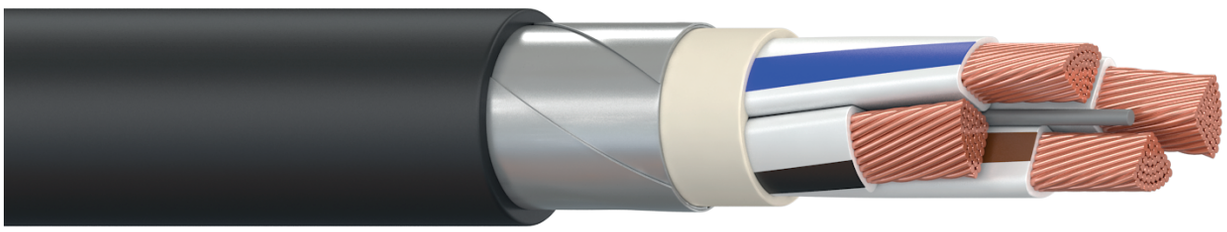
Analogues of flame-retardant low-smoke low-toxicity NAVY, NYY, NAYCY, and NYCY,

AVBSHvng(A)-LSLTx, VBSHvng(A)-LSLTx

TU 3520-013-63976268-2014
GOST 31565-2012

rated for 0.66 and 1 kV

Armored power cables insulated and jacketed with a reduced fire risk, low toxic combustion polyvinyl chloride compound.



APPLICATION

The cables are designed for transmission and distribution of electrical energy in stationary electrical installations for rated AC voltages of 0.66 and 1 kV with a rated frequency of 50 Hz.

The cables are intended for installation in buildings classes F1 to F3 of fire risk, including preschool educational institutions, specialized care centers for elderly and disabled people, hospitals, dormitories of residential institutions and children's institutions, hotels, hostels, sanatoriums and rest homes, camping, motels, boarding houses, as well as for entertainment, club, sports facilities, buildings of public service organizations, subway, and for nuclear power plants' systems outside of containment zones.

The **AVBSHvng-LSLTx** cables are intended for use in classes V-1g and V-II explosive areas, and the **VBSHvng-LSLTx** cables are intended for use in class V-1 explosive areas.

CERTIFICATES

Certificate of compliance.

FIRE HAZARD CLASS

P1b.8.2.1.2.

CONSTRUCTION

No. of cores	Cross section (mm²)
1-5	6-630

Core – copper or aluminum, solid or stranded, round or sector-shaped, compacted.

Insulation – reduced fire risk, low toxic combustion PVC compound. Insulated conductors are stranded around an insulating cord.

Inner sheath – reduced fire risk, low toxic combustion PVC compound.

Armor – two galvanized steel tapes.

Jacket – reduced fire risk, low toxic combustion PVC compound.

OPERATION GUIDELINES

Ambient operating temperature (C⁰)	-50 to +50
Relative air humidity (at +35 C⁰)	98%
Installation temperature, not lower than (C⁰)	-15
Bending radius, not smaller than (OD) single wire stranded	 10 7.5
Service life (yrs)	30
Guaranty period (yrs)	5

Analogues of flame-retardant low-smoke low-toxicity NAYBY and NYBY, respectively.

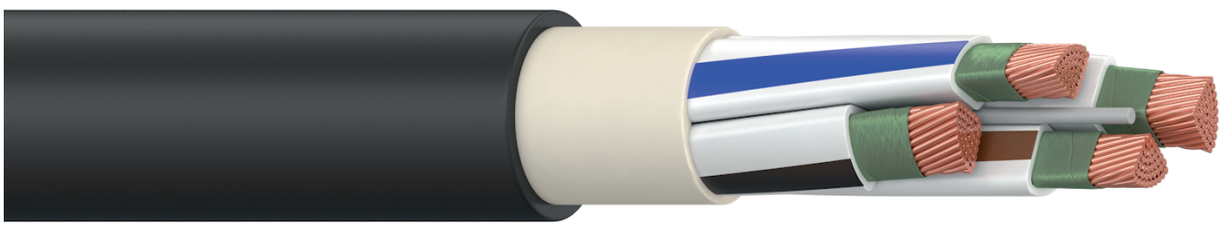
VVGng(A)-FRLSLTx, VVGEng(A)-FRLSLTx

TU 3520-013-63976268-2014

GOST 31565-2012

rated for 0.66 and 1 kV

Power cables with a mica tape thermal barrier over copper cores, insulated and sheathed with a reduced fire risk, low toxic combustion polyvinyl chloride compound.



APPLICATION

The cables are designed for transmission and distribution of electrical energy in stationary electrical installations for rated AC voltages of 0.66 and 1 kV with a rated frequency of 50 Hz.

The cables are intended for installation in buildings classes F1 to F3 of fire risk, including preschool educational institutions, specialized care centers for elderly and disabled people, hospitals, dormitories of residential institutions and children's institutions, hotels, hostels, sanatoriums and rest homes, camping, motels, boarding houses, as well as for entertainment, club, sports facilities, buildings of public service organizations, subway, and for nuclear power plants' systems outside of containment zones.

The cables are intended for use in class V-1a explosive areas.

CERTIFICATES

Certificate of compliance.

FIRE HAZARD CLASS

P1b.8.2.1.2.

CONSTRUCTION

No. of cores	Cross section (mm^2)
1-5	6-1000

Core – copper or aluminum, solid or stranded, round or sector-shaped, compacted.

Insulation – reduced fire risk, low toxic combustion PVC compound. Insulated conductors are stranded around an insulating cord.

Inner sheath – reduced fire risk, low toxic combustion PVC compound.

Armor – two galvanized steel tapes.

Sheath – reduced fire risk, low toxic combustion PVC compound.

OPERATION GUIDELINES

Ambient operating temperature (C^0)	-50 to +50
Relative air humidity (at +35 C^0)	98%
Installation temperature, not lower than (C^0)	-15
Bending radius, not smaller than (OD) single wire stranded	 10 7.5
Service life (yrs)	30
Guaranty period (yrs)	5

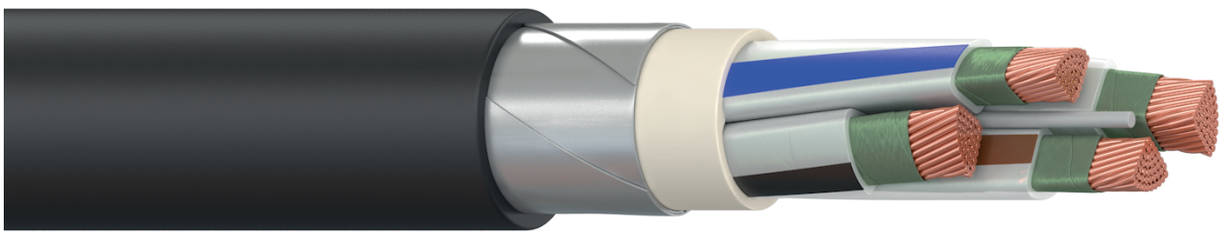
Analogues of fire-resistant, low-smoke, low-toxicity NYY and NYCY, respectively.

VBSHvng(A)-FRLSLTx

TU 3520-013-63976268-2014
GOST 31565-2012

rated for 0.66 and 1 kV

Power cables armored with galvanized steel tapes, with a mica tape thermal barrier over copper cores, insulated and sheathed with a reduced fire risk, low toxic combustion polyvinyl chloride compound.



APPLICATION

The cables are designed for transmission and distribution of electrical energy in stationary electrical installations for rated AC voltages of 0.66 and 1 kV with a rated frequency of 50 Hz.

The cables are intended for installation in buildings classes F1 to F3 of fire risk, including preschool educational institutions, specialized care centers for elderly and disabled people, hospitals, dormitories of residential institutions and children's institutions, hotels, hostels, sanatoriums and rest homes, camping, motels, boarding houses, as well as for entertainment, club, sports facilities, buildings of public service organizations, subway, and for nuclear power plants' systems outside of containment zones.

The cables are intended for use in class V-1 explosive areas.

CERTIFICATES

Certificate of compliance.

FIRE HAZARD CLASS

P1b.8.2.1.2.

CONSTRUCTION

No. of cores	Cross section (mm^2)
1-5	6-630

Core – copper, solid or stranded, round or sector-shaped, compacted.
Thermal barrier – mica tape.
Insulation – reduced fire risk, low toxic combustion PVC compound. Insulated conductors are stranded around an insulating cord.
Inner sheath – reduced fire risk, low toxic combustion PVC compound.
Screen (for "**E**" cable types) – copper tape or copper wire.
Sheath – reduced fire risk, low toxic combustion PVC compound.

OPERATION GUIDELINES

Ambient operating temperature (C^0)	-50 to +50
Relative air humidity (at +35 C^0)	98%
Installation temperature, not lower than (C^0)	-15
Bending radius, not smaller than (OD) single wire stranded	 10 7.5
Service life (yrs)	30
Guaranty period (yrs)	5

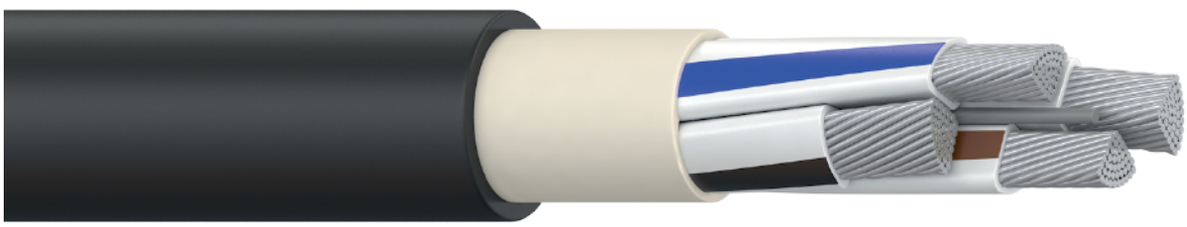
Analogue of fire-resistant, low-smoke, low-toxicity NYBY.

VVG-HL, AVVG-HL, VVGE-HL, AVVGE-HL, VVGng(A)-HL, AVVGng(A)-HL, VVGEng(A)-HL, AVVGEng(A)-HL

TU 3520-010-63976268-2012
GOST 31996-2012

rated for 0.66, 1 and 3 kV

Cold-resistant power cables insulated and sheathed with a polyvinyl chloride compound, including fire-retardant cables.



APPLICATION

The cables are designed for transmission and distribution of electrical energy in stationary electrical installations for rated AC voltages of 0.66, 1 and 3 kV with a rated frequency of 50 Hz.

The **VVG-HL, AVVG-HL, VVGE-HL** and **AVVGE-HL** cables are intended for installation of single cable runs both in dry and damp locations, in cable structures, blocks, and for powering of electric installations.

The **VVGng(A)-HL, AVVGng(A)-HL, VVGEng(A)-HL** and **AVVGEng(A)-HL** are intended for installation of bunched cable runs (taking combustible material volume into account) in cable structures, outdoors (open) cable installations (cable structures, cable ways) where there is no risk of mechanical damage to the cable. Installations in cable spaces of industrial, occupational environments, and communal buildings is not allowed.

The **VVGE-HL, AVVGE-HL, VVGEng(A)-HL** and **AVVGEng(A)-HL** cables are used where protection from electromagnetic interference is required.

CERTIFICATES

Certificate of compliance.

FIRE HAZARD CLASS

01.8.2.3.4 - **VVG-HL, AVVG-HL, VVGE-HL, AVVGE-HL**

P1b.8.2.1.2 - **VVGng(A)-HL, AVVGng(A)-HL, VVGEng(A)-HL, AVVGEng(A)-HL**

CONSTRUCTION

No. of cores	Cross section (mm^2)
1-5	6-1000

Core – copper or aluminum, solid or stranded, round or sector-shaped, compacted.
Insulation – cold-resistant PVC compound. For "**ng**"-type cables – cold-resistant fire retardant PVC compound.
Inner sheath – cold-resistant PVC compound. For "**ng**"-type cables – cold-resistant fire retardant PVC compound.
Screen (for "**E**" cable types) – copper tape or copper wire.
Sheath – cold-resistant PVC compound. For "**ng**"-type cables – cold-resistant fire retardant PVC compound.

OPERATION GUIDELINES

Ambient operating temperature (C^0)	-60 to +40
Relative air humidity (at +35 C^0)	98%
Installation temperature, not lower than (C^0)	-20
Bending radius, not smaller than (OD) single wire stranded	 10 7.5
Service life (yrs)	30
Guaranty period (yrs)	5

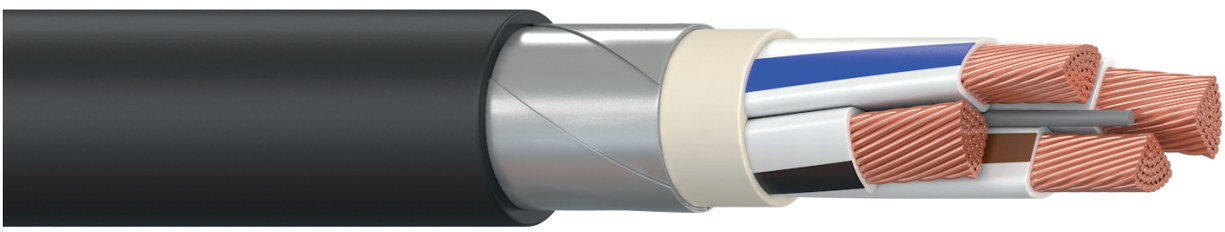
Analogues of cold-resistant NYY, NYCY, flame-retardant cold-resistant NYY, NAY, NYCY, and NAYCY, respectively.

VBSHv-HL, AVBSHv-HL, VBSHvng(A)-HL, AVBSHvng(A)-HL

TU 3520-010-63976268-2012
GOST 31996-2012

rated for 0.66, 1 and 3 kV

Armored power cables insulated and jacketed with a cold-resistant polyvinyl chloride compound.



APPLICATION

The cables are designed for transmission and distribution of electrical energy in stationary electrical installations for a rated AC voltage of 1 kV with a rated frequency of 50 Hz.

The **VBSHv-HL** and **AVBSHv-HL** cables are intended for installation of single cable runs in cable structures where there are no risks of mechanical damage and tensional strain to cables, and for burial in dry soils.

The **VBSHvng(A)-HL** and **AVBSHvng(A)-HL** cables are intended for installation of bunched cable runs (taking combustible material volume into account) in cable structures, outdoors (open) cable installations (cable structures, cable ways) where there is a risk of mechanical damage to the cable (with no tensional strain).

Installations in cable spaces of industrial, occupational environments, and communal buildings is not allowed.

CERTIFICATES

Certificate of compliance.

FIRE HAZARD CLASS

O1.8.2.3.4 - **VBSHv-HL, AVBSHv-HL.**
P1b.8.2.1.2 - **VBSHvng(A)-HL, AVBSHvng(A)-HL**

CONSTRUCTION

No. of cores	Cross section (mm²)
1-5	6-630

Core – copper or aluminum, solid or stranded, round or sector-shaped, compacted.
Insulation – cold-resistant PVC compound.
Inner sheath – cold-resistant PVC compound. For "**ng(A)**"-type cables – cold-resistant fire retardant PVC compound.
Armor – two galvanized steel tapes.
Jacket – cold-resistant PVC compound. For "**ng(A)**"-type cables – cold-resistant fire retardant PVC compound.

OPERATION GUIDELINES

Ambient operating temperature (C⁰)	-60 to +40
Relative air humidity (at +35 C⁰)	98%
Installation temperature, not lower than (C⁰)	-15
Bending radius, not smaller than (OD) single wire stranded	 10 7.5
Service life (yrs)	30
Guaranty period (yrs)	5

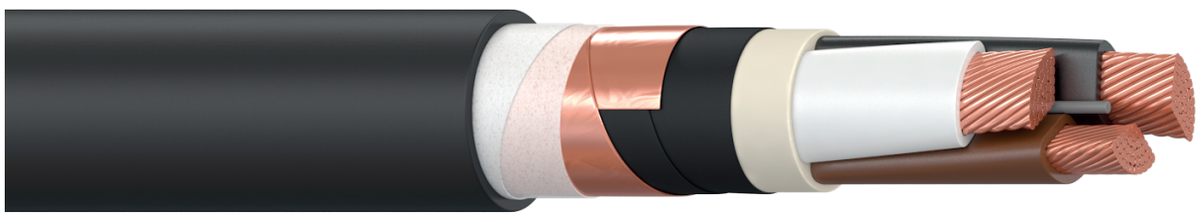
Analogues of cold-resistant NYBY, NAYBY, flame-retardant cold-resistant NYBY, and NAYBY, respectively.

VVG, AVVG, VVGng(A), AVVGng(A)

TU 3530-017-63976268-2016
GOST R 55025-2012

rated for 6 kV

Non-armored PVC-insulated and PVC-sheathed power cables, including fire-retardant cables.



APPLICATION

The cables are designed for transmission and distribution of electrical energy in stationary electrical installations for a rated AC voltage of 6 kV with a rated frequency of 50 Hz.

The **VVG** and **AVVG** cables are intended for installation both in dry and damp locations, in cable structures, blocks, and for outdoor installation.

The **VVGng(A)** and **AVVGng(A)** cables are intended for installation of bunched cable lines in outdoor cable structures (cable ways) and premises.

OPERATION GUIDELINES

Ambient operating temperature (C^0)	-50 to +50
Relative air humidity (at +35 C^0)	98%
Installation temperature, not lower than (C^0)	-15
Bending radius, not smaller than (OD) single wire stranded	 15 12
Service life (yrs)	30
Guaranty period (yrs)	5

CONSTRUCTION

No. of cores	Cross section (mm^2)
1, 3	16-800

Core – copper or aluminum, stranded or solid, round or sector-shaped, compacted.
Insulation – polyvinyl chloride compound. Insulated conductors are stranded around an insulating cord.
Belt insulation – polyvinyl chloride compound. For "**ng(A)**"-type cables – reduced combustibility PVC compound.
Conductive layer – synthetic conductive tape.
Screen – copper tape or copper wire.
Separating layer – non-woven fabric or polymer tape. For **"ng(A)"**-type cables – glass tape.
Sheath – polyvinyl chloride compound. For **"ng(A)"**-type cables – reduced combustibility PVC compound.

CERTIFICATES

Declaration of compliance.
Certificate of compliance.

FIRE HAZARD CLASS

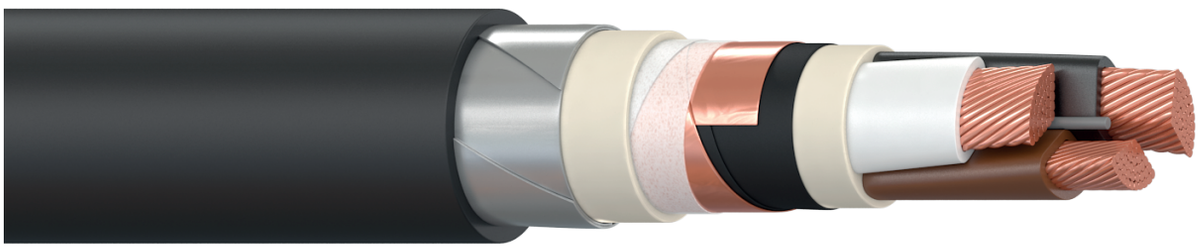
O1.8.2.5.4 - **VVG, AVVG.**
P1b.8.2.5.4 – **VVGng(A), AVVGng(A).**

VBV, AVBV, VBVng(A), AVBVng(A)

TU 3530-017-63976268-2016
GOST R 55025-2012

rated for 6 kV

Armored power cables insulated with a PVC compound, including fire-retardant cables.



APPLICATION

The cables are designed for transmission and distribution of electrical energy in stationary electrical installations for a rated AC voltage of 6 kV with a rated frequency of 50 Hz.

The laying in dry soils (sand, sand-clay, and normal soils with humidity of not less than 14%) is allowed.

The **VBVng(A)** and **AVBVng(A)** cables are intended for installation in class V-1b, V-1g, V-II, and V-IIa explosive areas.

OPERATION GUIDELINES

Ambient operating temperature (C^0)	-50 to +50
Relative air humidity (at +35 C^0)	98%
Installation temperature, not lower than (C^0)	-15
Bending radius, not smaller than (OD)	12
Service life (yrs)	30
Guaranty period (yrs)	5

FIRE HAZARD CLASS

O1.8.2.5.4 - **VBV, AVBV.**
P1b.8.2.5.4 - **VBVng(A), AVBVng(A).**

CONSTRUCTION

No. of cores	Cross section (mm^2)
3	16-400

Core – copper or aluminum, stranded or solid, round or sector-shaped, compacted.
Insulation – polyvinyl chloride compound. Insulated conductors are stranded around an insulating cord.
Belt insulation – polyvinyl chloride compound. For "**ng(A)**"-type cables – reduced combustibility PVC compound.
Conductive layer – synthetic conductive tape.
Screen – copper tape or copper wire.
Separating layer – non-woven fabric or polymer tape. For "**ng(A)**"-type cables – glass tape.
Armor bedding – polyvinyl chloride compound.
Armor – two galvanized steel tapes.
Sheath – polyvinyl chloride compound. For "**ng(A)**"-type cables – reduced combustibility PVC compound.

CERTIFICATES

Declaration of compliance.
Certificate of compliance.

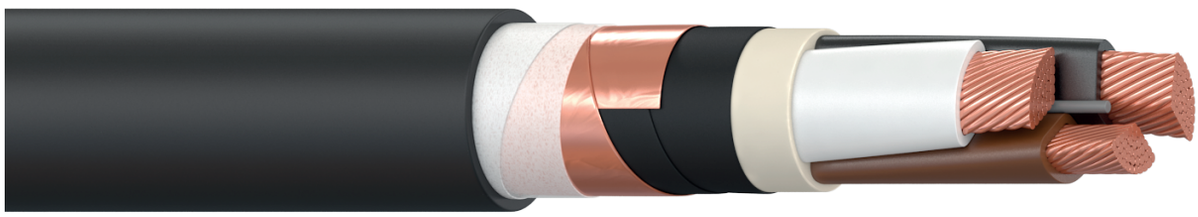
Analogues of NYSBY, NAYSBY, flame-retardant NYSBY, and NAYSBY, respectively.

VVGng(A)-LS, AVVGng(A)-LS

rated for 6 kV

TU 3530-017-63976268-2016
GOST R 55025-2012

Power cables insulated and sheathed with a reduced fire risk PVC-compound.



APPLICATION

The cables are designed for transmission and distribution of electrical energy in stationary electrical installations for a rated AC voltage of 6 kV with a rated frequency of 50 Hz.

Burial of **VVGng(A)-LS** and **AVVGng(A)-LS** cables is allowed under a condition of providing mechanical protection.

OPERATION GUIDELINES

Ambient operating temperature (C^0)	-50 to +50
Relative air humidity (at +35 C^0)	98%
Installation temperature, not lower than (C^0)	-15
Bending radius, not smaller than (OD)	12
Service life (yrs)	30
Guaranty period (yrs)	5

FIRE HAZARD CLASS

P1b.8.2.2.2.

CONSTRUCTION

No. of cores	Cross section (mm^2)
1, 3	16-800

Core – copper or aluminum, solid or stranded, round or sector-shaped, compacted.
Insulation – reduced fire risk PVC compound. Insulated conductors are stranded around an insulating cord made of a fire-resistant PVC compound.
Belt insulation – reduced fire risk PVC compound.
Conductive layer – synthetic conductive tape.
Screen – copper tape or copper wire.
Separating layer – glass tape.
Sheath – reduced fire risk PVC compound.

CERTIFICATES

Declaration of compliance.
Certificate of compliance.

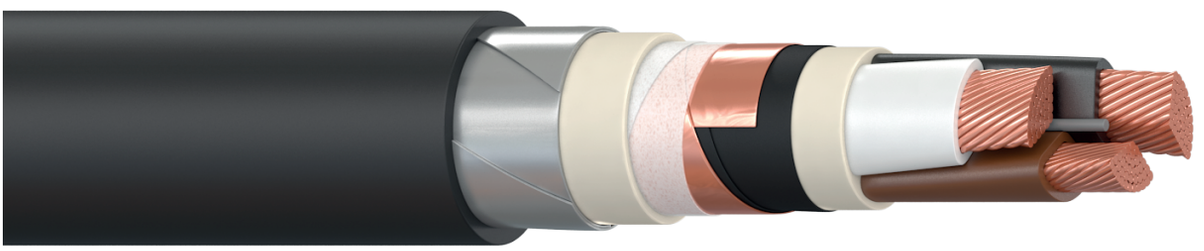
Analogues of flame-retardant, low-smoke NYY and NAYY, respectively.

VBVng(A)-LS, AVBVng(A)-LS

TU 3530-017-63976268-2016
GOST R 55025-2012

rated for 6 kV

Armored power cables insulated with a PVC compound.



APPLICATION

The cables are designed for transmission and distribution of electrical energy in stationary electrical installations for a rated AC voltage of 6 kV with a rated frequency of 50 Hz.
The laying in dry soils (sand, sand-clay, and normal soils with humidity of not less than 14%) is allowed.
The cables are intended for installation in class V-1b, V-1g, V-II, and V-IIa explosive areas.

OPERATION GUIDELINES

Ambient operating temperature (C^0)	-50 to +50
Relative air humidity (at +35 C^0)	98%
Installation temperature, not lower than (C^0)	-15
Bending radius, not smaller than (OD)	12
Service life (yrs)	30
Guaranty period (yrs)	5

FIRE HAZARD CLASS

P1b.8.2.2.2.

CONSTRUCTION

No. of cores	Cross section (mm^2)
3	16-400

Core – copper or aluminum, solid or stranded, round or sector-shaped, compacted.
Insulation – reduced fire risk PVC compound. Insulated conductors are stranded around an insulating cord made of a fire-resistant PVC compound.
Belt insulation – reduced fire risk PVC compound.
Conductive layer – synthetic conductive tape.
Screen – copper tape or copper wire.
Separating layer – glass tape.
Armor bedding – reduced fire risk PVC compound.
Armor – two galvanized steel tapes.
Sheath – reduced fire risk PVC compound.

CERTIFICATES

Declaration of compliance.
Certificate of compliance.

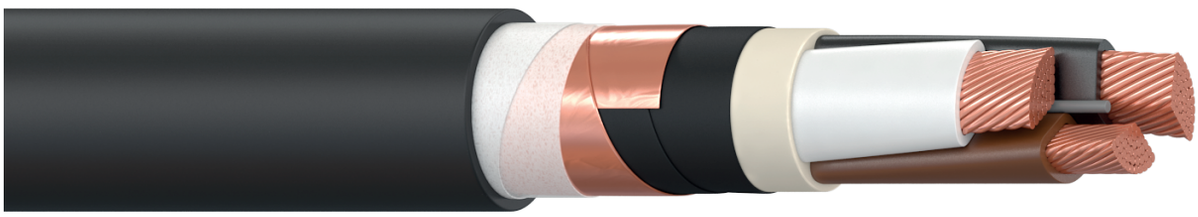
Analogues of flame-retardant, low-smoke NYSBY and NAYSBY, respectively.

VVG-HL, AVVG-HL, VVGng(A)-HL, AVVGng(A)-HL

TU 3530-017-63976268-2016
GOST R 55025-2012

rated for 6 kV

Power cables insulated and sheathed with a reduced fire risk PVC compound, cold-resistant.



APPLICATION

The cables are designed for transmission and distribution of electrical energy in stationary electrical installations for a rated AC voltage of 6 kV with a rated frequency of 50 Hz.
The laying in dry soils (sand, sand-clay, and normal soils with humidity of not less than 14%) is allowed.

OPERATION GUIDELINES

Ambient operating temperature (C^0)	-60 to +50
Relative air humidity (at +35 C^0)	98%
Installation temperature, not lower than (C^0)	-20
Bending radius, not smaller than (OD) single wire stranded	 15 12
Service life (yrs)	30
Guaranty period (yrs)	5

CERTIFICATES

Declaration of compliance.
Certificate of compliance.

FIRE HAZARD CLASS

O1.8.2.3.4 - **VBVng-HL, AVBVng-HL.**
P1.8.2.3.4 - **VVGng(A)-HL, AVVGng(A)-HL.**

CONSTRUCTION

No. of cores	Cross section (mm^2)
1, 3	16-800

Core – copper or aluminum, solid or stranded, round or sector-shaped, compacted.
Insulation – cold-resistant PVC compound.
Belt insulation – cold-resistant PVC compound. For "**ng(A)**"-type cables – cold-resistant fire retardant PVC compound.
Conductive layer – synthetic conductive tape.
Screen – copper tape or copper wire.
Separating layer – non-woven fabric or polymer tape. For "**ng(A)**"-type cables – glass tape.
Sheath – cold-resistant PVC compound. For "**ng**"-type cables – cold-resistant fire retardant PVC compound.

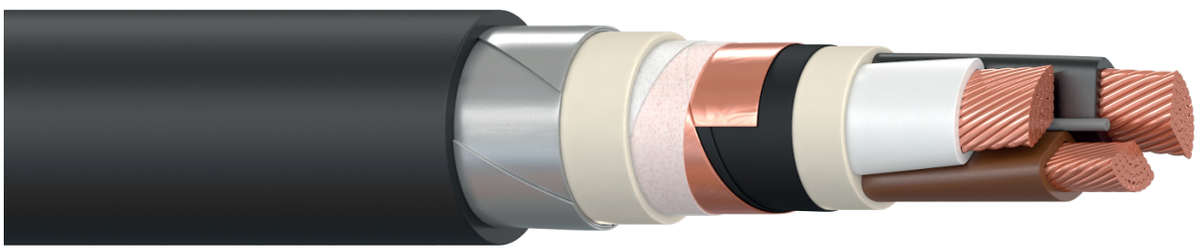
Analogues of cold-resistant NYSY, NAYSY, cold-resistant flame-retardant NYSY, and NAYSY, respectively.

VBV-HL, AVBV-HL, VBVng(A)-HL, AVBVng(A)-HL

TU 3530-017-63976268-2016
GOST R 55025-2012

rated for 6 kV

Armored cold-resistant power cables insulated and sheathed with a reduced fire risk PVC compound.



APPLICATION

The cables are designed for transmission and distribution of electrical energy in stationary electrical installations for a rated AC voltage of 6 kV with a rated frequency of 50 Hz.

The laying in dry soils (sand, sand-clay, and normal soils with humidity of not less than 14%) is allowed.

The **VBVng(A)-HL** and **AVBVng(A)-HL** cables are intended for installation in class V-1b, V-1g, V-II, and V-IIa explosive areas.

OPERATION GUIDELINES

Ambient operating temperature (C^0)	-60 to +50
Relative air humidity (at +35 C^0)	98%
Installation temperature, not lower than (C^0)	-20
Bending radius, not smaller than (OD)	12
Service life (yrs)	30
Guaranty period (yrs)	5

FIRE HAZARD CLASS

O1.8.2.3.4 - **VBV-HL, AVBV-HL.**
P1.8.2.3.4 - **VBVng(A)-HL, AVBVng(A)-HL.**

CERTIFICATES

Declaration of compliance.
Certificate of compliance.

CONSTRUCTION

No. of cores	Cross section (mm^2)
3	16-400

Core – copper or aluminum, solid or stranded, round or sector-shaped, compacted.
Insulation – PVC compound. Insulated conductors are stranded around an insulating cord.
Belt insulation – cold-resistant PVC compound. For "**ng(A)**"-type cables – cold-resistant fire retardant PVC compound.
Conductive layer – synthetic conductive tape.
Screen – copper tape or copper wire.
Separating layer – non-woven fabric or polymer tape. For **"ng(A)**"-type cables – glass tape.
Armor bedding - cold-resistant PVC compound. For **"ng(A)"**-type cables – cold-resistant fire retardant PVC compound.
Armor – two galvanized steel tapes.
Sheath – cold-resistant PVC compound. For **"ng(A)"**-type cables – cold-resistant fire retardant PVC compound.

Analogues of cold-resistant NYSBY, NAYSBY, cold-resistant flame-retardant NYSBY, and NAYSBY, respectively.

IMPROVED RELIABILITY POWER CABLES

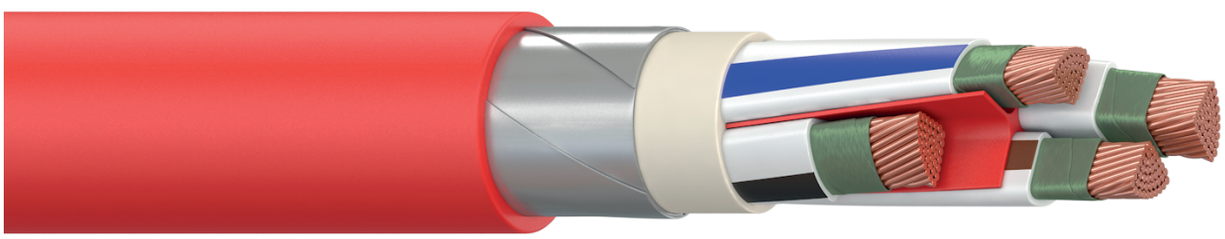
for use in explosive areas, earthquake-prone region, and densely-populated areas

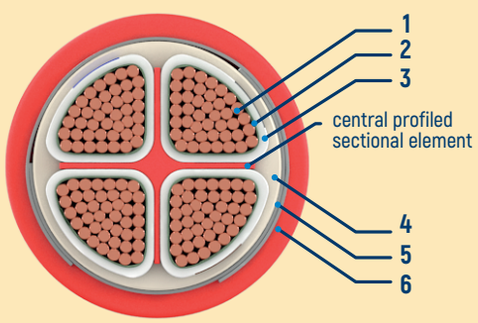
Vz-APSPGng(A)-HF, Vz-PSPGng(A)-HF, Vz-APSPGEng(A)-HF, Vz-PSPGEng(A)-HF, Vz-APSBPng(A)-HF, Vz-PSBPng(A)-HF, Vz-PSPGng(A)-FRHF, Vz-PSPGEng(A)-FRHF, Vz-PSBPng(A)-FRHF

TU 16.K71-454-2013
GOST 31996-2012

rated for 1 kV

Improved reliability power cables for use in explosive areas, flame-retardant and fire-resistant, insulated, filled, and sheathed with a halogen-free compound.





CONSTRUCTION

No. of cores	Cross section (mm2)
3-5	1.5-240

1. Core – copper or aluminum, solid or stranded, round or sector-shaped, compacted.
2. Thermal barrier – for "FRHF"-type cables – mica tape.
3. Insulation – halogen-free compound. The insulated conductors are placed around the slotted central core.
4. Filling – halogen-free compound.
Screen – for **"E"**-type cables – copper tape or copper wire.
5. Armor – two galvanized steel tapes.
6. Sheath – halogen-free compound.

OPERATION GUIDELINES

Ambient operating temperature (C^0)	-50 to +50
Relative air humidity (at +35 C^0)	98%
Installation temperature, not lower than (C^0)	-15
Bending radius, not smaller than (OD)	7.5
Service life (yrs)	40
Guaranty period (yrs)	5

CERTIFICATES

Certificate of compliance.
Nuclear supervision license.

APPLICATION

The cables are designed for transmission and distribution of electrical energy in stationary electrical installations in explosive areas, for a rated AC voltage of 1 kV with a rated frequency of 50 Hz.

The cables are designed for installation in cable structures and premises, indoor electric installations, buildings, including classes 0,66 and 1(V1 and V1a) explosive areas, and in circuits which must remain operational in case of a fire.

The **Vz-PSPGEng(A)-HF, Vz-PSBPng(A)-HF, Vz-PSPGEng(A)-FRHF** and **Vz-PSBPng(A)-FRHF** cables are permitted for open installation in explosive areas of all classes, in cable trays, trunks installed on construction metal structures, in cable channels and tunnels, including class 0 and 1 (V1 and V1a) explosive areas, as well as in spark-hazardous and spark-safe circuits.

The **Vz-APSPGng(A)-HF, Vz-PSPGng(A)-HF, Vz-PSPGEng(A)-HF, Vz-PSBPng(A)-HF** and **Vz-PSPGng(A)-FRHF** cables are permitted for open installation in classes 20, 21, and 22 explosive areas, in cable trays, trunks installed on construction metal structures, on walls and in cable structures.

The **Vz-PSPGng(A)-FRHF, Vz-PSPGEng(A)-FRHF** and **Vz-PSBPng(A)-FRHF** cables are intended for use in circuits where operation in an event of fire is required.

FIRE HAZARD CLASS

P1b.8.1.2.1 - **Vz-APSPGng(A)-HF, Vz-PSPGng(A)-HF, Vz-APSPGEng(A)-HF, Vz-PSPGEng(A)-HF, Vz-APSBPng(A)-HF, Vz-PSBPng(A)-HF.**

P1b.1.1.2.1 - **Vz-PSPGng(A)-FRHF, Vz-PSPGEng(A)-FRHF, Vz-PSBPng(A)-FRHF.**

ADVANTAGES

01 IMPACT RESISTANCE

The central slotted sectional element of the cable creates a damping layer between the conductors that helps to avoid short current between the conductors during high mechanical impact on the cable.

02 EXPLOSION SAFETY

The central slotted sectional element completely fills the space between the conductors, thus preventing the possibility of "injection" or involvement of potentially-explosive gases inside of the cable at atmospheric pressures of not lower than 0.05MPa.

03 SEISMIC STABILITY

The cable is resistant to an impact of a maximum credible earthquake of 9 points intensity, when installed on a level not higher than 50 m above the zero line.

04 FIRE RESISTANCE

The use of mica tape thermal barrier of the conductors guarantees good dielectric properties in the temperature range from 750 to 1000^{0}C.

05 LOW SMOKE and GAS EMISSION

The insulation, the slotted core element, and the sheath are made of a halogen-free polymer compound which allows to significantly reduce emissions of smoke, corrosive, and health-hazardous combustion products.

06 EASE of INSTALLATION

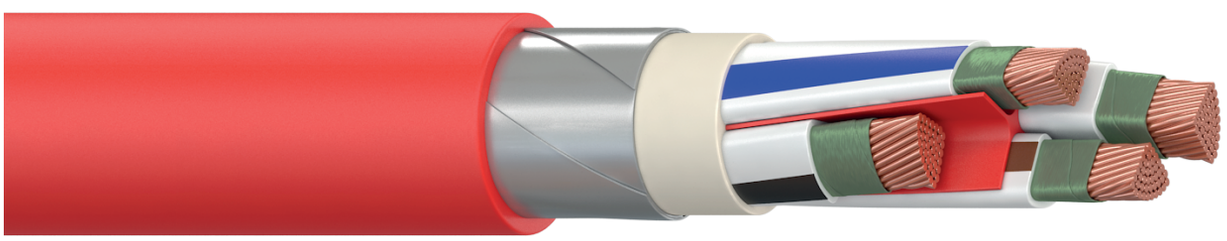
The central slotted sectional element of the cable prevents ellipticity that guarantees tightness of a cable guard when passing the cable through a case of an equipment, and it guarantees high-quality joint assembly.

Vz-AVSVGng(A)-LS, Vz-VSVGng(A)-LS, Vz-AVSVGEng(A)-LS, Vz-VSVGEng(A)-LS, Vz-AVSBVng(A)-LS, Vz-VSBVng(A)-LS

TU 16.K71-454-2013
GOST 31996-2012

rated for 0.66 and 1 kV

Improved reliability power cables for use in explosive areas, flame-retardant, insulated, filled and sheathed with a reduced fire risk PVC compound.



APPLICATION

The cables are designed for transmission and distribution of electrical energy in stationary electrical installations in explosive areas, for rated AC voltages of 0.66, and 1 kV with a rated frequency of 50 Hz.

The **Vz-VSVGEng(A)-LS** and **Vz-VSBVng(A)-LS** cables are permitted for open installation in explosive areas of all classes, in cable trays, trunks installed on construction metal structures, in cable channels and tunnels, including class 0 and 1 (V1 and V1a) explosive areas, as well as in spark-hazardous and spark-safe circuits.

The **Vz-AVSVGEng(A)-LS, Vz-AVSBVng(A)-LS, Vz-VSVGng(A)-LS** and **Vz-VSVGEng(A)-LS** cables are permitted for open installation in classes 20, 21, and 22 explosive areas, in cable trays, trunks installed on construction metal structures, on walls and in cable structures.

The **Vz-VSVGEng(A)-LS** and **Vz-VSBVng(A)-LS** cables are intended for use in circuits where the operation in an event of fire is required.

CERTIFICATES

Certificate of compliance.
Nuclear supervision license.

FIRE HAZARD CLASS

P1b.8.2.2.2.

CONSTRUCTION

No. of cores	Cross section (mm^2)
3-5	1.5-240

Core – copper or aluminum, solid or stranded, round or sector-shaped, compacted.
Insulation – reduced fire risk PVC compound. The insulated conductors are placed around the slotted central core.
Filling – reduced fire risk PVC compound.
Screen – for "**E**"-type cables – copper tape or copper wire.
Armor – for **"B"**-type cables – two galvanized steel tapes.
Sheath – reduced fire risk PVC compound.

OPERATION GUIDELINES

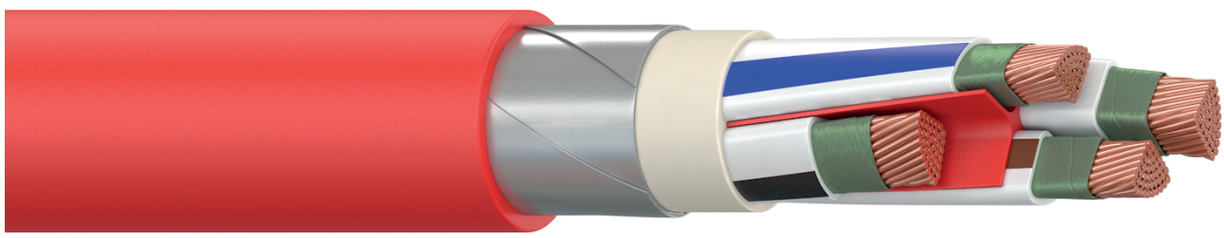
Ambient operating temperature (C^0)	-50 to +50
Relative air humidity (at +35 C^0)	98%
Installation temperature, not lower than (C^0)	-15
Bending radius, not smaller than (OD)	7.5
Service life (yrs)	30
Guaranty period (yrs)	5

Vz-APSVGng(A)-LS, Vz-PSVGng(A)-LS, Vz-APSVGEng(A)-LS, Vz-PSVGEng(A)-LS, Vz-APSBVng(A)-LS, Vz-PSBVng(A)-LS

TU 16.K71-454-2013
GOST 31996-2012

rated for 0.66 and 1 kV

Improved reliability power cables for use in explosive areas, flame-retardant, insulated, and filled with a halogen-free compound, and sheathed with a reduced fire risk PVC compound.



APPLICATION

The cables are designed for transmission and distribution of electrical energy in stationary electrical installations in explosive areas, for rated AC voltages of 0.66, and 1 kV with a rated frequency of 50 Hz.

The **Vz-PSVGEng(A)-LS** and **Vz-PSBVng(A)-LS** cables are permitted for open installation in explosive areas of all classes, in cable trays, trunks installed on construction metal structures, in cable channels and tunnels, including class 0 and 1 (V1 and V1a) explosive areas, as well as in spark-hazardous and spark-safe circuits.

The **Vz-APSVGng(A)-LS, Vz-PSVGng(A)-LS, Vz-APSVGEng(A)-LS** and **Vz-APSVBng(A)-LS** cables are permitted for open installation in classes 20, 21, and 22 explosive areas, in cable trays, trunks installed on construction metal structures, on walls and in cable structures.

CERTIFICATES

Certificate of compliance.
Nuclear supervision license.

FIRE HAZARD CLASS

P1b.8.2.2.2.

CONSTRUCTION

No. of cores	Cross section (mm^2)
3-5	1.5-240

Core – copper or aluminum, solid or stranded, round or sector-shaped, compacted.
Insulation – halogen-free compound. The insulated conductors are placed around the slotted central core.
Filling – halogen-free compound.
Screen – for "**E**"-type cables – copper tape or copper wire.
Armor – for "**B**"-type cables – two galvanized steel tapes.
Sheath – reduced fire risk PVC compound.

OPERATION GUIDELINES

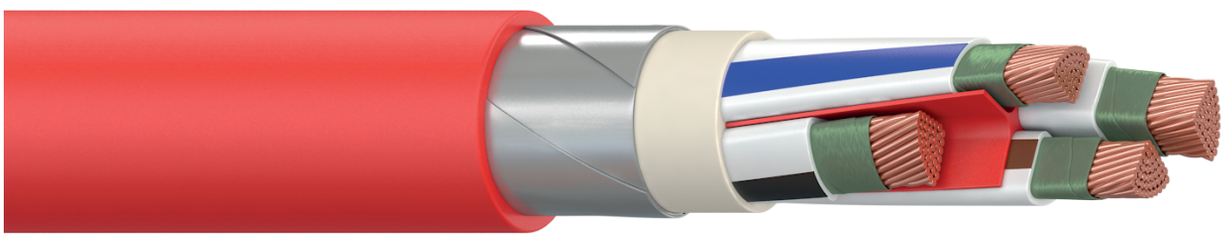
Ambient operating temperature (C^0)	-50 to +50
Relative air humidity (at +35 C^0)	98%
Installation temperature, not lower than (C^0)	-15
Bending radius, not smaller than (OD)	7.5
Service life (yrs)	30
Guaranty period (yrs)	5

Vz-PSVGng(A)-FRLS, Vz-PSVGEng(A)-FRLS, Vz-PSBVng(A)-FRLS

TU 16.K71-454-2013
GOST 31996-2012

rated for 0.66 and 1 kV

Improved reliability power cables for use in explosive areas, flame-retardant, fire-resistant, insulated, and filled with a halogen-free compound, and sheathed with a reduced fire risk PVC compound



APPLICATION

The cables are designed for transmission and distribution of electrical energy in stationary electrical installations in explosive areas, for rated AC voltages of 0.38/0.66 and 0.6/1 kV with a rated frequency of 50 Hz.

The **Vz-PSBVng(A)-FRLS** and **Vz-PSVGEng(A)-FRLS** cables are permitted for open installation in explosive areas of all classes, in cable trays, trunks installed on construction metal structures, in cable channels and tunnels, including class 0 and 1 (V1 and V1a) explosive areas, as well as in spark-hazardous and spark-safe circuits.

The **Vz-PSVGng(A)-FRLS** cables are permitted for open installation in classes 20, 21 and 22 explosive areas, in cable trays, trunks installed on construction metal structures, on walls and in cable structures.

The cables are intended for use in circuits where the operation in an event of fire is required.

CERTIFICATES

Certificate of compliance.
Nuclear supervision license.

FIRE HAZARD CLASS

P1b.8.2.2.2.

CONSTRUCTION

No. of cores	Cross section (mm^2)
3-5	1.5-240

Core – copper, solid or stranded, round or sector-shaped, compacted.
Thermal barrier – mica tape.
Insulation – halogen-free compound. The insulated conductors are placed around the slotted central core.
Filling – halogen-free compound.
Screen – for **"E"**-type cables – copper tape or copper wires bound with copper tape.
Armor – for **"B"**-type cables – two galvanized steel tapes.
Sheath – reduced fire risk PVC compound.

OPERATION GUIDELINES

Ambient operating temperature (C^0)	-50 to +50
Relative air humidity (at +35 C^0)	98%
Installation temperature, not lower than (C^0)	-15
Bending radius, not smaller than (OD)	7.5
Service life (yrs)	30
Guaranty period (yrs)	5

XLPE-Insulated
POWER CABLES

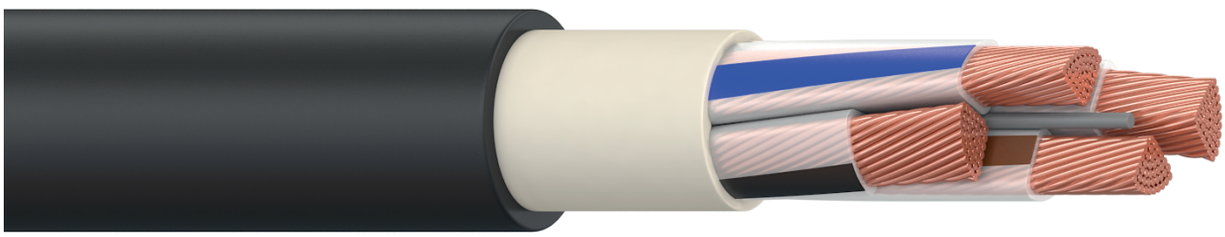
Rated voltages: 0.66, 1, 3, 6, 10, 15, 20, 35 and 64/110 kV

PvVG, PvVGE, APvVG, APvVGE

TU 16-705.499-2010
GOST 31996-2012

rated for 0.66, 1 and 3 kV

Non-armored XLPE-insulated and PVC-sheathed power cables.



APPLICATION

The cables are designed for transmission and distribution of electrical energy in stationary electrical installations for a rated AC voltage of 0.66, 1 and 3 kV with a rated frequency of 50 Hz.

Cables are designed for operation in AC electrical networks with either grounded or isolated neutral, where the operation time in an event of a single-phase short circuit to the ground does not exceed 8 hours, and the total operation time in a condition of a single-phase short circuit to the ground does not exceed 125 hours per year.

Cables are designed for installation of single cable lines in cable structures and premises.

OPERATION GUIDELINES

Ambient operating temperature (C^0)	-50 to +50
Relative air humidity (at +35 C^0)	98%
Installation temperature, not lower than (C^0)	-15
Bending radius, not smaller than (OD) single wire stranded	 10 7.5
Service life (yrs)	30
Guaranty period (yrs)	5

CONSTRUCTION

No. of cores	Cross section (mm^2)
1-5	6-1000

Core – copper or aluminum, solid or stranded, round or sector-shaped, compacted.
Insulation – cross-linked polyethylene. Insulated conductors are stranded around an insulating cord.
Inner sheath – PVC compound.
Screen – for "E"-type cables – copper tape or copper wire.
Sheath – fire-resistant PVC compound.

CERTIFICATES

Certificate of compliance.

FIRE HAZARD CLASS

01.8.2.5.4

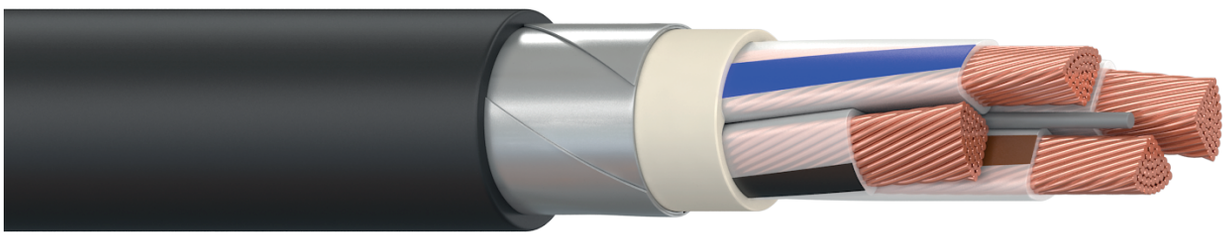
Analogues of N2XY, N2XCY, NA2XY, and NA2XCY, respectively.

PvBSHv, APvBSHv, PvBSHp, APvBSHp

TU 16-705.499-2010
GOST 31996-2012

rated for 0.66, 1 and 3 kV

Armored with galvanized steel tapes XLPE-insulated power cables with a protective sheath made of a PVC (or PE) compound.



APPLICATION

The cables are designed for transmission and distribution of electrical energy in stationary electrical installations for a rated AC voltage of 0.66, 1 and 3 kV with a rated frequency of 50 Hz.

PvBSHv and **APvBSHv** cables are designed for installation of single cable lines in cable structures and premises.

PvBSHp and **APvBSHp** cables are designed for burying in trenches independently of corrosiveness of grounds and ground waters. It is allowed to lay the cables in non-navigational rivers and ponds on a condition of deepening the cables in the ground.

CONSTRUCTION

No. of cores	**Cross section (mm²)**
1-5	6-400

Core – copper or aluminum, solid or stranded, round or sector-shaped, compacted.

Insulation – cross-linked polyethylene. Insulated conductors are stranded around an insulating cord.

Inner sheath – polyvinyl chloride compound.

Sheath – fire-resistant polyvinyl chloride compound.

Armor – two galvanized steel tapes.

Jacket – polyvinyl chloride compound for **PvBSHv, APvBSHv** and polyethylene for **PvBSHp, APvBSHp**.

OPERATION GUIDELINES

Ambient operating temperature (C⁰) **PvBSHv, APvBSHv** **PvBSHp, APvBSHp**	 -50 до +50 -60 до +50
Relative air humidity (at +35 C⁰)	98%
Installation temperature, not lower than (C⁰) **PvBSHv, APvBSHv** **PvBSHp, APvBSHp**	 -15 -20
Bending radius, not smaller than (OD) Single wire Stranded	 10 7.5
Service life (yrs)	30
Guaranty period (yrs)	5

CERTIFICATES

Certificate of compliance

FIRE HAZARD CLASS

01.8.2.5.4 - **PvBSHv, APvBSHv**
02.8.2.5.4 - **PvBSHp, APvBSHp**

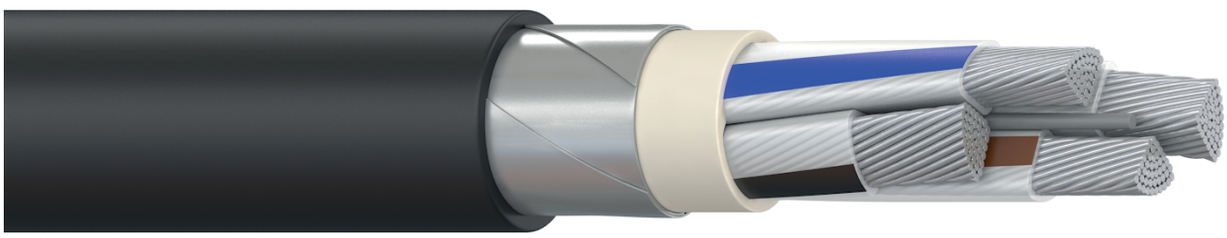
Analogues of N2XBY, NA2XBY, N2XB2Y, and NA2XB2Y, respectively.

PvBSHvng(V), APvBSHvng(V)

TU 16-705.499-2010
GOST 31996-2012

rated for 0.66, 1, 3 kV

Armored with galvanized steel tapes XLPE-insulated power cables with a protective sheath made of a fire-resistant PVC compound.



APPLICATION

The cables are designed for transmission and distribution of electrical energy in stationary electrical installations for a rated AC voltage of 0.66, 1 and 3 kV with a rated frequency of 50 Hz.
Cables are designed for operation in AC electrical networks with either grounded or isolated neutral, where the operation time in an event of a single-phase short circuit to the ground does not exceed 8 hours, and the total operation time in a condition of a single-phase short circuit to the ground does not exceed 125 hours per year.
Cables are designed for bunched installation in cable structures (tray systems, walkways) of outdoor electric installations.

OPERATION GUIDELINES

Ambient operating temperature (C^0)	-50 to +50
Relative air humidity (at +35 C^0)	98%
Installation temperature, not lower than (C^0)	-15
Bending radius, not smaller than (OD) single wire stranded	 10 7.5
Service life (yrs)	30
Guaranty period (yrs)	5

CONSTRUCTION

No. of cores	Cross section (mm2)
1-5	6-400

Core – copper or aluminum, solid or stranded, round or sector-shaped, compacted.
Insulation – cross-linked polyethylene. Insulated conductors are stranded around an insulating cord.
Inner sheath – polyvinylchloride compound.
Armor – two galvanized steel tapes.
Protective sheath – fire-resistant polyvinylchloride compound.

CERTIFICATES

Certificate of compliance.

FIRE HAZARD CLASS

P2.8.2.3.4.

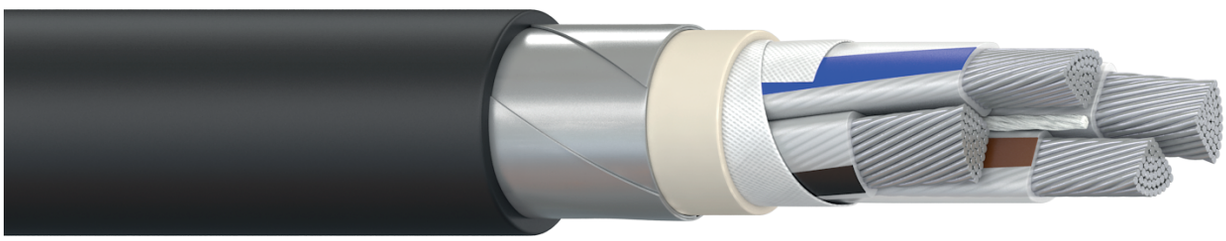
Analogues of flame-retardant N2XBY and NA2XBY, respectively.

APvBSHp(g), PvBSHp(g)

TU 16.K71-277-98
GOST 31996-2012

rated for 1 kV

Armored with galvanized steel tapes XLPE-insulated power cables with a protective sheath made of a PE compound.



APPLICATION

The cables are designed for transmission and distribution of electrical energy in stationary electrical installations for a rated AC voltage of up to 1 kV with a rated frequency of 50 Hz with insulated or grounded neutral.
Cables are designed for burying in the ground (in trenches) exclusive of heaving and collapsible soils.

OPERATION GUIDELINES

Ambient operating temperature (C^0)	-60 to +50
Relative air humidity (at +35 C^0)	98%
Installation temperature, not lower than (C^0)	-20
Bending radius, not smaller than (OD)	15
Service life (yrs)	30
Guaranty period (yrs)	5

CONSTRUCTION

No. of cores	Cross section (mm2)
1-5	6-400

Core – copper or aluminum, solid or stranded, round or sector-shaped, compacted.
Insulation – silane cross-linked polyethylene. Insulated conductors are stranded around a water-blocking yarn. The yarn is covered with an overlapping water-blocking rape.
Inner sheath – polyvinyl chloride compound.
Armor – two galvanized steel tapes.
Protective sheath – polyethylene.

CERTIFICATES

Certificate of compliance.
Moscow United Electric Grid Company (MUEGC) permission.
LENENERGO permission.

FIRE HAZARD CLASS

02.8.2.5.4.

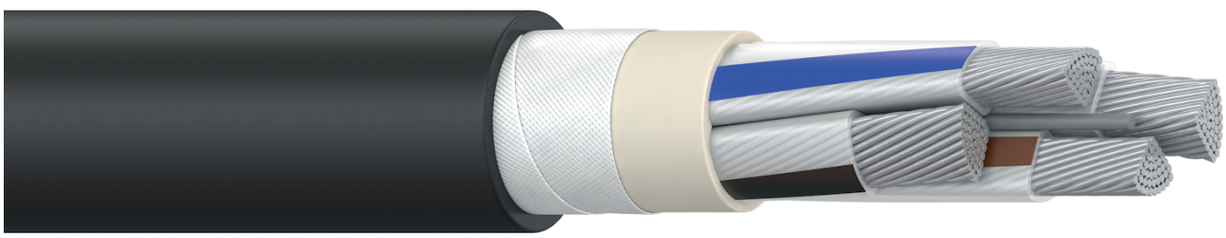
Analogues of NA2X(F)B2Y and N2X(F)B2Y, respectively.

APvVGng(A)-LS, PvVGng(A)-LS, APvBSHvng(A)-LS, PvBSHvng(A)-LS

TU 16.K71-277-98
GOST 31996-2012

rated for 1 kV

Silane-cross-linked PE-insulated power cables sheathed with a fire-resistant PVC-compound.



APPLICATION

The cables are designed for transmission and distribution of electrical energy in stationary electrical installations for a rated AC voltage of 1 kV with a rated frequency of 50 Hz.

It is allowed to bury armored cables in the ground (in trenches).

APvVGng(A)-LS and **PvVGng(A)-LS** cables are designed for bunched installation in cable structures and premises of indoor electric installations, including fire-hazardous and explosive areas (except class V-1 and V-1a explosive areas) where there is no risk of mechanical damage to cables during the operation.

APvBSHvng(A)-LS cable is designed for bunched installation in cable structures and premises of indoor electric installations, including fire-hazardous and explosive areas (except class V-1 and V-1a explosive areas) where there is no risk of tensional strain during the operation.

The application of **PvBSHvng(A)-LS** cables is the same, including class V-1 and V-1a explosive areas.

CERTIFICATES

Certificate of compliance.
Nuclear supervision license.
Moscow United Electric Grid Company (MUEGC) permission.
LENENERGO permission.

FIRE HAZARD CLASS

P1b.8.2.2.2.

CONSTRUCTION

No. of cores	Cross section (mm2)
1-5	6-1000

Core – copper or aluminum, solid or stranded, round or sector-shaped, compacted.
Insulation – silane cross-linked polyethylene. Insulated conductors are stranded around an insulating cord made of fire-resistant PVC compound.
Inner sheath – fire-resistant PVC compound.
Wrap – glass tape or glass-mica tape.
Armor – two galvanized steel tapes.
Sheath – fire-resistant polyvinyl chloride compound.

OPERATION GUIDELINES

Ambient operating temperature (C^0)	-50 to +50
Relative air humidity (at +35 C^0)	98%
Installation temperature, not lower than (C^0)	-15
Bending radius, not smaller than (OD)	15
Service life (yrs)	30
Guaranty period (yrs)	5

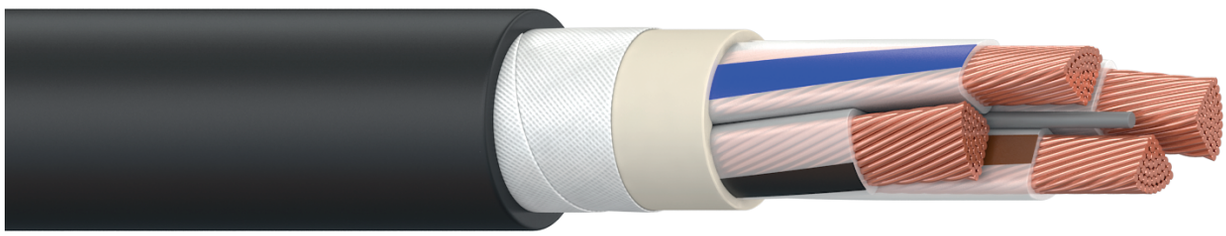
Analogues of flame-retardant, low-smoke NA2XY, N2XY, NA2XBY, and N2XBY, respectively.

PvPGng(A)-HF

TU 16.K71-304-2001
GOST 31996-2012

rated for 0.66 and 1 kV

Power cables, XLPE-insulated and sheathed with a halogen-free compound.



APPLICATION

The cables are designed for transmission and distribution of electrical energy in stationary electrical installations for a rated AC voltage of 0.66 and 1 kV with a rated frequency of 50 Hz.
The cables are used for stationary installation inside and outside of containment areas of nuclear power plants.
The cables are designed for laying in cable runs with no limits to elevation differences, including vertical cable runs.
The cables are intended for installation in cable structures and premises where there is no risk of mechanical damage to a cable.
The cables are intended for use in power- and control circuits of nuclear power plants, office buildings equipped with computers and micro-controller appliances, kindergartens, schools, hospitals, sports- and social centers.

CERTIFICATES

Certificate of compliance.
Nuclear supervision license.

FIRE HAZARD CLASS

P1b.8.1.2.1.

CONSTRUCTION

No. of cores	Cross section (mm^2)
1-5	6-1000

Core – copper, solid or stranded, round or sector-shaped, compacted.
Insulation – cross-linked polyethylene. Insulated conductors are stranded around an insulating cord.
Inner sheath – halogen-free compound.
Wrap – glass- or mica tape.
Sheath – halogen-free compound.

OPERATION GUIDELINES

Ambient operating temperature (C^0)	-50 to +50
Relative air humidity (at +35 C^0)	98%
Installation temperature, not lower than (C^0)	-15
Bending radius, not smaller than (OD) single wire stranded	 10 7.5
Service life (yrs)	30
Guaranty period (yrs)	5

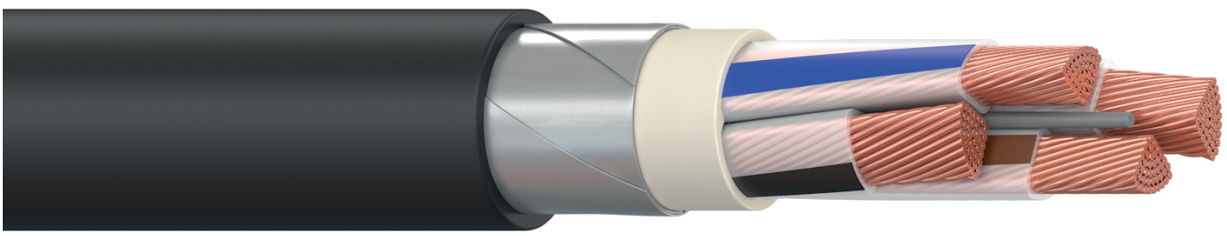
Analogue of N2XH.

PvBPng(A)-HF

TU 16.K71-374-2006
GOST 31565-2012

rated for 1 kV and 3 kV

Armored power cables insulated and sheathed with a halogen-free compound.



APPLICATION

The cables are designed for transmission and distribution of electrical energy in stationary electrical installations for a rated AC voltage of 1 and 3 kV with a rated frequency of 50 Hz.

The cables are used for stationary installation inside and outside of tight areas of nuclear power plants.

The cables are used for installation in cable structures, production areas, and subway areas, including fire-hazardous and explosive areas of all classes (with no tensional strain during the operation) where there are risks of mechanical damage to the cable.

OPERATION GUIDELINES

Ambient operating temperature (C^0)	-50 to +50
Relative air humidity (at +35 C^0)	98%
Installation temperature, not lower than (C^0)	-20
Bending radius, not smaller than (OD) single wire stranded	 15 10
Service life (yrs)	30
Guaranty period (yrs)	5

CONSTRUCTION

No. of cores	Cross section (mm^2)
1, 3-5	6-400

Core – copper, solid or stranded, round or sector-shaped, compacted.
Insulation – cross-linked polyethylene. Insulated conductors are stranded around an insulating cord.
Inner sheath – halogen-free compound.
Separating layer – (for solid conductors) – glass tape
Armor – two galvanized steel tapes.
Sheath – halogen-free compound.

CERTIFICATES

Certificate of compliance.
Nuclear supervision license.

FIRE HAZARD CLASS

P1b.8.1.2.1.

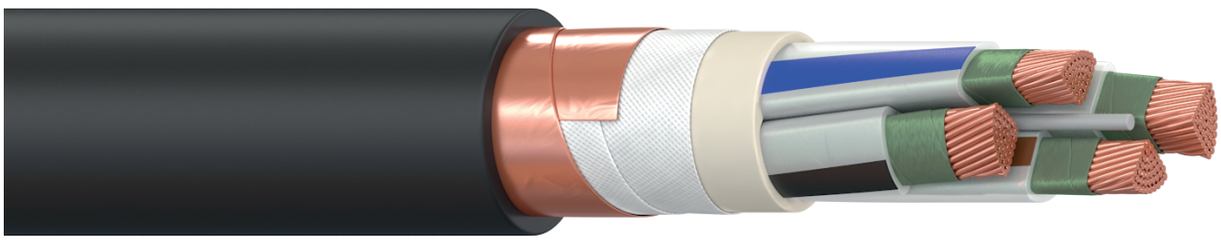
Analogue of NHXBH.

PvPGng(A)-FRHF, PvPGEng(A)-FRHF

TU 16.K71-339-2004
GOST 31996-2012

rated for 1 kV

Power cables, XLPE-insulated and sheathed with a halogen-free compound



APPLICATION

The cables are designed for transmission and distribution of electrical energy in stationary electrical installations for a rated AC voltage of 0.66 and 1 kV with a rated frequency of 50 Hz.
The cables are used for stationary installation inside and outside of containment areas of nuclear power plants.
The cables are designed for laying in cable runs with no limits to elevation differences, including vertical cable runs.
The cables are intended for general purpose industrial use and for use in circuits of nuclear power plants including class 2 nuclear power systems according to OBP 88/97 (PNAE G-01-011) classification.
The cables are intended for use in power- and control circuits of nuclear power plants, power supply circuits of fire safety systems (fire alarms, fire extinguishing pumps, lighting of emergency exits and fire escape routes, smoke exhaust and ventilation systems, evacuation elevators).

CERTIFICATES

Certificate of compliance.
Nuclear supervision license.

FIRE HAZARD CLASS

P1b.1.1.2.1.

CONSTRUCTION

No. of cores	Cross section (mm^2)
1-5	6-1000

Core – copper, solid or stranded, round or sector-shaped, compacted.
Thermal barrier – mica tape wrap.
Insulation – cross-linked polyethylene. Insulated conductors are stranded around an insulating cord.
Inner sheath – halogen-free compound.
Wrap – glass- or mica tape.
Screen – for **"E"**-type cables – copper tape or copper wire.
Sheath – halogen-free compound.

OPERATION GUIDELINES

Ambient operating temperature (C^0)	-50 to +50
Relative air humidity (at +35 C^0)	98%
Installation temperature, not lower than (C^0)	-20
Bending radius, not smaller than (OD) single wire stranded	 15 10
Service life (yrs)	30
Guaranty period (yrs)	5

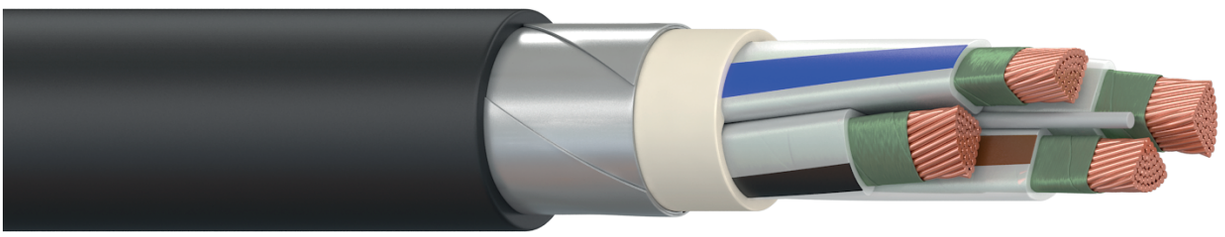
Analogues of NHXH and NHXCH, respectively.

PvBPng(A)-FRHF

TU 16.K71-374-2006
GOST 31565-2012

rated for 1 and 3 kV

Fire-proof armored power cable insulated and sheathed with a halogen-free compound, with a mica tape thermal barrier over copper cores.



APPLICATION

The cables are designed for transmission and distribution of electrical energy in stationary electrical installations for a rated AC voltage of 1 kV and 3 kV with a rated frequency of up to 100 Hz.
The cable is used for installation in cable structures, production areas, and subway areas, including fire-hazardous and explosive areas of all classes (with no tensional strain during the operation) where there are risks of mechanical damage to the cable.
The cable is used for power supply networks where the operation in an event of fire is required.

OPERATION GUIDELINES

Ambient operating temperature (C^0)	-50 to +50
Relative air humidity (at +35 C^0)	98%
Installation temperature, not lower than (C^0)	-20
Bending radius, not smaller than (OD) single wire stranded	 15 10
Service life (yrs)	30
Guaranty period (yrs)	5

CONSTRUCTION

No. of cores	Cross section (mm^2)
1, 3-5	6-400

Core – copper, solid or stranded, round or sector-shaped, compacted.
Thermal barrier – mica tape wrap.
Insulation – cross-linked polyethylene. Insulated conductors are stranded around an insulating cord.
Inner sheath – halogen-free compound.
Separation layer (for single-core cables) – glass tape.
Armor – two galvanized steel tapes.
Sheath – halogen-free compound.

CERTIFICATES

Certificate of compliance.
Nuclear supervision license.

FIRE HAZARD CLASS

P1b.1.1.2.1.

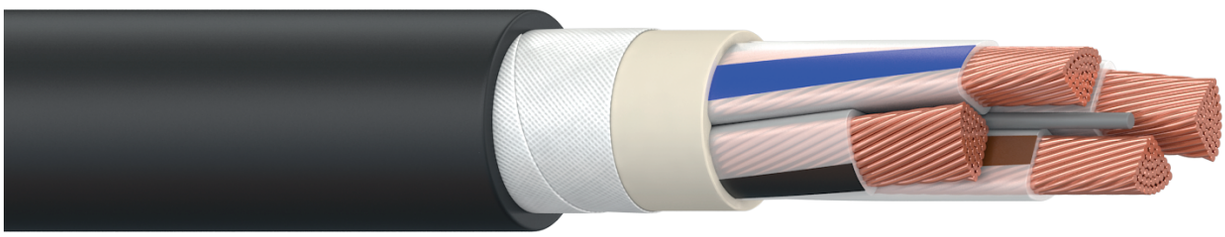
Analogue of NHXBH.

PvVng(A)-HL

rated for 0.66, 1, and 3 kV

TU 3520-010-63976268-2012
GOST 31565-2012

Cross-linked PE-insulated power cables with outer sheath made of a reduced fire risk PVC compound.



APPLICATION

The cables are designed for transmission and distribution of electrical energy in stationary electrical installations for rated AC voltages of 0.66, 1, and 3 kV with a rated frequency of 50 Hz.
The cables are designed for bunched installation in cable structures, premises, and production areas.
The cables are intended for installation of bunched cable runs (taking combustible material volume into account) in cable structures, outdoors (open) cable installations (cable structures, cable runs) where there is no risk of mechanical damage to the cable.
Installations in cable spaces of industrial, occupational environments, and communal buildings is not allowed.

OPERATION GUIDELINES

Ambient operating temperature (C^0)	-60 to +40
Relative air humidity (at +35 C^0)	98%
Installation temperature, not lower than (C^0)	-20
Bending radius, not smaller than (OD) single wire stranded	 15 10
Service life (yrs)	30
Guaranty period (yrs)	5

CONSTRUCTION

No. of cores	Cross section (mm^2)
1-5	6-240

Core – copper, solid or stranded, round or sector-shaped, compacted.
Insulation – cross-linked polyethylene. Insulated conductors are stranded around an insulating cord made of a cold-resistant reduced fire-risk PVC compound.
Inner sheath – cold-resistant reduced fire-risk PVC compound.
Separating layer – glass tape.
Sheath – cold-resistant reduced fire-risk PVC compound.

CERTIFICATES

Certificate of compliance.

FIRE HAZARD CLASS

P1.8.2.3.4.

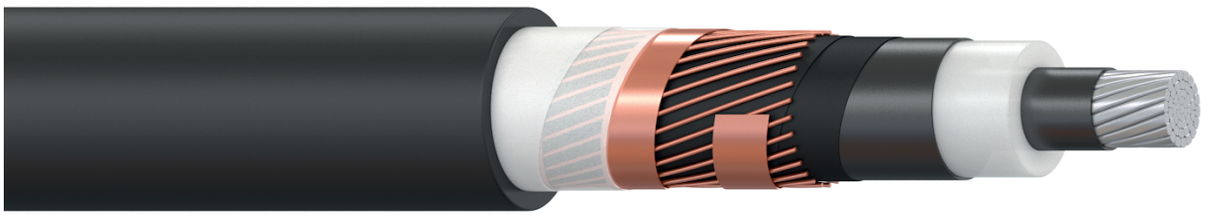
Analogue of flame-retardant cold-resistant N2XY.

PvP, APvP, PvPu, APvPu

rated for 6, 10, 15, 20, and 35 kV

6 kV	TU 16.K71-359-2005
10-35 kV	TU 16.K71-335-2004
	GOST R 55025-2012

Cross-linked PE-insulated power cables with PE outer sheath.



APPLICATION

The cables are designed for transmission and distribution of electrical energy in stationary electrical installations for rated AC voltages of 6, 10, 15, 20, and 35 kV with a rated frequency of 50 Hz, with insulated or grounded neutral.

The cables are designed for burying in ground irrespectively of corrosiveness of soils.

It is allowed to lay the cables on air, including in cable structures, on a condition of provision of additional fire protection measures.

The cables are designed for laying in cable runs with no limits to elevation differences.

OPERATION GUIDELINES

Ambient operating temperature (C^0)	-60 to +50
Relative air humidity (at +35 C^0)	98%
Installation temperature, not lower than (C^0)	-20
Bending radius, not smaller than (OD) single wire stranded	 15 12
Service life (yrs)	30
Guaranty period (yrs)	5

CONSTRUCTION

No. of cores	Cross section (mm^2)
1; 3	35 - 800 **6 kV**
	35 - 1000 **10-35 kV**

Core – copper or aluminum, solid or stranded, round, compacted.
Conductor screen – cross-linkable conductive compound.
Insulation – cross-linked polyethylene.
Insulation screen – cross-linkable conductive compound.
Separating layer – conductive paper tape or conductive non-woven fabric.
Screen – copper wires fastened with copper tape.

Single core

Separating layer – non-woven fabric tape.
Sheath – high-density polyethylene, reinforced – for **"u"**-type cables.

Three cores

Filling – PVC compound.
Sheath – high-density polyethylene, reinforced – for **"u"**-type cables.

CERTIFICATES

Certificate of compliance.

FIRE HAZARD CLASS

O2.8.2.5.4.

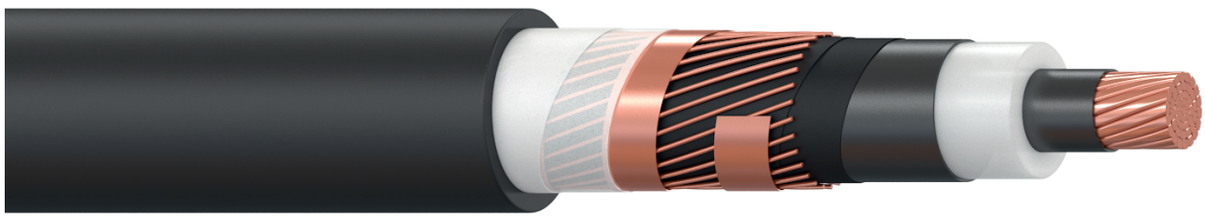
Analogues of N2XS2Y, NA2XS2Y, N2XSE2Y, NA2XSE2Y.

PvV, APvV

rated for 6, 10, 15, 20, and 35 kV

6 kV TU 16.K71-359-2005
10-35 kV TU 16.K71-335-2004
GOST R 55025-2012

Cross-linked PE-insulated power cables with outer sheath made of a PVC compound.



APPLICATION

The cables are designed for transmission and distribution of electrical energy in stationary electrical installations for rated AC voltages of 6, 10, 15, 20, and 35 kV with a rated frequency of 50 Hz, with insulated or grounded neutral.
The **PvV** and **APvV** cables are designed for installation of single cable lines in cable structures, premises, and production areas.
The laying in dry soils (sand, sand-clay, and normal soils with humidity of not less than 14%) is allowed.
The cables are designed for laying in cable runs with no limits to elevation differences.

OPERATION GUIDELINES

Ambient operating temperature (C^0)	-50 to +50
Relative air humidity (at +35 C^0)	98%
Installation temperature, not lower than (C^0)	-15
Bending radius, not smaller than (OD) single wire stranded	 15 12
Service life (yrs)	30
Guaranty period (yrs)	5

CONSTRUCTION

No. of cores	Cross section (mm^2)
1; 3	35 - 800 **6 kV**
	35 - 1000 **10-35 kV**

Core – copper or aluminum, solid or stranded, round, compacted.
Conductor screen – cross-linkable conductive compound.
Insulation – cross-linked polyethylene.
Insulation screen – cross-linkable conductive compound.
Separating layer – conductive paper tape or conductive non-woven fabric.
Screen – copper wires fastened with copper tape.

Single core

Separating layer – non-woven fabric tape.
Sheath – PVC compound.

Three cores

Filling – PVC compound.
Sheath – PVC compound.

CERTIFICATES

Declaration of compliance.
Certificate of compliance.

FIRE HAZARD CLASS

01.8.2.5.4.

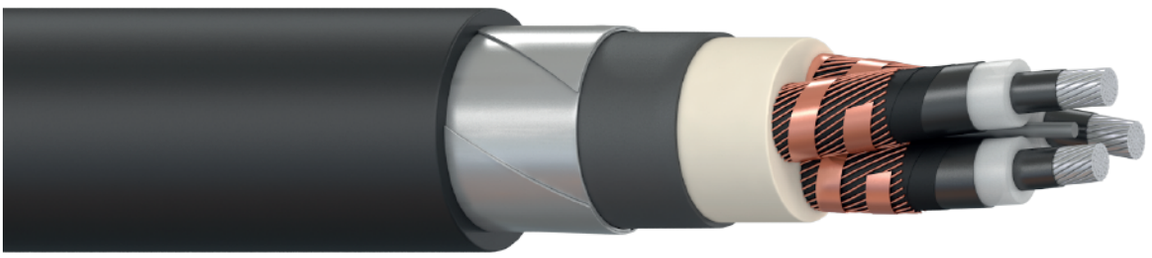
Analogues of N2XSY, N2XSEY, NA2XSY, NA2XSEY.

PvBV, APvBV

rated for 6, 10, 15, 20, and 35 kV

6 kV TU 16.K71-359-2005
10-35 kV TU 16.K71-335-2004
GOST R 55025-2012

Cross-linked PE-insulated power cables with outer sheath made of a reduced fire risk PVC compound.



APPLICATION

The cables are designed for transmission and distribution of electrical energy in stationary electrical installations for rated AC voltages of 6, 10, 15, 20, and 35 kV with a rated frequency of 50 Hz, with insulated or grounded neutral.

The **PvBV** and **APvBV** cables are designed for burying in ground (in trenches), and installation of single cable lines in cable structures, premises, and production areas.

The laying in dry soils (sand, sand-clay, and normal soils with humidity of not less than 14%) is allowed.

The cables are designed for laying in cable runs with no limits to elevation differences.

OPERATION GUIDELINES

Ambient operating temperature (C^0)	-50 to +50
Relative air humidity (at +35 C^0)	98%
Installation temperature, not lower than (C^0)	-15
Bending radius, not smaller than (OD)	12
Service life (yrs)	30
Guaranty period (yrs)	5

CONSTRUCTION

No. of cores	Cross section (mm^2)
3	35 - 240 **6 kV**
	35 - 400 **10-35 kV**

Core – copper or aluminum, solid or stranded, round, compacted.
Conductor screen – cross-linkable conductive compound.
Insulation – cross-linked polyethylene.
Insulation screen – cross-linkable conductive compound.
Separating layer – conductive paper tape or conductive non-woven fabric.
Screen – copper wires fastened with copper tape.
Filling – PVC compound.
Armor bedding – PVC compound.
Armor – galvanized steel tapes.
Sheath – PVC compound.

CERTIFICATES

Declaration of compliance.
Certificate of compliance.

FIRE HAZARD CLASS

01.8.2.5.4.

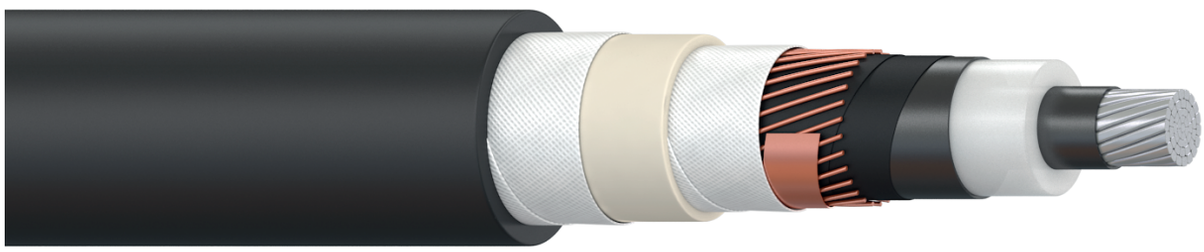
Analogues of N2XSEBY, and NA2XSEBY, respectively.

PvVng(A)-LS, APvVng(A)-LS

rated for 6, 10, 15, 20, and 35 kV

6 kV TU 16.K71-359-2005
10-35 kV TY 16.K71-335-2004
GOST R 55025-2012

Cross-linked PE-insulated power cables with outer sheath made of a reduced fire risk PVC compound.



APPLICATION

The cables are designed for transmission and distribution of electrical energy in stationary electrical installations for rated AC voltages of 6, 10, 15, 20, and 35 kV with a rated frequency of 50 Hz, with insulated or grounded neutral.

The cables are designed for bunched installation in cable structures, premises, and production areas.

The laying in dry soils (sand, sand-clay, and normal soils with humidity of not less than 14%) is allowed.

The cables are designed for laying in cable runs with no limits to elevation differences.

The **PvVng(A)-LS** cables can be installed in classes V-1 and V-1a explosive areas, and **APvVng(A)-LS** cables can be installed in classes V-1b, V-1g, V-II, and V-IIa explosive areas.

OPERATION GUIDELINES

Ambient operating temperature (C^0)	-50 to +50
Relative air humidity (at +35 C^0)	98%
Installation temperature, not lower than (C^0)	-15
Bending radius, not smaller than (OD) single wire stranded	 15 12
Service life (yrs)	30
Guaranty period (yrs)	5

CONSTRUCTION

No. of cores	Cross section (mm^2)
1; 3	35 - 800 **6 kV**
	35 - 1000 **10-35 kV**

Core – copper or aluminum, solid or stranded, round, compacted.
Conductor screen – cross-linkable conductive compound.
Insulation – cross-linked polyethylene.
Insulation screen – cross-linkable conductive compound.
Separating layer – conductive paper tape or conductive non-woven fabric.
Screen – copper wires fastened with copper tape.

Single core

Separating layer – glass tape.
Inner sheath – reduced fire-risk PVC compound.
Thermal barrier – glass tape.
Sheath – reduced fire-risk PVC compound.

Three core

Filling – reduced fire-risk PVC compound.
Sheath – reduced fire-risk PVC compound.

CERTIFICATES

Declaration of compliance.
Certificate of compliance.

FIRE HAZARD CLASS

P1b.8.2.2.2.

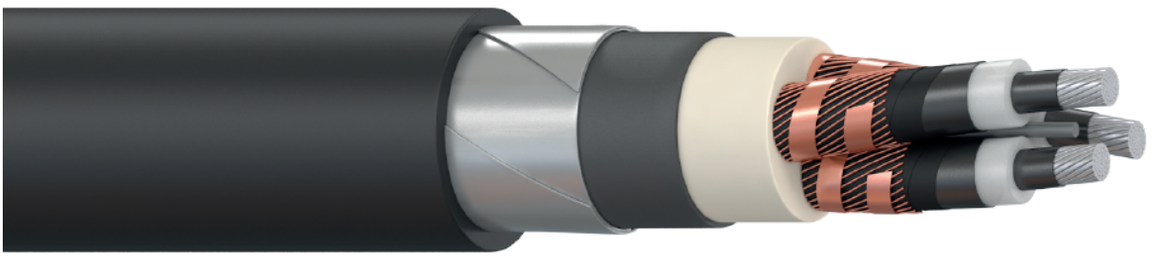
Analogues of flame-retardant, low-smoke N2XSY, N2XSEY, and NA2XSY, NA2XSEY, respectively.

PvBVng(A)-LS, APvBVng(A)-LS

rated for 6, 10, 15, 20, and 35 kV

6 kV TU 16.K71-359-2005
10-35 kV TU 16.K71-335-2004
GOST R 55025-2012

Cross-linked PE-insulated power cables armored with galvanized steel tapes with outer sheath made of a reduced fire risk PVC compound.



APPLICATION

The cables are designed for transmission and distribution of electrical energy in stationary electrical installations for rated AC voltages of 6, 10, 15, 20, and 35 kV with a rated frequency of 50 Hz, with insulated or grounded neutral.

The cables are designed for bunched installation in cable structures, premises, and production areas.

The laying in dry soils (sand, sand-clay, and normal soils with humidity of not less than 14%) is allowed.

The cables are designed for laying in cable runs with no limits to elevation differences.

The **PvBVng(A)-LS** cables can be installed in classes V-1 and V-1a explosive areas, and **APvBVng(A)-LS** cables can be installed in classes V-1b, V-1g, V-II, and V-IIa explosive areas.

OPERATION GUIDELINES

Ambient operating temperature (C^0)	-50 to +50
Relative air humidity (at +35 C^0)	98%
Installation temperature, not lower than (C^0)	-15
Bending radius, not smaller than (OD)	12
Service life (yrs)	30
Guaranty period (yrs)	5

CONSTRUCTION

No. of cores	Cross section (mm^2)
3	35 - 240 **6 kV**
	35 - 400 **10-35 kV**

Core – copper or aluminum, solid or stranded, round, compacted.
Conductor screen – cross-linkable conductive compound.
Insulation – cross-linked polyethylene.
Insulation screen – cross-linkable conductive compound.
Separating layer – conductive paper tape or conductive non-woven fabric.
Screen – copper wires fastened with copper tape.
Filling – reduced fire-risk PVC compound.
Armor padding – reduced fire-risk PVC compound.
Armor – galvanized steel tapes.
Sheath – reduced fire-risk PVC compound.

CERTIFICATES

Declaration of compliance.
Certificate of compliance.

FIRE HAZARD CLASS

P1b.8.2.2.2.

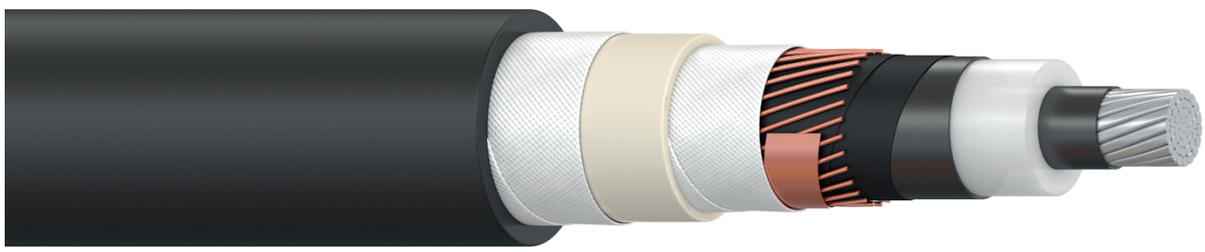
Analogues of flame-retardant, low-smoke N2XSEBY, and NA2XSEBY, respectively.

PvPng(A)-HF, APvPng(A)-HF, PvP2gzhng(A)-HF, APvP2gzhng(A)-HF

TU 27.32.14-030-63976268-2018
GOST 55025-2012

rated for 10, 15, 20, and 35 kV

Cross-linked PE-insulated power cables with PE outer sheath with additional water-blocking elements.



APPLICATION

The cables are designed for transmission and distribution of electrical energy in stationary electrical installations for rated AC voltages of 6, 10, 15, 20, and 35 kV with a rated frequency of 50 Hz, with insulated or grounded neutral.

The laying in dry soils (sand, sand-clay, and normal soils with humidity of not less than 14%) is allowed.

The **PvPng(A)-HF** and **PvP2gzhng(A)-HF** cables can be installed in classes V-1 and V-1a explosive areas and **APvPng(A)-HF** and **APvP2gzhng(A)-HF** cables can be installed in classes V-1b, V-1g, V-II, and V-IIa explosive areas.

OPERATION GUIDELINES

Ambient operating temperature (C^0)	-50 to +50
Relative air humidity (at +35 C^0)	98%
Installation temperature, not lower than (C^0)	-15
Bending radius, not smaller than (OD) single wire stranded	 15 12
Service life (yrs)	30
Guaranty period (yrs)	5

FIRE HAZARD CLASS

P1b.8.1.2.1.

CONSTRUCTION

No. of cores	Cross section (mm^2)
1, 3	35 - 1000

Core – copper or aluminum, solid or stranded, round, compacted. For **"gzh"**-type cables – longitudinally-sealed.
Conductor screen – cross-linkable conductive compound.
Insulation – cross-linked polyethylene.
Insulation screen – cross-linkable conductive compound.
Separating layer – conductive paper- or conductive non-woven material tapes; for **"2g"**-cables: conductive water-blocking tape with aluminum-polymer tape.
Screen – copper wires fastened with copper tape.

Single core

Separating layer – conductive paper- or conductive non-woven material tapes; for **"2g"**-cables: conductive water-blocking tape with aluminum-polymer tape.
Inner sheath – halogen-free compound.
Thermal barrier – glass tape.
Sheath – halogen-free compound.

Three cores

Filling – reduced fire-risk PVC compound.
Sheath – halogen-free compound.

CERTIFICATES

Certificate of compliance.

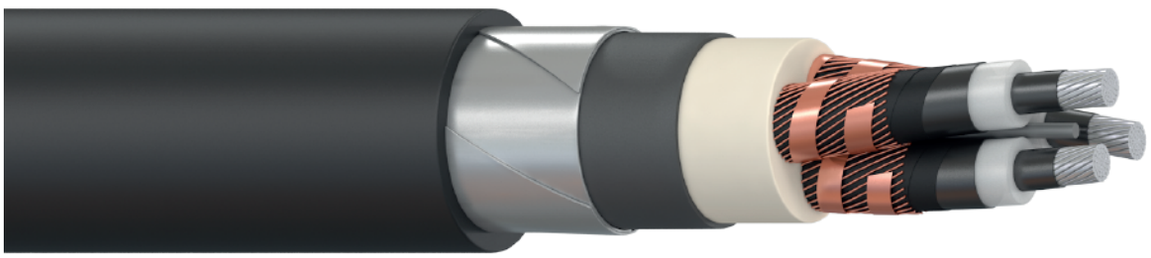
Analogues of halogen-free N2XS2Y (N2XSE2Y), NA2XS2Y (NA2XSE2Y), N2XS(F)2Y (N2XSE(F)2Y), and NA2XS(F)2Y (NA2XSE(F)2Y), respectively.

PvBPng(A)-HF, APvBPng(A)-HF

TU 27.32.14-030-63976268-2018
GOST 55025-2012

rated for 10, 15, 20, and 35 kV

Cross-linked PE-insulated armored power cables with an outer sheath made of a halogen-free compound..



APPLICATION

The cables are designed for transmission and distribution of electrical energy in stationary electrical installations for rated AC voltages of 10, 15, 20, and 35 kV with a rated frequency of 50 Hz, with insulated or grounded neutral.

The laying in dry soils (sand, sand-clay, and normal soils with humidity of not less than 14%) is allowed.

The **PvBPng(A)-HF** cables can be installed in classes V-1 and V-1a explosive areas, and **APvBPng(A)-HF** cables can be installed in classes V-1b, V-1g, V-II, and V-IIa explosive areas.

OPERATION GUIDELINES

Ambient operating temperature (C^0)	-50 to +50
Relative air humidity (at +35 C^0)	98%
Installation temperature, not lower than (C^0)	-15
Bending radius, not smaller than (OD)	12
Service life (yrs)	30
Guaranty period (yrs)	5

CONSTRUCTION

No. of cores	Cross section (mm^2)
3	35 - 400

Core – copper or aluminum, solid or stranded, round, compacted. For **"gzh"**-type cables – longitudinally-sealed.
Conductor screen – cross-linkable conductive compound.
Insulation – cross-linked polyethylene.
Insulation screen – cross-linkable conductive compound.
Separating layer – conductive paper- or conductive non-woven material tapes.
Screen – copper wires fastened with copper tape.
Inner sheath – halogen-free compound.
Armor padding – halogen-free compound.
Armor – 2 galvanized steel tapes.
Sheath – halogen-free compound.

CERTIFICATES

Certificate of compliance.

FIRE HAZARD CLASS

P1b.8.1.2.1.

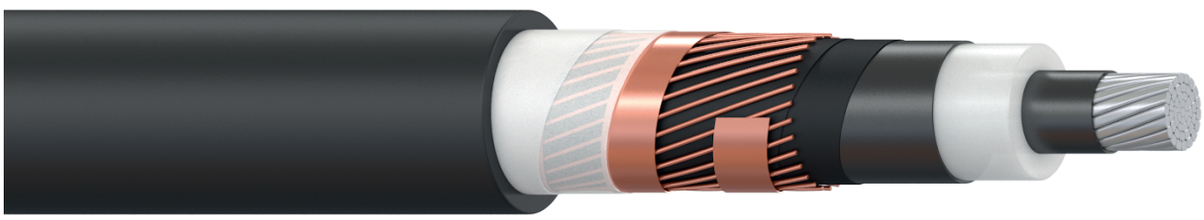
Analogues of halogen-free N2XSEBY, and NA2XSEBY, respectively.

PvPg, APvPg, PvPug, APvPug, PvP2g, APvP2g, PvPu2g, APvPu2g

6 kV TU 16.K71-359-2005
10-35 kV TU 16.K71-335-2004
GOST R 55025-2012

rated for 6, 10, 15, 20, and 35 kV

Cross-linked PE-insulated power cables with PE outer sheath with additional water-blocking elements.



APPLICATION

The cables are designed for transmission and distribution of electrical energy in stationary electrical installations for rated AC voltages of 6, 10, 15, 20, and 35 kV with a rated frequency of 50 Hz, with insulated or grounded neutral.

The cables are designed for burying in ground irrespectively of corrosiveness of soils, and in non-navigational waters on a condition of eliminating risks of mechanical damage to cables.

It is allowed to lay the cables on air, including in cable structures, on a condition of provision of additional fire protection measures.

The cables are designed for laying in cable runs with no limits to elevation differences.

OPERATION GUIDELINES

Ambient operating temperature (C^0)	-60 to +50
Relative air humidity (at +35 C^0)	98%
Installation temperature, not lower than (C^0)	-20
Bending radius, not smaller than (OD) single wire stranded	 15 12
Service life (yrs)	30
Guaranty period (yrs)	5

CONSTRUCTION

No. of cores	Cross section (mm^2)
1; 3	35 - 1000

Core – copper or aluminum, solid or stranded, round, compacted.
Conductor screen – cross-linkable conductive compound.
Insulation – cross-linked polyethylene.
Insulation screen – cross-linkable conductive compound.
Separating layer – conductive water-blocking tape.
Screen – copper wires fastened with copper tape.

Single core

Separating layer – for **"g"**-cables: water-blocking tape; for **"2g"**-cables: conductive water-blocking tape with aluminum-polymer tape.
Sheath – polyethylene.

Three cores

Filling – PVC or PE compound.
Separating layer – for **"2g"**-cables: conductive water-blocking tape with aluminum-polymer tape.
Sheath – high-density polyethylene, reinforced – for **"u"**-type cables.

CERTIFICATES

Declaration of compliance.

FIRE HAZARD CLASS

O2.8.2.5.4.

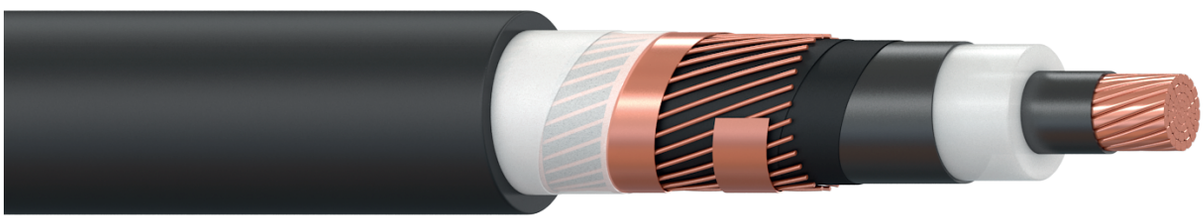
Analogues of N2XS(F)2Y (N2XSE(F)2Y), and NA2XS(F)2Y (NA2XSE(F)2Y).

PvPgzh, APvPgzh, PvPugzh, APvPugzh, PvP2gzh, APvP2gzh, PvPu2gzh, APvPu2gzh

6 kV TU 16.K71-359-2005
10-35 kV TU 16.K71-335-2004
GOST R 55025-2012

rated for 6, 10, 15, 20, and 35 kV

Cross-linked PE-insulated power cables with PE outer sheath with additional water-blocking elements.



APPLICATION

The cables are designed for transmission and distribution of electrical energy in stationary electrical installations for rated AC voltages of 6, 10, 15, 20, and 35 kV with a rated frequency of 50 Hz, with insulated or grounded neutral.

The cables are designed for burying in ground irrespectively of corrosiveness of soils, and in non-navigational waters on a condition of eliminating risks of mechanical damage to cables.

It is allowed to lay the cables on air, including in cable structures, on a condition of provision of additional fire protection measures.

The cables are designed for laying in cable runs with no limits to elevation differences.

OPERATION GUIDELINES

Ambient operating temperature (C^0)	-60 to +50
Relative air humidity (at +35 C^0)	98%
Installation temperature, not lower than (C^0)	-20
Bending radius, not smaller than (OD) single wire stranded	 15 12
Service life (yrs)	30
Guaranty period (yrs)	5

Analogues of N2XS(F)2Y (N2XSE(F)2Y), and NA2XS(F)2Y (NA2XSE(F)2Y).

CONSTRUCTION

No. of cores	Cross section (mm^2)
1; 3	35 - 800 **6 kV**
	35 - 1000 **10-35 kV**

Core – copper or aluminum, solid or stranded, round, compacted, with longitudinal sealing (**"gzh"**-types).
Conductor screen – cross-linkable conductive compound.
Insulation – cross-linked polyethylene.
Insulation screen – cross-linkable conductive compound.
Separating layer – conductive water-blocking tape.
Screen – copper wires fastened with copper tape.

Single core

Separating layer – for **"g"** - cables: water-blocking tape; for **"2g"** - cables: conductive water-blocking tape with aluminum-polymer tape.
Sheath – high-density polyethylene, reinforced – for **"u"**-type cables.

Three cores

Filling – PVC or PE compound.
Separating layer – for **"2g"**-cables: conductive water-blocking tape with aluminum-polymer tape.
Sheath – high-density polyethylene, reinforced – for **"u"**-type cables.

CERTIFICATES

Declaration of compliance.

FIRE HAZARD CLASS

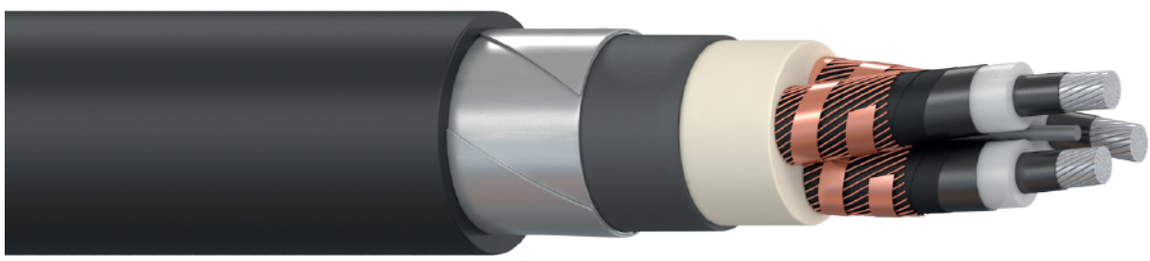
02.8.2.5.4.

PvBP, APvBP, PvBPg, APvBPg, PvBPgzh, APvBPgzh, PvBP2g, APvBP2g, PvBP2gzh, APvBP2gzh

6 kV TU 16.K71-359-2005
10-35 kV TU 16.K71-335-2004
GOST R 55025-2012

rated for 6, 10, 15, 20, and 35 kV

Cross-linked PE-insulated armored power cables with PE outer sheath with additional water-blocking elements.



APPLICATION

The cables are designed for transmission and distribution of electrical energy in stationary electrical installations for rated AC voltages of 6, 10, 15, 20, and 35 kV with a rated frequency of 50 Hz, with insulated or grounded neutral.
The cables are designed for burying in ground irrespectively of corrosiveness of soils.
It is allowed to lay the cables on air, including in cable structures, on a condition of provision of additional fire protection measures.
The cables are designed for laying in cable runs with no limits to elevation differences.

OPERATION GUIDELINES

Ambient operating temperature (C^0)	-60 to +50
Relative air humidity (at +35 C^0)	98%
Installation temperature, not lower than (C^0)	-20
Bending radius, not smaller than (OD)	12
Service life (yrs)	30
Guaranty period (yrs)	5

Analogues of N2XS(F)B2Y (N2XSE(F)B2Y), and NA2XS(F)B2Y (NA2XSE(F)B2Y).

CONSTRUCTION

No. of cores	Cross section (mm^2)
3	35 - 240 **6 kV**
	35 - 400 **10-35 kV**

Core – copper or aluminum, solid or stranded, round, compacted, for **"gzh"**-cables – with longitudinal sealing.
Conductor screen – cross-linkable conductive compound.
Insulation – cross-linked polyethylene.
Insulation screen – cross-linkable conductive compound.
Separating layer – conductive non-woven fabric, for **"gzh"** - cables – conductive water-blocking tape, for "**2g"** - cables – conductive water-blocking tape with aluminum-polymer tape.
Screen – copper wires fastened with copper tape.
Filling – PVC compound.
Armor padding – polyethylene.
Armor – galvanized steel tapes.
Sheath – polyethylene.

CERTIFICATES

Декларация о соответствии.

FIRE HAZARD CLASS

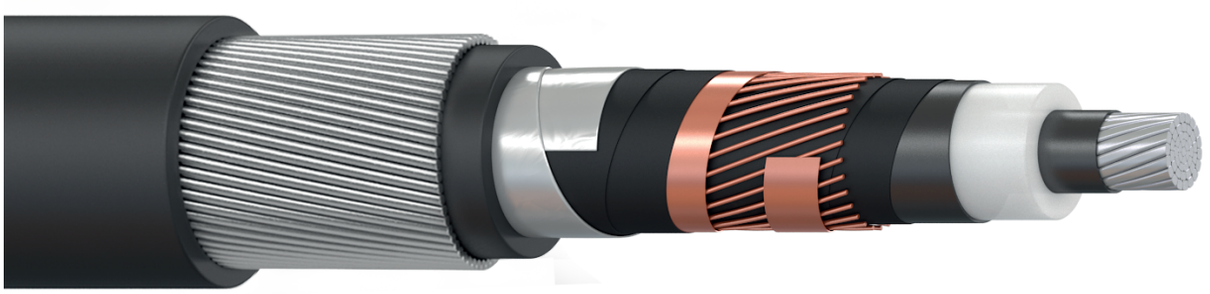
02.8.2.5.4.

PvKaP, PvKsP, PvKP, APvKaP, APvKsP, APvKP, PvKaPg, PvKsPg, PvKPg, APvKaPg, APvKsPg, APvKPg, PvKaPgzh, PvKsPgzh, PvKPgzh, APvKaPgzh, APvKsPgzh, APvKPgzh, PvKaP2g, PvKsP2g, PvKP2g, APvKaP2g, APvKsP2g, APvKP2g, PvKaP2gzh, PvKsP2gzh, PvKP2gzh, APvKaP2gzh, APvKsP2gzh, APvKP2gzh

TU 27.32.14-025-63976268-2017
GOST R 55025-2012

rated for 10, 15, 20, and 35 kV

Cross-linked PE-insulated and sheathed power cables armored with round wire armor, with additional water-blocking elements.



OPERATION GUIDELINES

Ambient operating temperature (C^0)	-60 to +50
Relative air humidity (at +35 C^0)	98%
Installation temperature, not lower than (C^0)	-20
Bending radius, not smaller than (OD) single wire stranded	 15 12
Service life (yrs)	30
Guaranty period (yrs)	5

CERTIFICATES
Declaration of compliance.

FIRE HAZARD CLASS
O2.8.2.5.4.

! Upon customer's request the cables can be made with a reinforced sheath. In this case the index **"u"** is added to the cable type denomination.

CONSTRUCTION

No. of cores	Cross section (mm²)
1; 3	35 - 1000

Core – copper or aluminum, solid or stranded, round or sector-shaped, compacted, for **"gzh"**-cables – with longitudinal sealing.
Conductor screen – cross-linkable conductive compound.
Insulation – cross-linked polyethylene.
Insulation screen – cross-linkable conductive compound.
Separating layer – conductive non-woven fabric, for **"gzh"**-cables – conductive water-blocking tape, for **"2g"**-cables – conductive water-blocking tape with aluminum-polymer tape.
Screen – copper wires fastened with copper tape.

Single-core and sector-shaped core cables

Separating layer – conductive non-woven fabric, for **"g"**- and **"gzh"**-cables – conductive water-blocking tape, for **"2g"** and **"2gzh"** - cables – conductive water-blocking tape with aluminum-polymer tape.
Armor padding – polyethylene.
Armor – wire armor, for **"Ks"** - type cables – aluminum alloy wires, for **"Ka"**-type cables – aluminum wires, for **"K"** -type cables (3-core only) – galvanized steel wires.
Sheath – high-density polyethylene, reinforced – for "u"-type cables.

Round-shaped core cables

Filling – PVC compound.
Separating layer – conductive non-woven fabric, for **"g"**- and **"gzh"**-cables – conductive water-blocking tape, for **"2g"** and **"2gzh"**-cables – conductive water-blocking tape with aluminum-polymer tape.
Armor padding – polyethylene.
Armor – wire armor, for **"Ks"**-type cables – aluminum alloy wires, for **"Ka"**-type cables – aluminum wires, for **"K"**-type cables (3-core only) – galvanized steel wires.
Sheath – high-density polyethylene, reinforced – for **"u"**-type cables.

APPLICATION

The cables are designed for transmission and distribution of electrical energy in stationary electrical installations for rated AC voltages of 10, 15, 20, and 35 kV with a rated frequency of 50 Hz, with insulated or grounded neutral.
The **PvKaP, APvKaP, PvKaPu, APvKaPu, PvKsP, APvKsP, PvKsPu, APvKsPu, PvKP, APvKP, PvKP, APvKP, PvPKu, APvKPu** cables are designed for burying in ground irrespectively of corrosiveness of soils.
It is allowed to lay the cables on air, including in cable structures, on a condition of provision of additional fire protection measures.

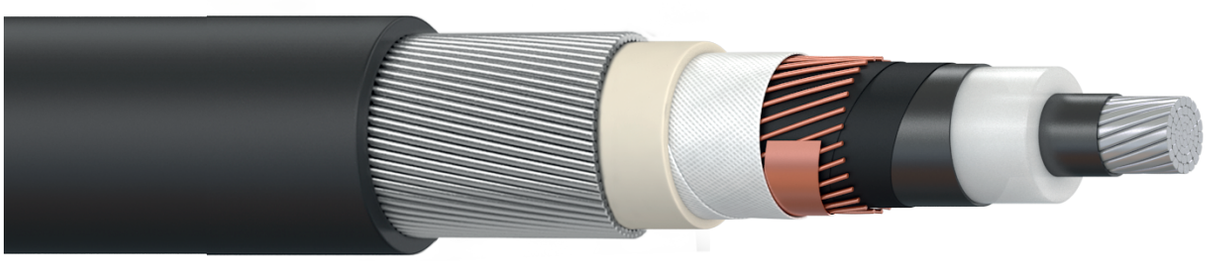
It is allowed to lay the sealed-type cables (**"g", "ug", "gzh", "ugzh", "2g", "u2g", "2gzh", "u2gzh"**) in non-navigational rivers and ponds on a condition of eliminating a possibility of mechanical damage to cable.

PvKaV, PvKsV, PvKV, APvKaV, APvKsV, APvKV, PvKaVng(A), PvKsVng(A), PvKVng(A), APvKaVng(A), PvKsVng(A), PvKVng(A), PvKaVng(A)-LS, PvKsVng(A)-LS, PvKVng(A)-LS, APvKaVng(A)-LS, APvKsVng(A)-LS, APvKVng(A)-LS

TU 27.32.14-025-63976268-2017
GOST R 55025-2012

rated for 10, 15, 20 and 35 kV

Cross-linked PE-insulated power cables armored with round wire armor, sheathed with a PVC compound (including reduced fire risk- and combustibility compounds).



OPERATION GUIDELINES

Ambient operating temperature (C^0)	-50 to +50
Relative air humidity (at +35 C^0)	98%
Installation temperature, not lower than (C^0)	-15
Bending radius, not smaller than (OD) single wire stranded	 15 12
Service life (yrs)	30
Guaranty period (yrs)	5

CERTIFICATES
Declaration of compliance.

FIRE HAZARD CLASS
O1.8.2.5.4 - **PvKav, PvKsV, PvKV, APvKaV, APvKsV, APvKV**
P1b.8.2.5.4 - **PvKaVng(A), PvKsVng(A), PvKVng(A), APvKaVng(A), APvKsVng(A), APvKVng(A)**
P1b.8.2.2.2 - **PvKaVng(A)-LS, PvKsVng(A)-LS, PvKVng(A)-LS, APvKaVng(A)-LS, PvKsVng(A)-LS, APvKVng(A)-LS**

CONSTRUCTION

No. of cores	Cross section (mm²)
1; 3	35 - 1000

Core – copper or aluminum, solid or stranded, round or sector-shaped, compacted.
Conductor screen – cross-linkable conductive compound.
Insulation – cross-linked polyethylene.
Insulation screen – cross-linkable conductive compound.
Separating layer – conductive polymer tape.
Screen – copper wires fastened with copper tape.

Single-core and sector-shaped core cables

Separating layer – conductive polymer tape, for **"ng(A)"-** and **"ng(A)-LS"**-cables – glass tape.
Armor padding – PVC compound; for **"ng(A)"**-cables – reduced combustibility PVC compound; for **"ng(A)-LS"**-cables – reduced fire-risk PVC compound.
Armor – wire armor, for **"Ks"**-type cables – aluminum alloy wires, for **"Ka"**-type cables – aluminum wires, for **"K"**-type cables (3-core cables only) – galvanized steel wires.
Sheath – PVC compound; for **"ng(A)"**-cables – reduced combustibility PVC compound; for **"ng(A)-LS"**-cables – reduced fire-risk PVC compound.

Round-shaped core cables

Filling – PVC compound; for **"ng(A)"**-cables – reduced combustibility PVC compound; for **"ng(A)-LS"**-cables – reduced fire-risk PVC compound.
Armor padding – PVC compound; for **"ng(A)"**-cables – reduced combustibility PVC compound; for **"ng(A)-LS"**-cables – reduced fire-risk PVC compound.
Armor – wire armor, for **"Ks"**-type cables – aluminum alloy wires, for **"Ka"**-type cables – aluminum wires, for **"K"**-type cables (3-core only) – galvanized steel wires.
Sheath – PVC compound; for **"ng(A)"**-cables – reduced combustibility PVC compound; for **"ng(A)-LS"** - cables – reduced fire-risk PVC compound.

APPLICATION

The cables are designed for transmission and distribution of electrical energy in stationary electrical installations for rated AC voltages of 10, 15, 20, and 35 kV with a rated frequency of 50 Hz, with insulated or grounded neutral.
The laying in dry soils (sand, sand-clay, and normal soils with humidity of not less than 14%) is allowed.
It is allowed to lay the cables on air, including in cable structures, on a condition of provision of additional fire protection measures.

Copper **"ng(A)-LS"**-cables can be installed in classes V-1 and V-1a explosive areas, and aluminum **"ng(A)-LS"** - cables can be installed in classes V-1b, V-1g, V-II, and V-IIa explosive areas.

PvKaV-HL, PvKsV-HL, PvKV-HL, APvKaV-HL, APvKsV-HL, APvKV-HL, PvKaVng(A)-HL, PvKsVng(A)-HL, PvKVng(A)-HL, APvKaVng(A)-HL, APvKsVng(A)-HL, APvKVng(A)-HL

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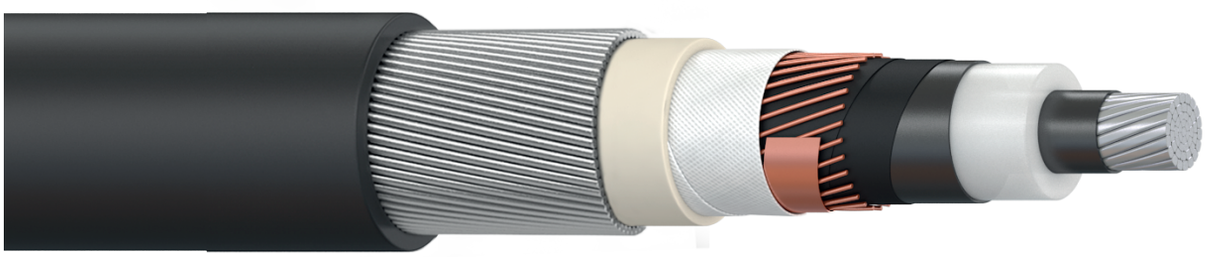
GOST R 55025-2012

rated for 10, 15, 20 and 35 kV

Cross-linked PE-insulated cold-resistant power cables armored with round wire armor, sheathed with a PVC compound (including reduced combustibility compounds).



APPLICATION

The cables are designed for transmission and distribution of electrical energy in stationary electrical installations for rated AC voltages of 10, 15, 20, and 35 kV with a rated frequency of 50 Hz, with insulated or grounded neutral.

The laying in dry soils (sand, sand-clay, and normal soils with humidity of not less than 14%) is allowed.

It is allowed to lay the cables on air, including in cable structures, on a condition of provision of additional fire protection measures.

CERTIFICATES

Declaration of compliance.

OPERATION GUIDELINES

Ambient operating temperature (C^0)	-60 to +50
Relative air humidity (at +35 C^0)	98%
Installation temperature, not lower than (C^0)	-20
Bending radius, not smaller than (OD) single wire stranded	 15 12
Service life (yrs)	30
Guaranty period (yrs)	5

FIRE HAZARD CLASS

O1.8.2.5.4 - **PvKaV-HL, PvKsV-HL, PvKV-HL, APvKaV-HL, APvKsV-HL, APvKV-HL**

P1b.8.2.5.4 - **PvKaVng(A)-HL, PvKsVng(A)-HL, PvKVng(A)-HL, APvKaVng(A)-HL, APvKsVng(A)-HL, APvKVng(A)-HL**

CONSTRUCTION

No. of cores	Cross section (mm²)
1; 3	35 - 1000

Core – copper or aluminum, solid or stranded, round or sector-shaped, compacted.
Conductor screen – cross-linkable conductive compound.
Insulation – cross-linked polyethylene.
Insulation screen – cross-linkable conductive compound.
Separating layer – conductive polymer tape.
Screen – copper wires fastened with copper tape.

Single-core and sector-shaped core cables

Separating layer – conductive polymer tape, for **"ng(A)-HL"**-cables – glass tape.
Armor padding – cold-resistant PVC compound; for **"ng(A)-HL"**-cables – cold-resistant reduced fire-risk PVC compound.
Armor – wire armor, for **"Ks"**-type cables – aluminum alloy wires, for **"Ka"**-type cables – aluminum wires, for **"K"**-type cables (3-core cables only) – galvanized steel wires.
Sheath – cold-resistant PVC compound; for **"ng(A)-HL"**-cables – cold-resistant reduced fire-risk PVC compound.

Round-shaped core cables

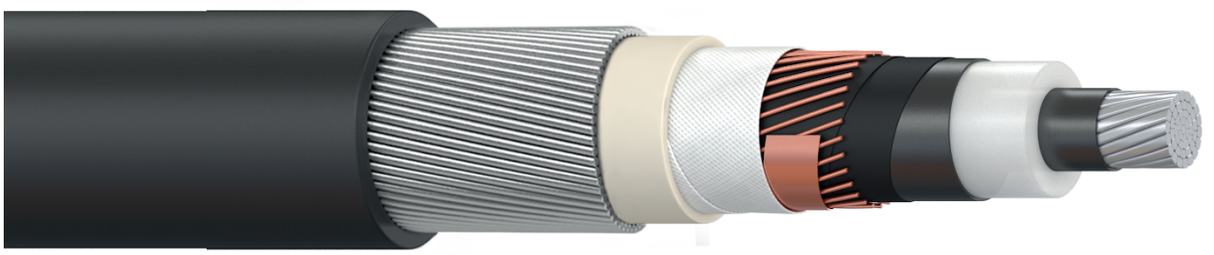
Filling – cold-resistant PVC compound; for **"ng(A)-HL"**-cables – cold-resistant reduced fire-risk PVC compound.
Armor padding – cold-resistant PVC compound; for **"ng(A)-HL"**-cables – cold-resistant reduced fire-risk PVC compound.
Armor – wire armor, for **"Ks"**-type cables – aluminum alloy wires, for **"Ka"**-type cables – aluminum wires, for **"K"**-type cables (3-core only) – galvanized steel wires.
Sheath – cold-resistant PVC compound; for **"ng(A)-HL"**-cables – cold-resistant reduced fire-risk PVC compound.

PvKaPng(A)-HF, PvKsPng(A)-HF, PvKPng(A)-HF, APvKaPng(A)-HF, APvKsPng(A)-HF, APvKPng(A)-HF

TU 27.32.14-025-63976268-2017
GOST R 55025-2012

rated for 10, 15, 20 and 35 kV

Cross-linked PE-insulated power cables armored with round wire armor and sheathed with a halogen-free compound.



APPLICATION

The cables are designed for transmission and distribution of electrical energy in stationary electrical installations for rated AC voltages of 10, 15, 20 and 35 kV with a rated frequency of 50 Hz, with insulated or grounded neutral.

The laying in dry soils (sand, sand-clay, and normal soils with humidity of not less than 14%) is allowed.

It is allowed to lay the cables on air, including in cable structures, on a condition of provision of additional fire protection measures.

Copper cables can be installed in classes V-1 and V-1a explosive areas, and aluminum cables can be installed in classes V-1b, V-1g, V-II, and V-IIa explosive areas.

OPERATION GUIDELINES

Ambient operating temperature (C^0)	-50 to +50
Relative air humidity (at +35 C^0)	98%
Installation temperature, not lower than (C^0)	-15
Bending radius, not smaller than (OD) single wire stranded	 15 12
Service life (yrs)	30
Guaranty period (yrs)	5

CERTIFICATES

Declaration of compliance.

FIRE HAZARD CLASS

P1b.8.1.2.1.

CONSTRUCTION

No. of cores	Cross section (mm²)
1; 3	35 - 1000

Core – copper or aluminum, solid or stranded, round or sector-shaped, compacted.
Conductor screen – cross-linkable conductive compound.
Insulation – cross-linked polyethylene.
Insulation screen – cross-linkable conductive compound.
Separating layer – conductive polymer tape.
Screen – copper wires fastened with copper tape.

Single-core and sector-shaped core cables

Separating layer – glass tape.
Armor padding – halogen-free compound.
Armor – wire armor, for **"Ks"**-type cables – aluminum alloy wires, for **"Ka"**-type cables – aluminum wires, for **"K"**-type cables (3-core only) – galvanized steel wires.
Sheath – halogen-free compound.

Round-shaped core cables

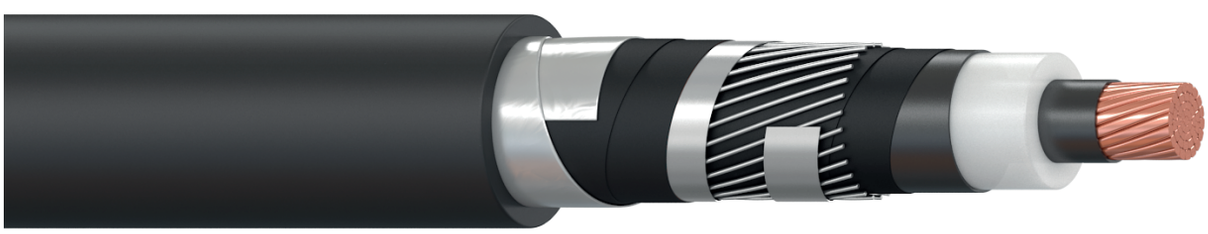
Filling – halogen-free compound.
Armor padding – halogen-free compound.
Armor – wire armor, for **"Ks"**-type cables – aluminum alloy wires, for **"Ka"**-type cables – aluminum wires, for **"K"**-type cables (3-core only) – galvanized steel wires.
Sheath – halogen-free compound.

PvEaP, APvEaP, PvEaPg, APvEaPg, PvEaPgzh, APvEaPgzh, PvEaP2g, APvEaP2g, PvEaP2gzh, APvEaP2gzh, PvEaBP, PvEaBPg, APvEaBPg, APvEaBP, PvEaBPgzh, APvEaBPgzh, PvEaBP2g, APvEaBP2g

TU 27.32.14-027-63976268-2017
GOST R 55025-2012

rated for 10, 15, 20, and 35 kV

Cross-linked PE-insulated and sheathed power cables with an aluminum wire screen, including cables with additional water-blocking elements, and armored cables.



OPERATION GUIDELINES

Ambient operating temperature (C^0)	-60 to +50
Relative air humidity (at +35 C^0)	98%
Installation temperature, not lower than (C^0)	-20
Bending radius, not smaller than (OD) single wire stranded	 15 12
Service life (yrs)	30
Guaranty period (yrs)	5

CERTIFICATES
Declaration of compliance.

FIRE HAZARD CLASS
02.8.2.5.4.

! The stock of the wire screen is agreed prior to placing the order. If the heat-resistant aluminum-alloy is used, the cable is marked with **AT1** or **TAS** index. In case if the **TAS** index is used, the **Ea** denomination is removed from the marking.

! Upon customer's request a distributed fiber-optic temperature sensor can be built in the copper wire screen.

! Upon customer's request the cables can be made with a reinforced sheath. In this case the index **"u"** is added to the cable type denomination.

CONSTRUCTION

No. of cores	Cross section (mm²)
1; 3	35 - 1000
3 (armored)	35 - 400

Core – copper or aluminum, solid or stranded, round or sector-shaped, compacted, for **"gzh"**-cables – with longitudinal sealing.
Conductor screen – cross-linkable conductive compound.
Insulation – cross-linked polyethylene.
Insulation screen – cross-linkable conductive compound.
Separating layer – conductive polymer tape; for sealed cables – conductive water-blocking tape.
Screen – aluminum wires fastened with aluminum tape.

Single-core and sector-shaped core cables

Separating layer – conductive non-woven fabric, for **"g"**- and **"gzh"**-cables – conductive water-blocking tape, for **"2g"** and **"2gzh"**-cables – conductive water-blocking tape with aluminum-polymer tape.
Armor padding – for **"B"**-type cables – polyethylene.
Armor – for **"B"**-type cables – galvanized steel tapes.
Sheath – high-density polyethylene, reinforced – for **"u"**-type cables.

Round-shaped core cables

Filling – PVC compound.
Separating layer (for sealed cables) – conductive non-woven fabric, for "g"- and "gzh"-cables – conductive water-blocking tape, for "2g" and "2gzh"-cables – conductive water-blocking tape with aluminum-polymer tape.
Armor padding – for "B"-type cables – polyethylene.
Armor – for **"B"**-type cables – galvanized steel tapes.
Sheath – high-density polyethylene, reinforced – for **"u"**-type cables.

APPLICATION

The cables are designed for transmission and distribution of electrical energy in stationary electrical installations for rated AC voltages of 10, 15, 20 and 35 kV with a rated frequency of 50 Hz, with insulated or grounded neutral.
The **PvEaP, APvEaP, PvEaPu, APvEaPu, PvPu, APvPu, PvEaBP, APvEaBP** cables are designed for burying in ground irrespectively of corrosiveness of soils.
It is allowed to lay the cables on air, including in cable structures, on a condition of provision of additional fire protection measures.

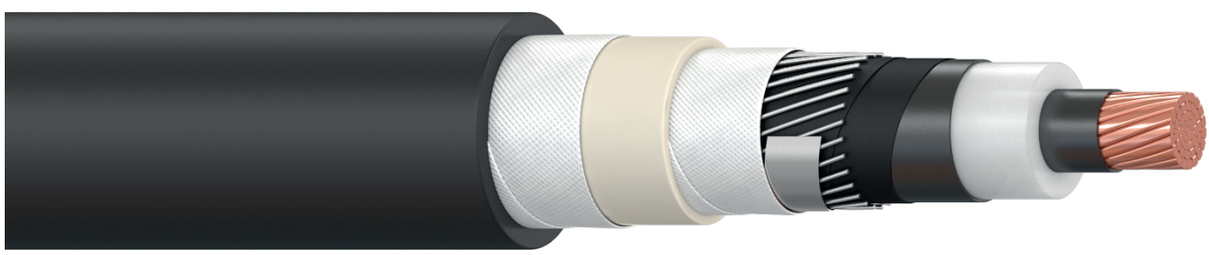
It is allowed to lay the sealed-type cables (**"g", "ug", "gzh", "ugzh", "2g", "u2g", "2gzh", "u2gzh"**) in non-navigational rivers and ponds on a condition of eliminating a possibility of mechanical damage to cable.

PvEaV, APvEaV, PvEaVng(A), APvEaVng(A), PvEaVng(A)-LS, APvEaVng(A)-LS, PvEaBV, APvEaBV, PvEaBVng(A), APvEaBVng(A), PvEaBVng(A)-LS, APvEaBVng(A)-LS

TU 27.32.14-027-63976268-2017
GOST R 55025-2012

rated for 10, 15, 20 and 35 kV

Cross-linked PE-insulated power cables with an aluminum wire screen, sheathed with a PVC compound (including reduced fire risk compounds), and armored cables.



OPERATION GUIDELINES

Ambient operating temperature (C^0)	-50 to +50
Relative air humidity (at +35 C^0)	98%
Installation temperature, not lower than (C^0)	-15
Bending radius, not smaller than (OD) single wire stranded	 15 12
Service life (yrs)	30
Guaranty period (yrs)	5

CERTIFICATES
Declaration of compliance.

! The stock of the wire screen is agreed prior to placing the order. If the heat-resistant aluminum-alloy is used, the cable is marked with **AT1** or **TAS** index. In case if the **TAS** index is used, the **Ea** denomination is removed from the marking.

! Upon customer's request a distributed fiber-optic temperature sensor can be built in the copper wire screen.

FIRE HAZARD CLASS

01.8.2.5.4 - **PvEaV, APvEaV, PvEaBV, APvEaBV**

01b.8.2.5.4 - **PvEaVng(A), APvEaVng(A), PvEaBVng(A), APvEaVng(A), PvEaVng(A)-LS, APvEaVng(A)-LS, PvEaBVng(A)-LS, APvEaBVng(A)-LS**

CONSTRUCTION

No. of cores	Cross section (mm^2)
1; 3	35 - 1000
3 (armored)	35 - 400

Core – copper or aluminum, solid or stranded, round or sector-shaped, compacted.
Conductor screen – cross-linkable conductive compound.
Insulation – cross-linked polyethylene.
Insulation screen – cross-linkable conductive compound.
Separating layer – conductive polymer tape.
Screen – aluminum wires fastened with aluminum tape.

Single-core and sector-shaped core cables

Separating layer – non-woven tape, for "ng(A)-LS"-cables – glass tape.
Inner sheath – for "ng(A)-LS"-cables – reduced fire-risk PVC compound.
Thermal barrier – for "ng(A)-LS"-cables – glass tape.
Armor padding (for **"B"**-cables) – PVC compound; for **"ng(A)"**-cables – reduced combustibility PVC compound; for **"ng(A)-LS"**-cables – reduced fire-risk PVC compound.
Armor (for **"B"**-cables) – galvanized steel tapes.
Sheath – PVC compound; for **"ng(A)"**-cables – reduced combustibility PVC compound; for **"ng(A)-LS"**-cables – reduced fire-risk PVC compound.

Round-shaped core cables

Inner sheath – PVC compound; for **"ng(A)"**-cables – reduced combustibility PVC compound; for **"ng(A)-LS"**-cables – reduced fire-risk PVC compound.
Armor padding (for **"B"**-cables) – PVC compound; for **"ng(A)"**-cables – reduced combustibility PVC compound; for **"ng(A)-LS"**-cables – reduced fire-risk PVC compound.
Armor (for **"B"**-cables) – galvanized steel tapes.
Sheath – PVC compound; for **"ng(A)"**-cables – reduced combustibility PVC compound; for **"ng(A)-LS"**-cables – reduced fire-risk PVC compound.

APPLICATION

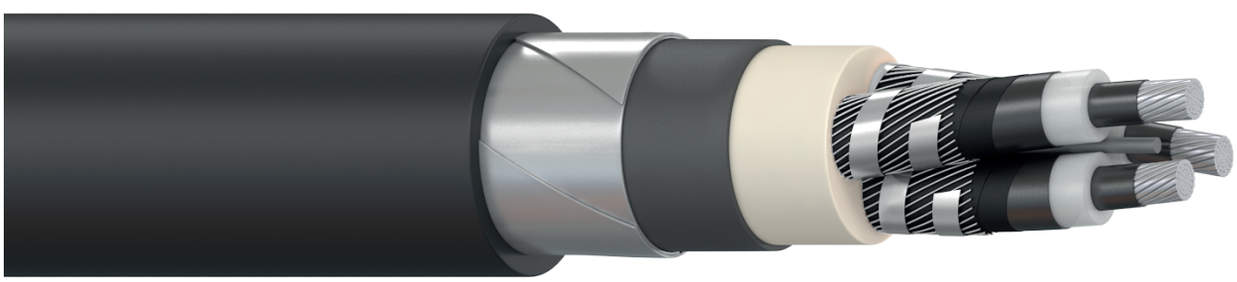
The cables are designed for transmission and distribution of electrical energy in stationary electrical installations for rated AC voltages of 10, 15, 20, and 35 kV with a rated frequency of 50 Hz, with insulated or grounded neutral.
The laying in dry soils (sand, sand-clay, and normal soils with humidity of not less than 14%) is allowed.
It is allowed to lay the cables on air, including in cable structures, on a condition of provision of additional fire protection measures.
Copper **"ng(A)-LS"**-cables can be installed in classes V-1 and V-1a explosive areas, and aluminum **"ng(A)-LS"**-cables can be installed in classes V-1b, V-1g, V-II, and V-IIa explosive areas.

PvEaPng(A)-HF, APvEaPng(A)-HF, PvEaPu2gng(A)-HF, APvEaPu2gng, PvEaPu2gng(B)-HF, APvEaPu2gng(B)-HF, PvEaBPng(A)-HF, APvEaBPng(A)-HF

TU 27.32.14-027-63976268-2017
GOST R 55025-2012

rated for 10, 15, 20 and 35 kV

Cross-linked PE-insulated power cables with an aluminum wire screen and sheathed with a halogen-free compound, including cables with additional water-blocking elements, and armored cables.



OPERATION GUIDELINES

Ambient operating temperature (C^0)	-50 to +50
Relative air humidity (at +35 C^0)	98%
Installation temperature, not lower than (C^0)	-15
Bending radius, not smaller than (OD) single wire stranded	 15 12
Service life (yrs)	30
Guaranty period (yrs)	5

CERTIFICATES

Declaration of compliance.

FIRE HAZARD CLASS

P1b.8.1.2.1 - **PvEaPng(A)-HF, APvEaPng(A)-HF, PvEaPu2gng(A)-HF, APvEaPu2gng(A)-HF, PvEaBPng(A)-HF, APvEaBPng(A)-HF**

P2.8.1.2.1 - **PvEaPu2gng(B)-HF, APvEaPu2gng(B)-HF**

! The stock of the wire screen is agreed prior to placing the order. If the heat-resistant aluminum-alloy is used, the cable is marked with **AT1** or **TAS** index. In case if the **TAS** index is used, the **Ea** denomination is removed from the marking

! Upon customer's request a distributed fiber-optic temperature sensor can be built in the copper wire screen.

CONSTRUCTION

No. of cores	Cross section (mm^2)
1; 3	35 - 1000
3 (armored)	35 - 400

Core – copper or aluminum, solid or stranded, round or sector-shaped, compacted.
Conductor screen – cross-linkable conductive compound.
Insulation – cross-linked polyethylene.
Insulation screen – cross-linkable conductive compound.
Separating layer – conductive polymer tape.
Screen – copper wires fastened with copper tape.

Single-core and sector-shaped core cables

Separating layer – glass tape.
Inner sheath – (for **PvEaPng(A)-HF, APvEaPng(A)-HF, PvEaPu2gng(A)-HF, APvEaPu2gng(A)-HF**) – halogen-free compound.
Thermal barrier – (for **PvEaPng(A)-HF, APvEaPng(A)-HF**) – glass tape.
Separating layer – (for **"2g"**-type cables) – conductive water-blocking tape and aluminum-polymer tape.
Armor padding (for **"B"**-cables) – halogen-free compound.**Armor** (for **"B"**-cables) – galvanized steel tapes.
Sheath – halogen-free compound.

Round-shaped core cables

Filling – halogen-free compound.
Armor padding (for **"B"**-cables) – halogen-free compound.
Armor (for **"B"**-cables) – galvanized steel tapes.
Sheath – halogen-free compound.

APPLICATION

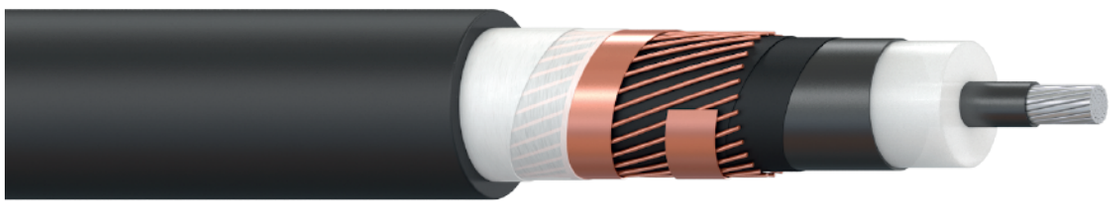
The cables are designed for transmission and distribution of electrical energy in stationary electrical installations for rated AC voltages of 10, 15, 20, and 35 kV with a rated frequency of 50 Hz, with insulated or grounded neutral.
The laying in dry soils (sand, sand-clay, and normal soils with humidity of not less than 14%) is allowed.
The cables are designed for laying in cable runs with no limits to elevation differences, including vertical cable runs.
It is allowed to lay the cables on air, including in cable structures, on a condition of provision of additional fire protection measures.
Copper "**ng(A)-HF**"-marked cables can be installed in classes V-1 and V-1a explosive areas, and aluminum **"ng(A)-HF"**-marked cables can be installed in classes V-1b, V-1g, V-II, and V-IIa explosive areas.

PvPg, APvPg

TU 16-705-495-2006
GOST RMEK 60840-2011

rated for 64/110 kV

Cross-linked PE-insulated copper- and aluminum power cables with a high-density PE outer sheath, with additional water-blocking elements.



APPLICATION

The cables are designed for transmission and distribution of electrical energy in 3-phase networks for a rated AC voltage of 64/110 kV and a maximum operating voltage of 126 kV with a rated frequency of 50 Hz.
The cables are designed for laying in cable runs with no limits to elevation differences.
The cables are designed for burying in ground irrespectively of corrosiveness of soils.
It is allowed to lay the cables on air, including in cable structures, on a condition of provision of additional fire protection measures.

OPERATION GUIDELINES

Ambient operating temperature (C^0)	-60 to +50
Relative air humidity (at +35 C^0)	98%
Installation temperature, not lower than (C^0)	-20
Bending radius, not smaller than (OD)	15
Service life (yrs)	30
Guaranty period (yrs)	5

CONSTRUCTION

No. of cores	Cross section (mm^2)
1	185 - 2000

Core – copper or aluminum, stranded, round, compacted.
Conductor screen – cross-linkable conductive compound.
Insulation – cross-linked polyethylene.
Insulation screen – cross-linkable conductive compound.
Separating layer – conductive water-blocking tape.
Screen – copper wires fastened with copper tape.
Separating layer – water-blocking tape.
Sheath – high-density polyethylene.

FIRE HAZARD CLASS

01.8.2.5.4.

! Upon customer's request cable conductors can be made with longitudinal sealing, in this case the cable is marked with **"gzh"** index.

! Upon customer's request a distributed fiber-optic temperature sensor can be built in the copper wire screen.

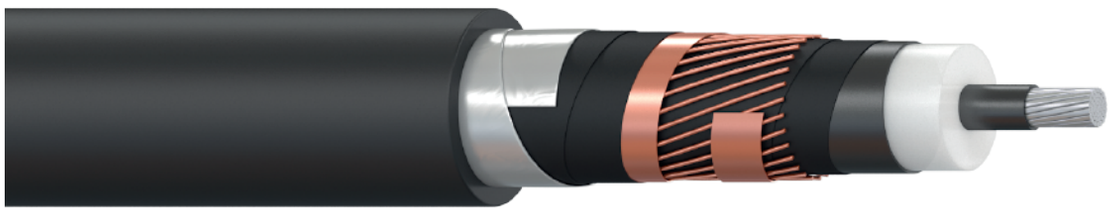
Analogues of N2XS(F)2Y and NA2XS(F)2Y, respectively.

PvP2g, APvP2g

TU 16-705-495-2006
GOST RMEK 60840-2011

rated for 64/110 kV

Cross-linked PE-insulated copper- and aluminum power cables with a high-density PE outer sheath, with additional water-blocking elements.



APPLICATION

The cables are designed for transmission and distribution of electrical energy in 3-phase networks for a rated AC voltage of 64/110 kV and a maximum operating voltage of 126 kV with a rated frequency of 50 Hz.
The cables are designed for laying in cable runs with no limits to elevation differences.
The cables are designed for burying in ground irrespectively of corrosiveness of soils, and in non-navigational waters on a condition of eliminating risks of mechanical damage to cables.
It is allowed to lay the cables on air, including in cable structures, on a condition of provision of additional fire protection measures.

CONSTRUCTION

No. of cores	Cross section (mm^2)
1	185 - 2000

Core – copper or aluminum, stranded, round, compacted.
Conductor screen – cross-linkable conductive compound.
Insulation – cross-linked polyethylene.
Insulation screen – cross-linkable conductive compound.
Separating layer – conductive water-blocking tape.
Screen – copper wires fastened with copper tape.
Separating layer – water-blocking tape and aluminum-polymer tape.
Sheath – high-density polyethylene.

OPERATION GUIDELINES

Ambient operating temperature (C^0)	-60 to +50
Relative air humidity (at +35 C^0)	98%
Installation temperature, not lower than (C^0)	-20
Bending radius, not smaller than (OD)	15
Service life (yrs)	30
Guaranty period (yrs)	5

FIRE HAZARD CLASS

01.8.2.5.4.

! Upon customer's request cable conductors can be made with longitudinal sealing, in this case the cable is marked with **"gzh"** index.

! Upon customer's request a distributed fiber-optic temperature sensor can be built in the copper wire screen.

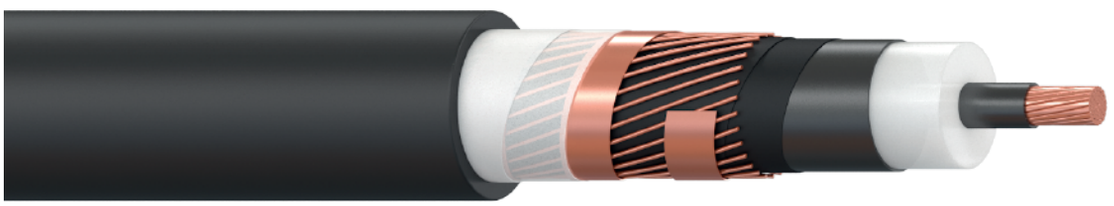
Analogues of N2XS(F)2Y and NA2XS(F)2Y, respectively.

PvV, APvV, PvVng(A), APvVng(A)

TU 16-705-495-2006
GOST RMEK 60840-2011

rated for 64/110 kV

Cross-linked PE-insulated copper- and aluminum power cables with a PVC outer sheath, including flame-retardant cables.



APPLICATION

The cables are designed for transmission and distribution of electrical energy in 3-phase networks for a rated AC voltage of 64/110 kV and a maximum operating voltage of 126 kV with a rated frequency of 50 Hz.
The cables are designed for laying in cable runs with no limits to elevation differences.
The laying in dry soils (sand, sand-clay, and normal soils with humidity of not less than 14%) is allowed.

OPERATION GUIDELINES

Ambient operating temperature (C^0)	-50 to +50
Relative air humidity (at +35 C^0)	98%
Installation temperature, not lower than (C^0)	-15
Bending radius, not smaller than (OD)	15
Service life (yrs)	30
Guaranty period (yrs)	5

FIRE HAZARD CLASS

O1.8.2.5.4 - **PvV, APvV.**
P1b.8.2.5.4 - **PvVng(A), APvVng(A).**

CONSTRUCTION

No. of cores	Cross section (mm^2)
1	185 - 2000

Core – copper or aluminum, stranded, round, compacted.
Conductor screen – cross-linkable conductive compound.
Insulation – cross-linked polyethylene.
Insulation screen – cross-linkable conductive compound.
Separating layer – conductive paper tape or conductive non-woven tape.
Screen – copper wires fastened with copper tape.
Separating layer (for **PvV** and **APvV** cables) – polymer tape.
Inner sheath (for **PvVng(A)** and **APvVng(A)** cables) – reduced combustibility PVC compound.
Sheath – PVC compound; for **"ng(A)"**-cables – reduced combustibility PVC compound.

! Upon customer's request a distributed fiber-optic temperature sensor can be built in the copper wire screen.

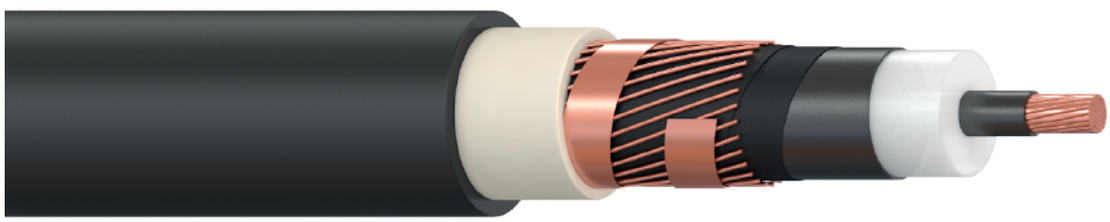
Analogues of N2XSY, NA2XSY, flame-retardant N2XSY, and NA2XSY, respectively.

PvPng(A)-HF, APvPng(A)-HF

TU 16-705-495-2006
GOST RMEK 60840-2011

rated for 64/110 kV

Cross-linked PE-insulated copper- and aluminum power cables sheathed with a halogen-free compound.



APPLICATION

The cables are designed for transmission and distribution of electrical energy in 3-phase networks for a rated AC voltage of 64/110 kV and a maximum operating voltage of 126 kV with a rated frequency of 50 Hz.
The cables are designed for laying in cable runs with no limits to elevation differences.
The laying in dry soils (sand, sand-clay, and normal soils with humidity of not less than 14%) is allowed.

OPERATION GUIDELINES

Ambient operating temperature (C^0)	-60 to +50
Relative air humidity (at +35 C^0)	98%
Installation temperature, not lower than (C^0)	-20
Bending radius, not smaller than (OD)	15
Service life (yrs)	30
Guaranty period (yrs)	5

CONSTRUCTION

No. of cores	Cross section (mm^2)
1	185 - 2000

Core – copper or aluminum, stranded, round, compacted.
Conductor screen – cross-linkable conductive compound.
Insulation – cross-linked polyethylene.
Insulation screen – cross-linkable conductive compound.
Separating layer – conductive paper tape or conductive non-woven tape.
Screen – copper wires fastened with copper tape.
Inner sheath – halogen-free compound.
Sheath – halogen-free compound.

FIRE HAZARD CLASS

P1b.8.1.2.1.

! Upon customer's request a distributed fiber-optic temperature sensor can be built in the copper wire screen.

Analogues of NHXH and NAHXH, respectively.

CONDUCTORS

for overhead power lines.

Innovative solutions for modern electric power industry

AAC

GOST 839-80

uninsulated aluminum conductor

APPLICATION

Mainly in atmosphere of type I and II air where the concentration of sulfur dioxide does not exceed 150 mg/m^2*day (1.5 mg/m^3), on the land of all macro-climatic regions according to GOST 15150 UHL, excluding TV and TS.

CONSTRUCTION

The conductor is made of uninsulated aluminum wires.

CERTIFICATES

Certificate of compliance.

OPERATIONAL GUIDELINES

Long term operation conductor temperature, not higher than (°C)	+90
Service life (yrs)	45

ACSR

GOST 839-80

uninsulated aluminum conductor with a core made of steel wires

APPLICATION

Mainly in atmosphere of type I and II air where the concentration of sulfur dioxide does not exceed 150 mg/m^2*day (1.5 mg/m^3), on the land of all macro-climatic regions according to GOST 15150 UHL, excluding TV and TS.

CONSTRUCTION

The conductor is made of uninsulated aluminum wires with a core made of steel wires.

CERTIFICATES

Certificate of compliance.

OPERATIONAL GUIDELINES

Long term operation conductor temperature, not higher than (°C)	+90
Service life (yrs)	45

ACSR/AS

TU 3511-005-63976268-2010

uninsulated aluminum conductor with a core made of aluminum-clad steel wires

APPLICATION

Mainly in atmosphere of type I and II air where the concentration of sulfur dioxide does not exceed 150 mg/m^2*day (1.5 mg/m^3), on the land of all macro-climatic regions according to GOST 15150 UHL, excluding TV and TS.

CONSTRUCTION

The conductor is made of uninsulated aluminum wires with a core made of aluminum-clad steel wires.

CERTIFICATES

Certificate of compliance.

OPERATIONAL GUIDELINES

Long term operation conductor temperature, not higher than (°C)	+90
Service life (yrs)	50

DESIGN PARAMETERS OF ACSR/AS AND TACSR/AS CONDUCTORS

Nominal cross section, mm^2	Cross section of aluminum alloy / aluminum-clad steel wires, mm^2	Conductor diameter, mm	Conductor core diameter, mm	DC current resistance of the conductor at 20 °C, not higher than, Ohm/km	Tensile strength, not lower than, N	Conductor weight, kg/km
70/72	68.4/72.2	15.4	11	0.3143	98200	667.0
120/19	117.5/18.8	15.15	5.55	0.2362	42457	449.0
120/27	114/26.6	15.4	6.6	0.2381	51186	490.0
150/19	147.6/18.8	16.75	5.55	0.19	47098	531.0
150/24	148.7/24.2	17.1	6.3	0.1803	53752	570.0
150/34	147/34.3	17.5	7.5	0.1846	66003	632.0
185/24	186.9/24.2	18.9	6.3	0.15	59352	675.0
185/29	181.2/29	18.8	6.9	0.1532	64218	692.0
240/32	244/31.65	21.6	7.2	0.1148	77522	881.8
240/39	235.8/38.6	21.55	7.95	0.1176	84506	905.3
300/39	301.4/38.6	24	8	0.09304	94213	1085.7
330/30	334.6/29	24.8	6.9	0.0849	89081	1116.2
330/43	332/43	25.2	8.4	0.0848	106789	1203.5
400/51	394/51	27.5	9.15	0.07124	125180	1427.4
500/64	490/63.5	30.6	10.2	0.574	154262	1773.5
700/86	687/86	36.2	12.0	0.04099	214444	2470.5
800/105	821/105	39.7	13.25	0.03431	257215	2956.8
1000/56	1003.2/56.3	42.4	9.6	0.02871	226995	3144.1

Remarks: in case if a customer requires a construction of the conductor not present in the specification, the manufacturer will calculate the outer diameter of the conductor, weight, its physical and mechanical properties. In this case the developed construction will meet the requirements of the present technical specification and the customer, and will have a unique number.

TACSR/AS

TU 3511-005-63976268-2010

uninsulated temperature-resistant aluminum alloy conductor with a core made of aluminum-clad steel wires

APPLICATION

Mainly in atmosphere of type I and II air where the concentration of sulfur dioxide does not exceed 150 mg/m^2*day (1.5 mg/m^3), on the land of all macro-climatic regions according to GOST 15150 UHL, excluding TV and TS.

CONSTRUCTION

The conductor is made of uninsulated temperature-resistant aluminum alloy wires with a core made of aluminum-clad steel wires.

CERTIFICATES

Certificate of compliance.
Approval of PJSC Rosseti.

OPERATIONAL GUIDELINES

Long term operation conductor temperature, not higher than (°C)	+150
Service life (yrs)	50

ADVANTAGES of using ACSR/AS and TACSR/AS conductors

According to the regulation of PJSC Rosseti "On a unified technical policy in the power grid complex" (item 9.6.1) corrosion-resistant conductors with aluminum-clad steel cores must be used near the coastal zone of the seas and contaminated industrial zones.

ACSR/AS and TACSR/AS conductors posses improved corrosion-resistant properties, comparing to the conventional ACSR conductors, due to aluminum cladding applied to the steel core giving it a reliable protection in aggressive environments.

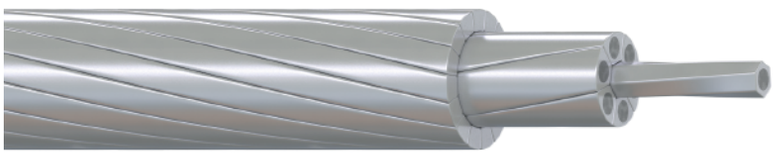
ADVANTAGES of TACSR/AS conductors

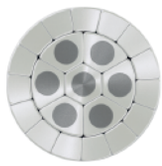
- Contrary to aluminum wires which are annealed and loose its mechanical strength at 90°C, aluminum-zirconium alloy wires retain its properties up to 150 °C with peak temperatures of up to 180°C.
- Twofold increase of current-carrying capacity of the line with the same cross section of the conductors.
- Simplified ice-melting.
- Low sag.
- Reduced load on power line towers.
- TACSR/AS conductors can be installed in both conventional and helical fittings.
- TACSR/AS conductors can be installed in existing electric transmission line systems, greatly reducing the upgrade costs.

ACSR/TW

TU 3511-019-63976268-2016

uninsulated compacted aluminum conductor with aluminum-clad steel core





APPLICATION

Mainly in atmosphere of type I and II air where the concentration of sulfur dioxide does not exceed 150 mg/m^2*day (1.5 mg/m^3), on the land of all macro-climatic regions according to GOST 15150 UHL.

CONSTRUCTION

The conductor is made of uninsulated temperature-resistant aluminum alloy wires with a core made of aluminum-clad steel wires.

CERTIFICATES

Certificate of compliance.
Approval of PJSC Rosseti.

OPERATIONAL GUIDELINES

Long term operation conductor temperature, not higher than (°C)	+90
Service life (yrs)	50

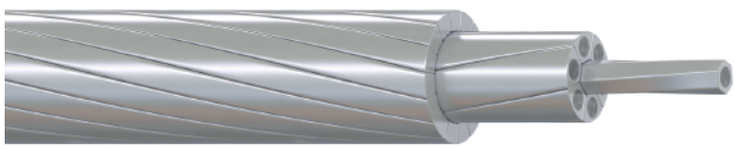
DESIGN PARAMETERS OF ACSR/TW AS AND TACSR/TW AS CONDUCTORS

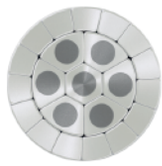
Nominal cross section, mm^2	Conductor core diameter, mm	Conductor diameter, mm	DC current resistance of the conductor at 20 °C, not higher than, Ohm/km	Conductor weight, kg/km
120/19	8.2	13.8	0.2421	478
120/24	9.4	14.0	0.2500	515
120/27	9.7	14.4	0.2411	536
150/19	8.2	15.5	0.1928	561
150/27	9.7	15.5	0.1973	616
150/34	11.1	16.2	0.1911	677
185/29	10.2	17.0	0.1565	730
185/43	12.3	17.6	0.1531	848
240/32	10.5	19.3	0.1180	898
240/39	11.5	19.5	0.1185	955
240/56	14.3	20.0	0.1184	1087
300/39	11.5	21.7	0.0948	1116
300/43	12.3	21.8	0.0945	1178
300/66	15.2	21.9	0.0983	1319
300/67	15.4	22.5	0.0985	1330
330/43	12.3	22.6	0.0877	1228
400/51	13.5	24.8	0.0726	1477
400/67	15.4	25.2	0.0695	1643
450/93	18.2	27,1	0.0632	1968
500/67	15.4	27.4	0.0583	1858
500/93	18.2	28.1	0.0565	2115
550/72	16.1	29.0	0.0528	2046
600/72	16.8	30.5	0.0472	2237

TACSR/TW AS

TU 3511-019-63976268-2016

uninsulated compacted temperature-resistant aluminum alloy conductor with a core made of aluminum-clad steel wires





APPLICATION

Mainly in atmosphere of type I and II air where the concentration of sulfur dioxide does not exceed 150 mg/m^2*day (1.5 mg/m^3), on the land of all macro-climatic regions according to GOST 15150 UHL.

CONSTRUCTION

The conductor is made of uninsulated temperature-resistant aluminum alloy wires with a core made of aluminum-clad steel wires.

CERTIFICATES

Certificate of compliance.
Approval of PJSC Rosseti.

OPERATIONAL GUIDELINES

Long term operation conductor temperature, not higher than (°C)	+150
Service life (yrs)	50

ADVANTAGES of using ACSR/TW and TACSR/TW conductors

According to the regulation of PJSC Rosseti "On a unified technical policy in the power grid complex" (item 9.6.1) it is recommended to use low aerodynamic resistance-, corrosion-resistant, and ice- and wind-resistant uninsulated conductors in high-voltage overhead electric transmission lines.

ACSR/TW and TACSR/TW conductors posses the above mentioned advantages due to its smaller diameter and more smooth surface, comparing to the conventional ACSR conductors. Additionally the ACSR/TW and TACSR/TW conductors have improved corrosion-resistance, due to aluminum cladding applied to the steel core giving it a reliable protection in aggressive environments.

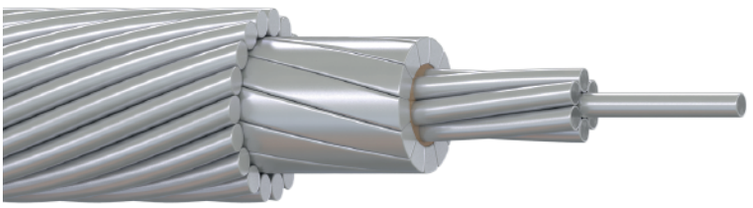
ADVANTAGES of TACSR/TW conductors

- Contrary to aluminum wires which are annealed and loose its mechanical strength at 90°C, aluminum-zirconium alloy wires retain its properties up to 150 °C with peak temperatures of up to 180°C.
- Use of compacted wires in the construction of ACSR/TW conductors provides it with a smooth surface, reducing its aerodynamic resistance, ice- and snow retention, thus reducing the wind- and ice load of conductors.
- Twofold increase of current-carrying capacity of the line with the same cross section of the conductors.
- Simplified ice-melting.
- Low sag.
- Reduced load on power line towers.
- TACSR/TW conductors can be installed in existing electric transmission line systems, greatly reducing the upgrade costs.

GTACSR/AS

TU 3511-005-63976268-2010

uninsulated temperature-resistant aluminum alloy conductor with a core made of aluminum-clad steel wires, with a gap and increased operational temperature



APPLICATION

Mainly in atmosphere of type I and II air where the concentration of sulfur dioxide does not exceed 150 mg/m^2*day (1,5 mg/m^3), on the land of all macro-climatic regions according to GOST 15150 UHL.

OPERATIONAL GUIDELINES

Long term operation conductor temperature, not higher than (°C)	+150
Service life (yrs)	50

CONSTRUCTION

The conductor is made of uninsulated temperature-resistant aluminum alloy wires with a core made of aluminum-clad steel wires. The first layer from the center of the conductor is made of trapezoid wire and is separated from the core with a circular gap. The core of the conductor and the gap is filled with high-temperature resistant grease along the full length of the conductor.

CERTIFICATES

Certificate of compliance.

DESIGN PARAMETERS OF GTACSR/AS CONDUCTORS

Nominal cross section, mm^2	Cross section of aluminum alloy/ aluminum-clad steel wires, mm^2	Conductor diameter, mm	DC current resistance of the conductor at 20 °C, not higher than, Ohm/km	Tensile strength, not lower than, N	Current, A*		Conductor weight, kg/km
					150°C	230°C	
116/15	116.20/15.33	14.70	0.2559	41820	540	630	442.5
182/24	182.30/24.22	18.42	0.1614	66290	765	895	696.7
256/37	255.78/37.17	22.00	0.1146	96760	960	1130	1000.0
354/40	354.00/40.00	25.24	0.0832	114250	1180	1390	1297.8
414/48	414.30/47.81	27.60	0.0711	135200	1315	1550	1521.0
563/43	562.80/43.12	31.78	0.05218	149100	1570	1850	1897.0

*at ambient temperature of 35 °C, wind speed 0.61 m/s, solar radiation 1000 W/m^2, reflection 0.5, absorption 0.5.

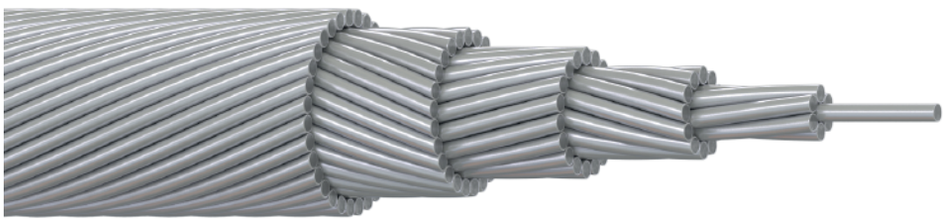
ADVANTAGES of GTACSR/AS conductors

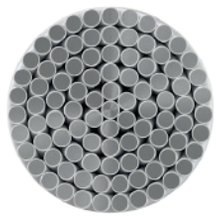
- Contrary to aluminum wires which are annealed and loose its mechanical strength at 90°C, aluminum-zirconium alloy wires retain its properties up to 150 °C with peak temperatures of up to 180°C.
- Due to unique construction of the conductor, low sag and reduced transmission line clearance are achieved.
- Twofold increase of current-carrying capacity of the line with the same cross section of the conductors.
- Absence of external corrosion of the steel core.
- Simplified ice-melting.
- Minimal sag.
- Reduced load on power line towers.

TACSR/ACS 521-A20SA

TU 3500-005-63976268-2015

uninsulated aluminum-clad steel conductor.





APPLICATION

Intended for use in 35 kV- and higher voltage overhead electric transmission lines for long crossings.
The unique features of such a high cross section conductor allow it to be used for long (2 to 4 km) crossings over rivers.
The conductor is resistant to eolian vibration and galloping.

CONSTRUCTION

The conductor is made either of aluminum-clad steel wires, or temperature-resistant aluminum alloy wires with a core made of aluminum-clad steel wires. The climatic version of the conductor is for moderate climate "U" according to GOST 15150.

CERTIFICATES

Certificate of compliance.

OPERATIONAL GUIDELINES

Operational ambient temperature (C^0)	-60 до +80
Service life (yrs)	50

DESIGN PARAMETERS OF THE TACSR/ACS 521-A20SA CONDUCTOR

Nominal cross section, mm^2	No. of wires/ diameter of wires, mm	Conductor diameter, mm	Conductor weight, kg/km	Tensile strength, N	TCLE 10^{-5} 1/C	Elasticity modulus, kN/mm^2	DC current resistance of the conductor, Ohm/km
521.03	91/2.70	29.7	3512	698180	1.30	157	0.1665

COMPLETED PROJECT

Long-distance crossing (more than 3 km) HVL 220 kV "220 kV substation Priangarskaya – 220 kV substation Razdolinskaya" over Angara river in Boguchansky district of Krasnoyarsk region during the construction of the "Kujumba-Taishet" main oil line.

A TACSR/ACS 512-A20SA conductor produced by EM-CABEL, Ltd. and an OPGW OKTG-c-2-48 (G.652)-29.9/619 co-produced by EM-CABEL, Ltd. and Saranskkabel-Optika, Ltd. were used for this project.

GTK

TU 3500-007-63976268-2011

corrosion-resistant overhead ground wire

APPLICATION

The conductor is intended for use as an overhead ground wire installed along overhead electric transmission lines to protect it from direct lightning strikes. It is intended for 35 kV - and higher voltage overhead electric transmission lines.

The operation ambient temperature is in range of -60 to +80 °C, taking solar radiation into account.

CONSTRUCTION

The conductor is made either of aluminum-clad steel wires, or aluminum alloy wires with a core made of aluminum-clad steel wires. Aluminum-clad steel wires of 20SA, 27SA, 30SA, and 40SA can be used.

CERTIFICATES

Certificate of compliance.
Approval of PJSC Rosseti.

PARAMETERS	GTK20-0/18 -5.5/22	GTK20-0/35 -7.6/42	GTK20-0/39 -8.1/47	GTK20-0/50 -9.1/60	GTK20-0/70 -11.1/87	GTK20-0/90 -12.1/104	GTK20-0/100 -13.2/123	GTK20-0/120 -14.2/142	GTK20-0/134 -15.0/162	GTK20-0/300 -22.6/360
Outer diameter, mm	5.5	7.6	8.1	9.1	11.1	12.1	13.2	14.2	15.0	22.6
Weight, kg/km	125	232	268	333	493	580	700	807	904	2040
UTS, kg	808	1280	1690	1844	2678	3186	3754	4352	5799	11021
S of steel elements, mm^2	14.11	26.07	10.2	37.47	54.43	64.75	76.27	88.72	100.88	223.95
S of aluminum elements, mm^2	4.70	8.69	30.6	12.49	18.14	21.58	25.42	29.47	33.63	74.65
S total, mm^2	18.82	34.8	40.08	49.96	72.58	86.34	101.7	117.9	134.5	298.6
DC current R at 20 °C, Ohm/km	4.547	2.472	2.195	1.7194	1.2038	0.9993	0.8704	0.747	0.641	0.2945
Short circuit thermal effect, $кA^2s$	3.2	11.0	14.6	22.7	48	67.7	94.1	126.6	164.8	811
TCLE, 10^{-6} $1/^0C$	13	13	13	13	13	13	13	13	13	13
Elasticity modulus, kN/mm^2	148	148	148	148	148	148	148	148	148	148
Elasticity modulus (installation), kN/mm^2	145	145	145	145	145	145	145	145	145	145
Elasticity modulus(tension), kN/mm^2	133	133	133	133	133	133	133	133	133	133

The ADVANTAGES of GTK

01	**INCREASED CORROSION RESISTANCE**	All steel wires are clad with aluminum which protects steel from corrosion several time more effectively.
02	**HIGH RELIABILITY**	All wires of conductors are preformed in such a way that in case if one or few wires would break they would stay in a layer.
03	**HIGH TEMPERATURE RESISTANCE**	Zinc coating is known to crack and peel from steel wires if the temperature is higher than 100°C, but a ground wire made of aluminum-clad steel wires retains its operational performance even if heated up to 400°C.
04	**INCREASED SHORT-CIRCUIT CURRENT RESISTANCE**	Aluminum makes 25% of the **GTK**'s cross section, increasing its electric conductivity.
05	**REDUCED LOAD ON TOWERS**	The weight of the aluminum-clad steel ground wire is significantly less than that of an all-steel ground wire, which also allows to deliver significantly longer lengths of the GTK ground wire, having the same weight as a conventional ground wire.
06	**SIMPLE TO INSTALL**	EM-CABEL, Ltd. provides all the necessary data to calculate sag of ground wires and can provide assistance with project design work. GTK is analogous in size to conventional ground wires, therefore it can be installed using standard conductor fittings.
07	**SERVICE LIFE**	Service life of GTK ground wire is 50 years.

SIP-2, SIP-3, SIP-4

TU 3553-004-63976268-2010
GOST 31946-2012

Self-supporting insulated cables.

CERTIFICATES
Certificate of compliance.
Approval of PJSC Rosseti.

SIP-2
Self-supporting aluminum cable insulated with a light-stabilized XLPE, with a supporting zero-carrying aluminum-alloy conductor insulated with a light-stabilized XLPE.

SIP-3
Self-supporting aluminum alloy cable insulated with a protective light-stabilized XLPE jacket.

SIP-4
Self-supporting aluminum cable insulated with a light-stabilized XLPE, without a supporting element.

SIPn-2, SIPn-3, SIPn-4

SIPn-3 TU 3553-016-63976268-2016
SIPn-2, SIPn-4 TU 16.K71-463-2014
GOST 31946-2012

Self-supporting flame-retardant insulated cables

CERTIFICATES
Certificate of compliance.

SIPn-2
Flame-retardant self-supporting aluminum cable insulated with a light-stabilized self-extinguishing XLPE, with a supporting zero-carrying aluminum alloy conductor insulated with a light-stabilized self-extinguishing XLPE.

SIPn-3
Flame-retardant self-supporting aluminum alloy cable insulated with a protective light-stabilized self-extinguishing XLPE jacket.

SIPn-4
Flame-retardant self-supporting aluminum cable insulated with a light-stabilized self-extinguishing XLPE, without a supporting element.

APPLICATION

SIP-2 and **SIPn-2** cables are intended for overhead transmission lines (OTL) and linear branches of OTL in atmosphere of types II and III according to GOST 15150-69, including sea shores, salt lakes, industrial regions and saline sands regions.
SIP-3 and **SIPn-3** cables are intended for OTL rated for nominal voltage of 10-35 kV in atmosphere of types II and III according to GOST 15150-69, including sea shores, salt lakes, industrial regions and saline sands regions.
SIP-4 and **SIPn-4** cables are intended for connections from OTL branches to inputs, installation on walls of buildings and engineering constructions in atmosphere of types II and III according to GOST 15150-69.

CONSTRUCTION

Core – aluminum (aluminum alloy for **SIP-3** and **SIPn-3** cables), stranded.
Zero-carrying supporting core – for **SIP-2** and **SIPn-2** cables – aluminum alloy.
Insulation – light-stabilized cross-linked PE. For **"n"**-type cables – light-stabilized self-extinguishing cross-linked PE.

OPERATION GUIDELINES

Rated voltage, kV **SIP-2, SIP-4, SIPn-2, SIPn-4** **SIP-3, SIPn-3**	0.6 and 1 up to 35
Ambient operating temperature (C^0)	-60 to +50
Relative air humidity (at +35 C^0)	98%
Installation temperature, not lower than (C^0)	-20
Bending radius, not smaller than (OD)	10
Service life (yrs)	40
Guaranty period (yrs)	3

Electrical Installation Code 7 (PUE 7)

4.2 Insulated conductor must be of protected type, insulated with a hard burning light-stabilized synthetic material, UV- and ozone-resistant. SIP cable must be flame-retardant.

ADVANTAGES of SIPn cable

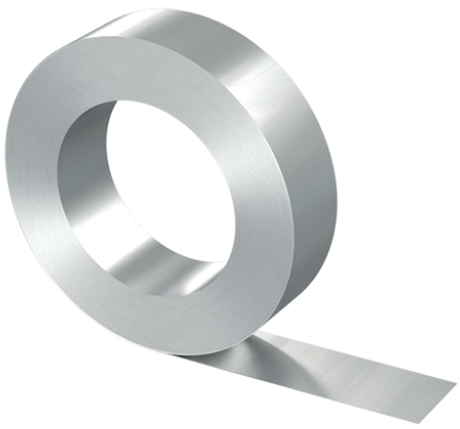
- Possibility to use in increased fire hazard conditions/
- Reduced damage to lines in an event of short circuit or effects of direct flame.
- Possibility to safely use for inputs in residential buildings.
- Increased safety of lines in crowded areas (flame-retardant properties in case of fire, reduced probability of drop formation of molten insulation in case of fire).

EQUIPMENT and TECHNOLOGICAL MATERIALS

for cable and wiring products

GALVANIZED STEEL TAPE for armoring of cables

GOST 3559-75



APPLICATION
Intended for use as cable armor to prevent cables from damage.

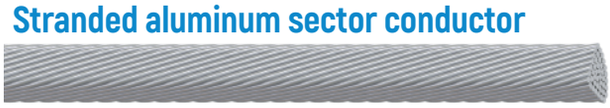
PROPERTIES

Type	APL2
Thickness, mm	0.2 - 0.6
Width, mm	30 - 900
Pad inner diameter, mm	200
Pad outer diameter, mm	up to 590

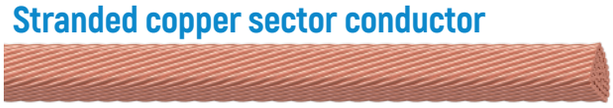
SECTOR CONDUCTOR

Solid aluminum sector conductor

Stranded aluminum sector conductor



Stranded copper sector conductor



PROPERTIES

Cross section, mm^2	95 - 240
Lay length, mm	1200-1900
Sector angle	72°, 90°, 120°

WIRE

Aluminum and aluminum alloy wire.

Copper wire

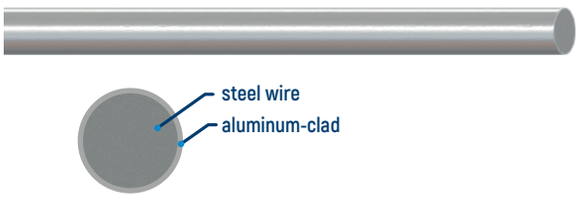
APPLICATION
Wires are intended for production of cable and wiring products, and other electrical products.

PROPERTIES

ASZ-1, ASZ-2, ASZ-3, ASZ-4, ASZ-5, ASZ-6	Aluminum alloy wire (KAS 6101-T4), thermomechanically hardened	1.45 – 5.00	**TU 1888-006-63976268-2011**
AT1	Aluminum-zirconium alloy wire (heat resistant of up to 180 °C)	1.45 – 5.00	**GOST R 62004-2014**
AVL	Aluminum wire for overhead conductors	1.7 – 5.0	**TU 16-705.472-87**
AT, APT, AM	Aluminum wire: hard, semi-hard, soft	1.7 – 5.0	**TU 16.K71-088-90**
MT, MM	Copper wire: hard	1.76 – 3.5	**TU 16-705.492-2005**

ALUMINUM-CLAD STEEL WIRE

TU 1264-009-63976268-2011



APPLICATION
Aluminum-clad steel wires are intended for use in uninsulated conductors as a corrosion-resistant core, or in other products where improved corrosion-resistant properties are required.

CLADDING is the process of applying a thin coating of one metal to the surface of another metal (in this case, aluminum to the surface of steel wire), where cold welding happens due to high compression forces. The main feature of this method is mutual diffusion of metals to depths of about 5 μm, without heating.

Types of aluminum-clad steel are determined by the specific conductivity, according to the values in the table below:

Type		Specific conductivity
20SA	type A	20,3%
	type B	20,3%
27SA		27%
30SA		30%
40SA		40%

Thickness of the aluminum layer is calculated on basis of a nominal radius or the wire and must correspond to the values in the table below.

Type		Aluminum thickness, min
20SA	type A	8 %
	type B	10 %
27SA		14 %
30SA		15 %
40SA		25 %

DESIGN PARAMETERS

Type		Diameter, mm		Tensile strength, min, MPa	1% elongation stress, MPa	Elongation, min, %
		Initial	Final			
20SA	type A	1.24	3.25	1340	1200	1.5
		3.25	3.45	1310	1180	
		3.45	3.65	1270	1140	
		3.65	3.95	1250	1100	
		3.95	4.10	1210	1100	
		4.10	4.40	1180	1070	
		4.40	4.60	1140	1030	
		4.60	4.75	1100	1000	
		4.75	5.50	1070	1000	
	type B	1.24	5.50	1320	1100	
27SA		2.50	5.00	1080	800	1.5
30SA		2.50	5.00	880	650	1.5
40SA		2.50	5.00	680	500	1.5

REFERENCE INFORMATION

REEL SIZE AND WEIGHT

Reel type	Reel size, mm		Estimated weight of the reel, with battening, kg
	Heigth	Width	
10	1000	750	115
12	1200	650	125
12a	1200	870	205
14г	1400	1100	265
16a	1600	990	225
17a	1750	1100	375
18y	1800	1100	425
20y	2000	1200	475
22y	2200	1250	625

ESTIMATED PLACEMENT of CABLE REELS WITH CABLING PRODUCTS in a VEHICLE

Reel type	Covered train car (63 tons)	Open train car (63 tons)	Containers				Road truck		
			3 т	5 т	20 т	40 т	10 т	18-wheel semitrailer (20t)	generic semitrailer (20 t)
10	48	44	3	6	10	24	12	26	24
12	42	36	1	6	8	20	10	22	20
12a	30	27	1	4	8	30	10	33	30
14г	27	24	1	3	8	16	8	18	16
16a	18	12	-	2	6	14	6	16	14
17a	16	12	-	2	6	14	6	16	14
18y	16	12	-	2	6	12	6	12	12
20y	-	11	-	4	3	6	3	6	6
22y	-	10	-	-	2	5	2	6	5

NOTES

Any information presented in this promotional material shall not be considered a public offer.
Any technical and design properties of cables and wires are for reference only.
Please contact specialists of EM-CABEL, Ltd. for any questions.

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