

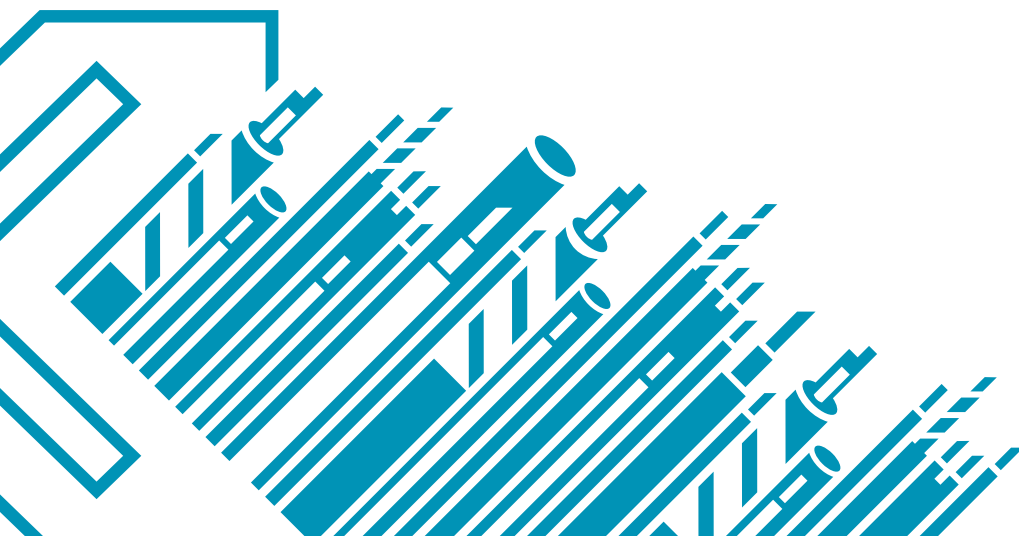


Output product catalogue

POWER CABLES for voltage 1 and 3 kV

TOFLEX®

IEC 60502-1



2017





Output product catalogue
POWER CABLES for voltage 1 and 3 kV
TOFLEX®
IEC 60502-1
Limited liability company TOMSKCABLE, 2017

FACTORY TODAY

LLC "Tomskcable" is one of the leading manufacturers of cable and wire products in Russia since 2000. Today the industrial capacity includes 60 modern production lines which process up to 1,500 tons of copper and 700 tons of aluminum monthly. The company is constantly carrying out the modernization and optimization of the production. The manufacturing technology is fully automated and is under strict control starting from the moment of selecting raw materials to shipping to warehouses.

All the products obtained mandatory and voluntary certification. The quality of "Tomskcable" products is confirmed by a range of certificates as "Technical Regulation of Customs Union", "GAZPROMSERT", Russian National Standard "GOST R", voluntary certification system "Voenny Registr" and certificates comply with the Technical regulations on fire safety requirements. The company also has a license to develop and manufacture products for nuclear power stations.

In January 2017, the company successfully passed through the quality management system audit. As a result the company got the recommendation of the leading auditor Bureau Veritas Certification in Russia to pass the QMS certification in accordance with ISO 9001:2008 and Russian National Standard GOST ISO 9001-2011.

"Tomskcable" produces more than 200 000 label sizes of cables including the following:

- Power cables for voltage 0.66; 1 and 3 kV, including cables with hard grade ethylene propylene rubber;
- Power cables for voltage 6 kV;
- Control cables;
- Cables for industrial heating, including self-regulating heating cables;
- Installation cables for process control application standards and receive/transmit protocols of data RS – 422, RS – 482, RS – 485, HART, FoundationFieldbus, Profibus, Ethernet;
- Cables for variable speed drives;
- Mining cables universal and for combined machines;
- Cables for use in the military;
- Cables for ships;
- Cables for electrical transmission lines;
- Cables for electrical installations;
- Self-supporting insulated cables.

The company produces cables with various index type: flame retardant "ng(A)", fire resistant "FR", halogen-free "HF", with low toxicity of combustion products "LSLTx" and with low smoke and gas retardant "LS".

Cold-resistant cables with index "HL" can be installed at a temperature up to - 35 °C.

The geography of supplies includes 46 regions in Russia and 11 countries including the Baltics, CIS countries and others.

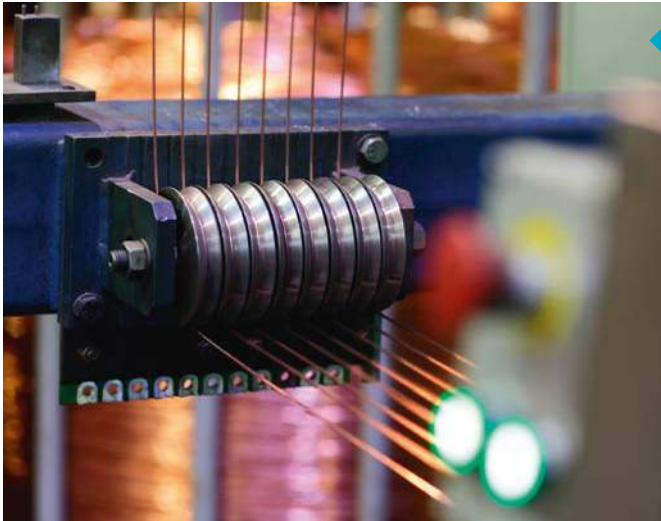
The delivery of products is carried out by rail and road transport. We cooperate with 15 transport companies and have an opportunity to deliver the cargo to any place in the country within 5 to 21 days. At customer's request we are ready to deliver the cargo directly to the object.

The partners of LLC "Tomskcable" are large Russian companies from energetic, oil and gas, petrochemical and nuclear industries as well as service enterprises of rolling stock, underground and social facilities. LLC "Tomskcable" is working closely with these companies to develop the analogues of foreign manufacturers' products. The company is an active participant of the import substitution program.

Technologically advanced group of cables TOFLEX is a high-profile cable product of "Tomskcable" and is able to withstand the requirements of the incoming control of the most demanding customer. The characteristics and indicators of fire safety as well as operational reliability of the cables TOFLEX exceed foreign-made analogues on the Russian market.

Upgraded production and highly professional approach to working process allow us optimizing our costs, which affects both production costs and flexible pricing policy.

CABLE PRODUCTION TECHNOLOGY



Wire drawing

The drawing divides in two stages: coarse drawing and mean drawing. Drawing is a process which uses tensile forces to stretch metal and reduce the cross-section of a wire. Drawing is carried out by pulling the metal through a draw bench machine. Raw material for the wire is copper or aluminum wire rod.

The drawing process includes the following steps:

- Using of the wire pointing machine for sharpening the ends of the metal raw material (aluminum or copper wire rod);
- The process of wire drawing;
- The annealing process.

Drawing is carried out on drawing machines of Mario Frigerio, Euro Alpha, Siktra.

Wire tinning

A process of galvanic tinning is applied in the production. Galvanic tinning is a process of passing the wire through a special tin bath. The raw material for the production of copper tinned wire is a copper wire get in the process of drawing. The main purpose of tinning is to give the product enhanced anticorrosion properties. After tinning process, re-drawing is also allowed. In this case the layer of the coated tin is retained on the wire surface.

The process of tinning includes the following steps:

- Wire degreasing;
- In the electrophoresis process, the work solution acidomedium and electrochemical process influence positive tin ions of soluble anodes. As a result, these ions are attracted to the wire;
- Washing with water and blowing with air.

Tinning is carried out on the equipment of Otomec.



Stranding

Stranding is a process of composing of a number of individual elements (wires, conductors, bunches) bundled or wrapped together around the central (one or several) elements.

The main purpose of stranding is to make the cable construction more stable and flexible.

Types of stranding, implemented in the production:

- Stranding in layers and stranding in bundles;
- Back-twist and no back-twist stranding;
- Simple and complex stranding;
- Correct and incorrect stranding.

Stranding is carried out on the stranding machines of Sampsystemi, Mario Frigerio, Cortinovis, Pourtier.



Applying of fire resistant barrier

Micatape is used in the process of applying the fire resistant barrier. Micatape fire resistant barrier is applied with the usage of semi-tangential tapping machines.

The main purpose of the process is to improve fire resistant properties of the cables.

Tapping process is carried out on the equipment of WTM, Pioneer.



Cable insulating

The process of insulating a conductor is carried out on the extrusion lines, which include an extruder, pay-off, traction and take-up machines, as well as a quenching bath, control and startup equipment. From the pay-off machine the wire or stranded conductor enter the extruder head.

The materials for Insulation: are various PVC and polyolefins based compounds

The process of Insulation::

- Melting of compound pellets in the extruder to a homogeneous mass;
- Pressing the molten plastic through the annular space between the forming tool: tip and the die;
- Placing the molten mass on the preform;
- Cooling the product in water;
- Blowing-off and drying the insulated conductor.

Types of Insulation::

- PVC-compound;
- Polyethylene;
- Thermoplastic elastomer;
- Halogen free compounds;
- Hard grade ethylene-propylene rubber

The main purpose of the process is to provide electrical Insulation: among the conductors. Insulating process is applied on the equipment of Maillefer, Sket, and others.



Polyethylene cross-linking

We use silane XLPE for cross linking. It consists of the material from the composition of low density copolymerized with vinylsilane polyethylene and a catalyst that participates in the cross-linking process. The usage of the material with a catalyst makes it possible to accelerate the cross-linking reaction. Cross-linking is carried out in a steam bath.

The main purpose of the process is to obtain high physical and mechanical characteristics of the Insulation:. Cross-linking is carried out in a cross-linking chamber.

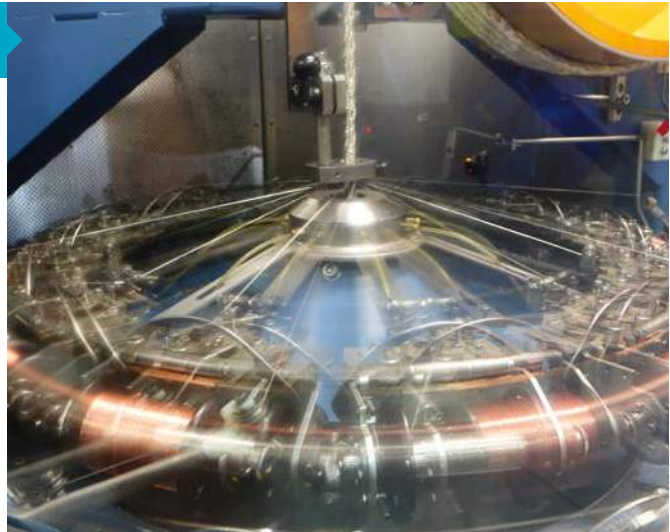
Shielding

Shielding with copper or aluminopolymer tapes can be carried out on semi-tangential tapping machines. The wire shield is applied with the usage of braiding machines.

Types of shields:

- Copper wire;
- Copper foil;
- Aluminopolymer tape;
- Copper tinned wire.

The main purpose of the process is to protect the cable from the external electromagnetic influence and to provide the instantaneous trip during the short circuit of the conductor to the shield. **Shielding is carried out on the equipment of Spirka, Pioneer.**



Applying of inner sheath

The process of applying cable inner sheath is carried out on extrusion lines, which is similar to the insulating process. The difference is in the using of more powerful extruders, pay-offs and other units because of large diameters of the preforms for sheaths.

Types of inner sheath:

- Polyvinyl chloride;
- Halogen-free polymer compounds;
- Thermoplastic elastomer.

The main purpose of the process is to provide a separation layer between the Insulation: of the current-conducting conductor and the shield or armor.

Applying of inner sheath is carried out on the equipment of Mallefer, Sket and others.



Armoring

Armoring is a process of strengthening the product by creating additional protection. Armoring is carried out with the usage of aluminum or steel galvanized tapes on semi-tangential tapping machines. Wire armor made from steel galvanized wires is applied on braiding or stranding machines.

Types of armor:

- Steel galvanized tapes
- Aluminium tapes
- Steel galvanized wires
- Aluminium wires

The main purpose of the process is to protect the cable from the mechanical damage.

Armoring is carried out on the equipment of Spirka, Pioneer, Poutrier and others.



Applying of outer sheath

The process of applying outer sheath is carried out on extrusion lines, which is similar to the insulating process. The difference is in the using of more powerful extruders, pay-offs and other units because of large diameters of the preforms for sheaths

Types of outer sheath:

- Polyvinyl chloride
- Polyethylene
- Halogen-free polymer compounds
- Thermoplastic elastomer
- Polyurethane

The main purpose of the process is to protect the cable from any mechanical and climatic effects.

The outer sheath is applied on the equipment of Maillefer, Sket, and others.



CONVENTIONAL SYMBOLS



Cables with index "HL" are designed for operation at a low ambient temperature



Cables "T" designed for tropics are resistant to mold fungi



Cables shield protects the circuit from the electromagnetic interference



Cables "ng (A)" are flame-retardant at a group laying



Cables with index "HF" have low smoke and gas emission



Tape armouring protects cable from mechanical damage when laying in the ground or in the air



Cables "UV" are resistant to UV radiation



Cables with index "HF" do not emit corrosive gases in condition of burning



Full lay-up from wires protects cable from tensile loads at a vertical cable run



Cables with letter "G" in a blank following TOFLEX trade mark designation have high flexibility parameters



Cables resistant to oils, diesel fuel, sea water and drilling fluids



Braiding from wires protects cable from mechanical damage retaining its high flexibility

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POWER CABLES FOR VOLTAGE 1 AND 3 KV

IEC 60502-1



APPLICATION

Power cables are designed for stationary laying in distributed networks and production facilities with nominal alternating voltage of 1kV and 3 kV and frequency of 50 Hz.

Cables are designated for national economy needs and used at industrial and power objects.

Cables can be laid without restriction for levels difference on a cable route, including vertical areas.



OPERATION GUIDELINES

Cables can be laid without preliminary heating at temperature not below:

for cables of all grades except for cold-resisting cables	minus 15 °C
for cold-resisting cables	minus 30 °C
for cables sheathed with cross-linked polyethylene or cables with polyethylene oversheath	minus 20 °C

Cables sheathed with cross-linked polyethylene or cables with polyethylene oversheath can be laid without preliminary heating at a temperature not below minus 20 °C.

Minimum radius of cables bend at laying:

single-conductor cables	10 D _H
multi-conductor cables	7.5 D _H

where D_H – cable outer diameter.

Cables are designed for operating in stationary state at an ambient temperature:

"HL", "ng(A)-HF-HL" cables and cables sheathed with polyethylene	from minus 60 °C to plus 50 °C
Other cables	from minus 50 °C to plus 50 °C

Air relative humidity at temperature 35 °C.....98 %

Tropic conditions resistant cables "T" are resistant to mold fungi.

Cables sheathed with highly elastic polymer compound resistant to mineral oil as per IEC 60811-2-1 and IEC 60811-1-1.

Cables service life.....30 years

Period of cables storage on the open areas - not more than two years, under roof- not more than five years, indoors - not more than 10 years.



FIRE SAFETY PERFORMANCE

Cables "without designation" and "HL" cables do not amplify burning at single laying as per IEC 60332-1-2.

"ng(A)-HF", "ng(A)-HF-HL" cables do not amplify burning at clustered laying as per IEC 60332-3-22.

"ng(A)-HF" and "ng(A)-HF-HL" cables are low-smoke in condition of burning or smouldering as per IEC 61034-2. Smoke emission does not decrease light permeability in test chamber more than by 40 %.

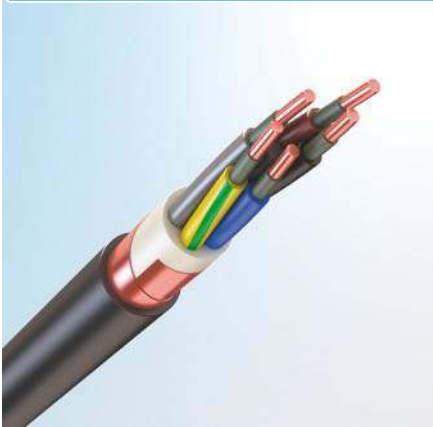
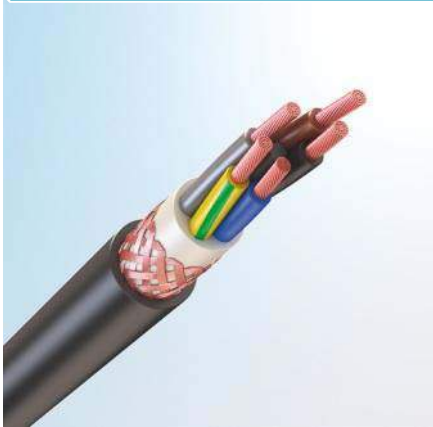
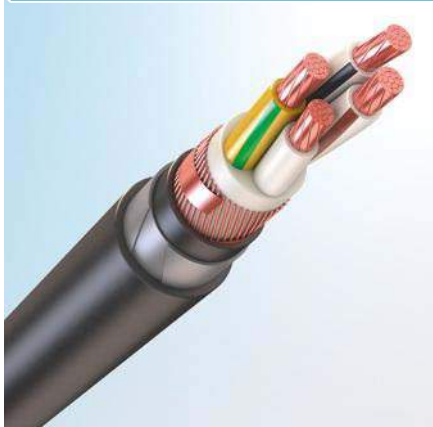
Value of toxicity of combustion products equivalent rate as per IEC 60754-1, for "ng(A)-HF" and "ng(A)-HF-HL" cables – more than 40 g/m³.



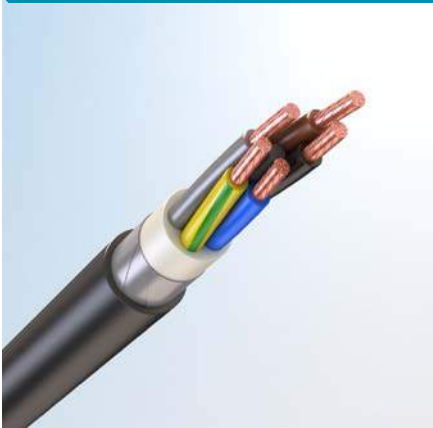


COMPARATIVE CHARACTERISTICS BASED ON CABLE ISOLATION MATERIAL:

Characteristics	EPR/HEPR	XLPE	PVC	Note
Heat endurance	90	90	70	The higher current loads, the smaller fuel weight
Flexibility	Good	Average	Average	High flexibility reduces installation time
Overload conditions, °C	130	130	80	Higher temperatures provide cable line capacity additional margin (18-25%)
Short-circuit test, °C	250	250	160	Higher temperature increases the reliability of the cable line in case of short circuit
Insulation material fire load, kWh/kg	6.4	12.2	—	Need to take into consideration in the designing of the objects requiring the redundancy of fuel weight
Possibility of using in hazardous zones of all classes	Yes	No	Yes	
Halogens content	No	No	Yes	Halogen gases cause accelerated corrosion of metal structures and electrical equipment

SHIELD TYPES

Copper foil or copper tape shield	Shield with braiding from copper wires	Shield with full lay-up from copper wires
		
Default option	Is used in cables with a flexible conductor	The cross section of shield is indicated after the slash in cable grade

ARMOUR TYPES

Galvanized steel tapes armour "B", or aluminium tapes armour, or aluminium alloy "Ba" armour	Galvanized steel tapes armour "K", or aluminium wires armour or aluminum alloy "Ka", full lay-up	Braiding from galvanized steel wires "P"
		
Protects a cable from mechanical damages at laying in the ground or in the air. For single-conductor cables the armour shall be made of aluminium tapes or aluminium alloy.	Protects a cable from tensile loading at a vertical laying.	Protects a cable from mechanical damages, thus keeping high flexibility. For cables for voltage 1 kV with a cross section of up to 6 mm ² .

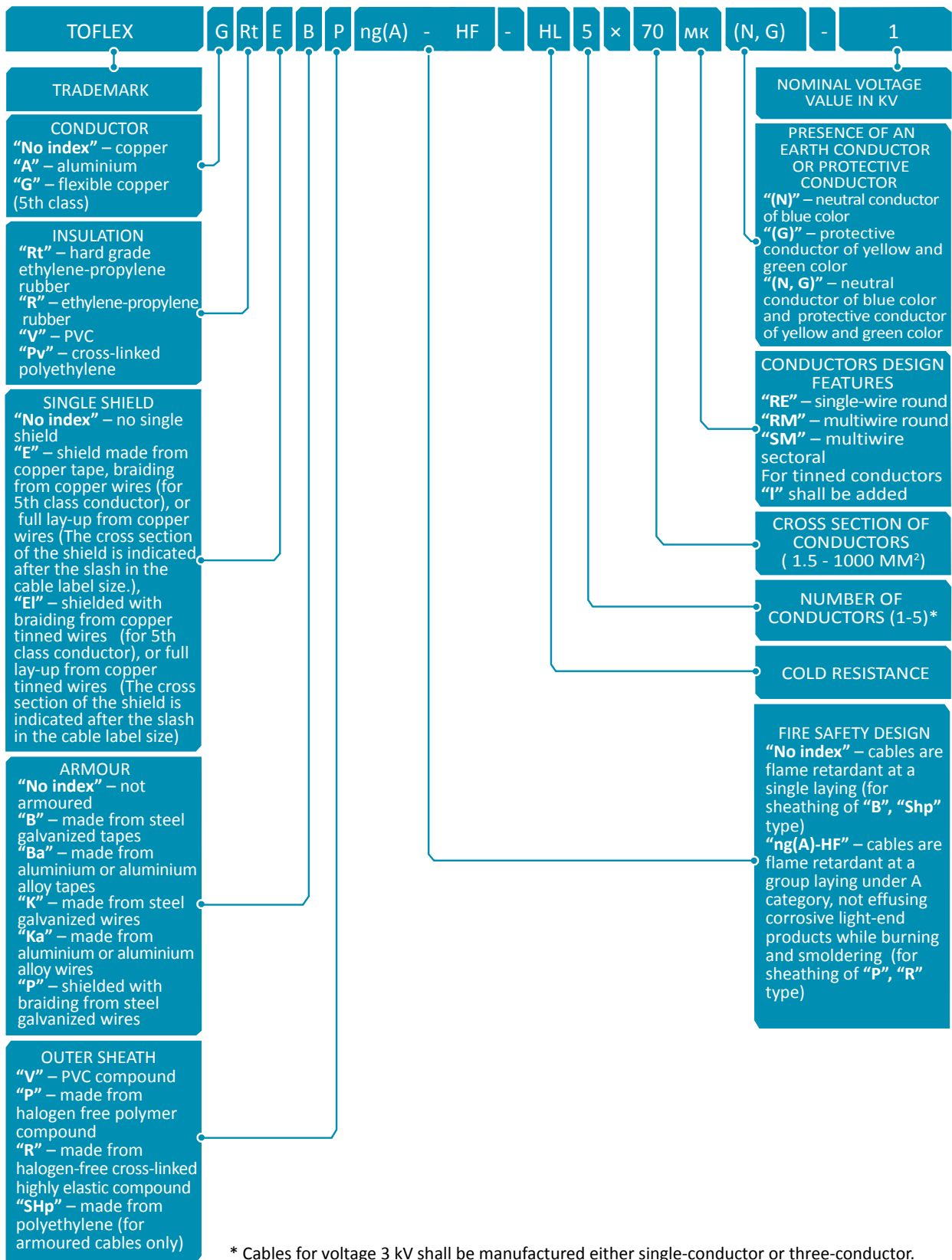


SHEATH MATERIAL SELECTION

Material type	Flame retardancy	Low smoke emission	Flexibility	Oil resistance	Resistance to diesel fuel	Hydrocarbon resistance	Fluids resistance	Moisture resistance	Mechanical impacts resistance
PVC	*	*	***	**	*	**	**	***	***
Halogen-free cross-linked highly elastic compound	*****	*****	****	*****	****	****	****	****	****
Halogen-free thermoplastic polymer compound	*****	*****	**	**	*	**	**	****	***

* — not resistant ** — low *** — average **** — good ***** — very good

GRADES FORMATION



"TOFLEX GRtEBPng(A)-HF-HL 5x70mk (N, G) – 1 IEC 60502-1";

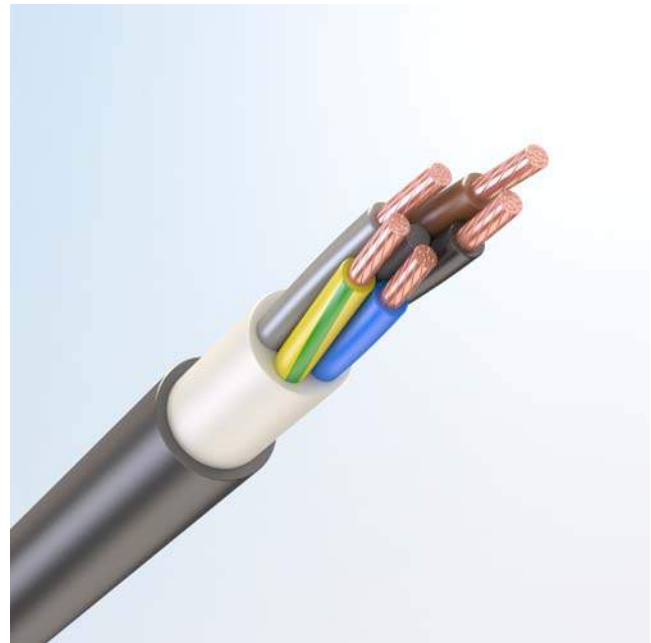
Power cable TOFLEX with five flexible copper multi wire conductors of a round cross section 70 mm², insulated with hard grade ethylene propylene rubber, shielded with braiding from copper wires, armoured with steel galvanized tapes, sheathed with halogen free cold-resistant polymer compound flame retardant, for nominal voltage 1 kV.

POWER CABLES FOR VOLTAGE 1 AND 3 KV

1. UNSHIELDED

IEC 60502-1

1.1 Sheathed with PVC compound



Cable grade	Cable structure elements
TOFLEX VVG	Cu/PVC/PVC
TOFLEX AVVG	Al/PVC/PVC
TOFLEX PvVG	Cu/XLPE/PVC
TOFLEX APvVG	Al/XLPE/PVC

Notes:

"HL" shall be added with a hyphen for cold resistant cables.

Cables for voltage 3 kV shall be manufactured either single-conductor or three-conductor.

DESIGN FEATURES

- ① **Electrical conductor** – aluminium or copper, or tinned copper - 2 class as per IEC 60228; copper or tinned copper – 5 class* as per IEC 60228;
 - ② **Insulation:**
 - "V" – PVC compound,
 - "Pv" – cross-linked polyethylene;
 - ③ **Outer sheath** – PVC compound;
- Possible design:**
- "HL" – cold-resistant PVC compound.

* Letter "G" shall be added for cables with flexible copper or tinned copper conductor in a blank following TOFLEX trade mark designation.

► **Ordering example:**

TOFLEX VVG 3×95RM(N, G)-1 IEC 60502-1

CABLE FEATURES



Conductor number and cross section, mm ²	Voltage, kV	Cable nominal outer diameter, mm	Minimum radius of cable bend, mm	Weight for 1 km cable, kg		Cable nominal outer diameter, mm	Minimum radius of cable bend, mm	Weight for 1 km cable, kg	
				TOFLEX VVG	TOFLEX VVG-HL			TOFLEX PvVG	TOFLEX PvVG-HL
1 x 4 RE	1	7,0	70,2	82	79	6,4	64,2	71	69
1 x 6 RE	1	7,5	75,2	104	101	6,9	69,2	93	90
1 x 10 RE	1	8,3	83,0	146	143	7,7	77,0	133	130
1 x 16 RE	1	9,5	94,5	213	208	8,7	86,5	193	191
1 x 16 RM	1	9,9	99,0	220	215	9,3	93,0	204	201
1 x 25 RE	1	11,0	109,5	310	305	10,4	103,5	290	287
1 x 25 RM	1	11,3	113,0	319	314	10,7	107,0	300	296
1 x 35 RM	1	12,3	123,0	413	407	11,7	117,0	392	387
1 x 50 RM	1	14,0	140,0	589	581	13,2	132,0	558	553
1 x 70 RM	1	15,6	156,0	759	751	15,0	150,0	729	724
1 x 95 RM	1	17,7	177,0	1017	1006	16,7	167,0	968	962
1 x 120 RM	1	19,5	195,0	1277	1265	18,7	187,0	1230	1222
1 x 150 RM	1	21,3	213,0	1560	1546	20,5	205,0	1506	1497
1 x 185 RM	1	23,3	233,0	1924	1907	22,5	225,0	1861	1851
1 x 240 RM	1	26,4	264,0	2463	2443	25,4	254,0	2379	2367
1 x 300 RM	1	30,7	306,5	3120	-	29,5	294,5	2986	-
1 x 400 RM	1	34,4	343,9	3981	-	32,8	327,9	3794	-
2 x 4 RE	1	11,4	85,8	204	196	10,2	76,8	171	165
2 x 6 RE	1	12,4	93,3	259	250	11,2	84,3	223	216
2 x 10 RE	1	14,0	105,0	362	351	12,8	96,0	321	313
2 x 16 RE	1	15,9	119,3	515	501	14,7	110,3	467	456
2 x 16 RM	1	16,8	126,0	543	528	15,6	117,0	494	482
2 x 25 RE	1	21,3	159,8	867	843	20,1	150,8	800	782
2 x 25 RM	1	22,0	165,0	902	877	20,8	156,0	835	815
2 x 35 RM	1	24,4	183,0	1163	1133	22,8	171,0	1067	1044
2 x 50 RM	1	27,8	208,5	1616	1578	26,2	196,5	1505	1475
2 x 70 SM	1	26,0	196,2	1733	1715	26,0	196,2	1669	1650
2 x 95 SM	1	28,0	211,2	2275	2253	28,0	211,2	2175	2153
2 x 120 SM	1	32,4	244,2	2837	2810	32,4	244,2	2738	2711
2 x 150 SM	1	34,8	262,2	3476	3442	34,8	262,2	3356	3325
2 x 185 SM	1	37,3	281,0	4237	4198	37,3	281,0	4087	4054
2 x 240 SM	1	43,2	325,2	5422	5372	43,2	325,2	5223	5182
3 x 1.5 RE	1	9,4	70,2	129	124	8,7	65,5	-	-
3 x 2.5 RE	1	10,2	76,7	170	164	9,8	73,5	155	-
3 x 4 RE	1	12,1	90,5	247	239	10,8	80,9	209	203
3 x 6 RE	1	13,1	98,6	320	311	11,9	88,9	278	272
3 x 10 RE	1	14,8	111,2	458	446	13,5	101,5	409	401
3 x 16 RE	1	16,9	126,5	663	649	15,6	116,8	606	596
3 x 16 RM	1	17,8	133,8	693	677	16,5	124,1	635	624
3 x 25 RE	1	22,5	168,7	1100	1076	21,2	159,0	1022	1003
3 x 25 RM	1	23,2	174,3	1140	1115	22,0	164,7	1062	1042
3 x 35 RM	1	25,8	193,5	1484	1453	24,5	183,8	1395	1372
3 x 50 RM	1	29,5	220,9	2089	2050	27,7	208,0	1959	1930
3 x 70 SM	1	30,0	226,2	2447	2423	30,0	226,2	2352	2329
3 x 95 SM	1	34,8	262,2	3337	3303	34,8	262,2	3187	3156
3 x 120 SM	1	37,8	284,7	4088	4050	37,8	284,7	3939	3905
3 x 150 SM	1	42,2	317,7	5036	4988	42,2	317,7	4857	4817
3 x 185 SM	1	46,6	350,7	6230	6171	46,6	350,7	6004	5957
3 x 240 SM	1	51,6	388,2	7853	7783	51,6	388,2	7554	7502

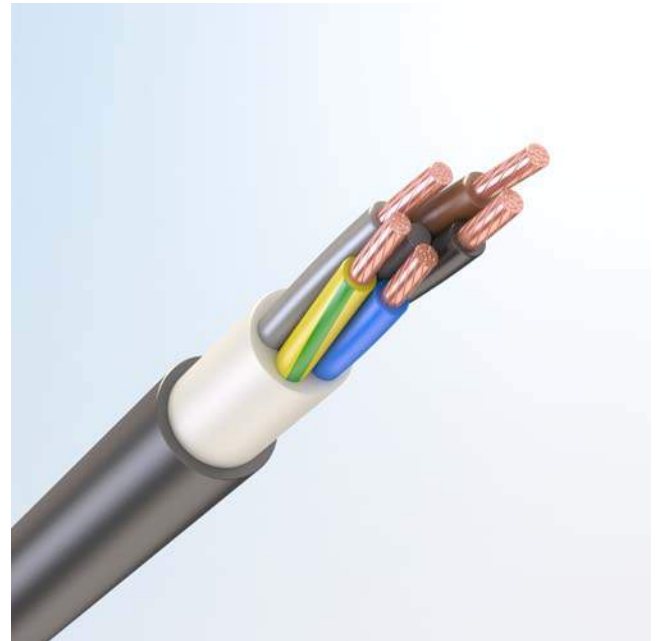
Conductor number and cross section, mm ²	Voltage, kV	Cable nominal outer diameter, mm	Minimum radius of cable bend, mm	Weight for 1 km cable, kg		Cable nominal outer diameter, mm	Minimum radius of cable bend, mm	Weight for 1 km cable, kg	
				TOFLEX VVG	TOFLEX VVG-HL			TOFLEX PvVG	TOFLEX PvVG-HL
4 x 1.5 RE	1	10,7	80,5	168	162	10,3	76,9	152	-
4 x 2.5 RE	1	11,7	87,7	221	213	11,2	84,1	202	-
4 x 4 RE	1	13,8	103,3	320	309	12,3	92,4	272	265
4 x 6 RE	1	15,0	112,3	415	403	13,5	101,5	362	354
4 x 10 RE	1	16,9	126,4	593	579	15,4	115,6	532	522
4 x 16 RE	1	19,1	143,6	859	842	17,7	132,7	789	776
4 x 16 RM	1	20,2	151,7	895	876	18,8	140,9	823	809
4 x 25 RE	1	25,0	187,2	1410	1382	23,3	174,9	1302	1282
4 x 25 RM	1	25,8	193,5	1459	1429	24,4	182,7	1362	1340
4 x 35 RM	1	28,2	211,6	1870	1837	26,8	200,8	1763	1738
4 x 50 RM	1	32,7	245,3	2679	2635	30,4	227,9	2493	2462
4 x 70 SM	1	34,8	262,2	3264	3230	34,8	262,2	3137	3106
4 x 95 SM	1	38,8	292,2	4337	4295	38,8	292,2	4137	4102
4 x 120 SM	1	42,2	317,7	5369	5320	42,2	317,7	5170	5130
4 x 150 SM	1	46,6	350,7	6592	6533	46,6	350,7	6353	6306
4 x 185 SM	1	51,6	388,2	8126	8055	51,6	388,2	7825	7772
4 x 240 SM	1	56,4	424,2	10353	10264	56,4	424,2	9954	9891
5 x 1.5 RE	1	11,6	86,9	202	194	11,1	82,9	181	-
5 x 2.5 RE	1	12,7	95,0	265	257	12,1	91,0	243	-
5 x 4 RE	1	15,0	112,5	387	376	13,4	100,3	330	323
5 x 6 RE	1	16,3	122,6	511	497	14,7	110,4	448	439
5 x 10 RE	1	18,5	138,4	728	713	16,8	126,2	656	646
5 x 16 RE	1	21,0	157,6	1055	1035	19,4	145,5	971	958
5 x 16 RM	1	22,2	166,7	1097	1076	20,6	154,6	1011	996
5 x 25 RE	1	27,3	204,5	1710	1679	25,6	192,3	1595	1572
5 x 25 RM	1	28,2	211,6	1768	1734	26,6	199,4	1652	1628
5 x 35 RM	1	31,3	234,8	2314	2274	29,3	219,7	2158	2131
5 x 50 RM	1	36,3	272,3	3317	3265	33,7	253,1	3094	3059
5 x 70 SM	1	37,8	284,7	4016	3975	37,8	284,7	3856	3823
5 x 95 SM	1	43,2	325,2	5406	5354	43,2	325,2	5155	5114
5 x 120 SM	1	48,6	365,7	6707	6645	48,6	365,7	6458	6409
5 x 150 SM	1	53,0	398,7	8238	8164	53,0	398,7	7939	7882
5 x 185 SM	1	58,4	439,2	10206	10116	58,4	439,2	9829	9764
5 x 240 SM	1	62,4	469,2	12829	12725	62,4	469,2	12331	12260
3 x 25 RE + 1 x 16 RE	1	25,0	187,2	1346	1317	22,6	169,3	1203	1183
3 x 25 RM + 1 x 16 RM	1	25,8	193,5	1392	1361	24,4	182,7	1297	1273
3 x 35 RM + 1 x 16 RM	1	27,3	204,6	1678	1645	25,9	194,2	1580	1555
3 x 50 RM + 1 x 25 RM	1	31,6	237,1	2405	2363	29,4	220,2	2232	2202
3 x 70 SM + 1 x 35 RM	1	34,8	262,2	2928	2895	34,8	262,2	2815	2784
3 x 95 SM + 1 x 50 SM	1	38,8	292,2	3922	3881	38,8	292,2	3741	3706
3 x 120 SM + 1 x 70 SM	1	42,2	317,7	4884	4837	42,2	317,7	4703	4663
3 x 150 SM + 1 x 70 SM	1	46,6	350,7	5832	5774	46,6	350,7	5620	5574
3 x 185 SM + 1 x 95 SM	1	51,6	388,2	7257	7189	51,6	388,2	6981	6929
3 x 240 SM + 1 x 120 SM	1	56,4	424,2	9209	9125	56,4	424,2	8860	8797

POWER CABLES FOR VOLTAGE 1 AND 3 KV

1. UNSHIELDED

IEC 60502-1

1.2 Cables sheathed with halogen-free polymer compound



Cable grade	Cable structure elements
TOFLEX RtPGng(A)-HF	Cu/HEPR/HFFR
TOFLEX ARtPGng(A)-HF	Al/HEPR/HFFR
TOFLEX RPGng(A)-HF	Cu/EPR/HFFR
TOFLEX ARPGng(A)-HF	Al/EPR/HFFR
TOFLEX PvPGng(A)-HF	Cu/XLPE/HFFR
TOFLEX APvPGng(A)-HF	Al/XLPE/HFFR

Notes:

"HL" shall be added with a hyphen for cold resistant cables.

Cables for voltage 3 kV shall be manufactured either single-conductor or three-conductor.



DESIGN FEATURES

- ① **Electrical conductor** – aluminium or copper, or tinned copper - 2 class as per IEC 60228; copper or tinned copper – 5 class* as per IEC 60228;
- ② **Insulation:**
 "Rt" – hard grade ethylene propylene rubber,
 "R" – ethylene propylene rubber,
 "Pv" – cross-linked polyethylene;
- ③ **Outer sheath** – made from halogen-free polymer compounds;
Possible design:
 "ng(A)-HF-HL" – made from cold-resistant halogen-free polymer compounds.

* Letter "G" shall be added for cables with flexible copper or tinned copper conductor in a blank following TOFLEX trade mark designation.

► **Ordering example:**

TOFLEX RPGng(A)-HF 3×95RM(N, G)-1 IEC 60502-1



CABLE FEATURES



Conductor number and cross section, mm ²	Voltage, kV	Cable nominal outer diameter, mm	Minimum radius of cable bend, mm	Weight for 1 km cable, kg	Amount of combustible materials, l/km
				TOFLEX RtPGng(A)-HF	
1 x 1.5 RE	1	7,0	69,6	63	36,3
1 x 2.5 RE	1	7,4	73,6	77	39,7
1 x 4 RE	1	7,8	78,2	95	43,7
1 x 6 RE	1	8,3	83,2	118	48,0
1 x 10 RE	1	9,1	91,0	161	54,8
1 x 16 RE	1	10,1	100,5	224	63,0
1 x 16 RM	1	10,5	105,0	231	66,9
1 x 25 RE	1	11,6	115,5	322	79,4
1 x 25 RM	1	11,9	119,0	330	82,7
1 x 35 RM	1	12,9	129,0	424	91,9
1 x 50 RM	1	14,6	146,0	599	112,7
1 x 70 RM	1	16,2	162,0	769	128,5
1 x 95 RM	1	18,3	183,0	1024	156,2
1 x 120 RM	1	19,7	197,0	1268	170,9
1 x 150 RM	1	21,5	215,0	1546	198,4
1 x 185 RM	1	23,5	235,0	1904	230,2
1 x 240 RM	1	26,6	266,0	2437	289,3
1 x 300 RM	1	30,9	308,5	3077	372,7
1 x 400 RM	1	35,0	349,9	3959	479,8
1 x 500 RM	1	38,6	385,7	4952	555,6
1 x 630 RM	1	42,5	425,3	6314	621,7
2 x 1.5 RE	1	10,3	77,4	142	82,7
2 x 2.5 RE	1	11,1	83,4	176	94,4
2 x 4 RE	1	12,0	90,3	221	108,5
2 x 6 RE	1	13,0	97,8	278	124,7
2 x 10 RE	1	14,6	109,5	384	151,5
2 x 16 RE	1	16,5	123,8	540	186,8
2 x 16 RM	1	17,4	130,5	568	204,6
2 x 25 RE	1	21,5	161,3	945	322,5
2 x 25 RM	1	22,2	166,5	983	340,6
2 x 35 RM	1	24,6	184,5	1261	410,7
2 x 50 RM	1	28,0	210,0	1740	522,4
2 x 70 RM	1	31,6	237,0	2257	649,1
2 x 95 RM	1	36,6	274,5	3047	865,1
2 x 120 RM	1	39,4	295,5	3696	981,5
2 x 150 RM	1	43,4	325,5	4526	1186,3
2 x 185 RM	1	48,2	361,5	5611	1462,2
2 x 240 RM	1	54,0	405,0	7114	1812,4
3 x 1.5 RE	1	10,8	81,2	161	88,8
3 x 2.5 RE	1	11,7	87,6	204	101,0
3 x 4 RE	1	12,7	95,0	262	115,7
3 x 6 RE	1	13,7	103,1	337	132,2
3 x 10 RE	1	15,4	115,7	476	159,2
3 x 16 RE	1	17,5	131,0	683	194,2
3 x 16 RM	1	18,4	138,3	711	211,6
3 x 25 RE	1	22,7	170,2	1163	335,4
3 x 25 RM	1	23,4	175,8	1203	353,3
3 x 35 RM	1	26,0	195,0	1560	423,0
3 x 50 RM	1	29,7	222,4	2182	536,2
3 x 70 RM	1	33,5	251,2	2838	659,8

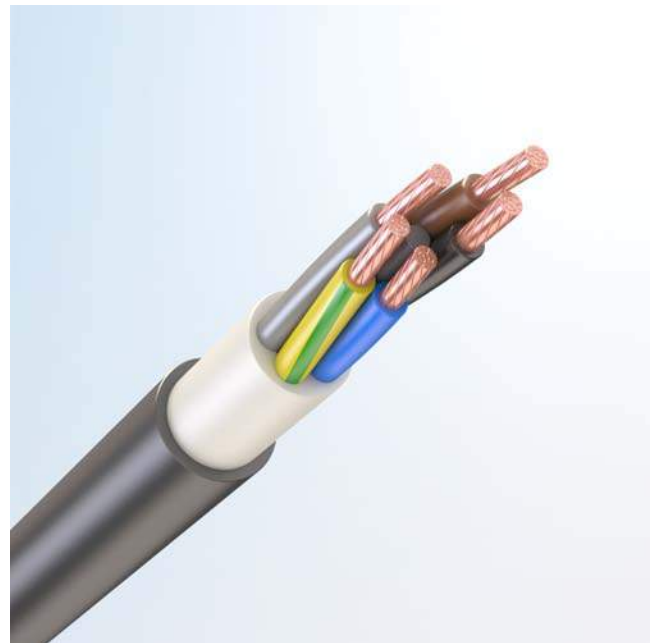
Conductor number and cross section, mm ²	Voltage, kV	Cable nominal outer diameter, mm	Minimum radius of cable bend, mm	Weight for 1 km cable, kg	Amount of combustible materials, l/km
				TOFLEX RtPgng(A)-HF	
3 x 120 RM	1	41,8	313,6	4699	987,9
3 x 150 RM	1	46,9	351,6	5852	1254,0
3 x 185 RM	1	51,2	383,9	7152	1470,5
3 x 240 RM	1	58,0	434,9	9167	1871,7
4 x 1.5 RE	1	11,7	87,7	188	100,5
4 x 2.5 RE	1	12,7	95,0	242	114,5
4 x 4 RE	1	13,8	103,3	315	131,1
4 x 6 RE	1	15,0	112,3	409	149,7
4 x 10 RE	1	16,9	126,4	586	179,9
4 x 16 RE	1	19,1	143,6	851	218,8
4 x 16 RM	1	20,2	151,7	883	237,9
4 x 25 RE	1	25,2	188,7	1454	392,4
4 x 25 RM	1	26,0	195,0	1502	412,7
4 x 35 RM	1	28,4	213,1	1924	472,4
4 x 50 RM	1	32,9	246,8	2750	621,1
4 x 70 RM	1	37,6	281,7	3606	783,2
4 x 95 RM	1	43,0	322,7	4838	1004,7
4 x 120 RM	1	47,2	354,0	6028	1187,5
4 x 150 RM	1	51,5	386,5	7319	1391,8
4 x 185 RM	1	57,4	430,2	9118	1725,7
4 x 240 RM	1	63,9	479,0	11495	2075,8
5 x 1.5 RE	1	12,7	95,0	223	114,0
5 x 2.5 RE	1	13,8	103,1	288	130,0
5 x 4 RE	1	15,0	112,5	380	149,0
5 x 6 RE	1	16,3	122,6	502	170,2
5 x 10 RE	1	18,5	138,4	718	204,5
5 x 16 RE	1	21,0	157,6	1042	248,5
5 x 16 RM	1	22,2	166,7	1078	270,1
5 x 25 RE	1	27,5	206,0	1768	442,8
5 x 25 RM	1	28,4	213,1	1823	465,7
5 x 35 RM	1	31,5	236,3	2388	553,2
5 x 50 RM	1	36,9	276,8	3440	749,1
5 x 70 RM	1	41,2	309,2	4462	881,9
5 x 95 RM	1	48,1	360,7	6047	1194,6
5 x 120 RM	1	51,9	389,0	7401	1335,4
5 x 150 RM	1	57,7	433,0	9124	1661,0
5 x 185 RM	1	63,1	473,5	11298	1943,4
5 x 240 RM	1	71,2	534,2	14347	2431,5

POWER CABLES FOR VOLTAGE 1 AND 3 KV

1. UNSHIELDED

IEC 60502-1

1.3 Cables sheathed with halogen free cross-linked highly elastic polymer compound



Cable grade	Cable structure elements
TOFLEX RrRGng(A)-HF	Cu/HEPR/XLHFFR
TOFLEX ARrRGng(A)-HF	Al/HEPR/XLHFFR
TOFLEX RRGng(A)-HF	Cu/EPR/XLHFFR
TOFLEX ARRNg(A)-HF	Al/EPR/XLHFFR

Notes:

"HL" shall be added with a hyphen for cold resistant cables.

Cables for voltage 3 kV shall be manufactured either single-conductor or three-conductor.



DESIGN FEATURES

- ① **Electrical conductor** – aluminium or copper, or tinned copper - 2 class as per IEC 60228; copper or tinned copper – 5 class* as per IEC 60228;
- ② **Insulation:**
 "Rt" – hard grade ethylene propylene rubber,
 "R" – ethylene propylene rubber,
- ③ **Outer sheath** – made from halogen-free polymer compounds;
Possible design:
 "ng(A)-HF-HL" – made from cold-resistant halogen-free cross-linked highly elastic polymer compound.

* Letter "G" shall be added for cables with flexible copper or tinned copper conductor in a blank following TOFLEX trade mark designation.

► **Ordering example:**

TOFLEX RrRGng(A)-HF 3x95RM(N, G)-1 IEC 60502-1



CABLE FEATURES



Conductor number and cross section, mm ²	Voltage, kV	Cable nominal outer diameter, mm	Minimum radius of cable bend, mm	Weight for 1 km cable, kg		Amount of combustible materials, l/km
				TOFLEX RtPng(A)-HF		
1 x 1.5 RE	1	7,0	69,6	63	36,3	
1 x 2.5 RE	1	7,4	73,6	77	39,7	
1 x 4 RE	1	7,8	78,2	95	43,7	
1 x 6 RE	1	8,3	83,2	118	48,0	
1 x 10 RE	1	9,1	91,0	161	54,8	
1 x 16 RE	1	10,1	100,5	224	63,0	
1 x 16 RM	1	10,5	105,0	231	66,9	
1 x 25 RE	1	11,6	115,5	322	79,4	
1 x 25 RM	1	11,9	119,0	330	82,7	
1 x 35 RM	1	12,9	129,0	424	91,9	
1 x 50 RM	1	14,6	146,0	599	112,7	
1 x 70 RM	1	16,2	162,0	769	128,5	
1 x 95 RM	1	18,3	183,0	1024	156,2	
1 x 120 RM	1	19,7	197,0	1268	170,9	
1 x 150 RM	1	21,5	215,0	1546	198,4	
1 x 185 RM	1	23,5	235,0	1904	230,2	
1 x 240 RM	1	26,6	266,0	2437	289,3	
1 x 300 RM	1	30,9	308,5	3077	372,7	
1 x 400 RM	1	35,0	349,9	3959	479,8	
1 x 500 RM	1	38,6	385,7	4952	555,6	
1 x 630 RM	1	42,5	425,3	6314	621,7	
2 x 1.5 RE	1	10,3	77,4	142	82,7	
2 x 2.5 RE	1	11,1	83,4	176	94,4	
2 x 4 RE	1	12,0	90,3	221	108,5	
2 x 6 RE	1	13,0	97,8	278	124,7	
2 x 10 RE	1	14,6	109,5	384	151,5	
2 x 16 RE	1	16,5	123,8	540	186,8	
2 x 16 RM	1	17,4	130,5	568	204,6	
2 x 25 RE	1	21,5	161,3	945	322,5	
2 x 25 RM	1	22,2	166,5	983	340,6	
2 x 35 RM	1	24,6	184,5	1261	410,7	
2 x 50 RM	1	28,0	210,0	1740	522,4	
2 x 70 RM	1	31,6	237,0	2257	649,1	
2 x 95 RM	1	36,6	274,5	3047	865,1	
2 x 120 RM	1	39,4	295,5	3696	981,5	
2 x 150 RM	1	43,4	325,5	4526	1186,3	
2 x 185 RM	1	48,2	361,5	5611	1462,2	
2 x 240 RM	1	54,0	405,0	7114	1812,4	
3 x 1.5 RE	1	10,8	81,2	161	88,8	
3 x 2.5 RE	1	11,7	87,6	204	101,0	
3 x 4 RE	1	12,7	95,0	262	115,7	
3 x 6 RE	1	13,7	103,1	337	132,2	
3 x 10 RE	1	15,4	115,7	476	159,2	
3 x 16 RE	1	17,5	131,0	683	194,2	
3 x 16 RM	1	18,4	138,3	711	211,6	
3 x 25 RE	1	22,7	170,2	1163	335,4	
3 x 25 RM	1	23,4	175,8	1203	353,3	
3 x 35 RM	1	26,0	195,0	1560	423,0	
3 x 50 RM	1	29,7	222,4	2182	536,2	
3 x 70 RM	1	33,5	251,2	2838	659,8	

Conductor number and cross section, mm ²	Voltage, kV	Cable nominal outer diameter, mm	Minimum radius of cable bend, mm	Weight for 1 km cable, kg	Amount of combustible materials, l/km
				TOFLEX RtPGng(A)-HF	
3 x 95 RM	1	38,8	291,0	3840	877,6
3 x 120 RM	1	41,8	313,6	4699	987,9
3 x 150 RM	1	46,9	351,6	5852	1254,0
3 x 185 RM	1	51,2	383,9	7152	1470,5
3 x 240 RM	1	58,0	434,9	9167	1871,7
4 x 1.5 RE	1	11,7	87,7	188	100,5
4 x 2.5 RE	1	12,7	95,0	242	114,5
4 x 4 RE	1	13,8	103,3	315	131,1
4 x 6 RE	1	15,0	112,3	409	149,7
4 x 10 RE	1	16,9	126,4	586	179,9
4 x 16 RE	1	19,1	143,6	851	218,8
4 x 16 RM	1	20,2	151,7	883	237,9
4 x 25 RE	1	25,2	188,7	1454	392,4
4 x 25 RM	1	26,0	195,0	1502	412,7
4 x 35 RM	1	28,4	213,1	1924	472,4
4 x 50 RM	1	32,9	246,8	2750	621,1
4 x 70 RM	1	37,6	281,7	3606	783,2
4 x 95 RM	1	43,0	322,7	4838	1004,7
4 x 120 RM	1	47,2	354,0	6028	1187,5
4 x 150 RM	1	51,5	386,5	7319	1391,8
4 x 185 RM	1	57,4	430,2	9118	1725,7
4 x 240 RM	1	63,9	479,0	11495	2075,8
5 x 1.5 RE	1	12,7	95,0	223	114,0
5 x 2.5 RE	1	13,8	103,1	288	130,0
5 x 4 RE	1	15,0	112,5	380	149,0
5 x 6 RE	1	16,3	122,6	502	170,2
5 x 10 RE	1	18,5	138,4	718	204,5
5 x 16 RE	1	21,0	157,6	1042	248,5
5 x 16 RM	1	22,2	166,7	1078	270,1
5 x 25 RE	1	27,5	206,0	1768	442,8
5 x 25 RM	1	28,4	213,1	1823	465,7
5 x 35 RM	1	31,5	236,3	2388	553,2
5 x 50 RM	1	36,9	276,8	3440	749,1
5 x 70 RM	1	41,2	309,2	4462	881,9
5 x 95 RM	1	48,1	360,7	6047	1194,6
5 x 120 RM	1	51,9	389,0	7401	1335,4
5 x 150 RM	1	57,7	433,0	9124	1661,0
5 x 185 RM	1	63,1	473,5	11298	1943,4
5 x 240 RM	1	71,2	534,2	14347	2431,5

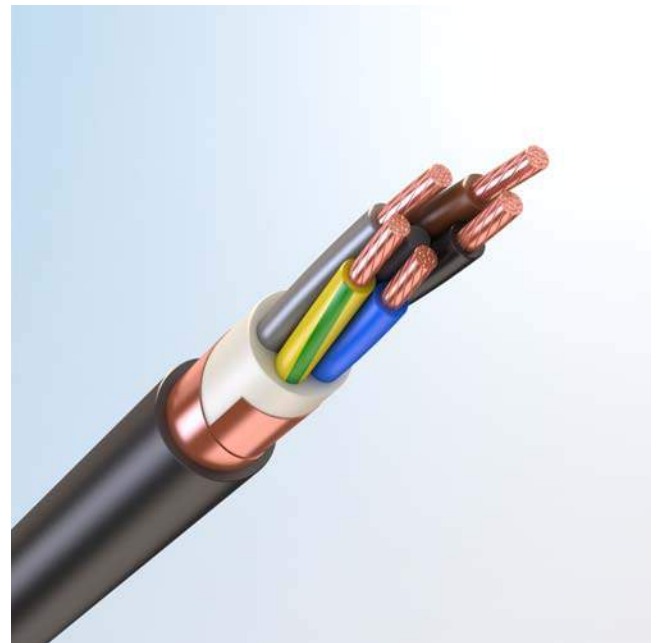
POWER CABLES FOR VOLTAGE 1 AND 3 KV

2. SHIELDED

IEC 60502-1

2.1 Cables with PVC sheath

Cable grade	Cable structure elements
TOFLEX VVGE	Cu/PVC/OSCR/PVC
TOFLEX AVVGE	Al/PVC/OSCR/PVC
TOFLEX PvvGE	Cu/XLPE/OSCR/PVC
TOFLEX APVVGE	Al/XLPE/OSCR/PVC



Notes:

"HL" shall be added with a hyphen for cold resistant cables.

Cables for voltage 3 kV shall be manufactured either single-conductor or three-conductor.

In case of concentric lay-up shield, its cross section shall be specified after slash in a cable macro size.



DESIGN FEATURES

- ① **Electrical conductor** – aluminium or copper, or tinned copper - 2 class as per IEC 60228; copper or tinned copper – 5 class* as per IEC 60228;
- ② **Insulation:**
 "V" – PVC compound,
 "Pv" – cross-linked polyethylene;
- ③ **Shield:**
 "E" – made from copper tape or copper wires,
 "EI" – made from tinned copper wires;
- ④ **Outer sheath** – PVC compound;
Possible design:
 "HL" – cold-resistant PVC compound.

* Letter "G" shall be added for cables with flexible copper or tinned copper conductor in a blank following TOFLEX trade mark designation.

► **Ordering example:**

TOFLEX PvvGE 3×95RM(N, G)-1 IEC 60502-1



CABLE FEATURES



Conductor number and cross section, mm ²	Voltage, kV	Cable nominal outer diameter, mm	Minimum radius of cable bend, mm	Weight for 1 km cable, kg		Cable nominal outer diameter, mm	Minimum radius of cable bend, mm	Weight for 1 km cable, kg	
				TOFLEX VVGE	TOFLEX VVGE-HL			TOFLEX PvvGE	TOFLEX PvvGE-HL
1 x 10 RE	1	9,5	94,8	180	128	8,7	86,8	161	156
1 x 16 RE	1	10,4	104,3	247	176	9,8	98,3	229	222
1 x 16 RM	1	10,9	108,8	256	242	10,3	102,8	238	231
1 x 25 RE	1	11,9	119,3	350	251	11,3	113,3	328	319
1 x 25 RM	1	12,3	122,8	361	345	11,7	116,8	339	329
1 x 35 RM	1	13,3	132,8	459	355	12,7	126,8	435	422
1 x 50 RM	1	15,0	149,8	641	452	14,2	141,8	607	589
1 x 70 RM	1	16,6	165,8	818	633	16,0	159,8	786	762
1 x 95 RM	1	19,1	190,8	1100	809	17,7	176,8	1031	1000
1 x 120 RM	1	20,5	204,8	1351	1089	19,7	196,8	1301	1262
1 x 150 RM	1	22,3	222,8	1641	1338	21,5	214,8	1584	1536
1 x 185 RM	1	24,7	246,8	2034	1626	23,9	238,8	1967	1908
1 x 240 RM	1	27,4	273,8	2564	2016	26,4	263,8	2476	2402
2 x 4 RE	1	13,6	102,2	285	275	12,4	93,2	244	236
2 x 6 RE	1	14,6	109,7	348	336	13,4	100,7	303	294
2 x 10 RE	1	16,2	121,4	461	447	15,0	112,4	412	401
2 x 16 RE	1	18,5	138,6	643	625	16,9	126,6	571	557
2 x 16 RM	1	19,4	145,4	678	659	17,8	133,4	603	588
2 x 25 RE	1	21,5	161,1	911	888	20,3	152,1	842	823
2 x 25 RM	1	22,2	166,4	948	923	21,0	157,4	878	858
2 x 35 RM	1	24,6	184,4	1214	1184	23,0	172,4	1115	1092
2 x 50 RM	1	28,0	209,9	1675	1637	26,4	197,9	1561	1530
2 x 70 SM	1	26,2	199,4	1788	1771	26,2	199,4	1724	1705
2 x 95 SM	1	28,2	214,4	2335	2313	28,2	214,4	2234	2213
2 x 120 SM	1	32,6	247,4	2908	2881	32,6	247,4	2808	2781
2 x 150 SM	1	35,0	265,4	3551	3518	35,0	265,4	3431	3401
2 x 185 SM	1	37,5	284,1	4319	4281	37,5	284,1	4168	4135
2 x 240 SM	1	43,4	328,4	5518	5469	43,4	328,4	5318	5277
3 x 2,5 RE	1	12,4	93,0	243	235	12,0	89,8	226	-
3 x 4 RE	1	14,3	106,9	333	322	13,0	97,2	286	278
3 x 6 RE	1	15,3	115,0	414	401	14,0	105,3	363	354
3 x 10 RE	1	17,0	127,5	563	548	15,7	117,9	505	494
3 x 16 RE	1	19,4	145,9	799	780	17,8	133,2	716	703
3 x 16 RM	1	20,4	153,1	836	816	19,1	143,4	768	753
3 x 25 RE	1	22,7	170,0	1148	1124	21,4	160,4	1066	1047
3 x 25 RM	1	23,8	178,7	1211	1184	22,1	166,0	1108	1088
3 x 35 RM	1	26,0	194,8	1538	1507	24,7	185,1	1447	1423
3 x 50 RM	1	29,6	222,2	2152	2114	27,9	209,3	2018	1989
3 x 70 SM	1	30,2	229,4	2512	2488	30,2	229,4	2416	2393
3 x 95 SM	1	35,0	265,4	3413	3379	35,0	265,4	3262	3232
3 x 120 SM	1	38,0	287,9	4171	4133	38,0	287,9	4021	3988
3 x 150 SM	1	42,4	320,9	5129	5083	42,4	320,9	4950	4910
3 x 185 SM	1	46,8	353,9	6333	6275	46,8	353,9	6107	6060
3 x 240 SM	1	51,8	391,4	7967	7899	51,8	391,4	7669	7616
4 x 4 RE	1	16,0	119,6	416	403	14,5	108,8	359	348
4 x 6 RE	1	17,2	128,7	520	504	15,7	117,8	457	445
4 x 10 RE	1	19,0	142,8	710	693	17,6	131,9	640	627
4 x 16 RE	1	21,3	159,9	992	971	19,9	149,1	912	896
4 x 16 RM	1	22,4	168,1	1036	1013	21,0	157,2	953	936

2

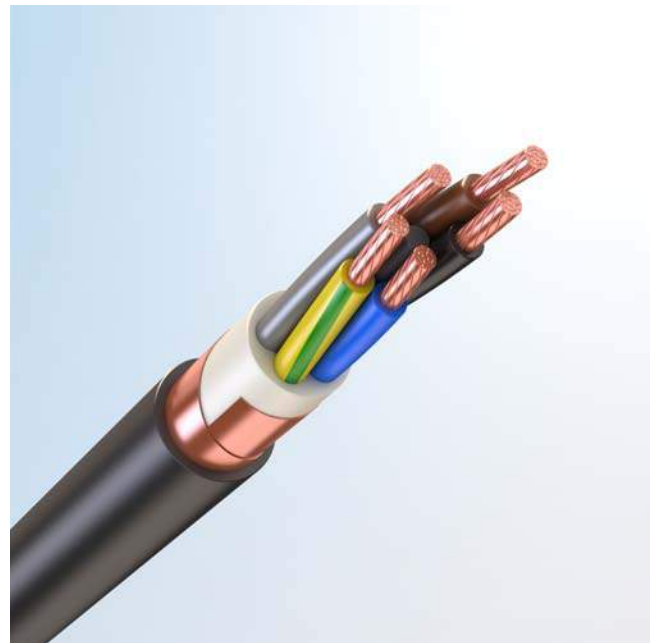
Conductor number and cross section, mm ²	Voltage, kV	Cable nominal outer diameter, mm	Minimum radius of cable bend, mm	Weight for 1 km cable, kg		Cable nominal outer diameter, mm	Minimum radius of cable bend, mm	Weight for 1 km cable, kg	
				TOFLEX VVGE	TOFLEX VVGE-HL			TOFLEX PvvGE	TOFLEX PvvGE-HL
4 x 25 RE	1	25,1	188,5	1462	1434	23,5	176,2	1351	1331
4 x 25 RM	1	26,0	194,9	1513	1483	24,5	184,0	1413	1390
4 x 35 RM	1	28,4	212,9	1931	1897	26,9	202,1	-	1795
4 x 50 RM	1	32,9	246,7	2750	2706	30,6	229,2	2558	2527
4 x 70 SM	1	35,0	265,4	3339	3306	35,0	265,4	3212	3181
4 x 95 SM	1	39,0	295,4	4422	4381	39,0	295,4	4222	4187
4 x 120 SM	1	42,4	320,9	5462	5415	42,4	320,9	5263	5223
4 x 150 SM	1	46,8	353,9	6695	6637	46,8	353,9	6456	6409
4 x 185 SM	1	51,8	391,4	8241	8171	51,8	391,4	7940	7887
4 x 240 SM	1	56,6	427,4	10478	10391	56,6	427,4	10079	10016
5 x 4 RE	1	17,2	128,8	492	477	15,6	116,7	424	413
5 x 6 RE	1	18,5	138,9	625	608	16,9	126,8	551	539
5 x 10 RE	1	20,6	154,7	857	837	19,0	142,6	774	759
5 x 16 RE	1	23,2	174,0	1200	1177	21,6	161,8	1106	1088
5 x 16 RM	1	24,6	184,6	1262	1236	22,8	170,9	1154	1135
5 x 25 RE	1	27,4	205,8	1768	1737	25,8	193,7	1649	1626
5 x 25 RM	1	28,4	212,9	1828	1795	26,8	200,8	1709	1685
5 x 35 RM	1	31,5	236,2	2381	2342	29,5	221,0	2221	2193
5 x 50 RM	1	36,5	273,6	3395	3344	34,3	257,4	3199	3162
5 x 70 SM	1	38,0	287,9	4098	4059	38,0	287,9	3939	3905
5 x 95 SM	1	43,4	328,4	5501	5450	43,4	328,4	5251	5209
5 x 120 SM	1	48,8	368,9	6814	6754	48,8	368,9	6566	6516
5 x 150 SM	1	53,2	401,9	8356	8283	53,2	401,9	8057	8000
5 x 185 SM	1	58,6	442,4	10336	10247	58,6	442,4	9960	9894
5 x 240 SM	1	62,6	472,4	12969	12866	62,6	472,4	12471	12400
3 x 25 RE + 1 x 16 RE	1	25,1	188,5	1398	1369	22,8	170,7	1250	1230
3 x 25 RM + 1 x 16 RM	1	26,0	194,9	1446	1415	24,5	184,0	1347	1324
3 x 35 RM + 1 x 16 RM	1	27,5	206,0	1736	1703	26,1	195,6	1634	1609
3 x 50 RM + 1 x 25 RM	1	31,8	238,4	2473	2431	29,5	221,6	2295	2265
3 x 70 SM + 1 x 35 SM	1	35,0	265,4	3003	2971	35,0	265,4	2890	2859
3 x 95 SM + 1 x 50 SM	1	39,0	295,4	4007	3967	39,0	295,4	3825	3791
3 x 120 SM + 1 x 70 SM	1	42,4	320,9	4977	4931	42,4	320,9	4796	4756
3 x 150 SM + 1 x 70 SM	1	46,8	353,9	5934	5878	46,8	353,9	5723	5676
3 x 185 SM + 1 x 95 SM	1	51,8	391,4	7372	7305	51,8	391,4	7096	7043
3 x 240 SM + 1 x 120 SM	1	56,6	427,4	9334	9252	56,6	427,4	8986	8922

POWER CABLES FOR VOLTAGE 1 AND 3 KV

2. SHIELDED

IEC 60502-1

2.2 Cables sheathed with halogen-free polymer compound



2

Cable grade	Cable structure elements
TOFLEX RtPGEEng (A)-HF	Cu/HEPR/OSCR/HFFR
TOFLEX ARtPGEEng (A)-HF	Al/HEPR/OSCR/HFFR
TOFLEX RPGEng (A)-HF	Cu/EPR/OSCR/HFFR
TOFLEX ARPGEEng (A)-HF	Al/EPR/OSCR/HFFR
TOFLEX PvPGEEng (A)-HF	Cu/XLPE/OSCR/HFFR
TOFLEX APvPGEEng(A)-HF	Al/XLPE/OSCR/HFFR

Notes:

"HL" shall be added with a hyphen for cold resistant cables.

Cables for voltage 3 kV shall be manufactured either single-conductor or three-conductor.

In case of concentric lay-up shield, its cross section shall be specified after slash in a cable macro size.



DESIGN FEATURES

- ① **Electrical conductor** – aluminium or copper, or tinned copper - 2 class as per IEC 60228; copper or tinned copper – 5 class* as per IEC 60228;
- ② **Insulation:**
 - "Rt" – hard grade ethylene propylene rubber,
 - "R" – ethylene propylene rubber;
 - "Pv" – cross-linked polyethylene;
- ③ **Shield:**
 - "E" – made from copper tape or copper wires,
 - "EI" – made from tinned copper wires;
- ④ **Outer sheath** – PVC compound;
 - Possible design:**
 - "HL" – cold-resistant PVC compound.

* Letter "G" shall be added for cables with flexible copper or tinned copper conductor in a blank following TOFLEX trade mark designation.

► **Ordering example:**

TOFLEX RPGEng (A)-HF 3x95RM(N, G)-1 IEC 60502-1



CABLE FEATURES



2

Conductor number and cross section, mm ²	Voltage, kV	Cable nominal outer diameter, mm	Minimum radius of cable bend, mm	Weight for 1 km cable, kg		Amount of combustible materials, l/km
				TOFLEX RtPGEng(A)-HF		
1 x 1.5 RE	1	9,1	91,4	120	62,3	
1 x 2.5 RE	1	9,5	95,4	136	67,0	
1 x 4 RE	1	10,0	100,0	158	72,4	
1 x 6 RE	1	10,5	105,0	185	78,3	
1 x 10 RE	1	11,3	112,8	234	87,5	
1 x 16 RE	1	12,2	122,3	306	98,7	
1 x 16 RM	1	12,7	126,8	316	104,0	
1 x 25 RE	1	13,7	137,3	416	119,9	
1 x 25 RM	1	14,1	140,8	427	124,2	
1 x 35 RM	1	15,1	150,8	529	136,6	
1 x 50 RM	1	16,8	167,8	717	162,7	
1 x 70 RM	1	18,4	183,8	901	183,5	
1 x 95 RM	1	20,5	204,8	1174	217,8	
1 x 120 RM	1	21,9	218,8	1429	236,9	
1 x 150 RM	1	24,1	240,8	1744	285,1	
1 x 185 RM	1	26,1	260,8	2120	324,4	
1 x 240 RM	1	28,8	287,8	2653	377,1	
1 x 300 RM	1	33,4	334,3	3366	494,6	
1 x 400 RM	1	37,6	375,7	4284	617,5	
1 x 500 RM	1	41,2	411,5	5310	706,9	
1 x 630 RM	1	46,3	463,1	6847	873,8	
2 x 1.5 RE	1	12,5	93,8	235	120,7	
2 x 2.5 RE	1	13,3	99,8	277	135,0	
2 x 4 RE	1	14,2	106,7	332	152,2	
2 x 6 RE	1	15,2	114,2	401	171,6	
2 x 10 RE	1	16,8	125,9	524	203,5	
2 x 16 RE	1	18,7	140,1	703	245,0	
2 x 16 RM	1	19,6	146,9	742	265,7	
2 x 25 RE	1	21,7	162,6	990	323,5	
2 x 25 RM	1	22,4	167,9	1029	341,7	
2 x 35 RM	1	24,8	185,9	1312	411,8	
2 x 50 RM	1	28,2	211,4	1800	523,6	
2 x 70 RM	1	31,8	238,4	2325	650,2	
2 x 95 RM	1	36,8	275,9	3126	866,5	
2 x 120 RM	1	39,6	296,9	3781	982,9	
2 x 150 RM	1	43,6	326,9	4621	1187,7	
2 x 185 RM	1	48,4	362,9	5716	1463,8	
2 x 240 RM	1	54,2	406,4	7233	1814,0	
3 x 1.5 RE	1	13,0	97,5	257	128,4	
3 x 2.5 RE	1	13,9	104,0	308	143,5	
3 x 4 RE	1	14,9	111,4	376	161,4	
3 x 6 RE	1	15,9	119,5	462	181,4	
3 x 10 RE	1	17,6	132,0	619	213,9	
3 x 16 RE	1	19,6	147,4	848	255,6	
3 x 16 RM	1	20,6	154,6	888	276,1	
3 x 25 RE	1	22,9	171,5	1211	336,5	
3 x 25 RM	1	24,0	180,2	1276	369,9	
3 x 35 RM	1	26,2	196,3	1614	424,1	
3 x 50 RM	1	29,8	223,7	2245	537,4	
3 x 70 RM	1	33,7	252,5	2911	660,9	

Conductor number and cross section, mm ²	Voltage, kV	Cable nominal outer diameter, mm	Minimum radius of cable bend, mm	Weight for 1 km cable, kg	
				TOFLEX RtPGE(A)-HF	Amount of combustible materials, l/km
3 x 95 RM	1	39,0	292,4	3924	879,0
3 x 120 RM	1	42,0	315,0	4790	989,3
3 x 150 RM	1	47,1	353,0	5953	1255,6
3 x 185 RM	1	51,4	385,2	7264	1472,2
3 x 240 RM	1	58,2	436,3	9294	1873,5
4 x 1.5 RE	1	13,9	104,1	291	143,1
4 x 2.5 RE	1	14,8	111,3	354	160,2
4 x 4 RE	1	16,0	119,6	438	180,4
4 x 6 RE	1	17,2	128,7	545	202,9
4 x 10 RE	1	19,0	142,8	741	239,3
4 x 16 RE	1	21,3	159,9	1030	285,6
4 x 16 RM	1	22,4	168,1	1074	308,3
4 x 25 RE	1	25,3	190,0	1508	393,6
4 x 25 RM	1	26,2	196,4	1557	413,9
4 x 35 RM	1	28,6	214,4	1985	473,5
4 x 50 RM	1	33,1	248,2	2822	622,3
4 x 70 RM	1	37,7	283,1	3687	784,6
4 x 95 RM	1	43,2	324,1	4932	1006,1
4 x 120 RM	1	47,4	355,4	6131	1189,2
4 x 150 RM	1	51,7	387,9	7432	1393,4
4 x 185 RM	1	57,5	431,5	9243	1727,6
4 x 240 RM	1	64,0	480,3	11636	2077,6
5 x 1.5 RE	1	14,9	111,4	334	159,7
5 x 2.5 RE	1	15,9	119,5	410	179,3
5 x 4 RE	1	17,2	128,8	514	202,3
5 x 6 RE	1	18,5	138,9	649	227,9
5 x 10 RE	1	20,6	154,7	886	269,1
5 x 16 RE	1	23,2	174,0	1237	321,4
5 x 16 RM	1	24,8	186,1	1310	363,1
5 x 25 RE	1	27,6	207,3	1827	444,0
5 x 25 RM	1	28,6	214,4	1883	466,9
5 x 35 RM	1	31,7	237,7	2455	554,4
5 x 50 RM	1	37,1	278,1	3519	750,5
5 x 70 RM	1	41,4	310,5	4552	883,4
5 x 95 RM	1	48,3	362,0	6152	1196,3
5 x 120 RM	1	52,1	390,4	7514	1337,0
5 x 150 RM	1	57,9	434,3	9251	1662,8
5 x 185 RM	1	63,3	474,8	11437	1945,3
5 x 240 RM	1	72,0	540,0	14608	2503,7

POWER CABLES FOR VOLTAGE 1 AND 3 KV

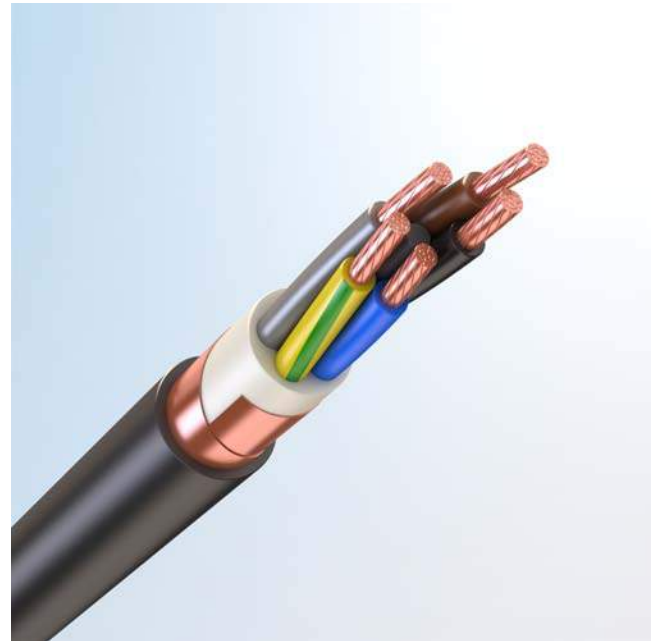
2

2. SHIELDED

IEC 60502-1

2.3 Cables sheathed with halogen free cross-linked highly elastic polymer compound

Cable grade	Cable structure elements
TOFLEX RtRGE _{ng} (A)-HF	Cu/HEPR/OSCR/XLHFFR
TOFLEX ARtRGE _{ng} (A)-HF	Al/HEPR/OSCR/XLHFFR
TOFLEX RRGE _{ng} (A)-HF	Cu/EPR/OSCR/XLHFFR
TOFLEX ARRGE _{ng} (A)-HF	Al/EPR/OSCR/XLHFFR



Notes:

"HL" shall be added with a hyphen for cold resistant cables.

Cables for voltage 3 kV shall be manufactured either single-conductor or three-conductor.

In case of concentric lay-up shield, its cross section shall be specified after slash in a cable macro size.



DESIGN FEATURES

- ① **Electrical conductor** – aluminium or copper, or tinned copper - 2 class as per IEC 60228; copper or tinned copper – 5 class* as per IEC 60228;
- ② **Insulation:**
 "Rt" – hard grade ethylene propylene rubber,
 "R" – ethylene propylene rubber;
 "Pv" – cross-linked polyethylene;
- ③ **Shield:**
 "E" – made from copper tape or copper wires,
 "EI" – made from tinned copper wires;
- ④ **Outer sheath** – made from halogen free cross-linked highly elastic polymer compound
Possible design:
 "ng(A)-HF-HL" – made from cold-resistant halogen free cross-linked highly elastic polymer compound.

* Letter "G" shall be added for cables with flexible copper or tinned copper conductor in a blank following TOFLEX trade mark designation.

► **Ordering example:**

TOFLEX ARRGE_{ng} (A)-HF 3×95RM(N, G)-1 IEC 60502-1



CABLE FEATURES



Conductor number and cross section, mm ²	Voltage, kV	Cable nominal outer diameter, mm	Minimum radius of cable bend, mm	Weight for 1 km cable, kg		Amount of combustible materials, l/km
				TOFLEX RtRGEng(A)-HF		
1 x 1.5 RE	1	9,1	91,4	114	62,3	
1 x 2.5 RE	1	9,5	95,4	131	67,0	
1 x 4 RE	1	10,0	100,0	152	72,4	
1 x 6 RE	1	10,5	105,0	179	78,3	
1 x 10 RE	1	11,3	112,8	227	87,5	
1 x 16 RE	1	12,2	122,3	298	98,7	
1 x 16 RM	1	12,7	126,8	308	104,0	
1 x 25 RE	1	13,7	137,3	407	119,9	
1 x 25 RM	1	14,1	140,8	417	124,2	
1 x 35 RM	1	15,1	150,8	519	136,6	
1 x 50 RM	1	16,8	167,8	706	162,7	
1 x 70 RM	1	18,4	183,8	889	183,5	
1 x 95 RM	1	20,5	204,8	1159	217,8	
1 x 120 RM	1	21,9	218,8	1414	236,9	
1 x 150 RM	1	24,1	240,8	1725	285,1	
1 x 185 RM	1	26,1	260,8	2099	324,4	
1 x 240 RM	1	28,8	287,8	2630	377,1	
1 x 300 RM	1	33,4	334,3	3339	494,6	
1 x 400 RM	1	37,6	375,7	4248	617,5	
1 x 500 RM	1	41,2	411,5	5271	706,9	
1 x 630 RM	1	46,3	463,1	6796	873,8	
2 x 1.5 RE	1	12,5	93,8	227	120,7	
2 x 2.5 RE	1	13,3	99,8	268	135,0	
2 x 4 RE	1	14,2	106,7	323	152,2	
2 x 6 RE	1	15,2	114,2	390	171,6	
2 x 10 RE	1	16,8	125,9	513	203,5	
2 x 16 RE	1	18,7	140,1	689	245,0	
2 x 16 RM	1	19,6	146,9	728	265,7	
2 x 25 RE	1	21,7	162,6	974	323,5	
2 x 25 RM	1	22,4	167,9	1013	341,7	
2 x 35 RM	1	24,8	185,9	1292	411,8	
2 x 50 RM	1	28,2	211,4	1777	523,6	
2 x 70 RM	1	31,8	238,4	2299	650,2	
2 x 95 RM	1	36,8	275,9	3090	866,5	
2 x 120 RM	1	39,6	296,9	3742	982,9	
2 x 150 RM	1	43,6	326,9	4578	1187,7	
2 x 185 RM	1	48,4	362,9	5660	1463,8	
2 x 240 RM	1	54,2	406,4	7170	1814,0	
3 x 1.5 RE	1	13,0	97,5	248	128,4	
3 x 2.5 RE	1	13,9	104,0	299	143,5	
3 x 4 RE	1	14,9	111,4	366	161,4	
3 x 6 RE	1	15,9	119,5	451	181,4	
3 x 10 RE	1	17,6	132,0	606	213,9	
3 x 16 RE	1	19,6	147,4	834	255,6	
3 x 16 RM	1	20,6	154,6	873	276,1	
3 x 25 RE	1	22,9	171,5	1194	336,5	
3 x 25 RM	1	24,0	180,2	1256	369,9	
3 x 35 RM	1	26,2	196,3	1593	424,1	
3 x 50 RM	1	29,8	223,7	2221	537,4	
3 x 70 RM	1	33,7	252,5	2883	660,9	

2

Conductor number and cross section, mm ²	Voltage, kV	Cable nominal outer diameter, mm	Minimum radius of cable bend, mm	Weight for 1 km cable, kg	Amount of combustible materials, l/km
				TOFLEX RtPGEng(A)-HF	
3 x 95 RM	1	39,0	292,4	3886	879,0
3 x 120 RM	1	42,0	315,0	4749	989,3
3 x 150 RM	1	47,1	353,0	5899	1255,6
3 x 185 RM	1	51,4	385,2	7205	1472,2
3 x 240 RM	1	58,2	436,3	9220	1873,5
4 x 1.5 RE	1	13,9	104,1	282	143,1
4 x 2.5 RE	1	14,8	111,3	344	160,2
4 x 4 RE	1	16,0	119,6	427	180,4
4 x 6 RE	1	17,2	128,7	533	202,9
4 x 10 RE	1	19,0	142,8	728	239,3
4 x 16 RE	1	21,3	159,9	1015	285,6
4 x 16 RM	1	22,4	168,1	1057	308,3
4 x 25 RE	1	25,3	190,0	1487	393,6
4 x 25 RM	1	26,2	196,4	1535	413,9
4 x 35 RM	1	28,6	214,4	1961	473,5
4 x 50 RM	1	33,1	248,2	2795	622,3
4 x 70 RM	1	37,7	283,1	3650	784,6
4 x 95 RM	1	43,2	324,1	4889	1006,1
4 x 120 RM	1	47,4	355,4	6076	1189,2
4 x 150 RM	1	51,7	387,9	7372	1393,4
4 x 185 RM	1	57,5	431,5	9170	1727,6
4 x 240 RM	1	64,0	480,3	11553	2077,6
5 x 1.5 RE	1	14,9	111,4	324	159,7
5 x 2.5 RE	1	15,9	119,5	399	179,3
5 x 4 RE	1	17,2	128,8	502	202,3
5 x 6 RE	1	18,5	138,9	636	227,9
5 x 10 RE	1	20,6	154,7	872	269,1
5 x 16 RE	1	23,2	174,0	1220	321,4
5 x 16 RM	1	24,8	186,1	1290	363,1
5 x 25 RE	1	27,6	207,3	1804	444,0
5 x 25 RM	1	28,6	214,4	1860	466,9
5 x 35 RM	1	31,7	237,7	2429	554,4
5 x 50 RM	1	37,1	278,1	3482	750,5
5 x 70 RM	1	41,4	310,5	4511	883,4
5 x 95 RM	1	48,3	362,0	6096	1196,3
5 x 120 RM	1	52,1	390,4	7454	1337,0
5 x 150 RM	1	57,9	434,3	9176	1662,8
5 x 185 RM	1	63,3	474,8	11355	1945,3
5 x 240 RM	1	72,0	540,0	14501	2503,7

POWER CABLES FOR VOLTAGE 1 AND 3 KV

3. ARMoured WITH TAPES

IEC 60502-1

3.1 Sheathed with PVC compound

Cable grade	Cable structure elements
TOFLEX VBSHv	Cu/PVC/PVC/STA/PVC
TOFLEX AVBSHv	Al/PVC/PVC/STA/PVC
TOFLEX PvBSHv	Cu/XLPE/PVC/STA/PVC
TOFLEX APvBSHv	Al/XLPE/PVC/STA/PVC

Notes:

"HL" shall be added with a hyphen for cold resistant cables.

Cables for voltage 3 kV shall be manufactured either single-conductor or three-conductor.

Armour for single-conductor cables shall be made from aluminium tapes or aluminium alloy, in this case armour shall be designated as "Ba".



3



DESIGN FEATURES

- ① **Electrical conductor** – aluminium or copper, or tinned copper - 2 class as per IEC 60228; copper or tinned copper – 5 class* as per IEC 60228;
 - ② **Insulation:**
 - "V" – PVC compound,
 - "Pv" – cross-linked polyethylene;
 - ③ **Inner sheath** – corresponds to the type of the outer sheath;
 - ④ **Armour:**
 - "B" – steel galvanized wires,
 - "Ba" – made from aluminium tapes or aluminium alloy;
 - ⑤ **Outer sheath** – PVC compound;
- Possible design:**
- "HL" – cold-resistant PVC compound.

* Letter "G" shall be added for cables with flexible copper or tinned copper conductor in a blank following TOFLEX trade mark designation.

► **Ordering example:**

TOFLEX APvBSHv 3x95RM(N, G)-1 IEC 60502-1



CABLE FEATURES



3

Conductor number and cross section, mm ²	Voltage, kV	Cable nominal outer diameter, mm	Minimum radius of cable bend, mm	Weight for 1 km cable, kg		Cable nominal outer diameter, mm	Minimum radius of cable bend, mm	Weight for 1 km cable, kg	
				TOFLEX VBSHv	TOFLEX VBSHv-HL			TOFLEX PvBSHv	TOFLEX PvBSHv-HL
2 x 4 RE	1	15,2	114,30	411	398	14,0	105,3	357	348
2 x 6 RE	1	16,2	121,80	483	470	15,0	112,8	427	416
2 x 10 RE	1	17,8	133,50	613	597	16,6	124,5	551	538
2 x 16 RE	1	19,7	147,75	789	770	18,5	138,8	721	706
2 x 16 RM	1	20,6	154,50	832	811	19,4	145,5	763	746
2 x 25 RE	1	22,7	170,25	1083	1059	21,5	161,3	1003	983
2 x 25 RM	1	23,4	175,50	1126	1100	22,2	166,5	1046	1025
2 x 35 RM	1	25,8	193,50	1411	1379	24,2	181,5	1300	1276
2 x 50 RM	1	29,2	219,00	1902	1862	27,6	207,0	1773	1742
2 x 70 SM	1	27,4	208,50	1999	1985	27,4	208,5	1936	1914
2 x 95 SM	1	29,4	223,50	2563	2545	29,4	223,5	2463	2440
2 x 120 SM	1	33,8	256,50	3175	3151	33,8	256,5	3076	3047
2 x 150 SM	1	36,2	274,50	3837	3807	36,2	274,5	3718	3685
2 x 185 SM	1	38,7	293,25	4627	4592	38,7	293,3	4476	4441
2 x 240 SM	1	44,6	337,50	5878	5831	44,6	337,5	5678	5635
3 x 1.5 RE	1	13,8	103,50	326	316	13,8	95,5	322	-
3 x 2.5 RE	1	14,0	105,18	356	346	13,8	102,0	342	-
3 x 4 RE	1	15,9	119,05	465	452	14,6	109,4	405	395
3 x 6 RE	1	16,9	127,11	557	542	15,7	117,4	493	481
3 x 10 RE	1	18,6	139,69	714	698	17,3	130,0	652	639
3 x 16 RE	1	20,7	155,01	953	933	19,4	145,3	875	860
3 x 16 RM	1	21,6	162,26	999	978	20,3	152,6	920	903
3 x 25 RE	1	23,9	179,19	1330	1305	22,6	169,5	1237	1217
3 x 25 RM	1	24,6	184,84	1379	1352	23,4	175,2	1285	1265
3 x 35 RM	1	27,2	203,96	1747	1715	25,9	194,3	1644	1619
3 x 50 RM	1	30,9	231,38	2393	2353	29,1	218,5	2244	2214
3 x 70 SM	1	31,4	238,50	2758	2737	31,4	238,5	2663	2638
3 x 95 SM	1	36,2	274,50	3699	3668	36,2	274,5	3549	3516
3 x 120 SM	1	39,2	297,00	4483	4448	39,2	297,0	4334	4298
3 x 150 SM	1	43,6	330,00	5480	5436	43,6	330,0	5301	5259
3 x 185 SM	1	48,0	363,00	6720	6665	48,0	363,0	6494	6445
3 x 240 SM	1	53,8	406,50	8753	8690	53,8	406,5	8454	8399
4 x 1.5 RE	1	13,9	104,50	339	329	13,8	100,9	328	-
4 x 2.5 RE	1	14,9	111,73	407	396	14,4	108,1	380	-
4 x 4 RE	1	17,0	127,28	538	524	15,5	116,4	467	457
4 x 6 RE	1	18,2	136,31	644	628	16,7	125,5	577	565
4 x 10 RE	1	20,1	150,41	851	832	18,6	139,6	768	754
4 x 16 RE	1	22,3	167,58	1151	1129	20,9	156,7	1059	1043
4 x 16 RM	1	23,4	175,72	1204	1180	22,0	164,9	1110	1092
4 x 25 RE	1	26,4	197,70	1664	1635	24,5	183,9	1528	1507
4 x 25 RM	1	27,2	204,02	1722	1691	25,8	193,2	1609	1586
4 x 35 RM	1	29,6	222,10	2161	2126	28,2	211,3	2038	2011
4 x 50 RM	1	34,1	255,83	3020	2974	31,8	238,4	2807	2775
4 x 70 SM	1	36,2	274,50	3626	3595	36,2	274,5	3498	3466
4 x 95 SM	1	40,2	304,50	4743	4705	40,2	304,5	4543	4506
4 x 120 SM	1	43,6	330,00	5813	5768	43,6	330,0	5614	5572
4 x 150 SM	1	48,0	363,00	7083	7026	48,0	363,0	6844	6794
4 x 185 SM	1	53,8	406,50	9026	8961	53,8	406,5	8725	8670
4 x 240 SM	1	58,6	442,50	11335	11253	58,6	442,5	10937	10870
5 x 2.5 RE	1	15,9	119,04	467	454	15,3	115,0	435	-

Conductor number and cross section, mm ²	Voltage, kV	Cable nominal outer diameter, mm	Minimum radius of cable bend, mm	Weight for 1 km cable, kg		Cable nominal outer diameter, mm	Minimum radius of cable bend, mm	Weight for 1 km cable, kg	
				TOFLEX VBSHv	TOFLEX VBSHv-HL			TOFLEX PvBSHv	TOFLEX PvBSHv-HL
5 x 4 RE	1	18,2	136,46	617	601	16,6	124,3	543	531
5 x 6 RE	1	19,5	146,58	761	743	17,9	134,4	673	661
5 x 10 RE	1	21,7	162,38	1010	990	20,0	150,2	914	899
5 x 16 RE	1	24,2	181,61	1375	1351	22,6	169,5	1267	1249
5 x 16 RM	1	25,8	193,73	1459	1431	23,8	178,6	1325	1306
5 x 25 RE	1	28,7	214,99	1990	1957	27,0	202,8	1856	1832
5 x 25 RM	1	29,6	222,08	2058	2023	28,0	209,9	1925	1899
5 x 35 RM	1	32,7	245,33	2639	2598	30,7	230,2	2461	2432
5 x 50 RM	1	37,7	282,75	3695	3641	35,1	263,6	3447	3410
5 x 70 SM	1	39,2	297,00	4411	4374	39,2	297,0	4251	4216
5 x 95 SM	1	44,6	337,50	5861	5813	44,6	337,5	5611	5568
5 x 120 SM	1	50,0	378,00	7220	7161	50,0	378,0	6971	6919
5 x 150 SM	1	55,2	417,00	9163	9095	55,2	417,0	8865	8805
5 x 185 SM	1	60,6	457,50	11225	11141	60,6	457,5	10849	10780
5 x 240 SM	1	64,6	487,50	13922	13823	64,6	487,5	13423	13349
3 x 25 RE + 1 x 16 RE	1	26,4	197,70	1600	1570	23,8	178,3	1421	1401
3 x 25 RM + 1 x 16 RM	1	27,2	204,02	1655	1623	25,8	193,2	1544	1519
3 x 35 RM + 1 x 16 RM	1	28,7	215,12	1958	1924	27,3	204,7	1844	1818
3 x 50 RM + 1 x 25 RM	1	33,0	247,58	2734	2690	30,8	230,7	2535	2504
3 x 70 SM + 1 x 35 RM	1	36,2	274,50	3290	3260	36,2	274,5	3176	3144
3 x 95 SM + 1 x 50 SM	1	40,2	304,50	4328	4291	40,2	304,5	4147	4110
3 x 120 SM + 1 x 70 SM	1	43,6	330,00	5329	5285	43,6	330,0	5148	5106
3 x 150 SM + 1 x 70 SM	1	48,0	363,00	6322	6268	48,0	363,0	6111	6062
3 x 185 SM + 1 x 95 SM	1	53,8	406,50	8157	8095	53,8	406,5	7881	7826
3 x 240 SM + 1 x 120 SM	1	58,6	442,50	10192	10114	58,6	442,5	9843	9776

3

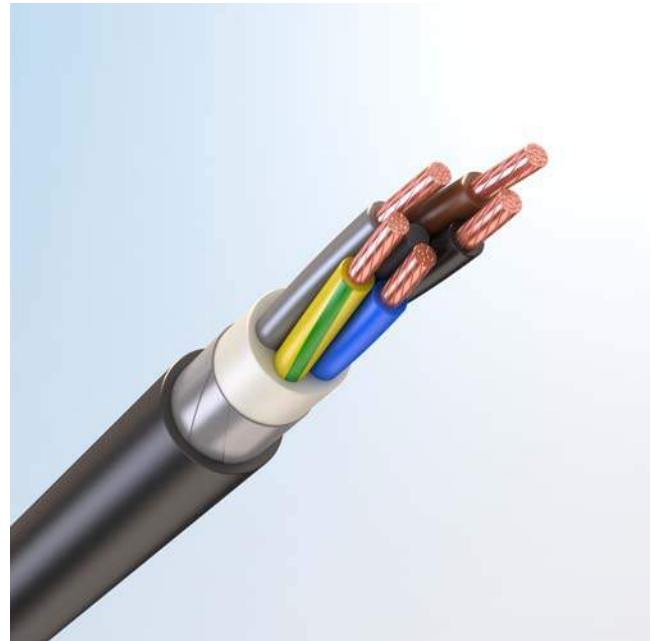
Conductor number and cross section, mm ²	Voltage, kV	Cable nominal outer diameter, mm	Minimum radius of cable bend, mm	Weight for 1 km cable, kg		Cable nominal outer diameter, mm	Minimum radius of cable bend, mm	Weight for 1 km cable, kg	
				TOFLEX VBaSHv	TOFLEX VBaSHv-HL			TOFLEX PvBaSHv	TOFLEX PvBaSHv-HL
1 x 4 RE	1	14,6	146,0	280	269	14,6	146,0	278	268
1 x 6 RE	1	14,6	146,0	294	284	14,6	146,0	292	282
1 x 10 RE	1	14,6	146,0	323	313	14,6	146,0	320	310
1 x 16 RE	1	14,6	146,0	367	358	14,6	146,0	364	355
1 x 16 RM	1	14,6	146,0	365	356	14,6	146,0	362	353
1 x 25 RE	1	15,6	155,5	465	454	15,0	149,5	438	429
1 x 25 RM	1	15,9	159,0	478	467	15,3	153,0	451	443
1 x 35 RM	1	16,9	169,0	584	572	16,3	163,0	555	546
1 x 50 RM	1	18,6	186,0	780	767	17,8	178,0	740	729
1 x 70 RM	1	20,2	202,0	965	950	19,6	196,0	928	916
1 x 95 RM	1	22,3	223,0	1247	1230	21,3	213,0	1187	1174
1 x 120 RM	1	23,7	237,0	1508	1489	22,9	229,0	1452	1438
1 x 150 RM	1	25,5	255,0	1810	1789	24,7	247,0	1747	1731
1 x 185 RM	1	27,9	279,0	2220	2195	27,1	271,0	2148	2129
1 x 240 RM	1	30,6	306,0	2768	2739	29,6	296,0	2673	2653

POWER CABLES FOR VOLTAGE 1 AND 3 KV

3. ARMoured WITH TAPES

IEC 60502-1

3.2 Cables sheathed with halogen free polymer compound



3

Cable grade	Cable structure elements
TOFLEX RtBPng (A)-HF	Cu/HEPR/HFFR/STA/HFFR
TOFLEX ARtBPng (A)-HF	Al/HEPR/HFFR/STA/HFFR
TOFLEX RBPng (A)-HF	Cu/EPR/HFFR/STA/HFFR
TOFLEX ARBPng (A)-HF	Al/EPR/HFFR/STA/HFFR
TOFLEX PvBPng (A)-HF	Cu/XLPE/HFFR/STA/HFFR
TOFLEX APvBPng (A)-HF	Al/XLPE/HFFR/STA/HFFR

Notes:

"HL" shall be added with a hyphen for cold resistant cables.

Cables for voltage 3 kV shall be manufactured either single-conductor or three-conductor.

Armour for single-conductor cables shall be made from aluminium tapes or aluminium alloy, in this case armour shall be designated as "Ba".

DESIGN FEATURES

- ① **Electrical conductor** – aluminium or copper, or tinned copper - 2 class as per IEC 60228; copper or tinned copper – 5 class* as per IEC 60228;
- ② **Insulation:**
 - "Rt" – hard grade ethylene propylene rubber,
 - "R" – ethylene propylene rubber;
 - "Pv" – cross-linked polyethylene;
- ③ **Inner sheath** – corresponds to the type of the outer sheath;
- ④ **Armour:**
 - "B" – steel galvanized wires,
 - "Ba" – made from aluminium tapes or aluminium alloy;
- ⑤ **Outer sheath** – made from halogen free polymer compound;
Possible design:
 - "ng (A)-HF-HL" – made from cold-resistant halogen free polymer compound.

* Letter "G" shall be added for cables with flexible copper or tinned copper conductor in a blank following TOFLEX trade mark designation.

► **Ordering example:**

TOFLEX RtBPng (A)-HF 3x95RM(N, G)-1 IEC 60502-1

CABLE FEATURES



3

Conductor number and cross section, mm ²	Voltage, kV	Cable nominal outer diameter, mm	Minimum radius of cable bend, mm	Weight for 1 km cable, kg		Amount of combustible materials, l/km
				TOFLEX RtBPng(A)-HF		
2 x 1.5 RE	1	13,4	100,5	299		130,0
2 x 2.5 RE	1	13,9	104,4	334		138,7
2 x 4 RE	1	14,8	111,3	394		155,8
2 x 6 RE	1	15,8	118,8	467		175,3
2 x 10 RE	1	17,4	130,5	599		207,2
2 x 16 RE	1	19,3	144,8	781		248,7
2 x 16 RM	1	20,2	151,5	824		269,4
2 x 25 RE	1	22,3	167,3	1082		327,2
2 x 25 RM	1	23,0	172,5	1125		345,3
2 x 35 RM	1	25,4	190,5	1418		415,9
2 x 50 RM	1	28,8	216,0	1922		527,7
2 x 70 RM	1	32,4	243,0	2464		654,3
2 x 95 RM	1	37,8	283,5	3407		874,5
2 x 120 RM	1	40,6	304,5	4086		990,9
2 x 150 RM	1	44,6	334,5	4959		1195,7
2 x 185 RM	1	49,4	370,5	6089		1473,2
2 x 240 RM	1	56,6	424,5	8102		1885,8
3 x 1.5 RE	1	13,6	102,2	312		132,1
3 x 2.5 RE	1	14,5	108,6	367		147,2
3 x 4 RE	1	15,5	116,0	441		165,0
3 x 6 RE	1	16,5	124,1	532		185,1
3 x 10 RE	1	18,2	136,7	692		217,6
3 x 16 RE	1	20,3	152,0	931		259,2
3 x 16 RM	1	21,2	159,3	975		279,8
3 x 25 RE	1	23,5	176,2	1309		340,1
3 x 25 RM	1	24,6	184,8	1378		374,0
3 x 35 RM	1	26,8	201,0	1727		428,2
3 x 50 RM	1	30,5	228,4	2376		541,4
3 x 70 RM	1	35,1	263,2	3126		710,3
3 x 95 RM	1	40,0	300,0	4224		887,0
3 x 120 RM	1	43,0	322,6	5115		997,3
3 x 150 RM	1	48,1	360,6	6316		1264,9
3 x 185 RM	1	53,2	398,9	8008		1488,8
3 x 240 RM	1	60,0	449,9	10137		1891,9
4 x 1.5 RE	1	14,5	108,7	351		146,7
4 x 2.5 RE	1	15,5	116,0	418		163,8
4 x 4 RE	1	16,6	124,3	509		184,0
4 x 6 RE	1	17,8	133,3	616		206,6
4 x 10 RE	1	19,7	147,4	821		243,0
4 x 16 RE	1	21,9	164,6	1121		289,3
4 x 16 RM	1	23,0	172,7	1170		312,0
4 x 25 RE	1	26,0	194,7	1616		397,6
4 x 25 RM	1	26,8	201,0	1669		417,9
4 x 35 RM	1	29,2	219,1	2109		477,6
4 x 50 RM	1	33,7	252,8	2967		626,3
4 x 70 RM	1	38,8	290,7	3977		792,6
4 x 95 RM	1	44,2	331,7	5267		1014,1
4 x 120 RM	1	48,4	363,0	6496		1198,5
4 x 150 RM	1	53,5	401,5	8181		1410,1
4 x 185 RM	1	59,4	445,2	10076		1746,0

Conductor number and cross section, mm ²	Voltage, kV	Cable nominal outer diameter, mm	Minimum radius of cable bend, mm	Weight for 1 km cable, kg		Amount of combustible materials, l/km
				TOFLEX RtBPng(A)-HF		
4 x 240 RM	1	65,9	494,0	12569		2096,1
5 x 1.5 RE	1	15,5	116,0	399		163,4
5 x 2.5 RE	1	16,6	124,1	480		182,9
5 x 4 RE	1	17,8	133,5	585		205,9
5 x 6 RE	1	19,1	143,6	726		231,5
5 x 10 RE	1	21,3	159,4	974		272,7
5 x 16 RE	1	24,2	181,6	1360		340,7
5 x 16 RM	1	25,4	190,7	1416		367,1
5 x 25 RE	1	28,3	212,0	1946		448,0
5 x 25 RM	1	29,2	219,1	2008		470,9
5 x 35 RM	1	32,3	242,3	2594		558,4
5 x 50 RM	1	38,1	285,8	3803		758,5
5 x 70 RM	1	42,4	318,2	4872		891,4
5 x 95 RM	1	49,3	369,7	6524		1205,6
5 x 120 RM	1	53,9	404,0	8269		1353,7
5 x 150 RM	1	59,7	448,0	10089		1681,2
5 x 185 RM	1	65,1	488,5	12359		1963,7
5 x 240 RM	1	73,8	553,7	15654		2525,1

Conductor number and cross section, mm ²	Voltage, kV	Cable nominal outer diameter, mm	Minimum radius of cable bend, mm	Weight for 1 km cable, kg		Amount of combustible materials, l/km
				TOFLEX RtBaPng(A)-HF		
1 x 4 RE	1	14,6	146,0	306		131,6
1 x 6 RE	1	14,6	146,0	319		129,6
1 x 10 RE	1	14,6	146,0	344		125,7
1 x 16 RE	1	14,6	146,0	383		119,6
1 x 16 RM	1	14,6	146,0	377		116,3
1 x 25 RE	1	15,6	155,5	477		130,2
1 x 25 RM	1	15,9	159,0	489		134,5
1 x 35 RM	1	16,9	169,0	596		146,9
1 x 50 RM	1	18,6	186,0	791		173,0
1 x 70 RM	1	20,2	202,0	976		193,8
1 x 95 RM	1	22,3	223,0	1257		228,1
1 x 120 RM	1	24,1	241,0	1540		262,2
1 x 150 RM	1	25,9	259,0	1841		296,5
1 x 185 RM	1	27,9	279,0	2224		335,8
1 x 240 RM	1	30,6	306,0	2768		388,5
1 x 300 RM	1	36,1	360,5	3564		550,8
1 x 400 RM	1	39,4	393,9	4432		631,2
1 x 500 RM	1	43,0	429,7	5472		720,6
1 x 630 RM	1	48,1	481,3	7029		889,8

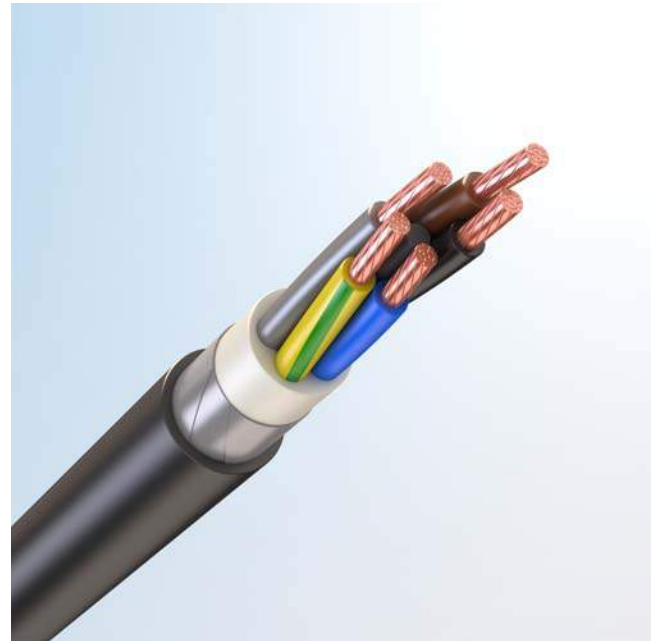
POWER CABLES FOR VOLTAGE 1 AND 3 KV

3. ARMoured WITH TAPES

3

IEC 60502-1

3.3 Cables sheathed with halogen free cross-linked highly elastic polymer compound



Cable grade	Cable structure elements
TOFLEX RtBRng (A)-HF	Cu/HEPR/HFFR/STA/XLHFFR
TOFLEX ARtBRng (A)-HF	Al/HEPR/HFFR/STA/XLHFFR
TOFLEX RBRng (A)-HF	Cu/EPR/HFFR/STA/XLHFFR
TOFLEX ARBRng (A)-HF	Al/EPR/HFFR/STA/XLHFFR

Notes:

"HL" shall be added with a hyphen for cold resistant cables.

Cables for voltage 3 kV shall be manufactured either single-conductor or three-conductor.

Armour for single-conductor cables shall be made from aluminium tapes or aluminium alloy, in this case armour shall be designated as "Ba".



DESIGN FEATURES

- ① **Electrical conductor** – aluminium or copper, or tinned copper – 2 class as per IEC 60228; copper or tinned copper – 5 class* as per IEC 60228;
- ② **Insulation:**
 "Rt" – hard grade ethylene propylene rubber,
 "R" – ethylene propylene rubber;
 "Pv" – cross-linked polyethylene;
- ③ **Inner sheath** – corresponds to the type of the outer sheath;
- ④ **Armour:**
 "B" – steel galvanized wires,
 "Ba" – made from aluminium tapes or aluminium alloy;
- ⑤ **Outer sheath** – made from halogen free cross-linked highly elastic polymer compound;
Possible design:
 "ng (A)-HF-HL" - made from cold-resistant halogen free cross-linked highly elastic polymer compound.

* Letter "G" shall be added for cables with flexible copper or tinned copper conductor in a blank following TOFLEX trade mark designation.

► **Ordering example:**

TOFLEX RtBPng (A)-HF 3x95RM(N, G)-1 IEC 60502-1



CABLE FEATURES



Conductor number and cross section, mm ²	Voltage, kV	Cable nominal outer diameter, mm	Minimum radius of cable bend, mm	Weight for 1 km cable, kg	Amount of combustible materials, l/km
				TOFLEX RtBRng(A)-HF	
2 x 1.5 RE	1	13,4	100,5	290	130,0
2 x 2.5 RE	1	13,9	104,4	324	138,7
2 x 4 RE	1	14,8	111,3	384	155,8
2 x 6 RE	1	15,8	118,8	456	175,3
2 x 10 RE	1	17,4	130,5	586	207,2
2 x 16 RE	1	19,3	144,8	767	248,7
2 x 16 RM	1	20,2	151,5	810	269,4
2 x 25 RE	1	22,3	167,3	1066	327,2
2 x 25 RM	1	23,0	172,5	1108	345,3
2 x 35 RM	1	25,4	190,5	1398	415,9
2 x 50 RM	1	28,8	216,0	1898	527,7
2 x 70 RM	1	32,4	243,0	2438	654,3
2 x 95 RM	1	37,8	283,5	3370	874,5
2 x 120 RM	1	40,6	304,5	4046	990,9
2 x 150 RM	1	44,6	334,5	4915	1195,7
2 x 185 RM	1	49,4	370,5	6032	1473,2
2 x 240 RM	1	56,6	424,5	8030	1885,8
3 x 1.5 RE	1	13,6	102,2	302	132,1
3 x 2.5 RE	1	14,5	108,6	358	147,2
3 x 4 RE	1	15,5	116,0	430	165,0
3 x 6 RE	1	16,5	124,1	520	185,1
3 x 10 RE	1	18,2	136,7	679	217,6
3 x 16 RE	1	20,3	152,0	917	259,2
3 x 16 RM	1	21,2	159,3	960	279,8
3 x 25 RE	1	23,5	176,2	1292	340,1
3 x 25 RM	1	24,6	184,8	1358	374,0
3 x 35 RM	1	26,8	201,0	1705	428,2
3 x 50 RM	1	30,5	228,4	2351	541,4
3 x 70 RM	1	35,1	263,2	3092	710,3
3 x 95 RM	1	40,0	300,0	4185	887,0
3 x 120 RM	1	43,0	322,6	5072	997,3
3 x 150 RM	1	48,1	360,6	6261	1264,9
3 x 185 RM	1	53,2	398,9	7947	1488,8
3 x 240 RM	1	60,0	449,9	10060	1891,9
4 x 1.5 RE	1	14,5	108,7	341	146,7
4 x 2.5 RE	1	15,5	116,0	408	163,8
4 x 4 RE	1	16,6	124,3	497	184,0
4 x 6 RE	1	17,8	133,3	603	206,6
4 x 10 RE	1	19,7	147,4	807	243,0
4 x 16 RE	1	21,9	164,6	1105	289,3
4 x 16 RM	1	23,0	172,7	1153	312,0
4 x 25 RE	1	26,0	194,7	1595	397,6
4 x 25 RM	1	26,8	201,0	1647	417,9
4 x 35 RM	1	29,2	219,1	2085	477,6
4 x 50 RM	1	33,7	252,8	2940	626,3
4 x 70 RM	1	38,8	290,7	3938	792,6
4 x 95 RM	1	44,2	331,7	5223	1014,1
4 x 120 RM	1	48,4	363,0	6440	1198,5
4 x 150 RM	1	53,5	401,5	8119	1410,1
4 x 185 RM	1	59,4	445,2	10000	1746,0

3

Conductor number and cross section, mm ²	Voltage, kV	Cable nominal outer diameter, mm	Minimum radius of cable bend, mm	Weight for 1 km cable, kg	Amount of combustible materials, l/km
				TOFLEX RtBRng(A)-HF	
4 x 240 RM	1	65,9	494,0	12484	2096,1
5 x 1.5 RE	1	15,5	116,0	388	163,4
5 x 2.5 RE	1	16,6	124,1	468	182,9
5 x 4 RE	1	17,8	133,5	572	205,9
5 x 6 RE	1	19,1	143,6	713	231,5
5 x 10 RE	1	21,3	159,4	959	272,7
5 x 16 RE	1	24,2	181,6	1341	340,7
5 x 16 RM	1	25,4	190,7	1396	367,1
5 x 25 RE	1	28,3	212,0	1923	448,0
5 x 25 RM	1	29,2	219,1	1984	470,9
5 x 35 RM	1	32,3	242,3	2568	558,4
5 x 50 RM	1	38,1	285,8	3765	758,5
5 x 70 RM	1	42,4	318,2	4830	891,4
5 x 95 RM	1	49,3	369,7	6468	1205,6
5 x 120 RM	1	53,9	404,0	8207	1353,7
5 x 150 RM	1	59,7	448,0	10013	1681,2
5 x 185 RM	1	65,1	488,5	12275	1963,7
5 x 240 RM	1	73,8	553,7	15544	2525,1

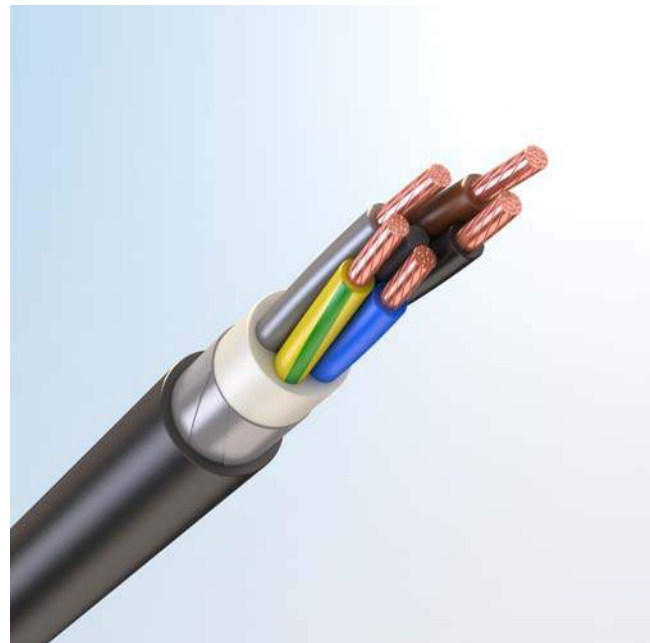
Conductor number and cross section, mm ²	Voltage, kV	Cable nominal outer diameter, mm	Minimum radius of cable bend, mm	Weight for 1 km cable, kg	Amount of combustible materials, l/km
				TOFLEX RtBaRng(A)-HF	
1 x 4 RE	1	14,6	146,0	297	131,6
1 x 6 RE	1	14,6	146,0	309	129,6
1 x 10 RE	1	14,6	146,0	334	125,7
1 x 16 RE	1	14,6	146,0	373	119,6
1 x 16 RM	1	14,6	146,0	367	116,3
1 x 25 RE	1	15,6	155,5	466	130,2
1 x 25 RM	1	15,9	159,0	479	134,5
1 x 35 RM	1	16,9	169,0	584	146,9
1 x 50 RM	1	18,6	186,0	778	173,0
1 x 70 RM	1	20,2	202,0	963	193,8
1 x 95 RM	1	22,3	223,0	1241	228,1
1 x 120 RM	1	24,1	241,0	1521	262,2
1 x 150 RM	1	25,9	259,0	1821	296,5
1 x 185 RM	1	27,9	279,0	2202	335,8
1 x 240 RM	1	30,6	306,0	2744	388,5
1 x 300 RM	1	36,1	360,5	3531	550,8
1 x 400 RM	1	39,4	393,9	4395	631,2
1 x 500 RM	1	43,0	429,7	5432	720,6
1 x 630 RM	1	48,1	481,3	6976	889,8

POWER CABLES FOR VOLTAGE 1 AND 3 KV

3. ARMoured WITH TAPES

IEC 60502-1

3.4 Sheathed with polyethylene



3

Cable grade	Cable structure elements
TOFLEX R t BSHp	Cu/HEPR/PE/STA/PE
TOFLEX AR t BSHp	Al/HEPR/PE/STA/PE
TOFLEX R B SHp	Cu/EPR/PE/STA/PE
TOFLEX AR B SHp	Al/EPR/PE/STA/PE
TOFLEX V B SHp	Cu/PVC/PE/STA/PE
TOFLEX AV B SHp	Al/PVC/PE/STA/PE
TOFLEX P v BSHp	Cu/XLPE/PE/STA/PE
TOFLEX AP v BSHp	Al/XLPE/PE/STA/PE

Notes:

Cables for voltage 3 kV shall be manufactured either single-conductor or three-conductor.

Armour for single-conductor cables shall be made from aluminium tapes or aluminium alloy, in this case armour shall be designated as "Ba".

DESIGN FEATURES

- ① **Electrical conductor** – aluminium or copper, or tinned copper - 2 class as per IEC 60228; copper or tinned copper – 5 class* as per IEC 60228;
- ② **Insulation:**
 - "Rt" – hard grade ethylene propylene rubber,
 - "R" – ethylene propylene rubber;
 - "V" – PVC compound,
 - "Pv" – cross-linked polyethylene;
- ③ **Inner sheath** – corresponds to the type of the outer sheath;
- ④ **Armour:**
 - "B" – steel galvanized wires,
 - "Ba" – made from aluminium tapes or aluminium alloy;
- ⑤ **Outer sheath** – made from polyethylene.

* Letter "G" shall be added for cables with flexible copper or tinned copper conductor in a blank following TOFLEX trade mark designation.

► **Ordering example:**

TOFLEX AR**t**BSHp 3×95RM(N, G)-1 IEC 60502-1

CABLE FEATURES



3

Conductor number and cross section, mm ²	Voltage, kV	Cable nominal outer diameter, mm	Minimum radius of cable bend, mm	Weight for 1 km cable, kg
				TOFLEX PvBShp
2 x 4 RE	1	14,0	105,3	326
2 x 6 RE	1	15,0	112,8	393
2 x 10 RE	1	16,6	124,5	514
2 x 16 RE	1	18,5	138,8	679
2 x 16 RM	1	19,4	145,5	718
2 x 25 RE	1	21,5	161,3	954
2 x 25 RM	1	22,2	166,5	994
2 x 35 RM	1	24,2	181,5	1244
2 x 50 RM	1	27,6	204,0	1684
2 x 70 SM	1	27,4	203,7	1847
2 x 95 SM	1	29,4	218,7	2368
2 x 120 SM	1	33,8	251,7	2965
2 x 150 SM	1	36,2	271,2	3601
2 x 185 SM	1	38,7	290,0	4351
2 x 240 SM	1	44,6	334,2	5533
3 x 1.5 RE	1	13,8	95,5	254
3 x 2.5 RE	1	13,8	102,0	305
3 x 4 RE	1	14,6	109,4	373
3 x 6 RE	1	15,7	117,4	458
3 x 10 RE	1	17,3	130,0	613
3 x 16 RE	1	19,4	145,3	831
3 x 16 RM	1	20,3	152,6	873
3 x 25 RE	1	22,6	169,5	1184
3 x 25 RM	1	23,4	175,2	1231
3 x 35 RM	1	25,9	191,3	1561
3 x 50 RM	1	29,1	215,5	2150
3 x 70 SM	1	31,4	233,7	2561
3 x 95 SM	1	36,2	271,2	3432
3 x 120 SM	1	39,2	293,7	4207
3 x 150 SM	1	43,6	326,7	5160
3 x 185 SM	1	48,0	361,2	6340
3 x 240 SM	1	53,8	404,7	8280
4 x 1.5 RE	1	13,8	100,9	286
4 x 2.5 RE	1	14,4	108,1	348
4 x 4 RE	1	15,5	116,4	433
4 x 6 RE	1	16,7	125,5	539
4 x 10 RE	1	18,6	139,6	726
4 x 16 RE	1	20,9	156,7	1011
4 x 16 RM	1	22,0	164,9	1059
4 x 25 RE	1	24,5	183,9	1471
4 x 25 RM	1	25,8	190,2	1526
4 x 35 RM	1	28,2	208,3	1947
4 x 50 RM	1	31,8	235,4	2704
4 x 70 SM	1	36,2	271,2	3382
4 x 95 SM	1	40,2	301,2	4413
4 x 120 SM	1	43,6	326,7	5473
4 x 150 SM	1	48,0	361,2	6690
4 x 185 SM	1	53,8	404,7	8551
4 x 240 SM	1	58,6	439,2	10714
5 x 2.5 RE	1	15,3	256,5	401

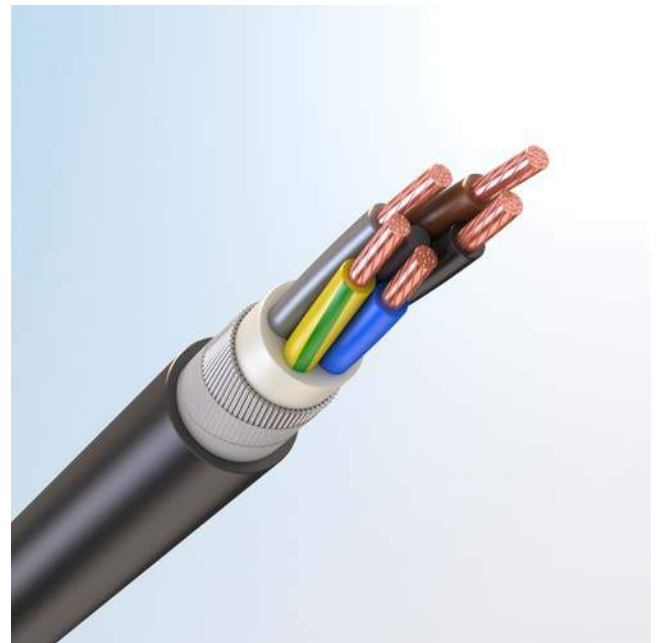
Conductor number and cross section, mm ²	Voltage, kV	Cable nominal outer diameter, mm	Minimum radius of cable bend, mm	Weight for 1 km cable, kg
				TOFLEX PvBShp
5 x 4 RE	1	16,6	124,3	505
5 x 6 RE	1	17,9	134,4	633
5 x 10 RE	1	20,0	150,2	868
5 x 16 RE	1	22,6	169,5	1214
5 x 16 RM	1	23,8	178,6	1269
5 x 25 RE	1	27,0	199,8	1769
5 x 25 RM	1	28,0	206,9	1834
5 x 35 RM	1	30,7	227,2	2361
5 x 50 RM	1	35,1	260,6	3332
5 x 70 SM	1	39,2	293,7	4125
5 x 95 SM	1	44,6	334,2	5466
5 x 120 SM	1	50,0	376,2	6810
5 x 150 SM	1	55,2	415,2	8686
5 x 185 SM	1	60,6	454,2	10618
5 x 240 SM	1	64,6	484,2	13177
3 x 25 RE + 1 x 16 RE	1	23,8	178,3	1365
3 x 25 RM + 1 x 16 RM	1	25,8	190,2	1461
3 x 35 RM + 1 x 16 RM	1	27,3	201,7	1756
3 x 50 RM + 1 x 25 RM	1	30,8	227,7	2435
3 x 70 SM + 1 x 35 RM	1	36,2	271,2	3060
3 x 95 SM + 1 x 50 SM	1	40,2	301,2	4017
3 x 120 SM + 1 x 70 SM	1	43,6	326,7	5006
3 x 150 SM + 1 x 70 SM	1	48,0	361,2	5957
3 x 185 SM + 1 x 95 SM	1	53,8	404,7	7708
3 x 240 SM + 1 x 120 SM	1	58,6	439,2	9620

Conductor number and cross section, mm ²	Voltage, kV	Cable nominal outer diameter, mm	Minimum radius of cable bend, mm	Weight for 1 km cable, kg
				TOFLEX PvBaShp
1 x 4 RE	1	14,6	146,0	248
1 x 6 RE	1	14,6	146,0	262
1 x 10 RE	1	14,6	146,0	290
1 x 16 RE	1	14,6	146,0	333
1 x 16 RM	1	14,6	146,0	331
1 x 25 RE	1	15,0	149,5	406
1 x 25 RM	1	15,3	153,0	419
1 x 35 RM	1	16,3	163,0	521
1 x 50 RM	1	17,8	178,0	701
1 x 70 RM	1	19,6	196,0	886
1 x 95 RM	1	21,3	213,0	1140
1 x 120 RM	1	22,9	229,0	1402
1 x 150 RM	1	24,7	247,0	1692
1 x 185 RM	1	27,1	267,0	2065
1 x 240 RM	1	29,6	292,0	2583
1 x 300 RM	1	34,1	336,5	3249
1 x 400 RM	1	37,8	375,9	4119
1 x 500 RM	1	41,4	411,7	5129

POWER CABLES FOR VOLTAGE 1 AND 3 KV

4. ARMoured WITH WIRES

IEC 60502-1



4

4.1 Sheathed with PVC compound

Cable grade	Cable structure elements
TOFLEX VKSHv	Cu/PVC/PVC/SWA/PVC
TOFLEX AVKSHv	Al/PVC/PVC/SWA/PVC
TOFLEX PvKSHv	Cu/XLPE/PVC/SWA/PVC
TOFLEX APvKSHv	Al/XLPE/PVC/SWA/PVC

Notes:

"HL" shall be added with a hyphen for cold resistant cables.

Cables for voltage 3 kV shall be manufactured either single-conductor or three-conductor.

Armour for shall be made from aluminium or aluminium alloy wires, in this case armour shall be designated as "Ka".

For cables designated for 1 kV with electrical conductor section up to 6 mm² armour can be made from braiding of steel galvanized wires, in this case armour shall be designated as "P".



DESIGN FEATURES

- ① **Electrical conductor** – aluminium or copper, or tinned copper - 2 class as per IEC 60228; copper or tinned copper – 5 class* as per IEC 60228;
- ② **Insulation:**
 "V" – PVC compound,
 "Pv" – cross-linked polyethylene;
- ③ **Inner sheath** – corresponds to the type of the outer sheath;
- ④ **Armour:**
 "K" – from steel galvanized wires,
 "Ka" – from aluminium or aluminum alloy wires,
 "P" – made from braiding of steel galvanized wires;
- ⑤ **Outer sheath** – made from PVC compound;
Possible design:
 "HL" – from cold-resistant PVC compound.

* Letter "G" shall be added for cables with flexible copper or tinned copper conductor in a blank following TOFLEX trade mark designation.

► **Ordering example:**

TOFLEX PvKSHv 3×95RM(N, G)-1 IEC 60502-1



CABLE FEATURES



Conductor number and cross section, mm ²	Voltage, kV	Cable nominal outer diameter, mm	Minimum radius of cable bend, mm	Weight for 1 km cable, kg		Cable nominal outer diameter, mm	Minimum radius of cable bend, mm	Weight for 1 km cable, kg	
				TOFLEX VKSHv	TOFLEX VKSHv-HL			TOFLEX PvkSHv	TOFLEX PvkSHv-HL
2 x 4 RE	1	16,7	125,1	585	571	14,7	110,1	419	409
2 x 6 RE	1	17,7	132,6	674	660	16,5	123,6	594	582
2 x 10 RE	1	19,2	144,3	824	808	18,0	135,3	748	734
2 x 16 RE	1	21,1	158,6	1035	1015	19,9	149,6	943	926
2 x 16 RM	1	22,8	171,3	1248	1226	20,8	156,3	1003	985
2 x 25 RE	1	24,9	187,1	1544	1519	23,7	178,1	1427	1406
2 x 25 RM	1	25,6	192,3	1597	1570	24,4	183,3	1496	1473
2 x 35 RM	1	28,0	210,3	1929	1896	26,4	198,3	1796	1770
2 x 50 RM	1	31,4	-	2501	2460	29,8	223,8	2339	2306
2 x 70 SM	1	29,7	223,5	2551	2546	29,7	225,3	2487	2464
2 x 95 SM	1	31,7	-	3160	3152	31,7	-	3060	3036
2 x 120 SM	1	36,9	277,5	4150	4119	36,9	279,3	4050	4020
2 x 150 SM	1	39,3	-	4872	4861	39,3	-	4752	4718
2 x 185 SM	1	41,8	-	5739	5697	41,8	-	5589	5552
2 x 240 SM	1	48,7	-	7621	7567	48,7	-	7422	7376
3 x 1.5 RE	1	13,8	103,5	356	346	13,4	100,3	336	-
3 x 2.5 RE	1	14,7	110,0	418	408	14,2	106,8	393	-
3 x 4 RE	1	17,3	129,8	651	637	15,2	114,2	469	459
3 x 6 RE	1	18,4	137,9	749	734	17,1	128,2	671	659
3 x 10 RE	1	20,1	150,5	944	926	18,8	140,8	850	836
3 x 16 RE	1	22,9	171,8	1368	1348	20,8	156,1	1116	1099
3 x 16 RM	1	23,9	179,1	1438	1415	22,6	169,4	1322	1304
3 x 25 RE	1	26,1	196,0	1812	1786	24,8	186,3	1699	1678
3 x 25 RM	1	26,9	201,6	1886	1858	25,6	192,0	1756	1735
3 x 35 RM	1	29,4	220,8	2301	2267	28,1	211,1	2162	2135
3 x 50 RM	1	33,9	254,2	3269	3227	31,4	-	2844	2813
3 x 70 SM	1	34,5	259,5	3654	3652	34,5	261,3	3558	3532
3 x 95 SM	1	39,3	-	4733	4722	39,3	-	4583	4549
3 x 120 SM	1	42,3	-	5591	5575	42,3	-	5441	5404
3 x 150 SM	1	47,7	-	7153	7142	47,7	-	6974	6929
3 x 185 SM	1	52,1	-	8558	8536	52,1	-	8332	8280
3 x 240 SM	1	57,1	-	10469	10395	57,1	-	10170	10113
4 x 2.5 RE	1	16,3	122,5	575	563	15,1	112,9	442	-
4 x 4 RE	1	18,4	138,1	731	716	17,0	127,2	648	636
4 x 6 RE	1	19,6	147,1	869	852	18,2	136,3	772	759
4 x 10 RE	1	22,3	167,2	1256	1236	20,0	150,4	998	983
4 x 16 RE	1	24,6	184,4	1599	1576	23,1	173,5	1472	1455
4 x 16 RM	1	25,7	192,5	1674	1649	24,2	181,7	1545	1526
4 x 25 RE	1	28,6	214,5	2193	2162	26,8	200,7	2021	1998
4 x 25 RM	1	29,4	220,8	2276	2243	28,0	210,0	2128	2103
4 x 35 RM	1	31,9	-	2773	2736	30,4	228,1	2615	2586
4 x 50 RM	1	37,2	278,6	3992	3944	34,8	261,2	3699	3665
4 x 70 SM	1	39,3	-	4660	4648	39,3	-	4533	4498
4 x 95 SM	1	43,3	-	5892	6283	43,3	-	5692	5653
4 x 120 SM	1	47,7	-	7486	7474	47,7	-	7287	7242
4 x 150 SM	1	52,1	-	8921	8897	52,1	-	8682	8630
4 x 185 SM	1	57,1	-	10743	10667	57,1	-	10441	10384
4 x 240 SM	1	61,9	-	13181	13128	61,9	-	12782	12713
5 x 2.5 RE	1	17,3	129,8	652	639	16,8	125,8	608	-
5 x 4 RE	1	19,6	147,3	841	825	18,0	135,1	730	718

4

4

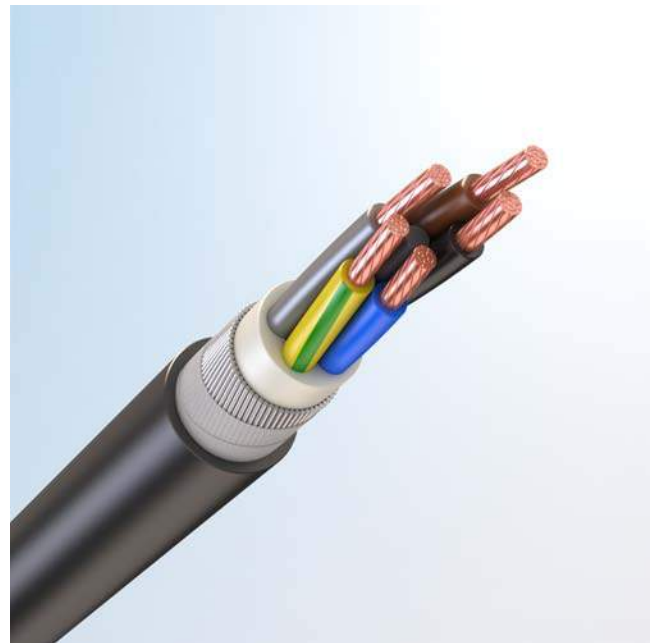
Conductor number and cross section, mm ²	Voltage, kV	Cable nominal outer diameter, mm	Minimum radius of cable bend, mm	Weight for 1 km cable, kg		Cable nominal outer diameter, mm	Minimum radius of cable bend, mm	Weight for 1 km cable, kg	
				TOFLEX VKSHv	TOFLEX VKSHv-HL			TOFLEX PvKSHv	TOFLEX PvKSHv-HL
5 x 6 RE	1	21,0	157,4	999	981	19,4	145,2	891	878
5 x 10 RE	1	23,9	179,2	1449	1428	22,3	167,0	1319	1303
5 x 16 RE	1	26,5	198,4	1870	1845	24,8	186,3	1729	1710
5 x 16 RM	1	28,1	210,5	1977	1948	26,1	195,4	1808	1787
5 x 25 RE	1	30,9	-	2579	2545	29,3	219,6	2412	2386
5 x 25 RM	1	31,9	-	2670	2634	30,2	226,7	2487	2460
5 x 35 RM	1	35,8	268,1	3573	3531	33,7	253,0	3338	3307
5 x 50 RM	1	40,7	-	4766	4711	38,2	-	4460	4421
5 x 70 SM	1	42,3	-	5518	5500	42,3	-	5359	5321
5 x 95 SM	1	48,7	-	7605	7549	48,7	-	7354	7309
5 x 120 SM	1	54,1	-	9159	9133	54,1	-	8910	8856
5 x 150 SM	1	58,5	-	10896	10858	58,5	-	10597	10535
5 x 185 SM	1	63,9	-	13158	13062	63,9	-	12781	12709
5 x 240 SM	1	67,9	-	15987	15877	67,9	-	15488	15412
3 x 25 RE + 1 x 16 RE	1	28,6	214,5	2129	2098	26,0	195,1	1904	1883
3 x 25 RM + 1 x 16 RM	1	29,4	220,8	2209	2176	28,0	210,0	2063	2037
3 x 35 RM + 1 x 16 RM	1	30,9	-	2546	2511	29,5	221,5	2397	2369
3 x 50 RM + 1 x 25 RM	1	36,1	270,4	3665	3619	33,8	253,5	3412	3379
3 x 70 SM + 1 x 35 SM	1	39,3	-	4324	4314	39,3	-	4211	4176
3 x 95 SM + 1 x 50 SM	1	43,3	-	5477	5870	43,3	-	5296	5257
3 x 120 SM + 1 x 70 SM	1	47,7	-	7002	6991	47,7	-	6820	6776
3 x 150 SM + 1 x 70 SM	1	52,1	-	8160	8139	52,1	-	7949	7897
3 x 185 SM + 1 x 95 SM	1	57,1	-	9874	9801	57,1	-	9597	9540
3 x 240 SM + 1 x 120 SM	1	61,9	-	12037	11989	61,9	-	11688	11619

POWER CABLES FOR VOLTAGE 1 AND 3 KV

4. ARMoured WITH WIRES

IEC 60502-1

4.2 Sheathed with halogen-free polymer compound



4

Cable grade	Cable structure elements
TOFLEX RtkPng (A)-HF	Cu/HEPR/HFFR/SWA/HFFR
TOFLEX ARtkPng (A)-HF	Al/HEPR/HFFR/SWA/HFFR
TOFLEX RkPng (A)-HF	Cu/EPR/HFFR/SWA/HFFR
TOFLEX ARkPng (A)-HF	Al/EPR/HFFR/SWA/HFFR
TOFLEX PvkPng (A)-HF	Cu/XLPE/HFFR/SWA/HFFR
TOFLEX APvkPng (A)-HF	Al/XLPE/HFFR/SWA/HFFR

Notes:

"HL" shall be added with a hyphen for cold resistant cables.

Cables for voltage 3 kV shall be manufactured either single-conductor or three-conductor.

Armour for shall be made from aluminium or aluminium alloy wires, in this case armour shall be designated as "Ka".

For cables designated for 1 kV with electrical conductor section up to 6 mm² armour can be made from braiding of steel galvanized wires, in this case armour shall be designated as "P".

DESIGN FEATURES

- ① **Electrical conductor** – aluminium, copper or tinned copper – 2nd class as per IEC 60228; copper or tinned copper – 5 class* as per IEC 60228;
- ② **Insulation:**
 - "Rt" – hard grade ethylene propylene rubber,
 - "R" – ethylene propylene rubber;
 - "Pv" – cross-linked polyethylene;
- ③ **Inner sheath** – corresponds to the type of the outer sheath;
- ④ **Armour:**
 - "K" – from steel galvanized wires,
 - "Ka" – from aluminum or aluminum alloy wires,
 - "P" – made from braiding of steel galvanized wires;
- ⑤ **Outer sheath** – made from halogen-free polymer compound;
Possible design:
 - "ng(A)-HF-HL" - made from cold-resistant halogen-free polymer compound.

* Letter "G" shall be added for cables with flexible copper or tinned copper conductor in a blank following TOFLEX trade mark designation.

► **Ordering example:**

TOFLEX ARtkPng (A)-HF 3×95RM(N, G)-1 IEC 60502-1

CABLE FEATURES



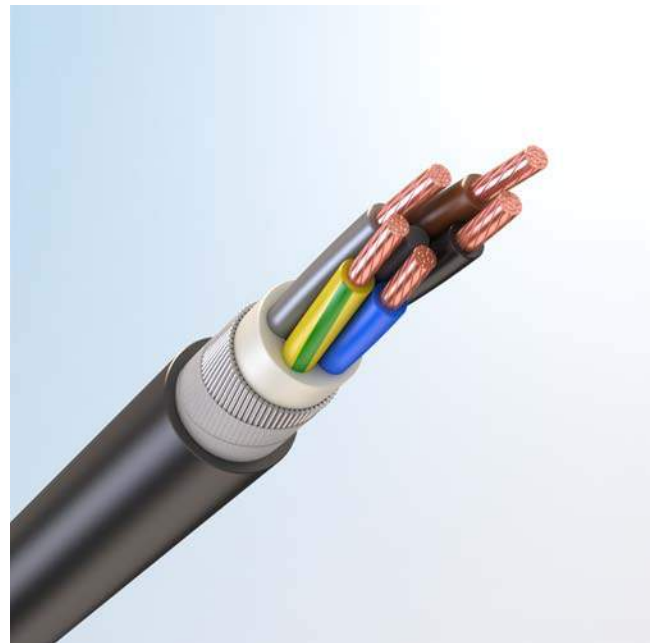
Conductor number and cross section, mm ²	Voltage, kV	Cable nominal outer diameter, mm	Minimum radius of cable bend, mm	Weight for 1 km cable, kg	Amount of combustible materials, l/km
				TOFLEX RtKpNg(A)-HF	
2 x 1.5 RE	1	14,3	107,1	387	131,2
2 x 2.5 RE	1	15,1	113,1	440	145,5
2 x 4 RE	1	16,8	126,0	615	167,4
2 x 6 RE	1	17,8	133,5	709	186,8
2 x 10 RE	1	19,4	145,2	867	218,7
2 x 16 RE	1	21,3	159,5	1089	260,2
2 x 16 RM	1	23,0	172,2	1306	285,6
2 x 25 RE	1	25,5	191,0	1640	359,9
2 x 25 RM	1	26,2	196,2	1696	378,5
2 x 35 RM	1	28,2	211,2	2019	433,9
2 x 70 RM	1	36,8	275,7	3576	725,0
3 x 1.5 RE	1	14,8	110,9	416	138,9
3 x 2.5 RE	1	16,4	123,3	582	158,7
3 x 4 RE	1	17,4	130,7	677	176,5
3 x 6 RE	1	18,5	138,8	779	196,6
3 x 10 RE	1	20,2	151,4	979	229,1
3 x 16 RE	1	23,0	172,7	1412	275,4
3 x 16 RM	1	24,4	183,0	1506	311,8
3 x 25 RE	1	26,7	199,9	1893	373,6
3 x 25 RM	1	27,4	205,5	1968	392,0
3 x 35 RM	1	29,6	221,7	2368	446,2
3 x 50 RM	1	34,8	261,1	3419	609,6
4 x 1.5 RE	1	16,5	123,4	565	158,2
4 x 2.5 RE	1	17,4	130,7	654	175,4
4 x 4 RE	1	18,5	139,0	755	195,6
4 x 6 RE	1	19,7	148,0	896	218,1
4 x 10 RE	1	22,4	168,1	1289	259,2
4 x 16 RE	1	25,1	188,3	1664	321,8
4 x 16 RM	1	26,2	196,4	1740	345,2
4 x 25 RE	1	28,7	215,4	2230	415,7
4 x 25 RM	1	29,6	221,7	2310	436,0
4 x 50 RM	1	38,1	285,5	4125	698,8
5 x 1.5 RE	1	17,4	130,7	635	174,9
5 x 2.5 RE	1	18,5	138,8	726	194,4
5 x 4 RE	1	19,8	148,2	865	217,4
5 x 6 RE	1	21,1	158,3	1026	243,0
5 x 10 RE	1	24,4	183,1	1505	304,8
5 x 16 RE	1	27,0	202,3	1936	358,8
5 x 16 RM	1	28,2	211,4	2017	385,1
5 x 35 RM	1	36,7	275,0	3707	629,0
5 x 70 RM	1	47,4	355,4	6579	985,3

POWER CABLES FOR VOLTAGE 1 AND 3 KV

4. ARMoured WITH WIRES

IEC 60502-1

4.3 Cables sheathed with cross-linked highly elastic halogen free polymer compound



4

Cable grade	Cable structure elements
TOFLEX RtkRng (A)-HF	Cu/HEPR/HFFR/SWA/XLHFFR
TOFLEX ARtkRng (A)-HF	Al/HEPR/HFFR/SWA/XLHFFR
TOFLEX RKRng (A)-HF	Cu/EPR/HFFR/SWA/XLHFFR
TOFLEX ARKRng (A)-HF	Al/EPR/HFFR/SWA/XLHFFR

Notes:

"HL" shall be added with a hyphen for cold resistant cables.

Cables for voltage 3 kV shall be manufactured either single-conductor or three-conductor.

Armour for shall be made from aluminium or aluminium alloy wires, in this case armour shall be designated as "Ka".

For cables designated for 1 kV with electrical conductor section up to 6 mm² armour can be made from braiding of steel galvanized wires, in this case armour shall be designated as "P".

DESIGN FEATURES

- ① **Electrical conductor** – aluminium, copper or tinned copper – 2nd class as per IEC 60228; copper or tinned copper – 5 class* as per IEC 60228;
- ② **Insulation:**
 - "Rt" – hard grade ethylene propylene rubber,
 - "R" – ethylene propylene rubber;
 - "Pv" – cross-linked polyethylene;
- ③ **Inner sheath** – corresponds to the type of the outer sheath;
- ④ **Armour:**
 - "K" – from steel galvanized wires,
 - "Ka" – from aluminum or aluminum alloy wires,
 - "P" – made from braiding of steel galvanized wires;
- ⑤ **Outer sheath** – made from halogen free cross-linked highly elastic polymer compound;
Possible design:
 - "ng(A)-HF-HL" – made from cold-resistant halogen-free cross-linked highly elastic polymer compound.

* Letter "G" shall be added for cables with flexible copper or tinned copper conductor in a blank following TOFLEX trade mark designation.

► **Ordering example:**

TOFLEX ARKRng (A)-HF 3×95RM(N, G)-1 IEC 60502-1

CABLE FEATURES



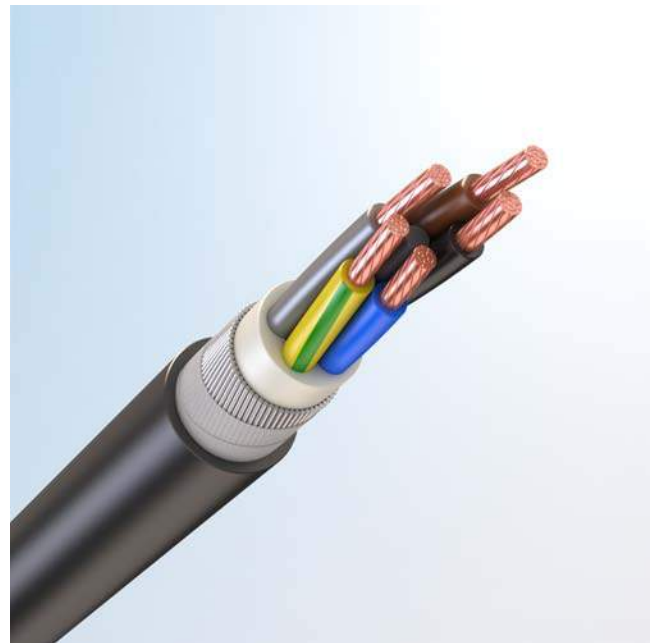
Conductor number and cross section, mm ²	Voltage, kV	Cable nominal outer diameter, mm	Minimum radius of cable bend, mm	Weight for 1 km cable, kg	Amount of combustible materials, l/km
				TOFLEX RtKRng(A)-HF	
2 x 1.5 RE	1	14,3	107,1	377	131,2
2 x 2.5 RE	1	15,1	113,1	430	145,5
2 x 4 RE	1	16,8	126,0	603	167,4
2 x 6 RE	1	17,8	133,5	697	186,8
2 x 10 RE	1	19,4	145,2	853	218,7
2 x 16 RE	1	21,3	159,5	1073	260,2
2 x 16 RM	1	23,0	172,2	1289	285,6
2 x 25 RE	1	25,5	191,0	1620	359,9
2 x 25 RM	1	26,2	196,2	1674	378,5
2 x 35 RM	1	28,2	211,2	1996	433,9
2 x 70 RM	1	36,8	275,7	3540	725,0
3 x 1.5 RE	1	14,8	110,9	406	138,9
3 x 2.5 RE	1	16,4	123,3	571	158,7
3 x 4 RE	1	17,4	130,7	664	176,5
3 x 6 RE	1	18,5	138,8	766	196,6
3 x 10 RE	1	20,2	151,4	964	229,1
3 x 16 RE	1	23,0	172,7	1395	275,4
3 x 16 RM	1	24,4	183,0	1486	311,8
3 x 25 RE	1	26,7	199,9	1872	373,6
3 x 25 RM	1	27,4	205,5	1945	392,0
3 x 35 RM	1	29,6	221,7	2344	446,2
3 x 50 RM	1	34,8	261,1	3385	609,6
4 x 1.5 RE	1	16,5	123,4	554	158,2
4 x 2.5 RE	1	17,4	130,7	642	175,4
4 x 4 RE	1	18,5	139,0	742	195,6
4 x 6 RE	1	19,7	148,0	882	218,1
4 x 10 RE	1	22,4	168,1	1273	259,2
4 x 16 RE	1	25,1	188,3	1644	321,8
4 x 16 RM	1	26,2	196,4	1719	345,2
4 x 25 RE	1	28,7	215,4	2206	415,7
4 x 25 RM	1	29,6	221,7	2286	436,0
4 x 50 RM	1	38,1	285,5	4087	698,8
5 x 1.5 RE	1	17,4	130,7	622	174,9
5 x 2.5 RE	1	18,5	138,8	713	194,4
5 x 4 RE	1	19,8	148,2	851	217,4
5 x 6 RE	1	21,1	158,3	1011	243,0
5 x 10 RE	1	24,4	183,1	1485	304,8
5 x 16 RE	1	27,0	202,3	1914	358,8
5 x 16 RM	1	28,2	211,4	1994	385,1
5 x 35 RM	1	36,7	275,0	3671	629,0
5 x 70 RM	1	47,4	355,4	6524	985,3

POWER CABLES FOR VOLTAGE 1 AND 3 KV

4. ARMoured WITH WIRES

IEC 60502-1

4.4 Cables sheathed with polyethylene



4

Cable grade	Cable structure elements
TOFLEX RtkSHp	Cu/HEPR/PE/SWA/PE
TOFLEX ArtKSHp	Al/HEPR/PE/SWA/PE
TOFLEX RKSHp	Cu/EPR/PE/SWA/PE
TOFLEX ARKSHp	Al/EPR/PE/SWA/PE
TOFLEX VKSHp	Cu/PVC/PE/SWA/PE
TOFLEX AVKSHp	Al/PVC/PE/SWA/PE
TOFLEX PvKSHp	Cu/XLPE/PE/SWA/PE
TOFLEX APvKSHp	Al/XLPE/PE/SWA/PE

Notes:

Cables for voltage 3 kV shall be manufactured either single-conductor or three-conductor.

Armour for shall be made from aluminium or aluminium alloy wires, in this case armour shall be designated as "Ka".

For cables designated for 1 kV with electrical conductor section up to 6 mm² armour can be made from braiding of steel galvanized wires, in this case armour shall be designated as "P".

DESIGN FEATURES

- ① **Electrical conductor** – aluminium, copper or tinned copper – 2nd class as per IEC 60228; copper or tinned copper – 5 class* as per IEC 60228;
- ② **Insulation:**
 - "Rt" – hard grade ethylene propylene rubber,
 - "R" – ethylene propylene rubber;
 - "V" – PVC compound,
 - "Pv" – cross-linked polyethylene;
- ③ **Inner sheath** – corresponds to the type of the outer sheath;
- ④ **Armour:**
 - "K" – from steel galvanized wires,
 - "Ka" – from aluminum or aluminum alloy wires,
 - "P" – made from braiding of steel galvanized wires;
- ⑤ **Outer sheath** – made from polyethylene

* Letter "G" shall be added for cables with flexible copper or tinned copper conductor in a blank following TOFLEX trade mark designation.

► **Ordering example:**

TOFLEX PvKSHp 3x95RM(N, G)-1 IEC 60502-1

CABLE FEATURES



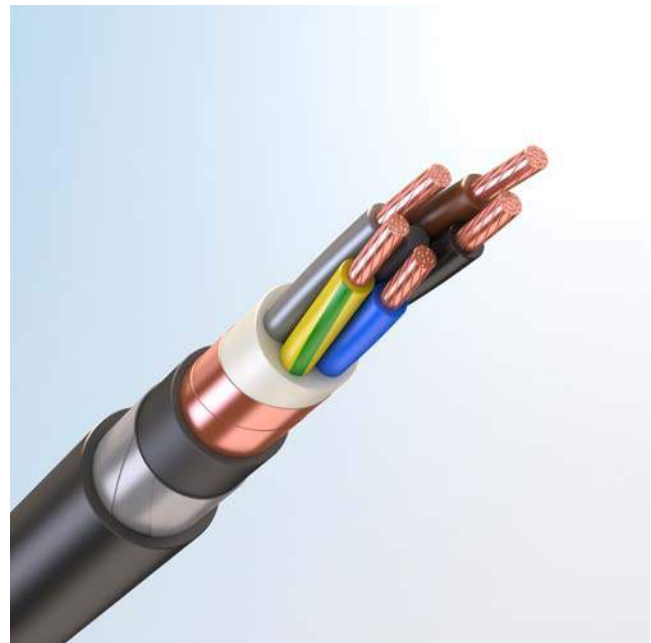
Conductor number and cross section, mm ²	Voltage, kV	Cable nominal outer diameter, mm	Minimum radius of cable bend, mm	Weight for 1 km cable, kg
				TOFLEX PvKSHp
2 x 4 RE	1	14,7	110,1	541
2 x 6 RE	1	16,5	123,6	832
2 x 10 RE	1	18,0	135,3	1006
2 x 16 RE	1	19,9	149,6	1209
2 x 16 RM	1	20,8	156,3	1277
2 x 25 RE	1	23,7	178,1	1886
2 x 25 RM	1	24,4	183,3	1960
2 x 35 RM	1	26,4	198,3	2303
2 x 50 RM	1	29,4	220,8	2886
2 x 70 SM	1	29,4	220,5	3046
2 x 120 SM	1	36,6	274,5	4959
3 x 1.5 RE	1	13,4	100,3	442
3 x 2.5 RE	1	14,2	106,8	510
3 x 4 RE	1	15,2	114,2	597
3 x 6 RE	1	17,1	128,2	917
3 x 10 RE	1	18,8	140,8	1130
3 x 16 RE	1	20,8	156,1	1389
3 x 16 RM	1	22,6	169,4	1750
3 x 25 RE	1	24,8	186,3	2168
3 x 25 RM	1	25,6	192,0	2250
3 x 35 RM	1	27,7	208,1	2681
3 x 70 SM	1	34,2	256,5	4407
4 x 2.5 RE	1	15,1	112,9	570
4 x 4 RE	1	17,0	127,2	887
4 x 6 RE	1	18,2	136,3	1035
4 x 10 RE	1	20,0	150,4	1258
4 x 16 RE	1	23,1	173,5	1914
4 x 16 RM	1	24,2	181,7	2013
4 x 25 RE	1	26,8	200,7	2544
4 x 25 RM	1	27,6	207,0	2639
4 x 35 RM	1	30,0	225,1	3173
4 x 50 RM	1	34,4	258,2	4563
5 x 2.5 RE	1	16,8	125,8	849
5 x 4 RE	1	18,0	135,1	996
5 x 6 RE	1	19,4	145,2	1143
5 x 10 RE	1	22,3	167,0	1730
5 x 16 RE	1	24,8	186,3	2197
5 x 16 RM	1	26,1	195,4	2309
5 x 25 RE	1	28,9	216,6	2942
5 x 25 RM	1	29,8	223,7	3052
5 x 35 RM	1	33,3	250,0	4153
3 x 25 RE + 1 x 16 RE	1	26,0	195,1	2404
3 x 25 RM + 1 x 16 RM	1	27,6	207,0	2574
3 x 35 RM + 1 x 16 RM	1	29,1	218,5	2942
3 x 50 RM + 1 x 25 RM	1	33,4	250,5	4232

POWER CABLES FOR VOLTAGE 1 AND 3 KV

5. SHIELDED, ARMoured WITH TAPES

IEC 60502-1

5.1 Cables sheathed with PVC compound



5

Cable grade	Cable structure elements
TOFLEX VEBSHv	Cu/PVC/OSCR/PVC/STA/PVC
TOFLEX AVEBSHv	Al/PVC/OSCR/PVC/STA/PVC
TOFLEX PvBSHv	Cu/XLPE/OSCR/PVC/STA/PVC
TOFLEX APvBSHv	Al/XLPE/OSCR/PVC/STA/PVC

Notes:

"HL" shall be added with a hyphen for cold resistant cables.

Cables for voltage 3 kV shall be manufactured either single-conductor or three-conductor.

Armour for single-conductor cables shall be made from aluminium tapes or aluminium alloy, in this case armour shall be designated as "Ba".

In case of concentric lay-up shield, its cross section shall be specified after slash in a cable macro size.

DESIGN FEATURES

- ① **Electrical conductor** – aluminium, copper or tinned copper – 2nd class as per IEC 60228; copper or tinned copper – 5 class* as per IEC 60228
- ② **Insulation:**
 "V" – PVC compound,
 "Pv" – cross-linked polyethylene;
- ③ **Inner sheath** – corresponds to the type of the outer sheath;
- ④ **Armour:**
 "B" – steel galvanized wires,
 "Ba" – made from PVC compound;
- ⑤ **Outer sheath** – made from polyethylene
Possible design:
 "HL" – made from cold-resistant PVC compound.

* Letter "G" shall be added for cables with flexible copper or tinned copper conductor in a blank following TOFLEX trade mark designation.

► **Ordering example:**

TOFLEX PvBSHv 3x95RM(N, G)-1 IEC 60502-1

CABLE FEATURES



Conductor number and cross section, mm ²	Voltage, kV	Cable nominal outer diameter, mm	Minimum radius of cable bend, mm	Weight for 1 km cable, kg		Cable nominal outer diameter, mm	Minimum radius of cable bend, mm	Weight for 1 km cable, kg	
				TOFLEX VEBShv	TOFLEX VEBShv-HL			TOFLEX PvEBShv	TOFLEX PvEBShv-HL
2 x 1.5 RE	1	14,9	111,8	378	365	14,5	108,8	358	346
2 x 2.5 RE	1	15,7	117,8	429	414	15,3	114,8	407	394
2 x 4 RE	1	17,4	130,7	532	514	16,2	121,7	470	455
2 x 6 RE	1	18,4	138,2	604	584	17,2	129,2	547	530
2 x 10 RE	1	20,0	149,9	744	721	18,8	140,9	674	655
2 x 16 RE	1	21,9	164,1	941	914	20,7	155,1	865	842
2 x 16 RM	1	22,8	170,9	991	961	21,6	161,9	913	888
2 x 25 RE	1	25,3	189,6	1280	1244	23,7	177,6	1169	1139
2 x 25 RM	1	26,0	194,9	1329	1291	24,4	182,9	1216	1186
2 x 35 RM	1	28,0	209,9	1606	1563	26,8	200,9	1510	1472
2 x 50 RM	1	31,4	235,4	2122	2069	29,8	223,4	1982	1937
2 x 70 SM	1	29,6	223,1	2208	2171	30,0	224,9	2144	2113
2 x 95 SM	1	31,6	238,1	2786	2744	32,0	239,9	2686	2652
2 x 120 SM	1	36,8	277,1	3499	3445	37,2	278,9	3400	3354
2 x 150 SM	1	38,8	292,1	4146	4086	39,2	293,9	4026	3978
2 x 185 SM	1	41,3	310,8	4955	4889	41,7	312,6	4805	4752
2 x 240 SM	1	48,0	361,1	6344	6257	48,4	362,9	6145	6075
3 x 1.5 RE	1	15,3	115,1	408	394	14,9	111,9	384	372
3 x 2.5 RE	1	16,2	121,5	469	454	15,8	118,3	444	430
3 x 4 RE	1	18,1	135,4	583	564	16,8	125,7	522	506
3 x 6 RE	1	19,1	143,5	682	661	17,8	133,8	609	592
3 x 10 RE	1	20,8	156,0	859	835	19,5	146,4	780	760
3 x 16 RE	1	22,8	171,4	1111	1084	21,6	161,7	1025	1002
3 x 16 RM	1	23,8	178,6	1164	1135	22,5	168,9	1076	1051
3 x 25 RE	1	26,5	198,5	1536	1499	24,8	185,9	1410	1381
3 x 25 RM	1	27,2	204,2	1591	1552	25,9	194,5	1487	1455
3 x 35 RM	1	29,4	220,3	1952	1908	28,1	210,6	1840	1804
3 x 50 RM	1	33,4	250,7	2658	2602	31,3	234,8	2463	2420
3 x 70 SM	1	34,0	256,1	3029	2982	34,4	257,9	2934	2895
3 x 95 SM	1	38,8	292,1	4007	3947	39,2	293,9	3857	3809
3 x 120 SM	1	41,8	314,6	4816	4750	42,2	316,4	4666	4613
3 x 150 SM	1	47,0	353,6	5937	5853	47,4	355,4	5758	5690
3 x 185 SM	1	51,8	389,6	7512	7417	52,2	391,4	7286	7212
3 x 240 SM	1	57,6	433,1	9381	9265	58,0	434,9	9082	8992
4 x 1.5 RE	1	16,1	120,9	451	436	15,6	117,2	423	410
4 x 2.5 RE	1	17,1	128,1	526	509	16,6	124,5	496	481
4 x 4 RE	1	19,2	143,6	663	643	17,7	132,8	591	575
4 x 6 RE	1	20,4	152,7	785	762	18,9	141,8	700	682
4 x 10 RE	1	22,2	166,8	1005	979	20,8	155,9	912	891
4 x 16 RE	1	24,5	183,9	1322	1291	23,1	173,1	1219	1195
4 x 16 RM	1	26,0	195,1	1406	1371	24,2	181,2	1278	1251
4 x 25 RE	1	28,5	214,0	1862	1822	27,1	203,2	1739	1706
4 x 25 RM	1	29,4	220,4	1926	1884	27,9	209,5	1803	1769
4 x 35 RM	1	31,8	238,4	2383	2335	30,3	227,6	2249	2210
4 x 50 RM	1	37,1	278,2	3344	3279	34,4	257,7	3079	3031
4 x 70 SM	1	38,8	292,1	3934	3874	39,2	293,9	3807	3758
4 x 95 SM	1	42,8	322,1	5084	5014	43,6	326,9	4883	4829
4 x 120 SM	1	47,0	353,6	6270	6185	47,4	355,4	6071	6003
4 x 150 SM	1	51,8	389,6	7875	7778	52,2	391,4	7636	7561
4 x 185 SM	1	57,6	433,1	9654	9537	58,0	434,9	9353	9263

Conductor number and cross section, mm ²	Voltage, kV	Cable nominal outer diameter, mm	Minimum radius of cable bend, mm	Weight for 1 km cable, kg		Cable nominal outer diameter, mm	Minimum radius of cable bend, mm	Weight for 1 km cable, kg	
				TOFLEX VEBSHv	TOFLEX VEBSHv-HL			TOFLEX PvEBSHv	TOFLEX PvEBSHv-HL
4 x 240 SM	1	62,0	466,1	11958	11822	62,4	467,9	11560	11458
5 x 1.5 RE	1	17,0	127,3	504	488	16,4	123,2	472	457
5 x 2.5 RE	1	18,1	135,4	584	566	17,5	131,3	557	542
5 x 4 RE	1	20,4	152,8	758	735	18,8	140,7	665	647
5 x 6 RE	1	21,7	162,9	911	886	20,1	150,8	812	793
5 x 10 RE	1	23,8	178,7	1176	1147	22,2	166,6	1068	1045
5 x 16 RE	1	26,8	201,0	1583	1548	24,8	185,8	1439	1412
5 x 16 RM	1	28,0	210,1	1653	1616	26,4	197,9	1530	1499
5 x 25 RE	1	30,8	231,3	2205	2160	29,2	219,2	2059	2024
5 x 25 RM	1	31,8	238,4	2279	2233	30,2	226,3	2134	2098
5 x 35 RM	1	35,7	267,7	2950	2891	33,3	249,5	2723	2679
5 x 50 RM	1	40,3	302,1	4013	3941	38,1	285,9	3780	3723
5 x 70 SM	1	41,8	314,6	4743	4676	42,2	316,4	4584	4531
5 x 95 SM	1	48,0	361,1	6327	6239	48,4	362,9	6077	6008
5 x 120 SM	1	53,8	404,6	8044	7944	54,2	406,4	7795	7717
5 x 150 SM	1	59,0	443,6	9807	9685	59,4	445,4	9508	9413
5 x 185 SM	1	64,0	481,1	11868	11729	64,4	482,9	11491	11386
5 x 240 SM	1	69,0	518,6	14759	14593	69,4	520,4	14261	14139
3 x 25 RE + 1 x 16 RE	1	28,5	214,0	1799	1758	26,4	197,7	1625	1594
3 x 25 RM + 1 x 16 RM	1	29,4	220,4	1860	1816	27,9	209,5	1738	1703
3 x 35 RM + 1 x 16 RM	1	30,9	231,5	2173	2127	29,5	221,1	2049	2012
3 x 50 RM + 1 x 25 RM	1	36,0	269,9	3048	2985	33,3	250,1	2798	2752
3 x 70 SM + 1 x 35 RM	1	38,8	292,1	3598	3539	39,2	293,9	3485	3436
3 x 95 SM + 1 x 50 SM	1	42,8	322,1	4669	4600	43,6	326,9	4487	4433
3 x 120 SM + 1 x 70 SM	1	47,0	353,6	5785	5702	47,4	355,4	5604	5536
3 x 150 SM + 1 x 70 SM	1	51,8	389,6	7114	7020	52,2	391,4	6903	6828
3 x 185 SM + 1 x 95 SM	1	57,6	433,1	8785	8671	58,0	434,9	8509	8419
3 x 240 SM + 1 x 120 SM	1	62,0	466,1	10815	10683	62,4	467,9	10466	10365

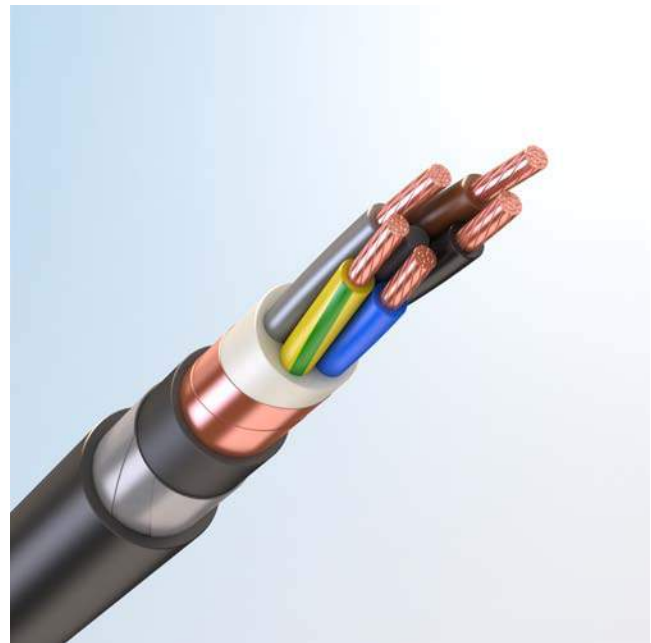
Conductor number and cross section, mm ²	Voltage, kV	Cable nominal outer diameter, mm	Minimum radius of cable bend, mm	Weight for 1 km cable, kg		Cable nominal outer diameter, mm	Minimum radius of cable bend, mm	Weight for 1 km cable, kg	
				TOFLEX VEBaSHv	TOFLEX VEBaSHv-HL			TOFLEX PvEBaSHv	TOFLEX PvEBaSHv-HL
1 x 6 RE	1	14,6	146,0	305	295	14,6	146,0	302	291
1 x 10 RE	1	14,6	146,0	341	325	14,6	146,0	331	321
1 x 16 RE	1	15,0	150,3	396	386	14,6	146,0	376	367
1 x 16 RM	1	15,5	154,8	410	400	14,9	148,8	385	376
1 x 25 RE	1	16,5	165,3	517	506	15,9	159,3	488	478
1 x 25 RM	1	16,9	168,8	532	520	16,3	162,8	503	493
1 x 35 RM	1	17,9	178,8	642	629	17,3	172,8	611	600
1 x 50 RM	1	19,6	195,8	841	826	18,8	187,8	797	785
1 x 70 RM	1	21,2	211,8	1036	1020	20,6	205,8	997	984
1 x 95 RM	1	23,3	232,8	1327	1308	22,3	222,8	1263	1248
1 x 120 RM	1	24,7	246,8	1593	1573	23,9	238,8	1534	1518
1 x 150 RM	1	26,9	268,8	1926	1902	26,1	260,8	1859	1840
1 x 185 RM	1	28,9	288,8	2322	2294	28,1	280,8	2246	2225
1 x 240 RM	1	31,6	315,8	2881	2850	30,6	305,8	2782	2759

POWER CABLES FOR VOLTAGE 1 AND 3 KV

5. SHIELDED, ARMoured WITH TAPES

IEC 60502-1

5.2 Cables sheathed with halogen free polymer compound.



5

Cable grade	Cable structure elements
TOFLEX RteBPng (A)-HF	Cu/HEPR/OSCR/HFFR/STA/HFFR
TOFLEX ARteBPng (A)-HF	Al/HEPR/OSCR/HFFR/STA/HFFR
TOFLEX REBPng (A)-HF	Cu/EPR/OSCR/HFFR/STA/HFFR
TOFLEX AREBPng (A)-HF	Al/EPR/OSCR/HFFR/STA/HFFR
TOFLEX PveBPng (A)-HF	Cu/XLPE/OSCR/HFFR/STA/HFFR
TOFLEX APveBPng (A)-HF	Al/XLPE/OSCR/HFFR/STA/HFFR

Notes:

"HL" shall be added with a hyphen for cold resistant cables.

Cables for voltage 3 kV shall be manufactured either single-conductor or three-conductor.

Armour for single-conductor cables shall be made from aluminium tapes or aluminium alloy, in this case armour shall be designated as "Ba".

In case of concentric lay-up shield, its cross section shall be specified after slash in a cable macro size.

DESIGN FEATURES

- ① **Electrical conductor** – aluminium, copper or tinned copper – 2nd class as per IEC 60228; copper or tinned copper – 5 class* as per IEC 60228
- ② **Insulation:**
 - "Rt" – hard grade ethylene propylene rubber,
 - "R" – ethylene propylene rubber;
 - "Pv" – cross-linked polyethylene;
- ③ **Inner sheath** – corresponds to the type of the outer sheath;
- ④ **Armour:**
 - "B" – steel galvanized wires,
 - "Ba" – made from aluminium tapes or aluminium alloy;
- ⑤ **Outer sheath** – made from halogen free polymer compound;
 - Possible design:**
 - "ng(A)-HF-HL" made from cold-resistant halogen free polymer compound.

* Letter "G" shall be added for cables with flexible copper or tinned copper conductor in a blank following TOFLEX trade mark designation.

► **Ordering example:**

TOFLEX AREBPng (A)-HF 3x95RM(N, G)-1 IEC 60502-1

CABLE FEATURES



Conductor number and cross section, mm ²	Voltage, kV	Cable nominal outer diameter, mm	Minimum radius of cable bend, mm	Weight for 1 km cable, kg		Amount of combustible materials, l/km
				TOFLEX	RtEBPng(A)-HF	
2 x 1.5 RE	1	15,3	114,8	420		169,5
2 x 2.5 RE	1	16,1	120,8	474		186,4
2 x 4 RE	1	17,0	127,7	543		206,6
2 x 6 RE	1	18,0	135,2	620		229,3
2 x 10 RE	1	19,6	146,9	766		266,3
2 x 16 RE	1	21,5	161,1	971		314,0
2 x 16 RM	1	22,4	167,9	1023		337,6
2 x 25 RE	1	24,9	186,6	1330		418,4
2 x 25 RM	1	25,6	191,9	1380		439,3
2 x 35 RM	1	27,6	206,9	1670		501,2
2 x 50 RM	1	31,0	232,4	2206		624,1
2 x 70 RM	1	36,2	271,4	3021		834,1
2 x 95 RM	1	40,4	302,9	3841		1024,8
2 x 120 RM	1	43,2	323,9	4551		1152,1
2 x 150 RM	1	48,4	362,9	5633		1465,4
2 x 185 RM	1	53,2	398,9	7074		1709,7
2 x 240 RM	1	60,0	449,9	8924		2182,2
3 x 1.5 RE	1	15,8	118,5	449		178,9
3 x 2.5 RE	1	16,7	125,0	513		196,8
3 x 4 RE	1	17,7	132,4	590		217,9
3 x 6 RE	1	18,7	140,5	691		241,4
3 x 10 RE	1	20,4	153,0	872		279,4
3 x 16 RE	1	22,4	168,4	1130		327,7
3 x 16 RM	1	23,4	175,6	1183		351,4
3 x 25 RE	1	26,1	195,5	1569		436,0
3 x 25 RM	1	26,8	201,2	1622		456,9
3 x 35 RM	1	29,0	217,3	1992		518,1
3 x 50 RM	1	33,0	247,7	2710		664,2
3 x 70 RM	1	38,1	285,5	3647		854,6
3 x 95 RM	1	42,6	319,4	4682		1045,9
3 x 120 RM	1	46,8	351,0	5766		1257,7
3 x 150 RM	1	51,1	383,0	6936		1488,2
3 x 185 RM	1	57,2	428,7	8869		1822,9
3 x 240 RM	1	63,4	475,3	11006		2206,0
4 x 1.5 RE	1	16,7	125,1	496		196,4
4 x 2.5 RE	1	17,6	132,3	568		216,6
4 x 4 RE	1	18,8	140,6	668		240,5
4 x 6 RE	1	20,0	149,7	791		266,9
4 x 10 RE	1	21,8	163,8	1014		309,4
4 x 16 RE	1	24,5	183,9	1364		379,1
4 x 16 RM	1	25,6	192,1	1425		406,1
4 x 25 RE	1	28,1	211,0	1873		484,8
4 x 25 RM	1	29,0	217,4	1934		507,9
4 x 35 RM	1	31,4	235,4	2397		575,4
4 x 50 RM	1	37,5	281,2	3546		812,9
4 x 70 RM	1	41,3	310,1	4421		946,6
4 x 95 RM	1	48,0	360,1	5935		1281,6
4 x 120 RM	1	51,4	385,4	7120		1423,2
4 x 150 RM	1	57,5	431,4	9048		1746,4
4 x 185 RM	1	62,7	470,5	10936		2056,8

Conductor number and cross section, mm ²	Voltage, kV	Cable nominal outer diameter, mm	Minimum radius of cable bend, mm	Weight for 1 km cable, kg	Amount of combustible materials, l/km
				TOFLEX RtEBPng(A)-HF	
4 x 240 RM	1	70,2	526,8	13729	2554,8
5 x 1.5 RE	1	17,7	132,4	549	216,2
5 x 2.5 RE	1	18,7	140,5	639	239,3
5 x 4 RE	1	20,0	149,8	761	266,3
5 x 6 RE	1	21,3	159,9	916	296,3
5 x 10 RE	1	23,4	175,7	1183	344,4
5 x 16 RE	1	26,4	198,0	1601	422,2
5 x 16 RM	1	27,6	207,1	1669	452,6
5 x 25 RE	1	30,4	228,3	2227	542,8
5 x 25 RM	1	31,4	235,4	2297	568,7
5 x 35 RM	1	36,1	270,7	3152	737,7
5 x 50 RM	1	40,7	305,1	4243	909,9
5 x 70 RM	1	46,2	346,5	5521	1148,3
5 x 95 RM	1	53,1	398,0	7514	1441,7
5 x 120 RM	1	57,9	433,9	9148	1692,0
5 x 150 RM	1	63,1	473,3	10962	1994,0
5 x 185 RM	1	69,5	521,3	13522	2417,3
5 x 240 RM	1	77,6	582,0	16851	2961,0

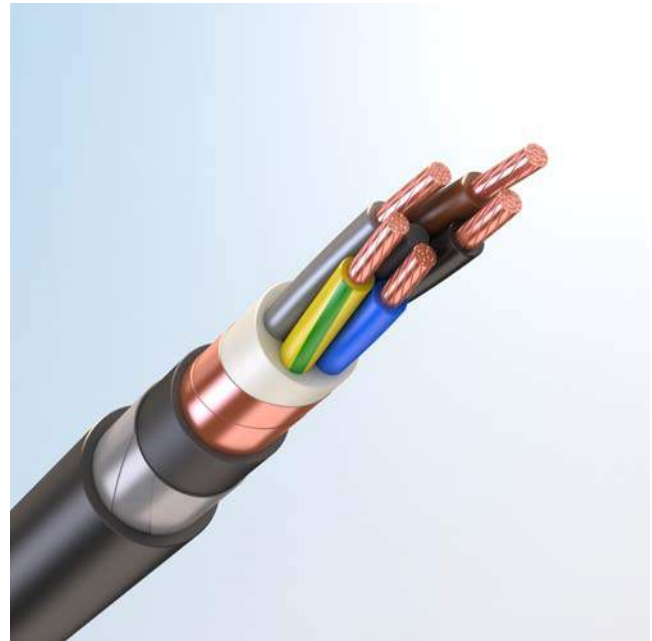
Conductor number and cross section, mm ²	Voltage, kV	Cable nominal outer diameter, mm	Minimum radius of cable bend, mm	Weight for 1 km cable, kg	Amount of combustible materials, l/km
				TOFLEX RtEBaPng(A)-HF	
1 x 1.5 RE	1	14,6	146,0	314	132,6
1 x 2.5 RE	1	14,6	146,0	322	131,5
1 x 4 RE	1	14,6	146,0	333	129,8
1 x 6 RE	1	14,6	146,0	348	127,7
1 x 10 RE	1	15,3	152,8	404	137,4
1 x 16 RE	1	16,2	162,3	488	151,6
1 x 16 RM	1	16,7	166,8	504	158,3
1 x 25 RE	1	17,7	177,3	617	177,4
1 x 25 RM	1	18,1	180,8	633	182,9
1 x 35 RM	1	19,1	190,8	744	198,4
1 x 50 RM	1	20,8	207,8	954	229,9
1 x 70 RM	1	22,4	223,8	1158	255,7
1 x 95 RM	1	24,9	248,8	1486	312,1
1 x 120 RM	1	26,3	262,8	1761	336,4
1 x 150 RM	1	28,1	280,8	2079	376,4
1 x 185 RM	1	30,1	300,8	2481	422,0
1 x 240 RM	1	32,8	327,8	3050	483,2
1 x 300 RM	1	38,6	386,3	3949	685,7
1 x 400 RM	1	42,0	419,7	4852	778,6
1 x 500 RM	1	46,8	467,5	6082	967,2
1 x 630 RM	1	51,1	511,1	7610	1101,1

POWER CABLES FOR VOLTAGE 1 AND 3 KV

5. SHIELDED, ARMoured WITH TAPES

IEC 60502-1

5.3 Cables sheathed with halogen free cross-linked highly elastic polymer compound



5

Cable grade	Cable structure elements
TOFLEX RtEBRng (A)-HF	Cu/HEPR/OSCR/HFFR/STA/XLHFFR
TOFLEX ARtEBRng (A)-HF	Al/HEPR/OSCR/HFFR/STA/XLHFFR
TOFLEX REBRng (A)-HF	Cu/EPR/OSCR/HFFR/STA/XLHFFR
TOFLEX AREBRng (A)-HF	Al/EPR/OSCR/HFFR/STA/XLHFFR

Notes:

"HL" shall be added with a hyphen for cold resistant cables.

Cables for voltage 3 kV shall be manufactured either single-conductor or three-conductor.

Armour for single-conductor cables shall be made from aluminum tapes or aluminum alloy, in this case armour shall be designated as "Ba".

In case of concentric lay-up shield, its cross section shall be specified after slash in a cable macro size.

DESIGN FEATURES

- ① **Electrical conductor** – aluminium, copper or tinned copper – 2nd class as per IEC 60228; copper or tinned copper– 5 class* as per IEC 60228
- ② **Insulation:**
 "Rt" – hard grade ethylene propylene rubber,
 "R" – ethylene propylene rubber;
 "Pv" – cross-linked polyethylene;
- ③ **Inner sheath** – corresponds to the type of the outer sheath;
- ④ **Shield:**
 "E" – made from copper tapes or copper wires,
 "El" – made from tinned copper wires;
- ⑤ **Armour:**
 "B" – steel galvanized wires,
 "Ba" – made from aluminum tapes or aluminum alloy;
- ⑥ **Outer sheath** – made from halogen free cross-linked highly elastic polymer compound;
Possible design:
 "ng(A)-HF-HL" – made from cold-resistant halogen free cross-linked highly elastic polymer compound.

* Letter "G" shall be added for cables with flexible copper or tinned copper conductor in a blank following TOFLEX trade mark designation.

► **Ordering example:**

TOFLEX RtEBRng (A)-HF 3×95RM(N, G)-1 IEC 60502-1

CABLE FEATURES



Conductor number and cross section, mm ²	Voltage, kV	Cable nominal outer diameter, mm	Minimum radius of cable bend, mm	Weight for 1 km cable, kg	Amount of combustible materials, l/km
				TOFLEX RtEBrng(A)-HF	
2 x 1.5 RE	1	15,3	114,8	415	169,5
2 x 2.5 RE	1	16,1	120,8	468	186,4
2 x 4 RE	1	17,0	127,7	537	206,6
2 x 6 RE	1	18,0	135,2	613	229,3
2 x 10 RE	1	19,6	146,9	758	266,3
2 x 16 RE	1	21,5	161,1	962	314,0
2 x 16 RM	1	22,4	167,9	1014	337,6
2 x 25 RE	1	24,9	186,6	1320	418,4
2 x 25 RM	1	25,6	191,9	1370	439,3
2 x 35 RM	1	27,6	206,9	1658	501,2
2 x 50 RM	1	31,0	232,4	2193	624,1
2 x 70 RM	1	36,2	271,4	3003	834,1
2 x 95 RM	1	40,4	302,9	3820	1024,8
2 x 120 RM	1	43,2	323,9	4528	1152,1
2 x 150 RM	1	48,4	362,9	5604	1465,4
2 x 185 RM	1	53,2	398,9	7041	1709,7
2 x 240 RM	1	60,0	449,9	8882	2182,2
3 x 1.5 RE	1	15,8	118,5	444	178,9
3 x 2.5 RE	1	16,7	125,0	507	196,8
3 x 4 RE	1	17,7	132,4	584	217,9
3 x 6 RE	1	18,7	140,5	684	241,4
3 x 10 RE	1	20,4	153,0	864	279,4
3 x 16 RE	1	22,4	168,4	1121	327,7
3 x 16 RM	1	23,4	175,6	1174	351,4
3 x 25 RE	1	26,1	195,5	1558	436,0
3 x 25 RM	1	26,8	201,2	1611	456,9
3 x 35 RM	1	29,0	217,3	1980	518,1
3 x 50 RM	1	33,0	247,7	2693	664,2
3 x 70 RM	1	38,1	285,5	3628	854,6
3 x 95 RM	1	42,6	319,4	4659	1045,9
3 x 120 RM	1	46,8	351,0	5738	1257,7
3 x 150 RM	1	51,1	383,0	6905	1488,2
3 x 185 RM	1	57,2	428,7	8830	1822,9
3 x 240 RM	1	63,4	475,3	10961	2206,0
4 x 1.5 RE	1	16,7	125,1	490	196,4
4 x 2.5 RE	1	17,6	132,3	561	216,6
4 x 4 RE	1	18,8	140,6	661	240,5
4 x 6 RE	1	20,0	149,7	784	266,9
4 x 10 RE	1	21,8	163,8	1005	309,4
4 x 16 RE	1	24,5	183,9	1355	379,1
4 x 16 RM	1	25,6	192,1	1414	406,1
4 x 25 RE	1	28,1	211,0	1861	484,8
4 x 25 RM	1	29,0	217,4	1922	507,9
4 x 35 RM	1	31,4	235,4	2384	575,4
4 x 50 RM	1	37,5	281,2	3527	812,9
4 x 70 RM	1	41,3	310,1	4399	946,6
4 x 95 RM	1	48,0	360,1	5906	1281,6
4 x 120 RM	1	51,4	385,4	7088	1423,2
4 x 150 RM	1	57,5	431,4	9008	1746,4
4 x 185 RM	1	62,7	470,5	10892	2056,8

Conductor number and cross section, mm ²	Voltage, kV	Cable nominal outer diameter, mm	Minimum radius of cable bend, mm	Weight for 1 km cable, kg	Amount of combustible materials, l/km
				TOFLEX RtEBRng(A)-HF	
4 x 240 RM	1	70,2	526,8	13679	2554,8
5 x 1.5 RE	1	17,7	132,4	542	216,2
5 x 2.5 RE	1	18,7	140,5	632	239,3
5 x 4 RE	1	20,0	149,8	753	266,3
5 x 6 RE	1	21,3	159,9	907	296,3
5 x 10 RE	1	23,4	175,7	1173	344,4
5 x 16 RE	1	26,4	198,0	1590	422,2
5 x 16 RM	1	27,6	207,1	1658	452,6
5 x 25 RE	1	30,4	228,3	2214	542,8
5 x 25 RM	1	31,4	235,4	2284	568,7
5 x 35 RM	1	36,1	270,7	3134	737,7
5 x 50 RM	1	40,7	305,1	4222	909,9
5 x 70 RM	1	46,2	346,5	5493	1148,3
5 x 95 RM	1	53,1	398,0	7482	1441,7
5 x 120 RM	1	57,9	433,9	9107	1692,0
5 x 150 RM	1	63,1	473,3	10917	1994,0
5 x 185 RM	1	69,5	521,3	13473	2417,3
5 x 240 RM	1	77,6	582,0	16788	2961,0

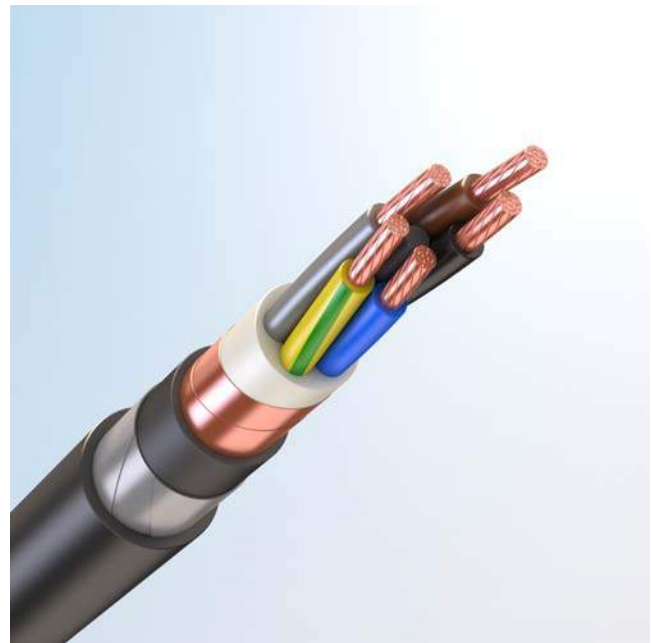
Conductor number and cross section, mm ²	Voltage, kV	Cable nominal outer diameter, mm	Minimum radius of cable bend, mm	Weight for 1 km cable, kg	Amount of combustible materials, l/km
				TOFLEX RtEBaRng(A)-HF	
1 x 1.5 RE	1	14,6	146,0	307	132,6
1 x 2.5 RE	1	14,6	146,0	316	131,5
1 x 4 RE	1	14,6	146,0	328	129,8
1 x 6 RE	1	14,6	146,0	344	127,7
1 x 10 RE	1	15,3	152,8	399	137,4
1 x 16 RE	1	16,2	162,3	483	151,6
1 x 16 RM	1	16,7	166,8	499	158,3
1 x 25 RE	1	17,7	177,3	612	177,4
1 x 25 RM	1	18,1	180,8	627	182,9
1 x 35 RM	1	19,1	190,8	737	198,4
1 x 50 RM	1	20,8	207,8	947	229,9
1 x 70 RM	1	22,4	223,8	1151	255,7
1 x 95 RM	1	24,9	248,8	1477	312,1
1 x 120 RM	1	26,3	262,8	1752	336,4
1 x 150 RM	1	28,1	280,8	2069	376,4
1 x 185 RM	1	30,1	300,8	2470	422,0
1 x 240 RM	1	32,8	327,8	3037	483,2
1 x 300 RM	1	38,6	386,3	3930	685,7
1 x 400 RM	1	42,0	419,7	4832	778,6
1 x 500 RM	1	46,8	467,5	6055	967,2
1 x 630 RM	1	51,1	511,1	7581	1101,1

POWER CABLES FOR VOLTAGE 1 AND 3 KV

5. SHIELDED, ARMoured WITH TAPES

IEC 60502-1

5.4 Cables sheathed with polyethylene



5

Cable grade	Cable structure elements
TOFLEX RteBSHp	Cu/HEPR/OSCR/PE/STA/PE
TOFLEX ArteBSHp	Al/HEPR/OSCR/PE/STA/PE
TOFLEX REBSHp	Cu/EPR/OSCR/PE/STA/PE
TOFLEX AREBSHp	Al/EPR/OSCR/PE/STA/PE
TOFLEX VEBSHp	Cu/PVC/OSCR/PE/STA/PE
TOFLEX AVEBSHp	Al/PVC/OSCR/PE/STA/PE
TOFLEX PvBSHp	Cu/XLPE/OSCR/PE/STA/PE
TOFLEX APvBSHp	Al/XLPE/OSCR/PE/STA/PE

Notes:

Cables for voltage 3 kV shall be manufactured either single-conductor or three-conductor.

Armour for single-conductor cables shall be made from aluminum tapes or aluminum alloy, in this case armour shall be designated as "Ba".

In case of concentric lay-up shield, its cross section shall be specified after slash in a cable macro size.



DESIGN FEATURES

- ① **Electrical conductor** – aluminium, copper or tinned copper – 2nd class as per IEC 60228; copper or tinned copper– 5 class* as per IEC 60228;
- ② **Insulation:**
 "Rt" – hard grade ethylene propylene rubber,
 "R" – ethylene propylene rubber;
 "V" – PVC compound,
 "Pv" – cross-linked polyethylene;
- ③ **Inner sheath** – corresponds to the type of the outer sheath;
- ④ **Shield:**
 "E" – made from copper tapes or copper wires,
 "EI" – made from tinned copper wires;
- ⑤ **Armour:**
 "B" – steel galvanized wires,
 "Ba" – made from aluminum tapes or aluminum alloy;
- ⑥ **Outer sheath** – made from polyethylene.

* Letter "G" shall be added for cables with flexible copper or tinned copper conductor in a blank following TOFLEX trade mark designation.

► **Ordering example:**

TOFLEX AVEBSHp 3×95RM(N, G)-1 IEC 60502-1



CABLE FEATURES



Conductor number and cross section, mm ²	Voltage, kV	Cable nominal outer diameter, mm	Minimum radius of cable bend, mm	Weight for 1 km cable, kg
				TOFLEX PvEBSHp
2 x 2.5 RE	1	15,3	114,8	344
2 x 4 RE	1	16,2	121,7	388
2 x 6 RE	1	17,2	129,2	438
2 x 10 RE	1	18,8	140,9	514
2 x 16 RE	1	20,7	155,1	627
2 x 16 RM	1	21,6	161,9	671
2 x 25 RE	1	23,7	177,6	818
2 x 25 RM	1	24,4	182,9	859
2 x 35 RM	1	26,4	197,9	1004
2 x 50 RM	1	29,4	220,4	1256
2 x 70 SM	1	29,3	220,1	1206
2 x 95 SM	1	31,3	235,1	1438
2 x 120 SM	1	36,7	275,6	1818
2 x 150 SM	1	38,7	290,6	2080
2 x 185 SM	1	41,2	309,3	2413
2 x 240 SM	1	48,1	361,1	3090
3 x 2.5 RE	1	15,8	118,3	365
3 x 4 RE	1	16,8	125,7	413
3 x 6 RE	1	17,8	133,8	462
3 x 10 RE	1	19,5	146,4	558
3 x 16 RE	1	21,6	161,7	688
3 x 16 RM	1	22,5	168,9	734
3 x 25 RE	1	24,8	185,9	904
3 x 25 RM	1	25,5	191,5	949
3 x 35 RM	1	27,7	207,6	1116
3 x 50 RM	1	30,9	231,8	1410
3 x 70 SM	1	33,7	253,1	1558
3 x 95 SM	1	38,7	290,6	2015
3 x 120 SM	1	41,7	313,1	2335
3 x 150 SM	1	47,1	353,6	2876
3 x 185 SM	1	51,9	389,6	3732
3 x 240 SM	1	57,5	431,6	4509
4 x 2.5 RE	1	16,6	124,5	399
4 x 4 RE	1	17,7	132,8	456
4 x 6 RE	1	18,9	141,8	514
4 x 10 RE	1	20,8	155,9	627
4 x 16 RE	1	23,1	173,1	781
4 x 16 RM	1	24,2	181,2	833
4 x 25 RE	1	26,7	200,2	1054
4 x 25 RM	1	27,5	206,5	1105
4 x 35 RM	1	29,9	224,6	1305
4 x 50 RM	1	34,0	254,7	1696
4 x 70 SM	1	38,7	290,6	1996
4 x 95 SM	1	42,7	320,6	2455
4 x 120 SM	1	47,1	353,6	2992
4 x 150 SM	1	51,9	389,6	3826
4 x 185 SM	1	57,5	431,6	4615
4 x 240 SM	1	61,9	464,6	5517
5 x 2.5 RE	1	17,5	131,3	444
5 x 4 RE	1	18,8	140,7	504

Conductor number and cross section, mm ²	Voltage, kV	Cable nominal outer diameter, mm	Minimum radius of cable bend, mm	Weight for 1 km cable, kg
				TOFLEX PvEBSHp
5 x 6 RE	1	20,1	150,8	588
5 x 10 RE	1	22,2	166,6	719
5 x 16 RE	1	24,8	185,8	900
5 x 16 RM	1	26,0	194,9	959
5 x 25 RE	1	28,8	216,2	1217
5 x 25 RM	1	29,8	223,3	1276
5 x 35 RM	1	32,9	246,5	1556
5 x 50 RM	1	37,9	284,4	2068
5 x 70 SM	1	41,7	313,1	2340
5 x 95 SM	1	48,1	361,1	3061
5 x 120 SM	1	53,9	404,6	3960
5 x 150 SM	1	58,9	442,1	4731
5 x 185 SM	1	63,9	479,6	5599
5 x 240 SM	1	68,5	514,1	6650
3 x 25 RE + 1 x 16 RE	1	26,0	194,7	996
3 x 25 RM + 1 x 16 RM	1	27,5	206,5	1096
3 x 35 RM + 1 x 16 RM	1	29,1	218,1	1223
3 x 50 RM + 1 x 25 RM	1	32,9	247,1	1585
3 x 70 SM + 1 x 35 RM	1	38,7	290,6	1884
3 x 95 SM + 1 x 50 SM	1	42,7	320,6	2317
3 x 120 SM + 1 x 70 SM	1	47,1	353,6	2836
3 x 150 SM + 1 x 70 SM	1	51,9	389,6	3583
3 x 185 SM + 1 x 95 SM	1	57,5	431,6	4329
3 x 240 SM + 1 x 120 SM	1	61,9	464,6	5144

Conductor number and cross section, mm ²	Voltage, kV	Cable nominal outer diameter, mm	Minimum radius of cable bend, mm	Weight for 1 km cable, kg
				TOFLEX PvEBSHp
1 x 6 RE	1	14,6	146,0	271
1 x 10 RE	1	14,6	146,0	300
1 x 16 RE	1	14,6	146,0	345
1 x 16 RM	1	14,9	148,8	353
1 x 25 RE	1	15,9	159,3	454
1 x 25 RM	1	16,3	162,8	468
1 x 35 RM	1	17,3	172,8	573
1 x 50 RM	1	18,8	187,8	756
1 x 70 RM	1	20,6	205,8	951
1 x 95 RM	1	22,3	222,8	1213
1 x 120 RM	1	23,9	238,8	1481
1 x 150 RM	1	25,7	256,8	1779
1 x 185 RM	1	27,7	276,8	2159
1 x 240 RM	1	30,2	301,8	2687
1 x 300 RM	1	34,6	346,3	3370
1 x 400 RM	1	38,6	385,7	4255
1 x 500 RM	1	42,2	421,5	5279
1 x 630 RM	1	48,3	483,1	6862

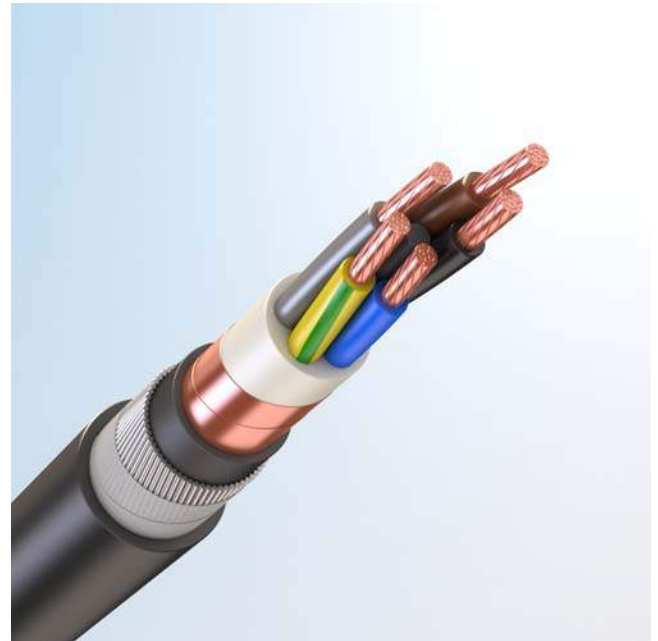
POWER CABLES FOR VOLTAGE 1 AND 3 KV

6. SHIELDED, ARMoured WITH WIRES

IEC 60502-1

6.1 Sheathed with PVC compound

Cable grade	Cable structure elements
TOFLEX VEKSHv	Cu/PVC/OSCR/PVC/SWA/PVC
TOFLEX AVEKSHv	Al/PVC/OSCR/PVC/SWA/PVC
TOFLEX PvEKSHv	Cu/XLPE/OSCR/PVC/SWA/PVC
TOFLEX APvEKSHv	Al/XLPE/OSCR/PVC/SWA/PVC



6

Notes:

"HL" shall be added with a hyphen for cold resistant cables.

Cables for voltage 3 kV shall be manufactured either single-conductor or three-conductor.

Armour for shall be made from aluminum or aluminum alloy wires, in this case armour shall be designated as "Ka".

For cables designated for 1 kV with electrical conductor section up to 6 mm² armour can be made from braiding of steel galvanized wires, in this case armour shall be designated as "P".

In case of concentric lay-up shield, its cross section shall be specified after slash in a cable macro size.

DESIGN FEATURES

- ① **Electrical conductor** – aluminium, copper or tinned copper – 2nd class as per IEC 60228; copper or tinned copper– 5 class* as per IEC 60228;
- ② **Insulation:**
 "V" – PVC compound,
 "Pv" – cross-linked polyethylene;
- ③ **Inner sheath** – corresponds to the type of the outer sheath;
- ④ **Shield:**
 "E" – made from copper tapes or copper wires,
 "EI" – made from tinned copper wires;
- ⑤ **Armour:**
 "K" – from steel galvanized wires,
 "Ka" – from aluminum or aluminum alloy wires,
 "P" – made from braiding of steel galvanized wires;
- ⑥ **Outer sheath** – made from PVC compound;
Possible design:
 "HL" – made from PVC compound.

* Letter "G" shall be added for cables with flexible copper or tinned copper conductor in a blank following TOFLEX trade mark designation.

► **Ordering example:**

TOFLEX PvEKSHv 3×95RM(N, G)-1 IEC 60502-1

CABLE FEATURES



Conductor number and cross section, mm ²	Voltage, kV	Cable nominal outer diameter, mm	Minimum radius of cable bend, mm	Weight for 1 km cable, kg		Cable nominal outer diameter, mm	Minimum radius of cable bend, mm	Weight for 1 km cable, kg	
				TOFLEX VEKSHv	TOFLEX VEKSHv-HL			TOFLEX PvEKSHv	TOFLEX PvEKSHv-HL
2 x 1.5 RE	1	16,3	122,6	547	532	15,1	113,6	423	410
2 x 2.5 RE	1	17,1	128,6	607	592	16,7	125,6	580	566
2 x 4 RE	1	18,9	141,5	738	720	17,7	132,5	662	646
2 x 6 RE	1	19,9	149,0	826	805	18,7	140,0	746	728
2 x 10 RE	1	22,2	166,7	1133	1109	20,2	151,7	902	882
2 x 16 RE	1	24,1	180,9	1377	1349	22,9	171,9	1281	1256
2 x 16 RM	1	25,0	187,7	1451	1420	23,8	178,7	1352	1326
2 x 25 RE	1	27,5	206,4	1787	1750	25,9	194,4	1653	1622
2 x 25 RM	1	28,2	211,7	1845	1806	26,6	199,7	1710	1678
2 x 35 RM	1	30,2	226,7	2169	2124	29,0	217,7	2051	2013
2 x 95 SM	1	34,8	260,9	3679	3635	34,8	260,9	3578	3543
2 x 185 SM	1	45,5	341,1	6570	6501	45,5	341,1	6419	6364
3 x 1.5 RE	1	16,8	125,9	581	566	16,4	122,7	552	539
3 x 2.5 RE	1	17,6	132,3	651	635	17,2	129,1	621	607
3 x 4 RE	1	19,5	146,2	800	780	18,2	136,5	716	700
3 x 6 RE	1	20,6	154,3	915	894	19,3	144,6	828	810
3 x 10 RE	1	23,0	172,8	1273	1248	21,0	157,2	1019	998
3 x 16 RE	1	25,1	188,2	1571	1542	23,8	178,5	1465	1440
3 x 16 RM	1	26,1	195,4	1647	1616	24,8	185,7	1522	1496
3 x 25 RE	1	28,7	215,3	2064	2026	27,0	202,7	1916	1886
3 x 25 RM	1	29,5	221,0	2144	2104	28,2	211,3	2004	1971
3 x 50 RM	1	36,5	273,5	3611	3553	34,4	257,6	3360	3315
3 x 70 SM	1	37,2	278,9	4001	3952	37,2	278,9	3905	3865
3 x 120 SM	1	46,0	344,9	6425	6357	46,0	344,9	6276	6220
4 x 1.5 RE	1	17,6	131,7	634	618	17,1	128,0	602	588
4 x 2.5 RE	1	18,5	138,9	726	709	18,0	135,3	692	677
4 x 4 RE	1	20,6	154,4	896	875	19,1	143,6	794	777
4 x 6 RE	1	22,6	169,5	1187	1163	20,3	152,6	936	917
4 x 10 RE	1	24,5	183,6	1454	1427	23,0	172,7	1326	1304
4 x 16 RE	1	26,8	200,7	1814	1782	25,3	189,9	1693	1667
4 x 16 RM	1	28,2	211,9	1922	1886	26,4	198,0	1773	1746
4 x 25 RE	1	30,8	230,8	2435	2394	29,3	220,0	2294	2260
4 x 35 RM	1	34,8	261,2	3274	3225	33,4	250,4	3104	3063
5 x 1.5 RE	1	18,4	138,1	696	679	17,9	134,0	661	646
5 x 2.5 RE	1	19,5	146,2	801	782	19,0	142,1	763	746
5 x 4 RE	1	22,6	169,6	1160	1136	20,2	151,5	893	875
5 x 6 RE	1	24,0	179,7	1349	1323	22,3	167,6	1217	1197
5 x 10 RE	1	26,1	195,5	1658	1629	24,5	183,4	1517	1493
5 x 16 RE	1	29,0	217,8	2124	2088	27,0	202,6	1945	1917
5 x 16 RM	1	30,3	226,9	2215	2176	28,6	214,7	2058	2027
5 x 25 RE	1	33,9	254,1	3081	3034	36,3	272,3	3678	3632
5 x 25 RM	1	34,8	261,2	3171	3123	46,0	344,9	6193	6137
5 x 70 SM	1	46,0	344,9	6352	6282	28,6	214,5	2155	2122
3 x 25 RE + 1 x 16 RE	1	30,8	230,8	2372	2329	30,2	226,3	2301	2264
3 x 35 RM + 1 x 16 RM	1	33,9	254,3	3049	3001	36,4	272,9	3752	3704

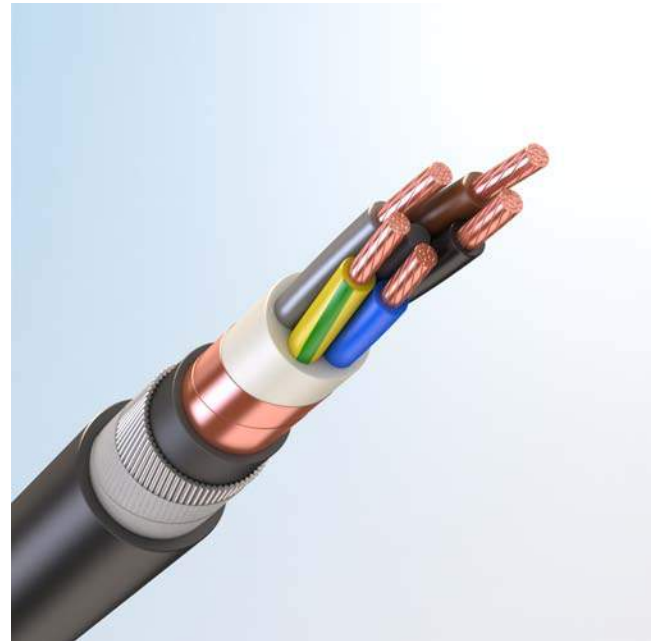
POWER CABLES FOR VOLTAGE 1 AND 3 KV

6. SHIELDED, ARMoured WITH WIRES

IEC 60502-1

6.2 Sheathed with halogen free polymer compound

Cable grade	Cable structure elements
TOFLEX RtEKPNg (A)-HF	Cu/HEPR/OSCR/HFFR/SWA/HFFR
TOFLEX ARtEKPNg (A)-HF	Al/HEPR/OSCR/HFFR/SWA/HFFR
TOFLEX REKPNg (A)-HF	Cu/EPR/OSCR/HFFR/SWA/HFFR
TOFLEX AREKPNg (A)-HF	Al/EPR/OSCR/HFFR/SWA/HFFR
TOFLEX PvEKPNg (A)-HF	Cu/XLPE/OSCR/HFFR/SWA/HFFR
TOFLEX APvEKPNg (A)-HF	Al/XLPE/OSCR/HFFR/SWA/HFFR



6

Notes:

"HL" shall be added with a hyphen for cold resistant cables.

Cables for voltage 3 kV shall be manufactured either single-conductor or three-conductor.

Armour for shall be made from aluminum or aluminum alloy wires, in this case armour shall be designated as "Ka".

For cables designated for 1 kV with electrical conductor section up to 6 mm² armour can be made from braiding of steel galvanized wires, in this case armour shall be designated as "P".

In case of concentric lay-up shield, its cross section shall be specified after slash in a cable macro size.



DESIGN FEATURES

- ① **Electrical conductor** – aluminium, copper or tinned copper – 2nd class as per IEC 60228; copper or tinned copper– 5 class* as per IEC 60228;
- ② **Insulation:**
 "Rt" – hard grade ethylene propylene rubber,
 "R" – ethylene propylene rubber;
 "Pv" – cross-linked polyethylene;
- ③ **Inner sheath** – corresponds to the type of the outer sheath;
- ④ **Shield:**
 "E" – made from copper tapes or copper wires,
 "El" – made from tinned copper wires;
- ⑤ **Armour:**
 "K" – from steel galvanized wires,
 "Ka" – from aluminum or aluminum alloy wires,
 "P" – made from braiding of steel galvanized wires;
- ⑥ **Outer sheath** – made from halogen free polymer compound;
Possible design:
 "ng(A)-HF-HL" – from cold-resistant halogen free polymer compound.

* Letter "G" shall be added for cables with flexible copper or tinned copper conductor in a blank following TOFLEX trade mark designation.

► **Ordering example:**

TOFLEX RtEKPNg (A)-HF 3x95RM(N, G)-1 IEC 60502-1



CABLE FEATURES



Conductor number and cross section, mm ²	Voltage, kV	Cable nominal outer diameter, mm	Minimum radius of cable bend, mm	Weight for 1 km cable, kg		Amount of combustible materials, l/km
				TOFLEX RtEKPng(A)-HF		
2 x 1.5 RE	1	17,3	129,5	638	181,0	
2 x 2.5 RE	1	18,1	135,5	705	198,0	
2 x 4 RE	1	19,0	142,4	794	218,1	
2 x 6 RE	1	20,0	149,9	888	240,8	
2 x 10 RE	1	22,3	167,6	1206	282,5	
2 x 16 RE	1	24,6	184,8	1490	346,2	
2 x 16 RM	1	25,5	191,6	1569	370,4	
2 x 25 RE	1	27,6	207,3	1900	436,4	
2 x 25 RM	1	28,3	212,6	1961	457,3	
2 x 35 RM	1	30,3	227,6	2303	519,3	
2 x 50 RM	1	35,3	265,1	3257	693,0	
3 x 1.5 RE	1	17,8	133,2	673	190,4	
3 x 2.5 RE	1	18,6	139,7	758	208,3	
3 x 4 RE	1	19,6	147,1	852	229,4	
3 x 6 RE	1	20,7	155,2	973	252,9	
3 x 10 RE	1	23,2	173,7	1340	295,6	
3 x 16 RE	1	25,6	192,1	1676	360,5	
3 x 16 RM	1	26,6	199,3	1756	384,8	
3 x 25 RE	1	28,8	216,2	2163	454,0	
3 x 25 RM	1	29,6	221,9	2245	474,9	
3 x 50 RM	1	37,4	280,4	3832	735,8	
4 x 1.5 RE	1	18,6	139,8	741	207,9	
4 x 2.5 RE	1	19,6	147,0	829	228,2	
4 x 4 RE	1	20,7	155,3	949	252,0	
4 x 6 RE	1	22,7	170,4	1246	283,1	
4 x 10 RE	1	25,0	187,5	1548	341,9	
4 x 16 RE	1	27,3	204,6	1921	397,1	
4 x 16 RM	1	28,4	212,8	2006	424,1	
4 x 25 RE	1	30,9	231,7	2519	502,8	
4 x 35 RM	1	35,8	268,1	3446	644,8	
4 x 70 RM	1	46,3	347,3	6069	1039,2	
5 x 1.5 RE	1	19,6	147,1	810	227,7	
5 x 2.5 RE	1	20,7	155,2	921	250,8	
5 x 4 RE	1	22,7	170,5	1216	282,5	
5 x 6 RE	1	24,5	183,6	1436	328,4	
5 x 10 RE	1	26,6	199,4	1756	377,9	
5 x 16 RE	1	29,2	218,7	2210	440,2	
5 x 16 RM	1	30,4	227,8	2302	470,6	
5 x 25 RE	1	34,8	261,0	3255	611,0	
5 x 25 RM	1	35,8	268,1	3346	638,1	

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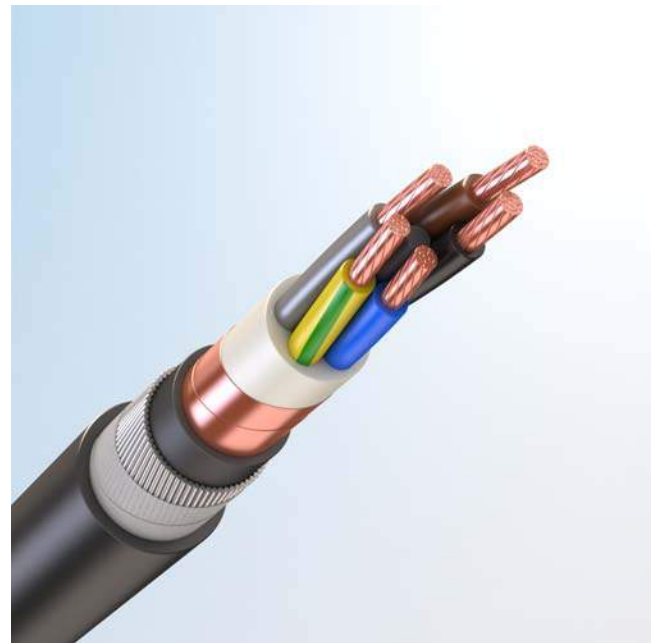
POWER CABLES FOR VOLTAGE 1 AND 3 KV

6. SHIELDED, ARMoured WITH WIRES

IEC 60502-1

6.3 Cables sheathed with halogen free cross-linked highly elastic polymer compound

Cable grade	Cable structure elements
TOFLEX RtEKRng (A)-HF	Cu/HEPR/OSCR/HFFR/SWA/XLHFFR
TOFLEX ARtEKRng (A)-HF	Al/HEPR/OSCR/HFFR/SWA/XLHFFR
TOFLEX REKRng (A)-HF	Cu/EPR/OSCR/HFFR/SWA/XLHFFR
TOFLEX AREKRng (A)-HF	Al/EPR/OSCR/HFFR/SWA/XLHFFR



6

Notes:

"HL" shall be added with a hyphen for cold resistant cables.

Cables for voltage 3 kV shall be manufactured either single-conductor or three-conductor.

Armour for shall be made from aluminum or aluminum alloy wires, in this case armour shall be designated as "Ka".

For cables designated for 1 kV with electrical conductor section up to 6 mm² armour can be made from braiding of steel galvanized wires, in this case armour shall be designated as "P".

In case of concentric lay-up shield, its cross section shall be specified after slash in a cable macro size.



DESIGN FEATURES

- ① **Electrical conductor** – aluminium, copper or tinned copper – 2nd class as per IEC 60228; copper or tinned copper– 5 class* as per IEC 60228;
- ② **Insulation:**
 "Rt" – hard grade ethylene propylene rubber,
 "R" – ethylene propylene rubber;
 "Pv" – cross-linked polyethylene;
- ③ **Inner sheath** – corresponds to the type of the outer sheath;
- ④ **Shield:**
 "E" – made from copper tapes or copper wires,
 "EI" – made from tinned copper wires;
- ⑤ **Armour:**
 "K" – from steel galvanized wires,
 "Ka" – from aluminum or aluminum alloy wires,
 "P" – made from braiding of steel galvanized wires;
- ⑥ **Outer sheath** – made from halogen free polymer compound;
Possible design:
 "ng(A)-HF-HL" – from cold-resistant halogen free polymer compound.

* Letter "G" shall be added for cables with flexible copper or tinned copper conductor in a blank following TOFLEX trade mark designation.

► **Ordering example:**

TOFLEX RtEKRng (A)-HF 3x95RM(N, G)-1 IEC 60502-1



CABLE FEATURES



Conductor number and cross section, mm ²	Voltage, kV	Cable nominal outer diameter, mm	Minimum radius of cable bend, mm	Weight for 1 km cable, kg	Amount of combustible materials, l/km
				TOFLEX RtEKRng(A)-HF	
2 x 1.5 RE	1	17,3	129,5	624	181,0
2 x 2.5 RE	1	18,1	135,5	689	198,0
2 x 4 RE	1	19,0	142,4	778	218,1
2 x 6 RE	1	20,0	149,9	871	240,8
2 x 10 RE	1	22,3	167,6	1187	282,5
2 x 16 RE	1	24,6	184,8	1466	346,2
2 x 16 RM	1	25,5	191,6	1545	370,4
2 x 25 RE	1	27,6	207,3	1873	436,4
2 x 25 RM	1	28,3	212,6	1934	457,3
2 x 35 RM	1	30,3	227,6	2273	519,3
2 x 50 RM	1	35,3	265,1	3216	693,0
3 x 1.5 RE	1	17,8	133,2	658	190,4
3 x 2.5 RE	1	18,6	139,7	742	208,3
3 x 4 RE	1	19,6	147,1	835	229,4
3 x 6 RE	1	20,7	155,2	955	252,9
3 x 10 RE	1	23,2	173,7	1320	295,6
3 x 16 RE	1	25,6	192,1	1652	360,5
3 x 16 RM	1	26,6	199,3	1731	384,8
3 x 25 RE	1	28,8	216,2	2135	454,0
3 x 25 RM	1	29,6	221,9	2216	474,9
3 x 50 RM	1	37,4	280,4	3788	735,8
4 x 1.5 RE	1	18,6	139,8	725	207,9
4 x 2.5 RE	1	19,6	147,0	813	228,2
4 x 4 RE	1	20,7	155,3	931	252,0
4 x 6 RE	1	22,7	170,4	1226	283,1
4 x 10 RE	1	25,0	187,5	1524	341,9
4 x 16 RE	1	27,3	204,6	1894	397,1
4 x 16 RM	1	28,4	212,8	1979	424,1
4 x 25 RE	1	30,9	231,7	2488	502,8
4 x 35 RM	1	35,8	268,1	3404	644,8
4 x 70 RM	1	46,3	347,3	6005	1039,2
5 x 1.5 RE	1	19,6	147,1	793	227,7
5 x 2.5 RE	1	20,7	155,2	903	250,8
5 x 4 RE	1	22,7	170,5	1196	282,5
5 x 6 RE	1	24,5	183,6	1412	328,4
5 x 10 RE	1	26,6	199,4	1730	377,9
5 x 16 RE	1	29,2	218,7	2182	440,2
5 x 16 RM	1	30,4	227,8	2272	470,6
5 x 25 RE	1	34,8	261,0	3215	611,0
5 x 25 RM	1	35,8	268,1	3305	638,1

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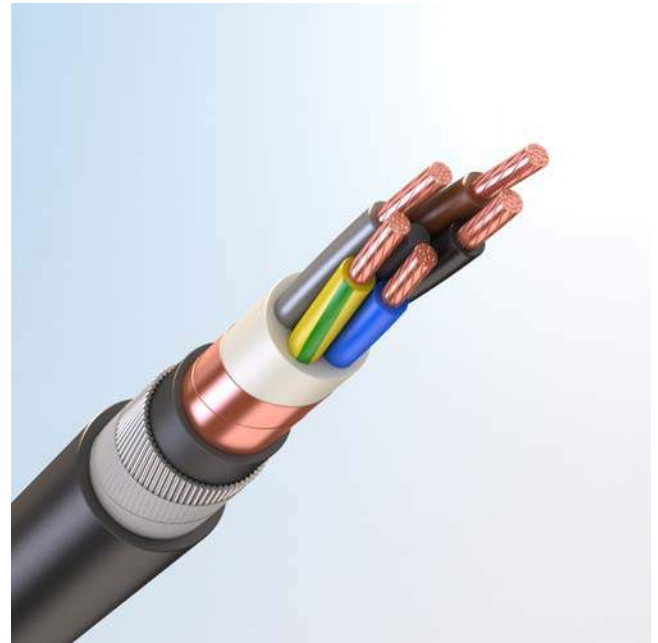
POWER CABLES FOR VOLTAGE 1 AND 3 KV

6. SHIELDED, ARMoured WITH WIRES

IEC 60502-1

6.4 Sheathed with polyethylene

Cable grade	Cable structure elements
TOFLEX R _t EKSHp	Cu/HEPR/OSCR/PE/SWA/PE
TOFLEX AR _t EKSHp	Al/HEPR/OSCR/PE/SWA/PE
TOFLEX REKSHp	Cu/EPR/OSCR/PE/SWA/PE
TOFLEX AREKSHp	Al/EPR/OSCR/PE/SWA/PE
TOFLEX VEKSHp	Cu/PVC/OSCR/PE/SWA/PE
TOFLEX AVEKSHp	Al/PVC/OSCR/PE/SWA/PE
TOFLEX PvEKSHp	Cu/XLPE/OSCR/PE/SWA/PE
TOFLEX APvEKSHp	Al/XLPE/OSCR/PE/SWA/PE



6

Notes:

Cables for voltage 3 kV shall be manufactured either single-conductor or three-conductor.

Armour for shall be made from aluminum or aluminum alloy wires, in this case armour shall be designated as "Ka".

For cables designated for 1 kV with electrical conductor section up to 6 mm² armour can be made from braiding of steel galvanized wires, in this case armour shall be designated as "P".

In case of concentric lay-up shield, its cross section shall be specified after slash in a cable macro size.



DESIGN FEATURES

- ① **Electrical conductor** – aluminium, copper or tinned copper – 2nd class as per IEC 60228; copper or tinned copper– 5 class* as per IEC 60228;
- ② **Insulation:**
 "R_t" – hard grade ethylene propylene rubber,
 "R" – ethylene propylene rubber;
 "V" – PVC compound,
 "Pv" – cross-linked polyethylene;
- ③ **Inner sheath** – corresponds to the type of the outer sheath;
- ④ **Shield:**
 "E" – made from copper tapes or copper wires,
 "EI" – made from tinned copper wires;
- ⑤ **Armour:**
 "K" – from steel galvanized wires,
 "Ka" – from aluminum or aluminum alloy wires,
 "P" – made from braiding of steel galvanized wires;
- ⑥ **Outer sheath** – made from halogen free polymer compound;
Possible design:
 "ng(A)-HF-HL" – from cold-resistant halogen free polymer compound.

* Letter "G" shall be added for cables with flexible copper or tinned copper conductor in a blank following TOFLEX trade mark designation.

► **Ordering example:**

TOFLEX VEKSHp 3×95RM(N, G)-1 IEC 60502-1



CABLE FEATURES



Conductor number and cross section, mm ²	Voltage, kV	Cable nominal outer diameter, mm	Minimum radius of cable bend, mm	Weight for 1 km cable, kg
				TOFLEX RtEKRng(A)-HF
2 x 1.5 RE	1	15,1	113,6	389
2 x 2.5 RE	1	16,7	125,6	543
2 x 4 RE	1	17,7	132,5	622
2 x 6 RE	1	18,7	140,0	703
2 x 10 RE	1	20,2	151,7	855
2 x 16 RE	1	22,9	171,9	1227
2 x 16 RM	1	23,8	178,7	1297
2 x 25 RE	1	25,9	194,4	1592
2 x 25 RM	1	26,6	199,7	1647
2 x 35 RM	1	28,6	214,7	1957
2 x 95 SM	1	34,4	257,9	3465
2 x 185 SM	1	45,3	339,6	6271
3 x 1.5 RE	1	16,4	122,7	516
3 x 2.5 RE	1	17,2	129,1	582
3 x 4 RE	1	18,2	136,5	675
3 x 6 RE	1	19,3	144,6	784
3 x 10 RE	1	21,0	157,2	970
3 x 16 RE	1	23,8	178,5	1409
3 x 16 RM	1	24,8	185,7	1464
3 x 25 RE	1	27,0	202,7	1852
3 x 25 RM	1	27,8	208,3	1913
3 x 35 RM	1	29,9	224,4	2319
3 x 50 RM	1	34,0	254,6	3248
3 x 70 SM	1	36,8	275,9	3783
3 x 120 SM	1	45,8	343,4	6126
4 x 1.5 RE	1	17,1	128,0	564
4 x 2.5 RE	1	18,0	135,3	651
4 x 4 RE	1	19,1	143,6	750
4 x 6 RE	1	20,3	152,6	889
4 x 10 RE	1	23,0	172,7	1273
4 x 16 RE	1	25,3	189,9	1634
4 x 16 RM	1	26,4	198,0	1711
4 x 25 RE	1	28,9	217,0	2198
4 x 25 RM	1	29,8	223,3	2268
4 x 35 RM	1	33,0	247,4	2995
4 x 50 RM	1	37,0	277,5	3925
5 x 1.5 RE	1	17,9	134,0	620
5 x 2.5 RE	1	19,0	142,1	719
5 x 4 RE	1	20,2	151,5	847
5 x 6 RE	1	22,3	167,6	1165
5 x 10 RE	1	24,5	183,4	1460
5 x 16 RE	1	27,0	202,6	1881
5 x 16 RM	1	28,2	211,7	1966
5 x 35 RM	1	35,9	269,3	3559
5 x 70 SM	1	45,8	343,4	6043
3 x 25 RE + 1 x 16 RE	1	28,2	211,5	2062
3 x 25 RM + 1 x 16 RM	1	29,8	223,3	2203
3 x 50 RM + 1 x 25 RM	1	36,0	269,9	3633

REFERENCE INFORMATION

Rated voltage, number and nominal section of the basic conductors:

Conductor type	Number of conductors	Nominal section of the basic conductors, mm ²	
		Rated voltage, kV	
		1.00	3.00
single-wire	1	1.5 – 25.0 (copper); 2.5-25.0 (aluminium)	10.0 – 25.0
multiwire		16.0 – 1000.0	25.0 – 1000.0
single-wire	2,3,4,5	1.5 – 25.0 (copper); 2.5-25.0 (aluminium)	10.0 – 25.0
multiwire		16.0 – 300.0	25.0-300.0

*- Cables for voltage 3 kV shall be manufactured either single-conductor or three-conductor.

Nominal section of the neutral conductors and earth conductors:

Conductor type	Nominal section of a conductor, mm ²									
Basic conductor	25	35	50	70	95	120	150	185	240	300
Neutral conductor or an earth conductor	16	16	25	35	50	70	70	95	120	150

Cables completed length:

Nominal section of the basic conductors, mm ²	Completed length, m, not less	Note
1.5 – 16.0 incl.	450	Not more than 20% of cables in length of not less than 50m shall be allowed per a lot
« 25.0 « 70.0 «	300	Not more than 10% of cables in length of not less than 50m shall be allowed per a lot
« 95.0 and above	200	

Note –completed length of cables supplied in coils shall be agreed at placing an order.

Supply of cables of any length is allowed as agreed upon with the customer.

Colouring of conductors isolation of multi-conductor cables based on number of conductors in a cable:

Number of conductors in a cable, pcs.	Colour of conductors isolation				
	Conductor sequence number				
	1	2	3	4	5
2	Grey *	Blue	—	—	—
3	Grey *	Brown	Black	—	—
	Grey *	Blue	Green-yellow	—	—
4	Grey *	Brown	Black	Blue	—
	Grey *	Brown	Black	Green-yellow **	—
5	Grey *	Brown	Black	Blue	Green-yellow

* - or natural.

** - as agreed upon with the customer.

As agreed upon with the customer other colors combination of basic conductors insulation shall be acceptable.

Insulation of single-conductor cables can be of any colour from those specified in the table.

Neutral conductor insulation (**N**) shall be of blue colour.

Earth conductor insulation (**G**) shall be two-coloured (green-yellow), thus one of colors shall cover not less than 30 % and not more than 70 % of insulation surface , and another one - the other part.

Marking of the basic insulated conductors with figures beginning with 1 shall be allowed as agreed upon with the customer.

Electric resistance of electric conductors counted for 1 km of a cable length and temperature of 20°C, conforms to IEC 60228.

Electric resistance of PVC insulation of the conductors, counted for 1 km of length and temperature 20°C, for all cables, except "HL" cables, for voltage 1 kv conforms to that specified in the table:

Table - Electric resistance values for cables for voltage 1 kV.

Nominal section of a conductor, mm ²	Electric resistance of Insulation, Mohm, not less
1.0 and 1.5	12
2.5 – 4.0	10
6.0	9
10.0 – 500.0	7

Electric resistance of PVC insulation of the conductors, counted for 1 km of length and temperature 20°C, for all cables, except "HL" cables for voltage 3 kV, except "HL" cables – not less than 12 Mohm.

Electric resistance of conductors PVC insulation of "HL" cables counted for 1 km of length and temperature 20°C - not less than 2 Mohm.

Electric resistance of conductors polyethylene insulation counted for 1 km of length and temperature 20°C - not less than 150 Mohm.

Electric resistance of conductors ethylene-propylene rubber and high grade ethylene-propylene rubber insulation counted for 1 km of length and temperature 20°C - not less than 100 Mohm.

Specific insulation resistance and electric resistance constant shall be not less the values specified in the table:

Values of maximum allowable cable conductor temperature to a normal mode, are specified in the table:

Table – Values of specific insulation resistance and electric resistance constant

Insulation material	PVC compound	Ethylene-propylene rubber, hard grade ethylene-propylene rubber	Cross-linked polyethylene
1. Specific insulation resistance ρ, Ohm*cm			
1.1. Specific insulation resistance at 20 °C	10 ¹³	-	-
1.2. Specific insulation resistance at maximum acceptable temperature* on conductor to the normal mode	10 ¹⁰	10 ¹²	10 ¹²
2. Insulation electric resistance constant Ki, MOhm*km			
2.1. Insulation electric resistance constant at 20 °C	36,7	-	-
2.2. Insulation electric resistance constant at maximum acceptable temperature on conductor to the normal mode	0,037	3,67	3,67
* Maximum acceptable temperature on conductor to the normal mode, °C	70	90	90

Cables shall hold ac voltage test at frequency 50 Hz during 5 min as per the table:

Table – Values of test ac voltage

Cable rated voltage, kV	Test ac voltage, kV
1	3.5
3	6.5

Cables shall hold ac voltage $4U_0$ at frequency 50 Hz during 4 hours, where U_0 – rated voltage value.

Cables for rated voltage 3 kV shall hold impulse voltage 40 kV.

Acceptable heating temperatures of cables electrical conductors during operation shall not exceed those specified in the table:

Table – Acceptable heating temperatures of cables electrical conductors.

Cables insulation material	Acceptable heating temperatures of cables electrical conductors, °C			
	Durable acceptable	In overload conditions	Maximum at short circuit	Under non-combustion condition at short circuit
PVC compound	70	90	160/140*	350
Cross-linked polyethylene	90	130	250	400
Ethylene-propylene rubber, hard grade ethylene-propylene rubber	90	130	250	400

*- for cables with electrical conductors with cross-section over 300mm².

Acceptable current loadings of cables with copper conductors insulated with PVC compound shall conform to those specified in the table:

Table – Acceptable current loadings of cables with copper conductors insulated with PVC compound.

Conductor rated cross-section, mm ²	Acceptable current loadings of power cables, A					
	Single-conductor				Multiconductor**	
	At DC		At AC*		At AC	
	In the air	In the ground	In the air	In the ground	In the air	In the ground
1.5	29	41	22	30	21	27
2.5	37	55	30	39	27	36
4.0	50	71	39	50	36	47
6.0	63	90	50	62	46	59
10.0	86	124	68	83	63	79
16.0	113	159	89	107	84	102
25.0	153	207	121	137	112	133
35.0	187	249	147	163	137	158
50.0	227	295	179	194	167	187
70.0	286	364	226	237	211	231
95.0	354	436	280	285	261	279
120.0	413	499	326	324	302	317
150.0	473	561	373	364	346	358
185.0	547	637	431	442	397	405
240.0	655	743	512	477	472	471
300.0	760	845	591	539	542	533
400.0	894	971	685	612	633	611
500.0	1054	1121	792	690	-	-
630.0	1252	1299	910	774	-	-

* At laying adjacently in a form of triangle

** For detection of current loadings of even cross-section four-conductor cables in four wire circuits at loading in all conductors to the normal mode and also for five-conductor cables these values shall be multiplied by factor 0.93.

Acceptable current loadings of cables with copper conductors insulated with cross-linked polyethylene shall correspond to those specified in the table:

Table – Acceptable current loadings of cables with copper conductors insulated with PVC compound.

Conductor rated cross-section, mm ²	Acceptable current loadings of power cables, A					
	Single-conductor				Multiconductor**	
	At DC		At AC*		At AC	
	In the air	In the ground	In the air	In the ground	In the air	In the ground
1.5	35	48	28	33	25	31
2.5	46	63	36	42	34	40
4.0	60	82	47	54	45	52
6.0	76	102	59	67	56	64
10.0	105	136	82	89	78	86
16.0	139	175	108	115	104	112
25.0	188	228	146	147	141	144
35.0	230	274	180	176	172	173
50.0	281	325	220	208	209	205
70.0	356	399	279	255	265	253
95.0	440	478	345	306	327	304
120.0	514	546	403	348	381	347
150.0	591	614	464	392	437	391
185.0	685	695	538	443	504	442
240.0	821	812	641	515	598	515
300.0	956	924	739	575	-	-
400.0	1124	1060	860	661	-	-
500.0	1328	1223	997	746	-	-
630.0	1576	1416	1149	840	-	-

* At laying adjacently in a form of triangle

** For detection of current loadings of even cross-section four-conductor cables in four wire circuits at loading in all conductors to the normal mode and also for five-conductor cables these values shall be multiplied by factor 0.93.

Acceptable current loadings of cables with aluminum conductors insulated with PVC compound shall correspond to those specified in the table:

Table – Acceptable current loadings of cables with aluminum conductors insulated with PVC compound

Conductor rated cross-section, mm ²	Acceptable current loadings of power cables, A					
	Single-conductor				Multiconductor**	
	At DC		At AC*		At AC	
	In the air	In the ground	In the air	In the ground	In the air	In the ground
2.5	30	32	22	30	21	28
4.0	40	41	30	39	29	37
6.0	51	52	37	48	37	44
10.0	69	68	50	63	50	59
16.0	93	83	68	82	67	77
25.0	117	159	92	106	87	102
35.0	143	192	113	127	106	123
50.0	176	229	139	150	126	143
70.0	223	282	176	184	161	178
95.0	275	339	217	221	197	214
120.0	320	388	253	252	229	244
150.0	366	434	290	283	261	274
185.0	425	494	336	321	302	312
240.0	508	576	401	374	359	363
300.0	589	654	464	423	-	-
400.0	693	753	544	485	-	-
500.0	819	870	636	556	-	-
630.0	971	1007	744	633	-	-

* At laying adjacently in a form of triangle

** For detection of current loadings of even cross-section four-conductor cables in four wire circuits at loading in all conductors to the normal mode and also for five-conductor cables these values shall be multiplied by factor 0.93.

Acceptable current loadings of cables with aluminum conductors insulated with cross-linked polyethylene shall correspond to those specified in the table:

Table – Acceptable current loadings of cables with aluminum conductors insulated with cross-linked polyethylene

Conductor rated cross-section, mm ²	Acceptable current loadings of power cables, A					
	Single-conductor				Multiconductor**	
	At DC		At AC*		At AC	
	In the air	In the ground	In the air	In the ground	In the air	In the ground
2.5	35	36	26	34	24	32
4.0	46	46	35	44	34	42
6.0	59	59	43	54	43	50
10.0	80	77	58	71	58	67
16.0	108	94	79	93	78	87
25.0	144	176	112	114	108	112
35.0	176	211	138	136	134	135
50.0	217	251	171	161	158	157
70.0	276	309	216	198	203	195
95.0	340	371	267	237	248	233
120.0	399	423	313	271	290	267
150.0	457	474	360	304	330	299
185.0	531	539	419	346	382	341
240.0	636	629	501	403	453	397
300.0	738	713	580	455	-	-
400.0	871	822	682	523	-	-
500.0	1030	949	800	599	-	-
625.0/630.0	1221	1098	936	685	-	-

* At laying adjacently in a form of triangle

** For detection of current loadings of even cross-section four-conductor cables in four wire circuits at loading in all conductors to the normal mode and also for five-conductor cables these values shall be multiplied by factor 0.93.

Admissible current capacities for cables in overload mode can be calculated by multiplying the corresponding values:

- For cables insulated with PVC compound:
 - by factor 1,13 – for the ground,
 - by factor 1,16 – for the air;
- For cables insulated with cross-linked polyethylene:
 - by factor 1,17 – for the ground,
 - by factor 1,20 – for the air.

Acceptable current of one second short circuit shall correspond to those specified in the table:

Table – Acceptable current of one second short circuit

Conductor rated cross-section, mm ²	Acceptable current of cables one second short circuit, kA, insulated			
	with PVC compound		with cross-linked polyethylene	
	with a copper conductor	with an aluminum conductor	with a copper conductor	with an aluminum conductor
1.5	0.17	-	0.21	-
2.5	0.27	0.18	0.34	0.22
4.0	0.43	0.29	0.54	0.36
6.0	0.65	0.42	0.81	0.52
10.0	1.09	0.70	1.36	0.87
16.0	1.74	1.13	2.16	1.40
25.0	2.78	1.81	3.46	2.24
35.0	3.86	2.50	4.80	3.09
50.0	5.23	3.38	6.50	4.18
70.0	7.54	4.95	9.38	6.12
95.0	10.48	6.86	13.03	8.48
120.0	13.21	8.66	16.43	10.71
150.0	16.30	10.64	20.26	13.16
185.0	20.39	13.37	25.35	16.53
240.0	26.80	17.54	33.32	21.70
300.0	33.49	21.90	41.64	27.12
400.0	39.60	26.00	55.20	36.16
500.0	49.50	32.50	69.00	45.20
625.0/630.0	62.37	40.95	86.95	56.95

For the short circuit lasting for more or less than 1 second, the short circuit current values are determined by multiplying 1 second short circuit current value by the correction factor

$$K = 1/\sqrt{\tau}$$

where τ – is the duration of short circuit, in seconds.

Maximum duration of short-circuit must not exceed 5 seconds.



Output product catalogue

**POWER CABLES for voltage 1 and 3 kV
TOFLEX®
IEC 60502-1**

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