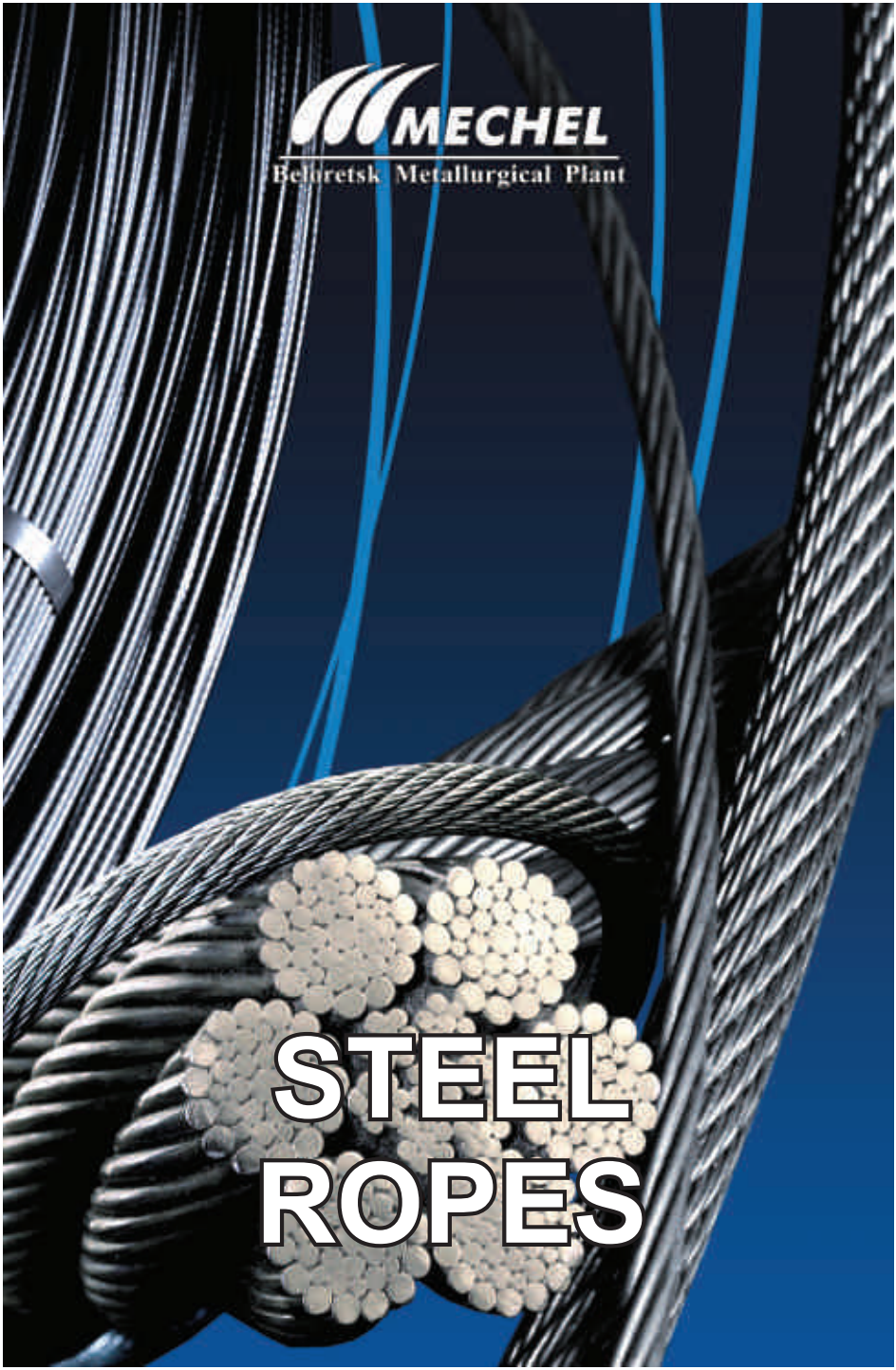
MECHEL

Beloretsk Metallurgical Plant



STEEL ROPES

Contents

STEEL ROPES

Beloretsk – 2021

ABOUT THE COMPANY

AO Beloretsk Metallurgical Plant (BMP AO) is one of the largest and stably operating company in Republic of Bashkortostan. It was founded in 1762.

Since 2003 BMP AO is the part of Mechel PAO, which is one of the leading Russian companies in mining and metallurgical industries. Mechel PAO unites producers of coal, iron-ore concentrate, ferroalloy, steel, mill, deep treatment products, thermal and electrical energy. Business of Mechel is represented by industrial companies in 11 regions of Russia, as well as in Lithuania and Ukraine. Mechel has its own three commercial ports, transport operators, distributor and service networks. Products of Mechel are realized in Russian and foreign markets.

Since 2010, according to the Prommetiz Association, Beloretsk Metallurgical Plant has been one of the leaders in hardware market. The main consumers of BMP products are the construction industry, the automotive industry, metallurgy, the oil and gas industry, as well as such high-tech industries as machine-building and defense.

Assortment of products manufactured at BMP includes steel wire made of high quality steel grades: carbon, alloy and stainless, ropes, strand, nails. The plant occupies a leading position in Russia in the production of steel-aluminum wire, high-strength wire with a diameter of 4.0 - 5.0 mm, wire for reinforcing the concrete structures (Bp1), spring and welding alloyed wire.

ROPE PRODUCTION

Rope production of Beloretsk Metallurgical Plant has a rich history, which goes back over nine decades. About three million tons of different types of ropes were produced at the Plant. If put them all together, it would be possible to encircle the Earth on equator 62 times. Today, every third ton of ropes on the Russian market is produced by BMP.

The Plant produces steel ropes more than 50 types of construction with diameters from 0,6 mm to 90 mm. The scope of Beloretsk ropes is varied. They are used for car window raisers, passenger lifts, aerial railways, on building, metallurgical and automobile cranes, on mine excavators, shaft hoists and drilling machines, fitting-out of marine and river fleet, system of aircraft and helicopter control, overhead lines etc.

Among the wide assortment of BMP rope products there is also a real exclusive. These are low-magnetic ropes of various constructions for the fitting-out mine-hunter, steel galvanized air ropes for steering system of civil and military helicopters. And also a new product of BMP is multi-strand ropes, including those with polymer coating, which are used in lifting equipment, bearing elements of suspension bridges, coal and mining industries, gas and oil production, fishing, and shipping. These products were started into production in 2019 as part of the implementation of BMP's new import-substituting investment project to organize the production of multi-strand ropes with the support of the RF Industry Development Fund and the Republic of Bashkortostan Government.

QUALITY SYSTEM

Quality management system of AO Beloretsk Metallurgical Plant is certified according to international standard ISO 9001:2015. This means that quality control at the plant is carried out on a systematic basis, along the entire production chain, from the selection of suppliers of raw materials and input control to certification of finished ropes, and guarantees the production and release of products that meet the requirements and expectations of consumers.

Certified measuring instruments are used on all stages of control. The laboratories, where tests are carried out, have the appropriate competence and are equipped by certified equipment that allows to carry out all the necessary tests of raw materials, semi-finished products and finished ropes, including checking surface defects, microstructure and chemical composition, the quality of zinc coating, the quality of rope lubricants, the strength and ductility of metal determining the quality of the finished ropes.

Ropes of BMP AO regularly undergo mandatory certification at the Federal Accreditation Service, confirming compliance with safety requirements.

BMP AO, as the manufacturer of ropes, has and annually confirms the validity of the Recognition Certificate issued by FAO Russian Maritime Register of Shipping and FAO Russian River Register, which means that ropes comply with requirements of sea and river shipping.

РОССИЙСКИЙ МОРСКОЙ РЕГИСТР СУДОХОДСТВА
RUSSIAN MARITIME REGISTER OF SHIPPING

СВИДЕТЕЛЬСТВО
О СООТВЕТСТВИИ СИСТЕМЫ КОНТРОЛЯ КАЧЕСТВА ИЗГОТОВИТЕЛЯ
MANUFACTURER'S QUALITY CONTROL SYSTEM CERTIFICATE
СКК-2

РОССИЙСКИЙ РЕЧНОЙ РЕГИСТР

СВИДЕТЕЛЬСТВО О ПРИЗНАНИИ
№ 07746

РОССИЙСКАЯ ФЕДЕРАЦИЯ

СЕРТИФИКАТ СООТВЕТСТВИЯ

СИСТЕМА СЕРТИФИКАЦИИ ГОСТ Р
ФЕДЕРАЛЬНОЕ АГЕНТСТВО ПО ТЕХНИЧЕСКОМУ РЕГУЛИРОВАНИЮ И МЕТРОЛОГИИ

СЕРТИФИКАТ СООТВЕТСТВИЯ

РОССИЙСКАЯ ФЕДЕРАЦИЯ

СЕРТИФИКАТ СООТВЕТСТВИЯ

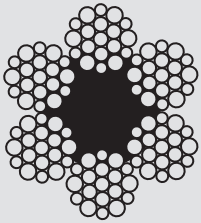
РОССИЙСКИЙ МОРСКОЙ РЕГИСТР СУДОХОДСТВА
RUSSIAN MARITIME REGISTER OF SHIPPING

СВИДЕТЕЛЬСТВО О ПРИЗНАНИИ ИЗГОТОВИТЕЛЯ
RECOGNITION CERTIFICATE FOR MANUFACTURER

РОССИЙСКАЯ ФЕДЕРАЦИЯ

СЕРТИФИКАТ СООТВЕТСТВИЯ

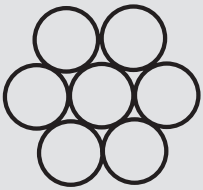
STANDARD ROPES



Two lay rope type ЛК-Р with fiber core

GOST 2688-80, DIN 3059

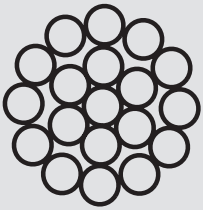
Construction:
6x19(1+6+6/6)+1 fiber core
Diameter: 3.6 – 56.0 mm



One lay rope type ЛК-О

GOST 3062-80, DIN 3052

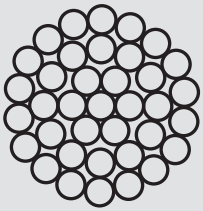
Construction:
1x7(1+6)
Diameter: 0.65 – 9.80 mm



One lay rope type ТК

GOST 3063-80, DIN 3053

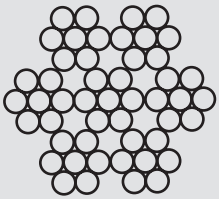
Construction:
1x19(1+6+12)
Diameter: 1.0 – 16.0 mm



One lay rope type ТК

GOST 3064-80, DIN 3054

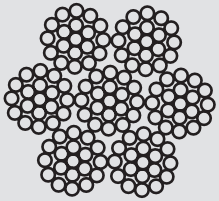
Construction:
1x37(1+6+12+18)
Diameter: 1.6 – 27.0 mm



Two lay rope type ЛК-О with metal core

GOST 3066-80, DIN 3055

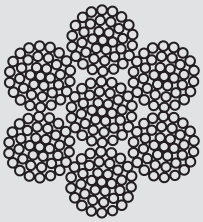
Construction:
6x7(1+6)+1x7(1+6)
Diameter: 1.9 – 27.5 mm



Two lay rope type ТК with metal core

GOST 3067-88, DIN 3060

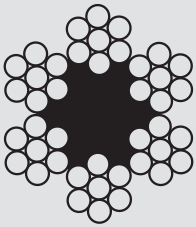
Construction:
6x19(1+6+12)+1x19(1+6+12)
Diameter: 3.1 – 18.5 mm



Two lay rope type ТК with metal core

GOST 3068-88, DIN 3066

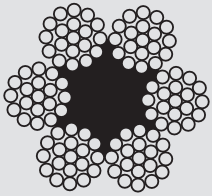
Construction:
6x37(1+6+12+18)+1x37(1+6+12+18)
Diameter: 4.7 – 13.0 mm



Two lay rope type ЛК-О with fiber core

GOST 3069-80, DIN 3055

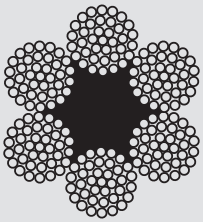
Construction:
6x7(1+6)+1 fiber core
Diameter: 2.2 – 29.0 mm



Two lay rope type ТК with fiber core

GOST 3070-88, DIN 3060

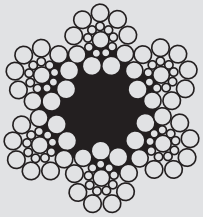
Construction:
6x19(1+6+12)+1 fiber core
Diameter: 3.3 – 13.0 mm



Two lay rope type ТК with fiber core

GOST 3071-88, DIN 3066

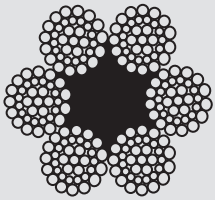
Construction:
6x37(1+6+12+18)+1 fiber core
Diameter: 5.0 – 15.5 mm



Two lay rope type ЛК-О with fiber core

GOST 3077-80, DIN 3058

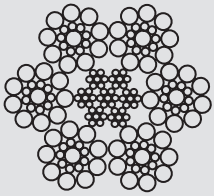
Construction:
6x19(1+9+9)+1 fiber core
Diameter: 4.6 – 46.0 mm



Two lay rope type ТЛК-О with fiber core

GOST 3079-80

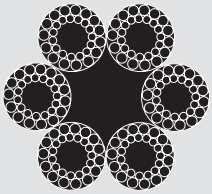
Construction:
6x37(1+6+15+15)+1 fiber core
Diameter: 13.5 – 66.5 mm



Two lay rope type ЛК-О with metal core

GOST 3081-80, DIN 3058

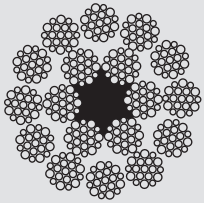
Construction:
6x19(1+9+9)+7x7(1+6)
Diameter: 6.4 – 45.5 mm



Two lay rope type ЛК-О with fiber core

GOST 3083-80

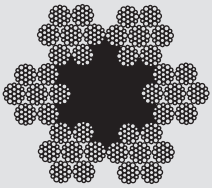
Construction:
6x30(0+15+15)+7 fiber core
Diameter: 8.6 – 61.0 mm



Two lay rope type ЛК-Р with fiber core

GOST 3088-80

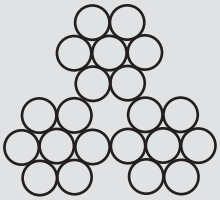
Construction:
18x19(1+6+6/6)+1 fiber core
Diameter: 6.3 – 68.0 mm



Three lay rope type ЛК-Р with fiber core

GOST 3089-80

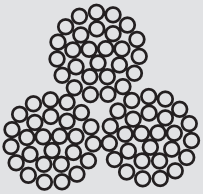
Construction:
6x7x19(1+6+6/6)+1 fiber core
Diameter: 11.5 – 68.5 mm



Two lay rope type ЛК-О

GOST 3093-80

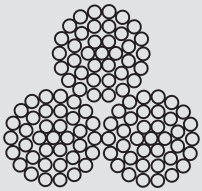
Construction:
3x7(1+6)
Diameter: 1.35, 3.0 mm



Two lay rope type ТК

GOST 3093-80

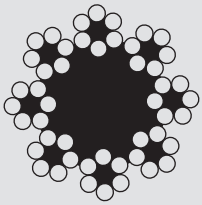
Construction:
3x27(3+9+15)
Diameter: 14.5 mm



Two lay rope type ТК

GOST 3093-80

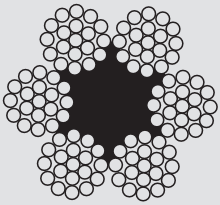
Construction:
3x37(1+6+12+18)
Diameter: 12.0, 17.0 mm



Two lay rope type ТК-О

GOST 3097-80

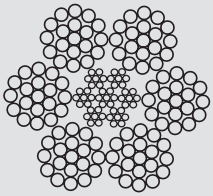
Construction:
8x6(0+6)+9 fiber core
Diameter: 10.2 mm



Two lay rope type ЛК-З with fiber core

GOST 7665-80, DIN 3057

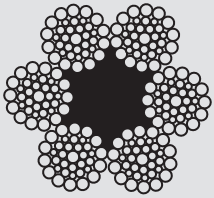
Construction:
6x25(1+6; 6+12)+1 fiber core
Diameter: 14.5 – 48.5 mm



Two lay rope type ЛК-3 with metal core

GOST 7667-80, DIN 3057

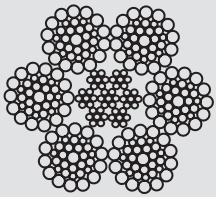
Construction:
6x25(1+6; 6+12)+7x7(1+6)
Diameter: 14.0 – 47.0 mm



Two lay rope type ЛК-РО with fiber core

GOST 7668-80, DIN 3064

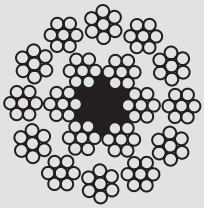
Construction:
6x36(1+7+7/7+14)+1 fiber core
Diameter: 11.5 – 68.0 mm



Two lay rope type ЛК-РО with metal core

GOST 7669-80, DIN 3064

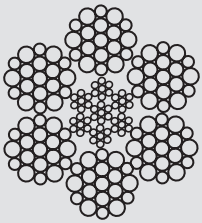
Construction:
6x36(1+7+7/7+14)+7x7(1+6)
Diameter: 13.0 – 68.0 mm



Two lay rope type ЛК-О with fiber core

GOST 7681-80, DIN 3069

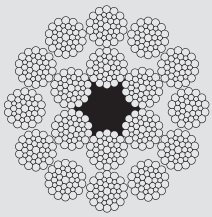
Construction:
18x7(1+6)+1 fiber core
Diameter: 4.8 – 31.5 mm



Two lay rope type ЛК-Р with metal core

GOST 14954-80, DIN 3059

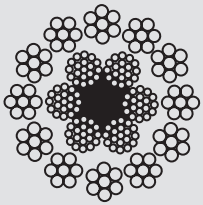
Construction:
6x19(1+6+6/6)+7x7(1+6)
Diameter: 5.1 – 55.0 mm



Two lay multi-strand low-twisting rope type ЛК-РО with fiber core

GOST 16827-81

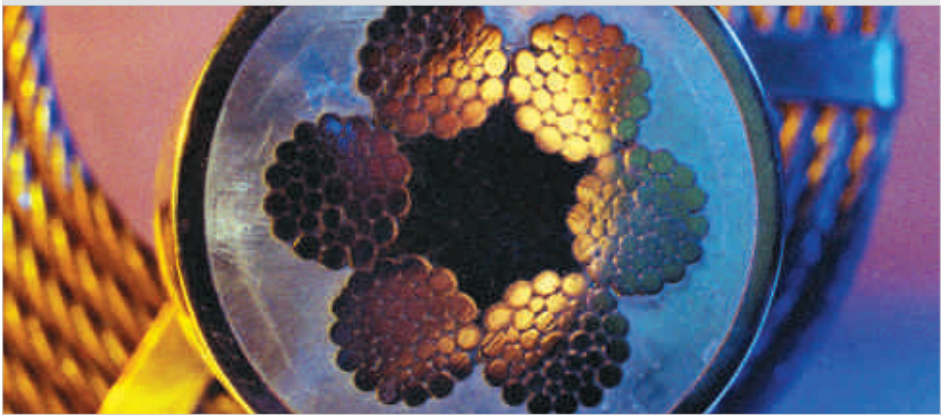
Construction:
12x36(1+7+7/7+14)+6x36(1+7+7/7+14)+1 fiber core
Diameter: 36.0 – 65.0 mm

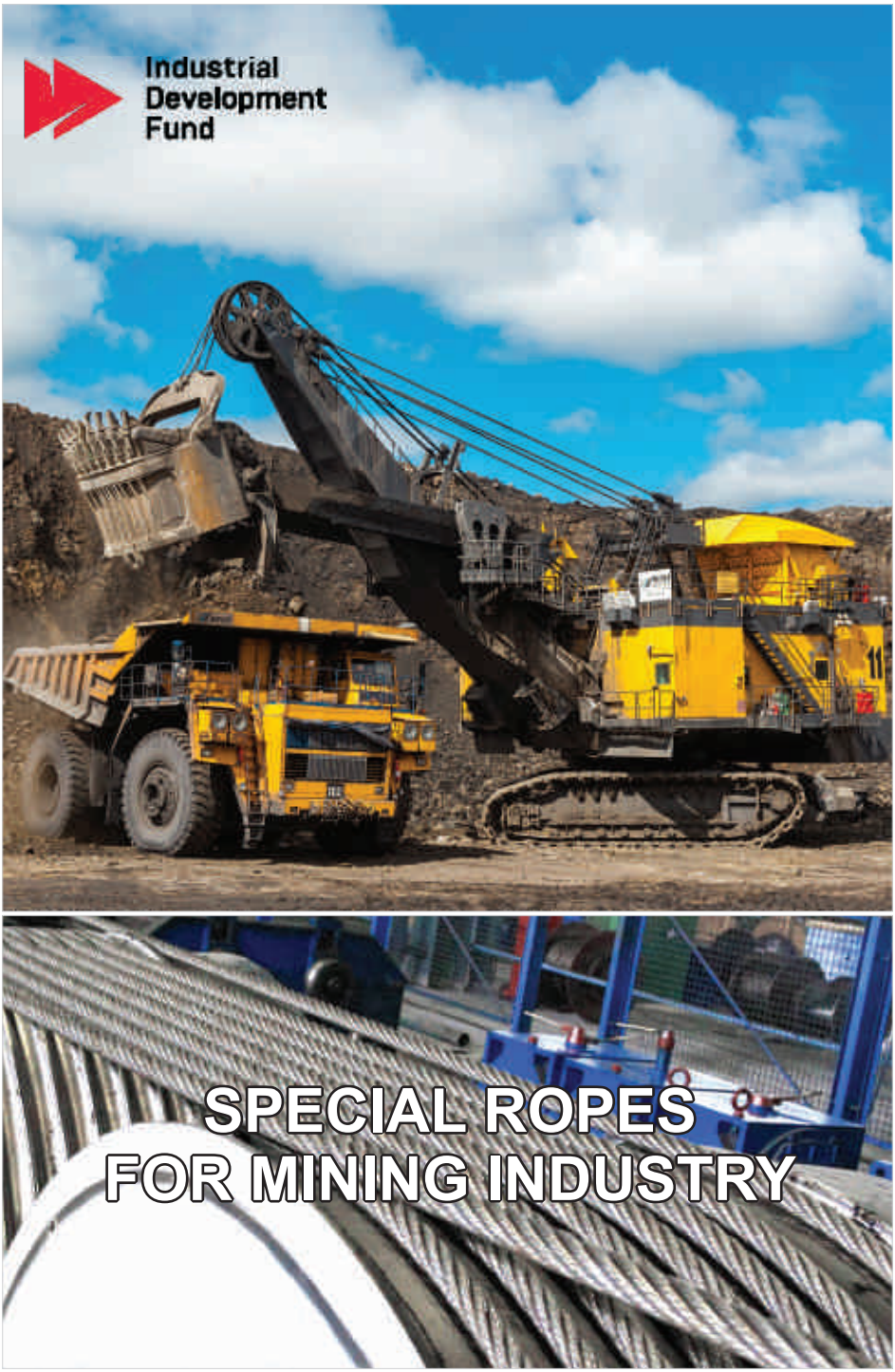


Two lay multi-strand low-twisting rope type ЛК-О and ЛК-Р with fiber core

GOST 16828-81

Construction:
12x7(1+6)+6x19(1+6+6/6)+1 fiber core
Diameter: 20.0 – 50.0 mm




Industrial
Development
Fund
SPECIAL ROPES
FOR MINING INDUSTRY

New Technologies
Compacted Strand Ropes

The most effective technological operations aimed at improving the quality of steel ropes include various methods of power processing of ropes.

The main method of power processing is circular compaction of strands (plane contact) carried out by drawing them through a monolithic die or roller cassette.

Ropes made of compacted strands after the surface power treatment acquire:

- less constructive elongation
- greater elastic modulus
- increased resistance to abrasive wear
- increased resistance to cross crushing
- greater total and aggregate breaking force
- increased service work of the rope

All these acquired properties enable our ropes to reduce contact stresses in the pair block-rope during their operation, and consequently reduce the overall stresses in wires. This increases the fatigue strength of wires, reduces the wire breakage and increases rope service life.

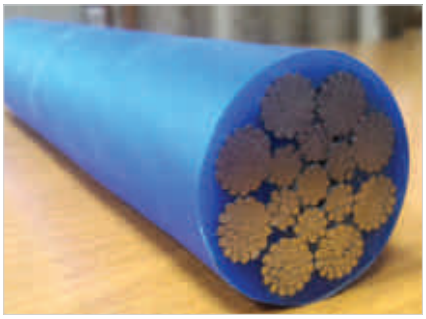
An increase in longitudinal and transverse stiffness of ropes as well as structural stability has a favorable effect on the condition of ropes during multilayer winding on the drum.

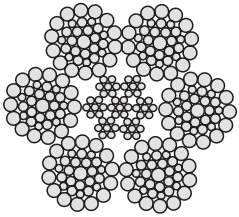
Ropes with Polymer Coating

One of the latest trends in increasing durability of rope products is coating ropes with polymer. The metal core and the whole rope can be covered by polymer depending on the purpose and nature of operations.

Polymer coating ensures:

- wear reduction of block-and-tackle system, blocks and pulleys (in case of fully coated rope)
- more uniform operation of the rope elements due to polymer coating of the core
- prevention of the impact of abrasive particles on the rope
- absorption of dynamic energy
- lack of friction between rope strands, partically eliminated the possibility of wire abrasion inside the rope
- less corrosive damage
- longer service life of ropes





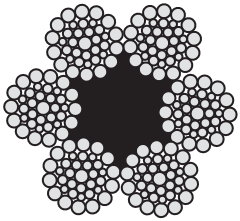
Two lay rope type ЛК-РО

GOST 7669-80; DIN 3064

Construction:
6x36(1+7+7/7+14)+6x7(1+6)+1x7(1+6)

Excavators, mine units, lifting mechanisms

Diameter, mm	Approximate weight of 1000 m rope, kg	Grade, N/mm^2 (kgs/mm^2)					
		1570 (160)		1670 (170)		1770 (180)	
		Breaking force, kN, no less					
		The total of all wires in the rope	Rope as a whole	The total of all wires in the rope	Rope as a whole	The total of all wires in the rope	Rope as a whole
13,0	733,0	126,0	100,0	134,0	106,5	141,5	108,5
14,5	906,0	151,0	120,5	160,5	128,0	169,5	130,0
16,0	1145,0	191,0	152,0	203,0	162,0	214,5	165,0
17,5	1360,0	227,0	181,5	241,5	193,0	255,5	196,0
19,5	1630,0	280,5	224,0	298,0	238,5	315,5	242,5
21,0	1950,0	334,5	267,5	355,5	284,0	376,0	289,5
23,0	2290,0	393,5	315,0	418,5	334,5	443,0	341,0
25,0	2660,0	458,0	366,0	486,5	389,0	515,0	396,0
26,5	2975,0	513,0	410,0	545,0	436,0	577,5	444,0
28,0	3395,0	585,0	467,0	621,5	497,0	658,0	506,5
30,0	3890,0	669,0	535,0	710,5	568,0	752,5	579,0
32,5	4445,0	764,0	611,0	812,0	649,0	859,5	661,5
35,5	5290,0	909,5	727,5	966,0	772,5	1020,0	787,5
36,5	5895,0	1010,0	810,0	1075,0	861,0	1140,0	877,5
39,0	6530,0	1120,0	898,0	1190,0	954,5	1260,0	972,5
41,0	7265,0	1245,0	994,5	1325,0	1055,0	1405,0	1075,0
42,0	7965,0	1320,0	1050,0	1405,0	1115,0	1485,0	1140,0
45,5	9045,0	1555,0	1235,0	1650,0	1315,0	1745,0	1340,0
49,0	10600,0	1820,0	1455,0	1935,0	1545,0	2050,0	1575,0
52,0	11850,0	2040,0	1625,0	2170,0	1730,0	2300,0	1765,0
57,0	13900,0	2380,0	1905,0	2530,0	1950,0	2650,0	2000,0
60,5	15240,0	2620,0	2090,0	2780,0	2140,0	2945,0	2205,0
61,5	16250,0	2790,0	2230,0	2965,0	2280,0	3140,0	2350,0
64,0	17148,0	2945,0	2350,0	3130,0	2435,0	3315,0	2530,0
68,0	18775,0	3225,0	2575,0	3425,0	2665,0	3630,0	2775,0



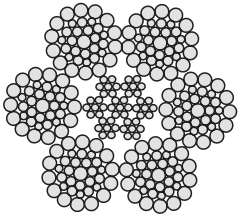
Two lay rope type ЛК-РО

GOST 7668-80; DIN 3064

Construction:
6x36(1+7+7/7+14)+1o.c.

Excavators, mine units, lifting mechanismss

Diameter, mm	Approximate weight of 1000 m rope, kg	Grade, N/mm^2 (kgs/mm^2)					
		1570 (160)		1670 (170)		1770 (180)	
		Breaking force, kN, no less					
		The total of all wires in the rope	Rope as a whole	The total of all wires in the rope	Rope as a whole	The total of all wires in the rope	Rope as a whole
13,5	696,5	110,5	90,65	117,5	96,3	124,0	101,5
15,0	812,0	128,5	104,5	136,5	111,5	144,5	116,5
16,5	1045,0	165,5	135,5	176,0	144,0	186,5	150,0
18,0	1245,0	197,0	161,5	209,5	171,5	221,5	175,5
20,0	1520,0	241,0	197,5	256,5	210,0	271,5	215,0
22,0	1830,0	290,0	237,5	308,0	252,5	326,5	258,5
23,5	2130,0	338,5	277,0	359,5	294,0	380,5	304,0
25,5	2495,0	395,5	324,0	420,5	344,0	445,0	352,5
27,0	2800,0	444,5	364,5	472,5	387,5	500,5	396,5
29,0	3215,0	510,0	417,5	542,0	444,0	574,0	454,5
31,0	3655,0	580,0	475,0	616,0	505,0	652,5	517,0
33,0	4155,0	660,0	540,5	701,0	574,5	742,5	588,0
34,5	4550,0	722,5	592,0	768,0	629,5	813,0	644,5
36,5	4965,0	788,5	646,0	838,0	686,5	887,0	703,5
38,0	5510,0	875,0	717,5	929,5	762,0	984,0	777,5
39,5	6080,0	965,5	791,5	1025,0	841,0	1085,0	861,0
42,0	6750,0	1070,0	878,5	1135,0	933,5	1205,0	955,0
43,0	7120,0	1120,0	919,5	1190,0	976,0	1265,0	1005,0
44,5	7770,0	1230,0	1005,0	1310,0	1065,0	1385,0	1095,0
46,5	8400,0	1330,0	1090,0	1415,0	1160,0	1500,0	1180,0
48,5	9155,0	1450,0	1190,0	1540,0	1265,0	1635,0	1290,0
50,5	9940,0	1575,0	1290,0	1675,0	1370,0	1775,0	1400,0
53,5	11150,0	1770,0	1455,0	1885,0	1540,0	1995,0	1570,0
56,0	12050,0	1910,0	1560,0	2030,0	1640,0	2150,0	1715,0
58,5	13000,0	2060,0	1685,0	2190,0	1730,0	2315,0	1790,0
60,5	14250,0	2265,0	1855,0	2410,0	1915,0	2550,0	1970,0
63,0	15200,0	2410,0	1970,0	2560,0	2020,0	2710,0	2085,0
65,0	16100,0	2560,0	2095,0	2720,0	2175,0	2880,0	2210,0
68,0	17700,0	2810,0	2295,0	2985,0	2385,0	3160,0	2430,0



Steel two lay rope ЛК-РО

TU 14-173-118-2002

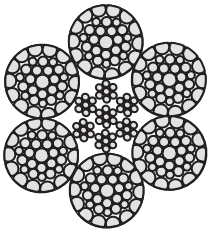
Construction:
6x36(1+7+7/7+14)+6x7(1+6)+1x7(1+6)

Excavators

Diameter, mm	Approximate weight of 1000 m rope, kg	Breaking force, kN, no less	
		The total of all wires in the rope	Rope as a whole
39,0	6578,0	1206,0	952,0
42,0	7770,0	1426,0	1126,0
45,5	9126,0	1675,0	1323,0
52,0	11965,0	2192,0	1732,0
57,0	13954,0	2560,0	2022,0
64,0	17250,0	3160,0	2496,0

Constructional features:
Ropes are manufactured of wires of two tensile strength grades; wires of the outer layer (K) of rope strands with tensile strength of 1570 N/mm^2, inner wires in the strands and in the core with tensile strength of 1770 N/mm^2.

Advantages:
Optimal combination of plastic rope characteristics, strength and increased wear resistance.



Steel ropes using compacted strands in the outer layer

TU 14-173-040-2011 (Version 1)

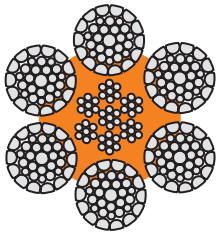
Construction:
6x36(1+7+7/7+14)+6x7(1+6)+1x7(1+6)

Excavators

Diameter, mm	Approximate weight of 1000 m rope, kg	Grade, N/mm^2 (kgs/mm^2)					
		1570 (160)		1670 (170)		1770 (180)	
		Breaking force, kN, no less					
		The total of all wires in the rope	Rope as a whole	The total of all wires in the rope	Rope as a whole	The total of all wires in the rope	Rope as a whole
39,0	6710,0	1166,0	932,8	1240,3	992,2	1314,6	1051,7
45,5	8938,0	1542,7	1234,2	1640,9	1312,7	1739,2	1391,4
52,0	11815,0	2039,3	1631,4	2169,2	1735,4	2299,1	1839,3
57,0	14220,0	2454,2	1963,4	2610,5	2088,4	2767,0	2213,6
60,0	15720,0	2713,3	2170,6	2886,1	2308,9	3059,0	2447,2
64,0	17859,0	3082,4	2465,9	3278,7	2623,0	3475,0	2780,0

Constructional features:
Ropes are manufactured of compacted strands of the outer layer (PK) with wire of one tensile strength of 1570 N/mm^2, 1670 N/mm^2 and 1770 N/mm^2.

Advantages:
Increased wear resistance, higher strength, les constructive elongation.



Steel excavator ropes with polymer coating

TU 14-173-141-2015 (Version 2)

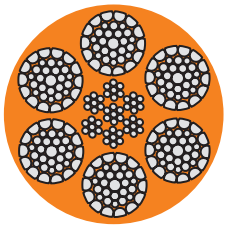
Construction:
6x36(1+7+7/7+14)+6x7(1+6)+1x7(1+6)

Excavators

Diameter, mm	Estimated weight of 1000 m rope taking into account the polymer coated metal core, kg	Grade, N/mm^2 (kgs/mm^2)					
		1670 (170)		1670 (170)		1770 (180)	
		Breaking force, kN, no less					
		The total of all wires in the rope	Rope as a whole	The total of all wires in the rope	Rope as a whole	The total of all wires in the rope	Rope as a whole
39,0	6870,0	1160,7	1234,6	1308,6	928,8	987,7	1046,9
45,5	9150,0	1544,3	1642,6	1741,0	1235,4	1314,1	1392,8
52,0	12000,0	2039,7	2169,7	2299,6	1631,8	1735,7	1839,7
57,0	14520,0	2454,2	2610,5	2766,9	1963,4	2088,4	2213,5
60,0	16100,0	2713,3	2886,1	3058,9	2170,6	2308,9	2447,2
64,0	18140,0	3084,6	3281,0	3477,5	2467,7	2624,8	2782,0

Constructional features:
Ropes are manufactured with compacted strands of the outer layer with polymer-coated metal core.

Advantages:
Increased wear resistance and strength, longer operation life of the rope.



Steel excavator ropes with polymer coating

TU 14-173-141-2015 (Version 3)

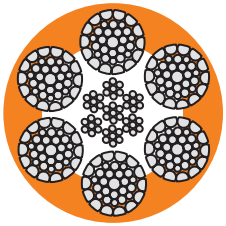
Construction:
6x36(1+7+7/7+14)+6x7(1+6)+1x7(1+6)

Excavators

Diameter, mm	Estimated weight of 1000 m rope taking into account the polymer coated metal core, kg	Grade, N/mm^2 (kgs/mm^2)					
		1670 (170)		1670 (170)		1770 (180)	
		Breaking force, kN, no less					
		The total of all wires in the rope	Rope as a whole	The total of all wires in the rope	Rope as a whole	The total of all wires in the rope	Rope as a whole
30,0	3720,0	641,2	513,0	682,0	545,6	722,9	578,3
32,5	4335,0	747,4	597,9	795,0	636,0	842,6	674,1
35,5	5210,0	898,0	718,4	955,2	764,2	1012,4	810,0
39,0	7100,0	1089,1	1158,5	1227,8	871,3	926,8	982,2
45,5	9200,0	1469,8	1563,5	1657,1	1175,8	1250,8	1325,7
52,0	11700,0	1868,5	1987,5	2106,5	1494,8	1590,0	1685,2
57,0	14820,0	2382,6	2534,4	2686,2	1906,1	2027,5	2149,0
60,0	16450,0	2651,3	2820,1	2990,0	2121,0	2256,1	2392,0
64,0	17820,0	2857,1	3039,1	3221,0	2285,7	2431,3	2576,8

Constructional features:
Ropes are manufactured with compacted strands of the outer layer with polymer-coated metal core and rope as a whole.

Advantages:
Increased wear resistance, higher strength and longer operation life, wear reduction and increase of service life of the used block-and-tackle system, blocks and pulley of the excavator.



Steel excavator ropes with polymer coating

TU 14-173-141-2015 (Version 4)

Construction:

6x36(1+7+7/7+14)+6x7(1+6)+1x7(1+6)

Excavators

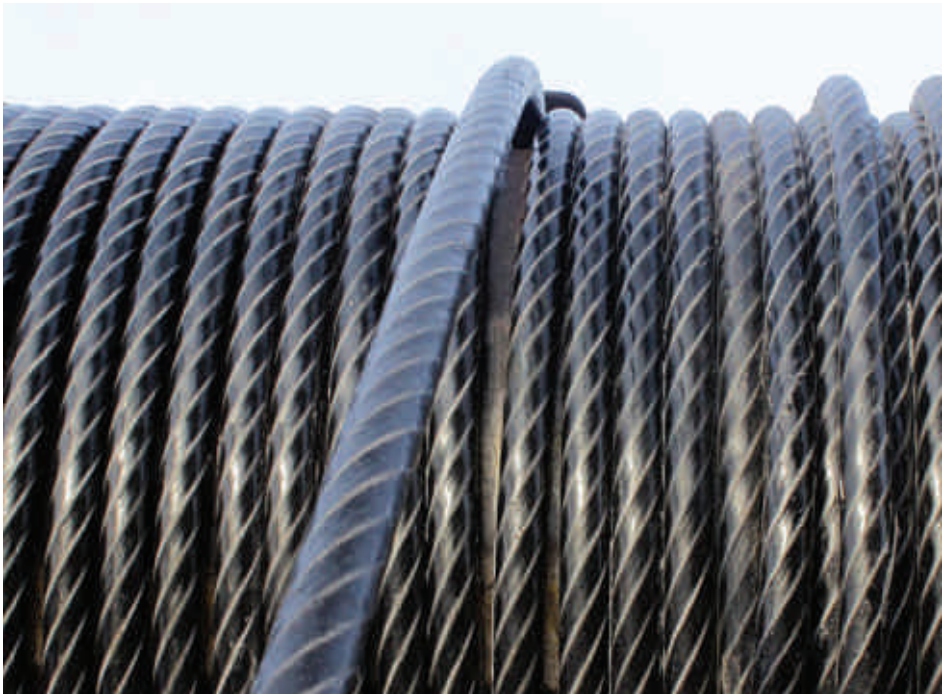
Diameter, mm	Estimated weight of 1000 m lubricated and coated by polymer whole rope , kg	Grade, N/mm^2 (kgs/mm^2)					
		1670 (170)		1670 (170)		1770 (180)	
		Breaking force, kN, no less					
		The total of all wires in the rope	Rope as a whole	The total of all wires in the rope	Rope as a whole	The total of all wires in the rope	Rope as a whole
21,0	1845,0	318,2	254,6	338,5	270,8	358,8	287,0
23,0	2240,0	385,9	308,7	410,5	328,4	435,1	348,0
39,0	7160,0	1160,7	1234,6	1308,5	928,6	987,7	1046,8
45,5	9220,0	1427,4	1518,4	1609,3	1141,9	1214,7	1287,4
52,0	12450,0	1925,4	2048,1	2170,7	1540,4	1638,5	1736,6
57,0	15730,0	2437,4	2592,7	2748,0	1950,0	2074,1	2198,3
60,0	17050,0	2643,4	2811,8	2980,1	2114,7	2249,4	2384,1
64,0	18870,0	2902,1	3087,0	3271,8	2321,7	2469,6	2617,5

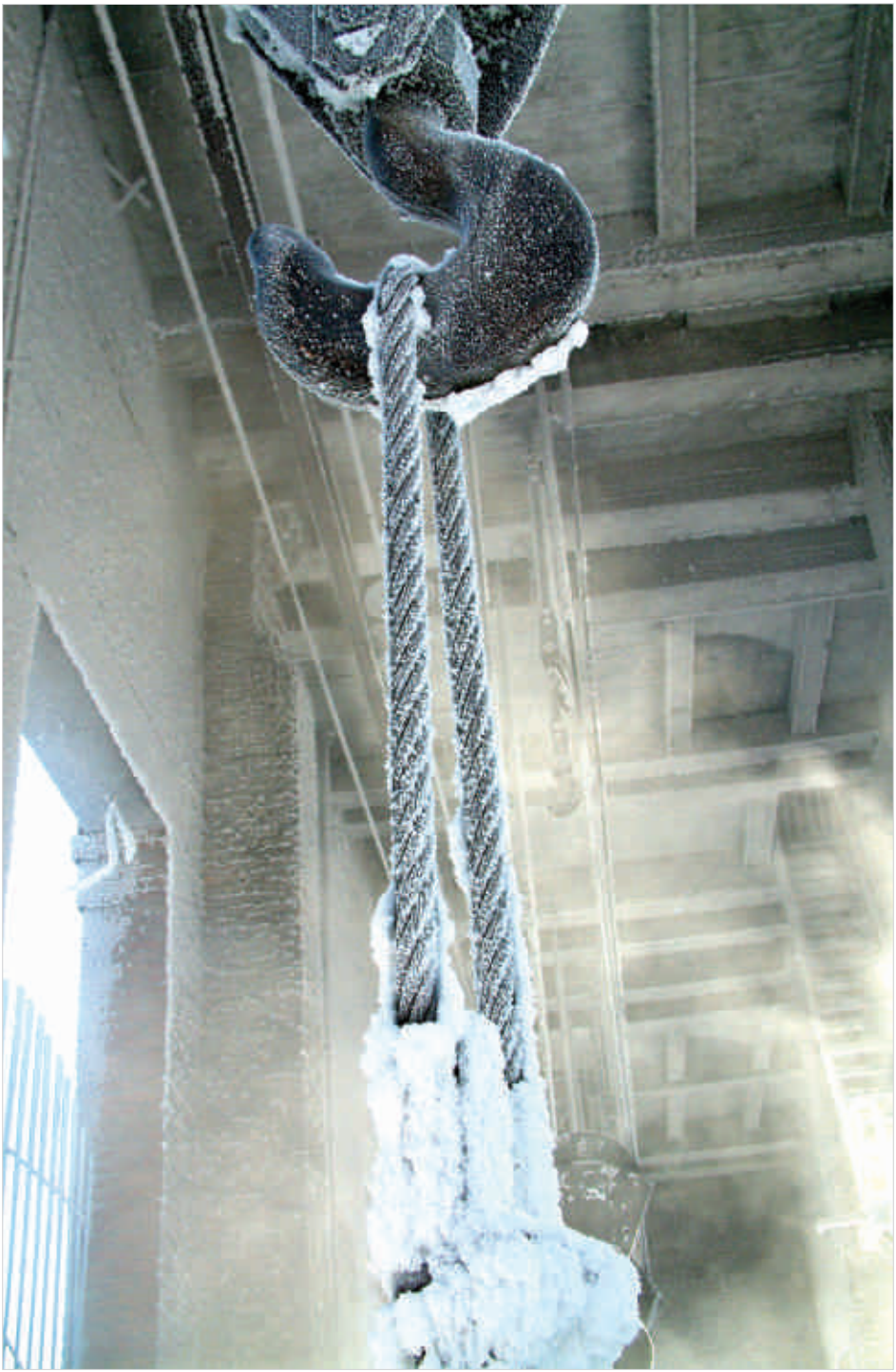
Constructional features:

Ropes are manufactured with compacted strands of outer lay with polymer coating of metal core and rope as a whole.

Advantages:

Increased wear resistance, higher strength and longer operation life, reduction of wear and increase of service life of the used block-and-tackle system, blocks and pulley of the excavator.

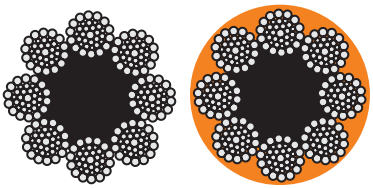




Steel ropes with the fiber and metal core of various versions
Construction: 8x36(1+7+7/7+14)
Technical conditions TU 25.93.11-145-00187263-2020

Functionality: for mining industry, for use in mining units, on excavators ets.

Eight strand steel ropes are manufactured with the fiber and metal core without compacting strands, using compacted strands(PK) of the following constructions:
- 8x36(1+7+7/7+14)+1 fiber core;
- 8x36(1+7+7/7+14)+6x7(1+6)+1x7(1+6);
- 8x36(1+7+7/7+14)+6x19(1+9+9)+1x19(1+9+9);
- 8x36(1+7+7/7+14)+6x36(1+7+7/7+14)+1x36(1+7+7/7+14).



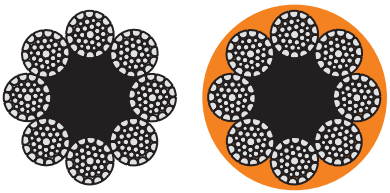
Construction:
8x36(1+7+7/7+14)+1 fiber core

Steel ropes of 8x36(1+7+7/7+14)+1 fiber core construction are manufactured in the following versions:
- without polymer coating with the fiber core (Version 1);
- with polymer coating of the rope and with the fiber core (Version 4).

Rope diameter, mm	Estimated weight of 1000 m rope, kg		Version 1			Version 4		
			Marking group, N/mm^2					
			1770	1860	1960	1770	1860	1960
	Ver. 1	Ver. 4	Breaking force, kN, no less					
1	2	3	4	5	6	7	8	9
20	1520	1650	207	218	229	207	218	229
22	1680	1781	251	264	278	240	252	265
24	2000	2120	299	314	331	286	300	316
26	2350	2491	351	369	388	335	352	371
28	2730	2894	407	428	450	389	408	430
30	3130	3318	467	491	517	446	469	494
32	3560	3774	531	558	588	507	533	562
34	4023	4264	560	630	664	535	562	592
36	4510	4781	672	706	744	642	674	711
38	5025	5327	749	787	830	715	752	792
40	5570	5568	830	872	919	797	838	883
42	6139	6139	915	962	1013	915	962	1013
44	6740	6737	1000	1051	1110	1000	1051	1110
46	7364	7364	1097	1153	1215	1097	1153	1215
48	8020	8018	1200	1261	1320	1200	1261	1320
50	8700	9222	1297	1344	-	1297	1344	-
52	9410	9975	1400	1471	-	1400	1471	-
54	10150	10759	1512	1589	-	1512	1589	-
56	10900	11554	1630	1713	-	1630	1713	-
58	11707	12409	1745	-	-	1745	-	-
60	12500	13250	1870	-	-	1870	-	-
62	15953	16910	2000	-	-	2000	-	-
64	17000	18020	2130	-	-	2130	-	-
66	18077	19162	2439	-	-	2439	-	-
68	19200	20352	2400	-	-	2400	-	-
70	20335	21555	2627	-	-	2627	-	-
72	21514	22805	2690	-	-	2690	-	-

Notes

1. Production of other marking groups is allowed.
2. Production of other diameters is allowed.
3. Ropes, the breaking force of which is given to the left of the fat line, are manufactured of uncoated and galvanized wire, to the right of the fat line of uncoated wire.



Construction:
8x36(1+5+5/5+10)+1 fiber core
with compacted of the outer strands(PK)

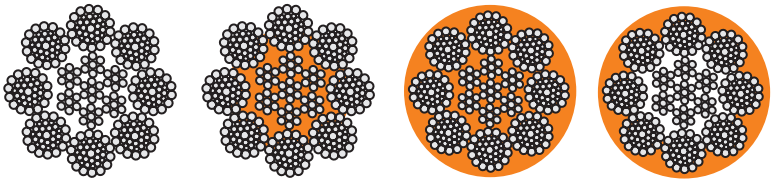
Steel rope of 8x36(1+7+7/7+14)+1 fiber core construction with compacted outer strands (PK) are manufactured in the following versions:

- without polymer coating with the fiber core (Version 1);
- with polymer coating of the rope as a whole with the fiber core (Version 4).

Rope diameter, mm	Estimated weight of 1000 m rope,kg		Version 1			Version 4		
			Marking group, N/mm^2					
			1770	1860	1960	1770	1860	1960
	Ver.1	Ver.4	Breaking force, kN, no less					
1	2	3	4	5	6	7	8	9
20	1540	1680	216	227	239	216	227	239
22	1640	1760	262	275	290	262	275	290
24	1950	2100	311	327	345	311	327	345
26	2290	2460	366	384	405	366	384	405
28	2660	2860	424	445	469	424	445	469
30	3050	3280	487	511	539	487	511	539
32	3470	3730	554	582	613	554	582	613
34	3920	4220	625	657	692	625	657	692
36	4400	4730	701	736	776	701	736	776
38	4900	5270	781	820	865	781	820	865
40	5430	5840	865	909	958	865	909	958
42	5990	6440	954	1002	1056	954	1002	1056
44	6570	7070	1047	1100	1159	1047	1100	1159
46	7180	7720	1144	1202	1267	1144	1202	1267
48	7820	8410	1246	1309	1380	1246	1309	1380
50	8490	9120	1352	1420	-	1352	1420	-
52	9180	9870	1462	1536	-	1462	1536	-
54	9900	10640	1577	1657	-	1577	1657	-
56	10630	11430	1696	-	-	1696	-	-
58	11420	12270	1819	-	-	1819	-	-
60	12190	13110	1946	-	-	1946	-	-
62	15560	16730	2078	-	-	2078	-	-
64	16580	17820	2214	-	-	2214	-	-
66	17630	18950	2355	-	-	2355	-	-
68	18730	20130	2500	-	-	2500	-	-
70	19830	21320	2649	-	-	2649	-	-
72	20980	22560	2803	-	-	2803	-	-
74	22170	23830	2961	-	-	2961	-	-
76	23380	25130	3123	-	-	3123	-	-
78	24630	26470	3289	-	-	3289	-	-
80	25900	27850	3460	-	-	3460	-	-

Notes

1. Production of other marking groups is allowed.
2. Production of other diameters is allowed.
3. Ropes, the breaking force of which is given to the left of the fat line, are manufactured of uncoated and galvanized wire, to the right of the fat line of uncoated wire.



Construction:

8x36(1+7+7/7+14)+6x7(1+6)+1x7(1+6)

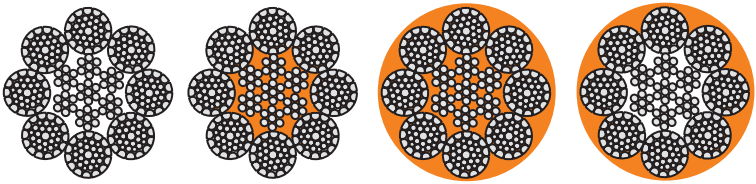
Steel rope of 8x36(1+7+7/7+14)+6x7(1+6)+1x7(1+6) construction are manufactured in the following versions:

- without polymer coating with the metal core (Version 1);
- with polymer coating of the metal core (Version 2);
- with polymer coating of the metal core and the rope as a whole (Version 3);
- with polymer coating of the rope as a whole with the metal core (Version 4).

Rope diameter, mm	Estimated weight of 1000 m rope, kg				Version 1			Version 2			Version 3			Version 4		
					Marking group, N/mm^2											
					1770	1860	1960	1770	1860	1960	1770	1860	1960	1770	1860	1960
	Ver. 1	Ver. 2	Ver. 3	Ver. 4	Breaking force, kN, no less											
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
20	1670	1790	1910	1810	264	278	292	264	278	292	260	273	288	260	273	288
22	2020	2070	2020	2020	320	336	354	320	336	354	315	331	349	315	331	349
24	2400	2320	2350	2350	380	400	421	380	400	421	375	394	415	375	394	415
26	2820	2780	2700	2700	446	469	494	446	469	494	440	462	487	440	462	487
28	3270	3270	3100	3100	518	544	573	518	544	573	510	536	565	510	536	565
30	3753	3780	3550	3550	594	624	658	594	624	658	585	615	648	585	615	648
32	4270	4360	4170	4170	676	710	749	676	710	749	666	700	737	666	700	737
34	4821	4940	4770	4770	763	802	845	763	802	845	752	790	832	752	790	832
36	5400	5550	5430	5430	856	900	948	856	900	948	844	886	934	844	886	934
38	6022	6050	6080	6080	954	1002	1056	954	1002	1056	940	987	1040	940	987	1040
40	6670	6790	6640	6330	1059	1112	1172	1059	1112	1172	1043	1096	1155	1043	1096	1155
42	7356	7400	7440	6640	1165	1225	1291	1165	1225	1291	1148	1207	1271	1148	1207	1271
44	8070	8150	8090	7440	1279	1344	-	1279	1344	-	1260	1324	-	1260	1324	-
46	8824	8980	8900	8090	1397	1468	-	1397	1468	-	1376	1446	-	1376	1446	-
48	9610	9700	9650	8900	1520	1597	-	1520	1597	-	1497	1573	-	1497	1573	-
50	10425	10430	10400	9650	1651	-	-	1651	-	-	1626	-	-	1626	-	-
52	11300	11380	11300	10400	1782	-	-	1782	-	-	1755	-	-	1755	-	-
54	12160	12110	12180	11300	1925	-	-	1925	-	-	1897	-	-	1897	-	-
56	13100	13140	13180	12180	2075	-	-	2075	-	-	2044	-	-	2044	-	-
58	14028	14110	14070	13180	2222	-	-	2222	-	-	2189	-	-	2189	-	-
60	15000	15250	15100	14070	2379	-	-	2379	-	-	2344	-	-	2344	-	-
62	15953	16200	16360	15100	2788	-	-	2788	-	-	2746	-	-	2746	-	-
64	17000	17000	17400	16360	2946	-	-	2946	-	-	2902	-	-	2902	-	-
66	18077	18200	18450	17400	3108	-	-	3108	-	-	3062	-	-	3062	-	-
68	19200	19350	19540	18450	3275	-	-	3275	-	-	3227	-	-	3227	-	-

Notes

1. Production of other marking groups is allowed.
2. Production of other diameters is allowed.
3. Ropes, the breaking force of which is given to the left of the fat line, are manufactured of uncoated and galvanized wire, to the right of the fat line of uncoated wire.



Construction:

8x36(1+7+7/7+14)+6x7(1+6)+1x7(1+6)
with compacted of the outer strands (PK)

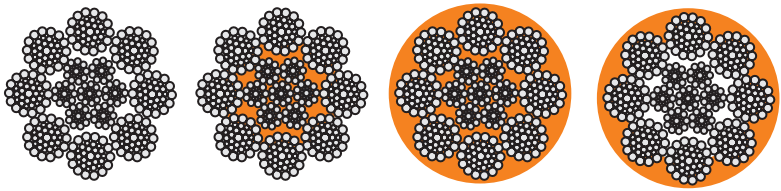
Steel rope of 8x36(1+7+7/7+14)+6x7(1+6)+1x7(1+6) construction with compacted outer strands (PK) are manufactured in the following versions:

- without polymer coating with the metal core (Version 1);
- with polymer coating of the metal core (Version 2);
- with polymer coating of the metal core and the rope as a whole (Version 3);
- with polymer coating of the rope as a whole with the metal core (Version 4).

Rope diameter, mm	Estimated weight of 1000 m rope, kg				Version 1			Version 2			Version 3			Version 4		
					Marking group, N/mm^2											
					1770	1860	1960	1770	1860	1960	1770	1860	1960	1770	1860	1960
	Ver. 1	Ver. 2	Ver. 3	Ver. 4	Breaking force, kN, no less											
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
20	1655	-	-	-	266	280	295	-	-	-	-	-	-	-	-	-
22	2070	2075	2091	1973	333	350	368	323	339	357	304	319	337	304	319	337
24	2506	2506	2582	2436	403	423	446	390	410	432	375	394	416	375	394	416
26	2893	2983	2931	2765	465	489	515	464	488	514	426	448	472	426	448	472
28	3410	3338	3496	3298	548	576	607	519	546	575	508	534	563	508	534	563
30	3920	3939	3989	3763	630	662	698	613	644	678	580	609	642	580	609	642
32	4484	4383	4688	4423	721	758	799	682	716	755	682	716	755	682	716	755
34	5064	5158	5383	5079	814	856	902	802	843	889	783	823	867	783	823	867
36	5670	5834	6241	5889	911	958	1009	908	954	1005	908	954	1005	908	954	1005
38	6370	6290	6729	6348	1024	1076	1134	978	1028	1083	978	1028	1083	978	1028	1083
40	7070	7033	7523	7098	1137	1194	1259	1094	1150	1211	1094	1150	1211	1094	1150	1211
42	7644	7901	8167	7705	1229	1292	-	1229	1292	-	1187	1248	-	1187	1248	-
44	8570	8857	9049	8537	1378	1448	-	1378	1448	-	1316	1383	-	1316	1383	-
46	9250	9560	9834	9278	1488	1563	-	1488	1563	-	1430	1503	-	1430	1503	-
48	10160	10502	10690	10086	1634	1717	-	1634	1717	-	1554	1633	-	1554	1633	-
50	11214	11592	11624	10967	1804	-	-	1804	-	-	1690	-	-	1690	-	-
52	11758	12154	12602	11890	1891	-	-	1891	-	-	1833	-	-	1833	-	-
54	13010	13447	13876	13091	2092	-	-	2092	-	-	2018	-	-	2018	-	-
56	14114	14590	15013	14165	2270	-	-	2270	-	-	2184	-	-	2184	-	-
58	15132	15641	15833	14938	2434	-	-	2434	-	-	2302	-	-	2302	-	-
60	16143	16686	17121	16153	2596	-	-	2596	-	-	2490	-	-	2490	-	-
62	16881	17449	18338	17302	2715	-	-	2715	-	-	2667	-	-	2667	-	-
64	18302	18918	19308	18216	2944	-	-	2944	-	-	2808	-	-	2808	-	-
66	18950	19584	20539	19378	3047	-	-	3047	-	-	2987	-	-	2987	-	-

Notes

1. Production of other marking groups is allowed.
2. Production of other diameters is allowed.
3. Ropes, the breaking force of which is given to the left of the fat line, are manufactured of uncoated and galvanized wire, to the right of the fat line of uncoated wire.



Construction:

8x36(1+7+7/7+14)+ 6x19(1+9+9)+1x19(1+9+9)

Steel rope of 8x36(1+7+7/7+14)+6x19(1+9+9)+1x19(1+9+9) construction are manufactured in the following versions:

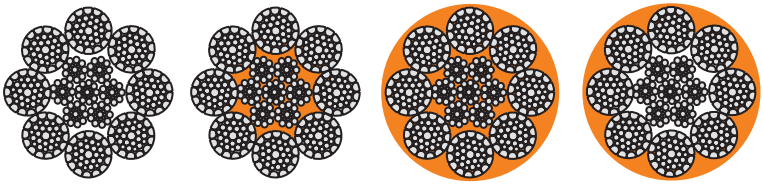
- without polymer coating with the metal core (Version 1);
- with polymer coating of the metal core (Version 2);
- with polymer coating of the metal core and the rope as a whole (Version 3);
- with polymer coating of the rope as a whole with the metal core (Version 4).

Rope diameter, mm	Estimated weight of 1000 m rope, kg				Version 1			Version 2			Version 3			Version 4		
					Marking group, N/mm^2											
					1770	1860	1960	1770	1860	1960	1770	1860	1960	1770	1860	1960
	Ver. 1	Ver. 2	Ver. 3	Ver. 4	Breaking force, kN, no less											
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
20	1670	1760	1920	1810	252	265	279	252	265	279	252	265	279	252	265	279
22	2020	2100	1980	1991	316	332	350	316	332	350	311	327	344	311	327	344
24	2400	2470	2180	2301	376	395	416	376	395	416	370	389	409	370	389	409

Rope diameter, mm	Estimated weight of 1000 m rope, kg				Version 1			Version 2			Version 3			Version 4		
					Marking group, N/mm^2											
					1770	1860	1960	1770	1860	1960	1770	1860	1960	1770	1860	1960
	Ver. 1	Ver. 2	Ver. 3	Ver. 4	Breaking force, kN, no less											
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
26	2820	2705	2942	2760	441	464	489	441	464	489	434	456	481	434	456	481
28	3106	3339	3530	3312	512	538	566	512	538	566	503	529	557	503	529	557
30	3501	3764	3700	3819	587	617	650	587	617	650	578	607	640	578	607	640
32	4102	4409	4524	4245	668	702	740	668	702	740	657	691	728	657	691	728
34	4950	5740	5110	4794	754	793	835	754	793	835	732	769	810	732	769	810
36	5400	5890	5780	5423	846	889	936	846	889	936	832	874	921	832	874	921
38	5620	6041	6455	6057	942	990	1043	942	990	1043	927	974	1026	927	974	1026
39	5870	6320	6884	6460	992	1043	1099	992	1043	1099	976	1026	1081	976	1026	1081
40	6488	6975	7245	6798	1044	1097	1156	1044	1097	1156	1027	1079	1137	1027	1079	1137
42	7010	7290	8098	7598	1151	1210	1275	1151	1210	1275	1132	1190	1254	1132	1190	1254
44	7490	7790	8659	8124	1263	1327	1399	1263	1327	1399	1243	1306	1376	1243	1306	1376
46	8230	8560	9513	8926	1351	1420	1496	1351	1420	1496	1329	1396	1471	1329	1396	1471
46	8340	8670	9642	9047	1381	1451	1529	1381	1451	1529	1358	1427	1504	1358	1427	1504
48	8980	9340	10387	9746	1503	1580	1665	1503	1580	1665	1479	1554	1638	1479	1554	1638
50	9780	10170	11310	10612	1631	1714	1806	1631	1714	1806	1605	1686	1777	1605	1686	1777
52	10650	11080	12316	11555	1764	1854	1954	1764	1854	1954	1736	1824	1922	1736	1824	1922
54	11580	12040	13385	12559	1903	1999	2107	1903	1999	2107	1872	1967	2073	1872	1967	2073
56	12350	12840	14278	13396	2046	2150	-	2046	2150	-	2013	2115	-	2013	2115	-
57	12820	13350	14824	13909	2120	2228	-	2120	2228	-	2085	2192	-	2085	2192	-
58	13400	13940	15492	14536	2195	2307	-	2195	2307	-	2159	2269	-	2159	2269	-
60	14370	14940	16612	15586	2349	-	-	2349	-	-	2311	-	-	2311	-	-
62	15340	15960	17740	16645	2508	-	-	2508	-	-	2467	-	-	2467	-	-
64	16410	17060	18966	17795	2673	-	-	2673	-	-	2629	-	-	2629	-	-

Notes

1. Production of other marking groups is allowed.
2. Production of other diameters is allowed.
3. Ropes, the breaking force of which is given to the left of the fat line, are manufactured of uncoated and galvanized wire, to the right of the fat line of uncoated wire.



Конструкция каната:

8x36(1+7+7/7+14)+ 6x19(1+9+9)+1x19(1+9+9)
with compacted of the outer strands (PK)

Steel rope of 8x36(1+7+7/7+14)+6x19(1+9+9)+1x19(1+9+9) construction with compacted outer strands (PK) are manufactured in the following versions:

- without polymer coating with the metal core (Version 1);
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Rope diameter, mm	Estimated weight of 1000 m rope, kg				Version 1			Version 2			Version 3			Version 4		
					Marking group, N/mm^2											
					1770	1860	1960	1770	1860	1960	1770	1860	1960	1770	1860	1960
	Ver. 1	Ver. 2	Ver. 3	Ver. 4	Breaking force, kN, no less											
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
20	1690	1790	1960	1840	271	285	300	271	285	300	259	272	287	259	272	287
22	2040	2190	2190	2054	341	358	378	341	358	378	310	325	343	310	325	343
24	2380	2560	2632	2469	376	396	417	376	396	417	369	388	409	369	388	409
26	2790	3000	3073	2883	464	488	514	464	488	514	438	460	485	438	460	485
28	3300	3550	3597	3375	528	555	585	528	555	585	498	523	551	498	523	551
30	3750	4040	4189	3930	590	620	653	590	620	653	580	609	642	580	609	642
32	4270	4560	4867	4567	671	706	743	671	706	743	665	699	737	665	699	737
34	4820	5140	5286	4960	757	796	839	757	796	839	733	771	812	733	771	812

Rope diameter, mm	Estimated weight of 1000 m rope, kg				Version 1			Version 2			Version 3			Version 4		
					Marking group, N/mm^2											
					1770	1860	1960	1770	1860	1960	1770	1860	1960	1770	1860	1960
	Ver. 1	Ver. 2	Ver. 3	Ver. 4	Breaking force, kN, no less											
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
36	5400	5830	6121	5744	850	894	942	850	894	942	843	886	933	843	886	933
38	6080	6540	6731	6316	962	1011	1065	962	1011	1065	939	986	1039	939	986	1039
39	6350	6800	7157	6715	997	1048	1104	997	1048	1104	986	1036	1092	986	1036	1092
40	6420	6760	7653	7180	1068	1122	1183	1068	1122	1183	1046	1100	1159	1046	1100	1159
42	7356	7310	8351	7835	1158	1216	1282	1158	1216	1282	1145	1203	1268	1145	1203	1268
44	8030	8290	9238	8668	1278	1343	1415	1278	1343	1415	1260	1324	1395	1260	1324	1395
46	8650	8970	9847	9239	1352	1421	1498	1352	1421	1498	1363	1432	1509	1363	1432	1509
46	8810	9120	10031	9412	1446	1520	1602	1446	1520	1602	1397	1468	1547	1397	1468	1547
48	9470	9890	11020	10340	1541	1619	1706	1541	1619	1706	1489	1565	1649	1489	1565	1649
50	10240	10670	12009	11268	1691	1777	1873	1691	1777	1873	1610	1692	1783	1610	1692	1783
52	11300	12100	13083	12275	1778	1868	-	1778	1868	-	1741	1829	-	1741	1829	-
54	12040	12460	14119	13248	1937	-	-	1937	-	-	1893	-	-	1893	-	-
56	12800	13210	15097	14165	2055	-	-	2055	-	-	2027	-	-	2027	-	-
57	13500	14500	15698	14729	2132	-	-	2132	-	-	2096	-	-	2096	-	-
58	14050	14490	16187	15188	2217	-	-	2217	-	-	2176	-	-	2176	-	-
60	15000	16100	17533	16450	2361	-	-	2361	-	-	2329	-	-	2329	-	-
62	16240	17180	18633	17483	2532	-	-	2532	-	-	2499	-	-	2499	-	-
64	17100	19700	19100	18428	2828	-	-	2828	-	-	2734	-	-	2734	-	-

Notes

1. Production of other marking groups is allowed.
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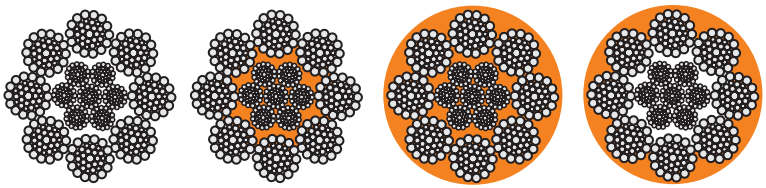
3. Ropes, the breaking force of which is given to the left of the fat line, are manufactured of uncoated and galvanized wire, to the right of the fat line of uncoated wire.



Construction:

8x36(1+7+7/7+14)+6x36(1+7+7/7+14)+1x36(1+7+7/7+14)

Steel rope of 8x36(1+7+7/7+14)+6x36(1+7+7/7+14)+1x36(1+7+7/7+14) construction are manufactured in the following versions:

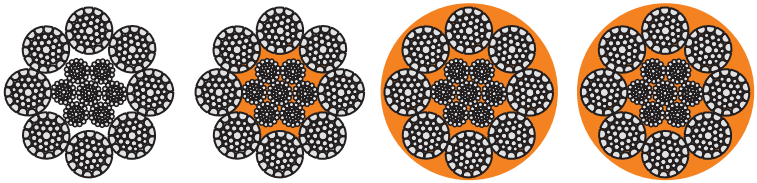
- without polymer coating with the metal core (Version 1);
- with polymer coating of the metal core (Version 2);
- with polymer coating of the metal core and the rope as a whole (Version 3);
- with polymer coating of the rope as a whole with the metal core (Version 4).

Rope diameter, mm	Estimated weight of 1000 m rope, kg				Version 1			Version 2			Version 3			Version 4		
					Marking group, N/mm^2											
					1770	1860	1960	1770	1860	1960	1770	1860	1960	1770	1860	1960
	Ver. 1	Ver. 2	Ver. 3	Ver. 4	Breaking force, kN, no less											
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
26	2702	-	-	-	439	461	486	-	-	-	-	-	-	-	-	-
28	3247	-	-	3245	521	547	577	-	-	-	-	-	-	512	538	567
30	3655	-	-	3694	587	616	650	-	-	-	-	-	-	583	612	645
32	4243	-	-	4205	682	717	755	-	-	-	-	-	-	664	697	735
34	4756	-	-	4856	767	806	849	-	-	-	-	-	-	766	805	849
36	5475	-	-	5469	879	924	973	-	-	-	-	-	-	863	907	956
38	6046	-	-	6120	971	1021	1075	-	-	-	-	-	-	966	1015	1069
40	6772	6793	-	6760	1088	1143	1205	1082	1137	1198	-	-	-	1066	1121	1181
42	7422	7519	-	7416	1193	1253	1321	1198	1259	1326	-	-	-	1170	1230	1296
44	8243	8265	-	8308	1324	1391	1466	1317	1384	1458	-	-	-	1311	1378	1452
46	8927	9164	9585	9043	1434	1507	1588	1431	1503	1585	1427	1499	1580	1427	1499	1580

Rope diameter, mm	Estimated weight of 1000 m rope, kg				Version 1			Version 2			Version 3			Version 4		
					Marking group, N/mm^2											
					1770	1860	1960	1770	1860	1960	1770	1860	1960	1770	1860	1960
	Ver. 1	Ver. 2	Ver. 3	Ver. 4	Breaking force, kN, no less											
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
48	9711	9864	10032	9465	1560	1639	1727	1551	1630	1717	1493	1569	1654	1493	1569	1654
50	10568	10923	10959	10339	1697	1783	-	1690	1776	-	1631	1714	-	1631	1714	-
52	11370	11753	12030	11351	1826	1919	-	1802	1894	-	1791	1882	-	1791	1882	-
54	12382	12799	13159	12415	1989	2091	-	1974	2074	-	1959	2059	-	1959	2059	-
56	13267	13661	13915	13129	2131	2239	-	2098	2205	-	2071	2176	-	2071	2176	-
58	14804	14341	15097	14244	2377	-	-	2284	-	-	2247	-	-	2247	-	-
60	15297	15302	16161	15248	2457	-	-	2437	-	-	2432	-	-	2432	-	-
62	16584	17023	18211	17182	2597	-	-	2512	-	-	2512	-	-	2512	-	-
64	17331	17954	19206	18121	2715	-	-	2694	-	-	2694	-	-	2694	-	-
66	18365	18991	19825	18704	2877	-	-	2811	-	-	2811	-	-	2811	-	-
68	19382	20269	21683	20457	3036	-	-	2943	-	-	2943	-	-	2943	-	-
70	20377	21490	22381	21116	3192	-	-	3117	-	-	3117	-	-	3117	-	-
72	21372	23000	23977	22621	3348	-	-	3276	-	-	3276	-	-	3276	-	-
74	22367	24157	25605	24158	3504	-	-	3409	-	-	3409	-	-	3409	-	-
76	23362	24958	27008	25482	3661	-	-	3585	-	-	3585	-	-	3585	-	-
78	24357	25645	27434	25884	3817	-	-	3702	-	-	3702	-	-	3702	-	-

Notes

1. Production of other marking groups is allowed.
2. Production of other diameters is allowed.
3. Ropes, the breaking force of which is given to the left of the fat line, are manufactured of uncoated and galvanized wire, to the right of the fat line of uncoated wire.



Construction:

8x36(1+7+7/7+14)+6x36(1+7+7/7+14)+1x36(1+7+7/7+14)
with compacted of the outer strands (PK)

Steel rope of 8x36(1+7+7/7+14)+6x36(1+7+7/7+14)+1x36(1+7+7/7+14) construction with compacted outer strands(PK) are manufactured in the following versions:

- without polymer coating with the metal core (Version 1);
- with polymer coating of the metal core (Version 2);
- with polymer coating of the metal core and the rope as a whole (Version 3);
- with polymer coating of the rope as a whole with the metal core (Version 4).

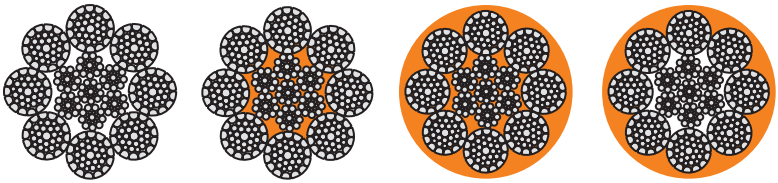
Rope diameter, mm	Estimated weight of 1000 m rope, kg				Version 1			Version 2			Version 3			Version 4		
					Marking group, N/mm^2											
					1770	1860	1960	1770	1860	1960	1770	1860	1960	1770	1860	1960
	Ver. 1	Ver. 2	Ver. 3	Ver. 4	Breaking force, kN, no less											
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
26	3110	-	-	3160	499	524	553	-	-	-	-	-	-	-	-	-
28	3570	-	-	3620	574	603	636	-	-	-	-	-	-	566	594	626
30	4180	-	-	4160	666	700	738	-	-	-	-	-	-	641	673	710
32	4730	-	-	4700	761	800	843	-	-	-	-	-	-	734	771	813
34	5320	-	-	5370	855	899	947	-	-	-	-	-	-	828	870	917
36	5890	6130	6410	6070	948	956	1049							924	977	1029
38	6720	7070	7220	6830	1080	1135	1196							1044	1097	1156
40	7370	7770	8020	7560	1185	1246	1313	1185	1246	1313	1158	1217	1275	1158	1217	1275
42	8150	8580	8830	8280	1311	1378	1452	1311	1378	1452	1268	1341	1413	1268	1341	1413
44	8930	9420	9680	9140	1436	1510	1591	1436	1510	1591	1399	1470	1539	1399	1470	1539
46	9770	10290	10520	9930	1570	1650	1739	1570	1650	1739	1519	1597	1682	1519	1597	1682
48	10560	11130	11490	10840	1698	1784	1880	1698	1784	1880	1659	1744	1828	1659	1744	1828
50	11430	12040	12520	11820	1839	1932	-	1839	1932	-	1797	1888	-	1797	1888	-

Rope diameter, mm	Estimated weight of 1000 m rope, kg				Version 1			Version 2			Version 3			Version 4		
					Marking group, N/mm^2											
					1770	1860	1960	1770	1860	1960	1770	1860	1960	1770	1860	1960
	Ver. 1	Ver. 2	Ver. 3	Ver. 4	Breaking force, kN, no less											
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
52	12390	13060	13460	12690	1993	2094	-	1993	2094	-	1935	2036	-	1935	2036	-
54	13280	13980	14560	13740	2136	2245	-	2136	2245	-	2090	2210	-	2090	2210	-
56	14270	15040	15740	14850	2145	-	-	2145	-	-	2097	-	-	2097	-	-
58	15400	16230	16790	15840	2315	-	-	2315	-	-	2238	-	-	2238	-	-
60	16390	17280	18150	17120	2464	-	-	2464	-	-	2438	-	-	2438	-	-
62	17580	18490	19250	18160	2642	-	-	2642	-	-	2596	-	-	2596	-	-
64	18780	19780	20480	19320	2822	-	-	2822	-	-	2763	-	-	2763	-	-
66	19250	20280	21980	20730	2986	-	-	2986	-	-	2947	-	-	2947	-	-
68	20960	21670	23300	21980	3150	-	-	3150	-	-	3104	-	-	3104	-	-
70	22500	23710	24670	23270	3380	-	-	3380	-	-	3295	-	-	3295	-	-
72	23600	24890	26070	24600	3592	-	-	3592	-	-	3492	-	-	3492	-	-
74	24890	26230	27540	25990	3740	-	-	3740	-	-	3668	-	-	3668	-	-
76	26400	27830	28290	26890	3968	-	-	3968	-	-	3817	-	-	3817	-	-
78	27070	28530	30690	28960	4067	-	-	4067	-	-	4056	-	-	4056	-	-

Notes

1. Production of other marking groups is allowed.
2. Production of other diameters is allowed.
3. Ropes, the breaking force of which is given to the left of the fat line, are manufactured of uncoated and galvanized wire, to the right of the fat line of uncoated wire.

Stranded ropes for general lifting purposes DIN EN 12385-4



Construction:

8x36(1+7+7/7+14)+6x19(1+9+9)+1x19(1+9+9)
8xK36WS-IWRC; 8xK36WS-EPIWRC

Excavators (lifting rope, pull rope, back digging line, shaft ropes). Ropes of main lifting.

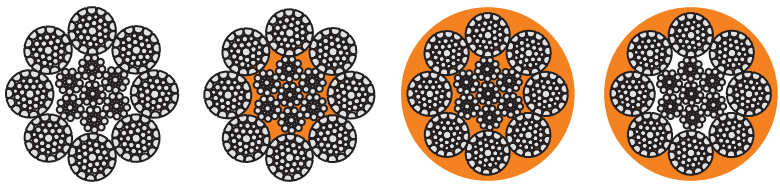
Constructional features:

Ropes are manufactured of compacted strands of the outer layer (K) with metal core (IWRC), version 2- with compacted outer strands (K), with polymer-coated metal core (EPIWRC).

Diameter, mm	Approximate weight of 1000 m rope, kg		Grade, N/mm^2(kgs/mm^2)			
			1770		1960	
			Breaking force, kN, not less			
	-	Ver. 2	The total of all wires in the rope	Rope as a whole	The total of all wires in the rope	Rope as a whole
22,0	2040,0	2190,0	423,6	338,9	464,7	371,7
24,0	2380,0	2560,0	467,7	374,2	524,1	419,2
26,0	2790,0	3000,0	576,9	461,5	635,8	508,6
28,0	3300,0	3550,0	656,1	524,8	717,1	573,6
30,0	3760,0	4040,0	769,6	615,6	859,5	687,6
32,0	4240,0	4560,0	867,7	694,1	972,7	778,1
34,0	4780,0	5140,0	997,7	798,1	1093,9	875,1
36,0	5420,0	5830,0	1108,1	886,4	1231,9	985,5
38,0	6080,0	6540,0	1197,1	924,8	1304,3	1012,3
39,0	6350,0	6800,0	1259,9	958,4	1395,1	1061,3
40,0	6420,0	6760,0	1327,1	1061,7	1469,6	1175,6
42,0	7020,0	7310,0	1416,8	1133,4	1568,9	1255,1
44,0	8030,0	8290,0	1510,4	1208,3	1672,5	1338,0
45,5	8650,0	8970,0	1714,9	1304,5	1899,0	1444,5
46,0	8810,0	9120,0	1797,2	1437,8	1990,1	1592,1
48,0	9470,0	9890,0	1914,4	1531,5	2119,9	1695,9
50,0	10240,0	10670,0	2101,4	1681,1	2327,0	1801,6
52,0	11300,0	12100,0	2239,9	1703,8	2480,3	1886,7
54,0	12040,0	12460,0	2407,7	1926,1	—	—
56,0	12800,0	13210,0	2589,4	2003,5	—	—
57,0	13500,0	14500,0	2691,3	2089,3	—	—
58,0	14050,0	14490,0	2816,8	2174,4	—	—
60,0	15000,0	16100,0	2982,1	2268,4	—	—

Ropes are manufactured of compacted strands of the outer layer (K) with metal core (IWRC):
- version 3 with compacted outer strands (K), with polymer-coated metal core and rope as a whole (IWRC);
- version 4 with compacted outer strands (K), with polymer-coated rope as a whole (IWRC).

Diameter, mm	Approximate weight of 1000 m rope, kg		Grade, N/mm²(kgs/mm²)			
			1770		1960	
			Breaking force, kN, not less			
	Ver. 3	Ver. 4	The total of all wires in the rope	Rope as a whole	The total of all wires in the rope	Rope as a whole
22,0	2189,6	2054,4	376,4	293,6	416,8	325,1
24,0	2631,8	2469,4	452,5	353,0	501	390,8
26,0	3073,0	2883,3	528,2	412,0	584,9	456,2
28,0	3597,4	3375,3	618,4	482,4	684,7	534,1
30,0	4189,0	3930,4	719,9	561,5	797,2	621,8
32,0	4867,3	4566,8	799,4	623,5	885,2	690,5
34,0	5286,0	4959,7	908,6	708,7	1006,2	784,8
36,0	6121,4	5743,5	1052,3	820,8	1165,3	908,9
38,0	6731,3	6315,8	1157,4	902,8	1281,6	999,6
39,0	7156,7	6714,9	1230,5	959,8	1362,6	1062,8
40,0	7652,7	7180,3	1315,9	1026,4	1457	1136,5
42,0	8350,9	7835,4	1435,6	1119,8	1589,7	1240,0
44,0	9237,9	8667,6	1588,2	1238,8	1758,7	1371,8
45,5	9847,2	9239,4	1693,2	1320,7	1874,9	1462,4
46,0	10030,7	9411,5	1724,7	1345,3	1909,8	1489,6
48,0	11020,3	10340,0	1894,7	1477,9	2090,1	1630,3
50,0	12009,1	11267,8	2064,6	1610,4	2286,2	1783,2
52,0	13082,5	12275,0	2249,4	1754,5	2490,9	1942,9
54,0	14119,4	13247,8	2427,4	1893,4	-	-
56,0	15097,0	14165,1	2595,8	2024,7	-	-
57,0	15697,9	14728,9	2699,1	2105,3	-	-
58,0	16186,8	15187,7	2782,9	2170,7	-	-
60,0	17532,7	16450,4	3014,4	2351,2	-	-
62,0	18632,6	17482,5	3203,7	2498,9	-	-
64,0	19640,2	18427,9	3377,1	2634,1	-	-



Construction:

8x36(1+7+7/7+14)+6x19(1+9+9)+1x19(1+9+9)

8x36WS-IWRC; 8x36WS-EPIWRC

Excavators (lifting rope, pull rope, back digging line, shaft ropes). Ropes of main lifting.

Constructional features:

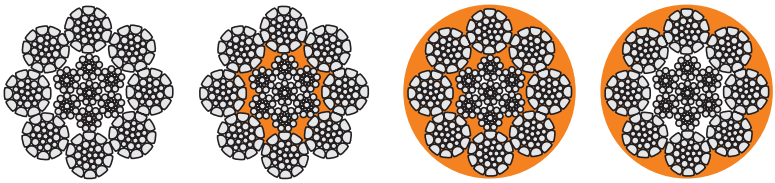
Ropes are manufactured with metal core (IWRC), version 2-with polymer-coated metal core (EPIWRC).

Diameter, mm	Approximate weight of 1000 m rope, kg		Grade, N/mm²(kgs/mm²)			
			1770		1960	
			Breaking force, kN, not less			
	-	Ver. 2	The total of all wires in the rope	Rope as a whole	The total of all wires in the rope	Rope as a whole
14,0	830,0	890,0	166,4	124,0	184,2	137,2
16,0	967,0	1040,0	202,1	151,1	223,5	179,0

Diameter, mm	Approximate weight of 1000 m rope, kg		Grade, N/mm^2(kgs/mm^2)			
			1770		1960	
			Breaking force, kN, not less			
	-	Ver. 2	The total of all wires in the rope	Rope as a whole	The total of all wires in the rope	Rope as a whole
18,0	1260,0	1354,0	263,2	204,7	292,4	226,4
20,0	1548,0	1664,0	323,9	252,4	358,6	279,3
22,0	2020,0	2100,0	403,5	305,0	446,8	338,0
24,0	2400,0	2470,0	475,2	363,0	526,2	402,0
26,0	2517,0	2705,0	526,5	426,2	583,6	472,0
28,0	3106,0	3339,0	649,1	494,6	719,1	547,4
30,0	3501,0	3764,0	732,9	567,1	810,5	628,0
32,0	4102,0	4409,0	847,7	645,1	958,8	715,2
36,0	5530,0	5940,0	1109,9	817,8	1229,1	904,1
38,0	5620,0	6041,0	1175,4	910,1	1302,2	1007,7
40,0	6488,0	6975,0	1357,6	1010,2	1502,1	1120,0

Ropes are manufactured with metal core (IWRC):
- version 3 with polymer-coated metal core and rope as a whole (IWRC);
- version 4 with polymer-coated rope as a whole (IWRC).

Diameter, mm	Approximate weight of 1000 m rope, kg		Grade, N/mm^2(kgs/mm^2)			
			1770		1960	
			Breaking force, kN, not less			
	Ver. 3	Ver. 4	The total of all wires in the rope	Rope as a whole	The total of all wires in the rope	Rope as a whole
22,0	2121,5	1990,6	364,4	284,2	403,5	314,7
24,0	2452,5	2301,1	421,2	328,5	466,4	363,8
26,0	2941,9	2760,3	505,7	394,4	560	436,8
28,0	3530,2	3312,3	606,7	473,2	671,8	524,0
30,0	4070,0	3818,8	699,3	545,5	774,3	604,0
32,0	4523,8	4244,6	777,3	606,3	860,7	671,3
34,0	5109,6	4794,2	877,9	684,8	972,2	758,3
36,0	5779,5	5422,8	993,2	774,7	1099,8	857,8
38,0	6455,4	6056,9	1109,3	865,3	1228,4	958,2
39,0	6884,4	6459,5	1183,2	922,9	1310,2	1022,0
40,0	7244,8	6797,6	1244,9	971,0	1379,6	1076,1
42,0	8098,0	7598,1	1391,6	1085,4	1541,0	1202,0
44,0	8658,8	8124,3	1487,9	1160,6	1647,6	1285,1
45,5	9513,1	8925,9	1635,0	1275,3	1810,5	1412,2
46,0	9642,4	9047,2	1657,0	1292,5	1834,8	1431,1
48,0	10386,7	9745,5	1784,9	1392,2	1976,4	1541,6
50,0	11309,6	10611,5	1943,7	1516,1	2152,2	1678,7
52,0	12315,6	11555,4	2116,3	1650,7	2343,5	1827,9
54,0	13385,4	12559,2	2300,2	1794,2	2547,1	1986,7
56,0	14277,7	13396,4	2143,2	1671,7	-	-
57,0	14823,9	13908,8	2221,3	1732,6	-	-
58,0	15492,3	14536,0	2320,2	1809,8	-	-
60,0	16611,8	15586,4	2495,8	1946,7	-	-
62,0	17739,6	16644,6	2672,8	2084,8	-	-
64,0	18966,2	17795,4	2848,7	2222,0	-	-



Construction:

8x26(1+5+5/5+10)+6x19(1+9+9)+1x19(1+9+9)
8xK26WS-IWRC; 8xK26WS-EPIWRC

Excavators (lifting rope, pulling rope, back digging line, shaft ropes). Ropes of main lifting.

Constructional features:

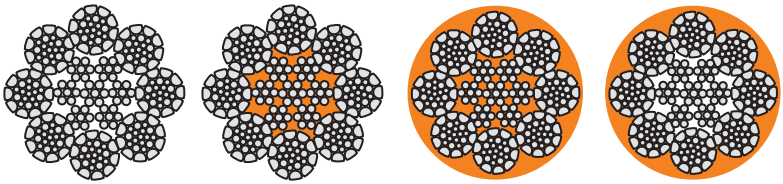
Ropes are manufactured with compacted strands of the outer layer (K) with metal core (IWRC), version 2- using compacted strands of the outer layer (K) and with polymer-coated metal core (EPIWRC).

Diameter, mm	Approximate weight of 1000 m rope, kg		Grade, N/mm^2(kgs/mm^2)			
			1770		1960	
			Breaking force, kN, not less			
	-	Ver. 2	The total of all wires in the rope	Rope as a whole	The total of all wires in the rope	Rope as a whole
22,0	1980,0	2130,0	398,5	305,0	441,3	337,7
25,0	2540,0	2730,0	509,6	393,8	564,3	436,1
26,0	5750,0	2960,0	552,6	426,0	611,9	471,7
28,0	3090,0	3320,0	620,6	494,0	687,3	547,0
29,0	3350,0	3600,0	673,3	529,9	745,9	586,8
30,0	3640,0	3910,0	731,5	567,1	810,0	628,0
32,0	4040,0	4340,0	811,7	645,2	898,9	714,5
35,0	4850,0	5210,0	974,4	771,9	1079,0	854,8
36,0	5560,0	5980,0	1118,7	894,9	1238,8	991,0
38,0	5790,0	6230,0	1164,1	909,9	1289,1	1007,6

Ropes are manufactured with compacted strands of the outer layer (K) with metal core (IWRC):
- version 3 with polymer-coated metal core and rope as a whole (IWRC);
- version 4 with polymer-coated rope as a whole (IWRC).

Diameter, mm	Approximate weight of 1000 m rope, kg		Grade, N/mm^2(kgs/mm^2)			
			1770		1960	
			Breaking force, kN, not less			
	Ver. 3	Ver. 4	The total of all wires in the rope	Rope as a whole	The total of all wires in the rope	Rope as a whole
22,0	2111,9	1981,5	363,2	283,3	402,2	313,7
24,0	2585,5	2425,9	444,7	346,9	492,5	384,2
26,0	3049,0	2860,8	524,4	409,0	580,7	452,9
28,0	3585,5	3364,1	616,7	481,0	682,9	532,7
30,0	4224,2	3963,4	726,6	566,7	804,5	627,5
32,0	4729,4	4437,5	813,5	634,5	900,8	702,6
34,0	5405,9	5072,2	929,9	725,3	1029,7	803,2
36,0	5972,1	5603,4	1027,3	801,3	1137,8	887,5
38,0	6794,4	6375,0	1162,6	906,8	1287,4	1004,2
39,0	7122,7	6683,0	1225,4	955,8	1356,9	1058,4
40,0	7490,5	7028,1	1288,6	1005,1	1426,9	1113,0
42,0	8283,9	7772,5	1425,1	1111,6	1578,1	1230,9
44,0	9092,1	8530,8	1564,1	1220,0	1732,0	1351,0
45,5	9722,2	9122,1	1672,5	1304,6	1852,1	1444,6

Diameter, mm	Approximate weight of 1000 m rope, kg		Grade, N/mm²(kgs/mm²)			
			1770		1960	
			Breaking force, kN, not less			
	Ver. 3	Ver. 4	The total of all wires in the rope	Rope as a whole	The total of all wires in the rope	Rope as a whole
46,0	10010,3	9392,3	1722,1	1343,2	1907,0	1487,5
48,0	10717,4	10055,8	1844,0	1438,3	2041,9	1592,7
50,0	11643,2	10924,5	2003,3	1562,6	-	-
52,0	12616,6	11837,8	2170,6	1693,1	-	-
54,0	13838,6	12984,4	2380,9	1857,1	-	-
56,0	14892,1	13972,9	2562,1	1998,4	-	-
57,0	15711,7	14741,8	2703,4	2108,7	-	-
58,0	15986,8	15000,0	2750,4	2145,3	-	-
60,0	17197,8	16136,2	2958,9	2307,9	-	-
62,0	18620,4	17471,0	3203,6	2498,8	-	-
64,0	19700,7	18484,6	3389,1	2643,5	-	-



Construction:

8x26(1+5+5/5+10)+6x7(1+6)+1x7(1+6)
8xK26WS-IWRC; 8xK26WS-EPIWRC

Excavators (lifting rope, pull rope, back digging line, shaft ropes). Ropes of main lifting.

Constructional features:

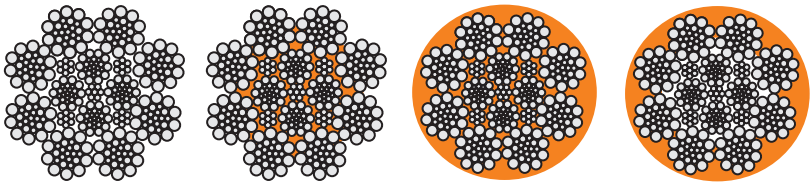
Ropes are manufactured of compacted strands of the outer layer (K) with metal core (IWRC), version 2- using compacted strands of the outer layer (K) and with polymer coated metal core (EPIWRC).

Diameter, mm	Approximate weight of 1000 m rope, kg		Grade, N/mm²(kgs/mm²)			
			1770		1960	
			Breaking force, kN, not less			
	-	Ver. 2	The total of all wires in the rope	Rope as a whole	The total of all wires in the rope	Rope as a whole
14,0	748,1	-	150,4	117,3	166,6	129,9
16,0	1023,2	-	205,7	160,4	227,8	177,7
18,0	1320,8	-	265,7	207,2	294,2	229,5
20,0	1658,7	-	333,6	260,2	369,4	288,1
22,0	2013,3	2164,3	404,9	315,8	448,4	349,8
24,0	2428,4	2610,5	488,4	381,0	540,9	421,9
25,0	2595,1	2789,7	521,8	407,0	577,9	450,8
26,0	2822,0	3033,7	567,8	442,9	628,7	490,4
28,0	3291,3	3538,1	661,9	516,3	732,9	571,7
29,0	3438,2	3696,1	691,4	539,3	765,7	597,2
30,0	3843,8	4132,1	773,1	603,0	856,1	667,8
32,0	4363,6	4690,9	877,8	684,7	972,1	758,2
34,0	4895,2	5262,3	984,8	768,1	1090,5	850,6
35,0	5201,1	5591,2	1046,1	816,0	1158,5	903,6

Diameter, mm	Approximate weight of 1000 m rope, kg		Grade, N/mm^2(kgs/mm^2)			
			1770		1960	
			Breaking force, kN, not less			
	-	Ver. 2	The total of all wires in the rope	Rope as a whole	The total of all wires in the rope	Rope as a whole
36,0	5458,5	5867,9	1097,9	856,4	1215,8	948,3
38,0	6242,0	6710,1	1255,5	979,3	1390,6	1084,7
39,0	6495,9	6983,1	1306,7	1019,2	1447,0	1128,7
40,0	6782,3	7290,9	1364,3	1064,2	1510,8	1178,4
42,0	7578,2	8146,5	1524,5	1189,1	1688,1	1316,7
44,0	8360,6	8987,6	1681,9	1311,9	1862,4	1452,7
46,0	9046,4	9724,9	1819,0	1418,8	-	-
48,0	10042,1	10795,3	2020,5	1576,0	-	-
50,0	10735,3	11540,4	2159,6	1684,5	-	-
52,0	11724,9	12604,2	2358,9	1839,9	-	-

Ropes are manufactured with compacted strands of the outer layer (K) with metal core (IWRC):
- version 3 with polymer-coated metal core and rope as a whole (IWRC);
- version 4 with polymer-coated rope as a whole (IWRC).

Diameter, mm	Approximate weight of 1000 m rope, kg		Grade, N/mm^2(kgs/mm^2)			
			1770		1960	
			Breaking force, kN, not less			
	Ver. 3	Ver. 4	The total of all wires in the rope	Rope as a whole	The total of all wires in the rope	Rope as a whole
14,0	-	772,2	141,5	110,4	122,2	122,2
16,0	-	1010,3	185,3	144,5	160,1	160,1
18,0	-	1347,5	247,1	192,7	213,4	213,4
20,0	-	1640,3	300,1	234,1	259,2	259,2
22,0	2116,0	1985,4	358,7	279,8	309,9	309,9
24,0	2519,8	2364,2	433,6	338,2	374,6	374,6
26,0	2988,0	2803,6	514,2	401,1	465,2	465,2
28,0	3524,1	3306,6	606,5	473,1	523,8	523,8
30,0	4029,4	3780,7	693,6	541,0	599,1	599,1
32,0	4657,0	4369,5	801,5	625,2	692,3	692,3
34,0	5530,0	5188,6	931,0	726,2	804,1	804,1
36,0	5994,3	5624,3	1031,8	804,8	891,2	891,2
38,0	6837,7	6415,6	1177,2	918,2	1016,8	1016,8
39,0	7073,7	6637,1	1217,6	949,7	1051,7	1051,7
40,0	7601,8	7132,5	1307,8	1020,1	1129,6	1129,6
42,0	8288,4	7776,7	1426,9	1113,0	1113,0	1113, 0
44,0	8997,1	8441,7	1549,1	1208,3	1208,3	1208,3
45,5	9703,1	9104,2	1670,4	1302,9	1302,9	1302,9
46,0	9878,8	9269,0	1700,7	1326,5	1469,0	1469,0
48,0	10954,3	10278,1	1886,2	1471,2	-	-
50,0	11833,1	11102,7	2037,6	1589,3	-	-
52,0	12730,5	11944,7	2191,6	1709,4	-	-
54,0	13682,8	12838,2	2355,7	1837,4	-	-
56,0	14882,4	13963,7	2563,3	1999,4	-	-
57,0	15367,4	14418,8	2645,8	2063,7	-	-
58,0	15864,6	14885,3	2731,3	2130,4	-	-
60,0	17076,3	16022,2	2939,9	2293,1	-	-
62,0	17119,6	16062,8	3117,2	2431,4	-	-
64,0	19327,7	18134,7	3327,4	2595,4	-	-



Construction:

8x26(1+5+5/5+10)+4x7(1+6)+4x26(1+5+5/5+10)+1x7(1+6)
8x26WS-IWRC; 8x26WS-EPIWRC

Excavators (lifting rope, pulling rope, back digging line, shaft ropes). Ropes of main lifting.

Constructional features:
Ropes are manufactured with metal core (IWRC), version 2- with polymer coated metal core (EPIWRC).

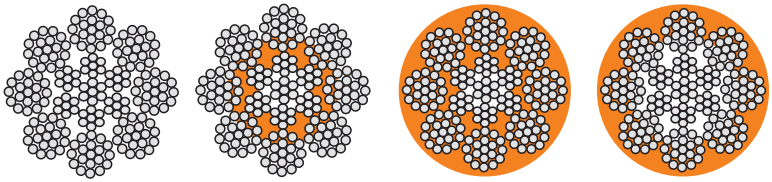
Diameter, mm	Approximate weight of 1000 m rope, kg		Grade, N/mm^2(kgs/mm^2)			
			1770		1960	
			Breaking force, kN, not less			
	-	Ver. 2	The total of all wires in the rope	Rope as a whole	The total of all wires in the rope	Rope as a whole
22,0	2090,0	2170,0	423,5	305,0	468,9	338,0
24,0	2480,0	2580,0	503,0	363,0	557,0	402,0
26,0	2950,0	3060,0	559,0	426,0	597,1	472,0
28,0	3310,0	3440,0	644,7	494,0	671,6	547,0
30,0	3920,0	4070,0	736,7	567,0	794,9	628,0
32,0	4370,0	4540,0	842,5	645,0	887,0	715,0
34,0	4890,0	5080,0	947,4	728,0	992,5	807,0
36,0	5490,0	5700,0	1060,7	817,0	1113,6	904,0
38,0	6160,0	6400,0	1190,0	910,0	1250,3	1008,0
40,0	6960,0	7220,0	1311,0	1010,0	1411,7	1120,0
42,0	7500,0	7790,0	1457,0	1112,0	1521,6	1231,0
44,0	8230,0	8550,0	1591,0	1220,0	1671,2	1350,0
46,0	8900,0	9240,0	1768,0	1333,0	1806,3	1476,0
48,0	9620,0	9990,0	1915,4	1450,0	1952,3	-
50,0	10470,0	10870,0	2087,3	1575,0	2124,7	-
52,0	11350,0	11780,0	2251,0	1700,0	2302,7	-
54,0	12200,0	12660,0	2437,0	1837,0	2473,4	-
56,0	13050,0	13560,0	2595,5	1980,0	2650,0	-
58,0	14620,0	15180,0	2784,4	2120,0	2967,3	-
60,0	15870,0	16400,0	3010,4	2270,0	3203,1	-

Ropes, breaking force of which is shown to the left of bold line are manufactured of uncoated and galvanized wire, those to the right of bold line are manufactured of uncoated wire.

Ropes are manufactured of metal core (IWRC):
- version 3 with polymer-coated metal core and rope as a whole (IWRC);
- version 4 with polymer-coated rope as a whole (IWRC).

Diameter, mm	Approximate weight of 1000 m rope, kg	Grade, N/mm^2(kgs/mm^2)			
		1770		1960	
		Breaking force, kN, not less			
		The total of all wires in the rope	Rope as a whole	The total of all wires in the rope	Rope as a whole
22,0	2200,0	404,3	305,0	447,7	338,0
24,0	2520,0	463,0	363,0	512,7	402,0
26,0	3020,0	553,0	426,0	612,3	472,0
28,0	3530,0	648,1	494,0	717,6	547,0

Diameter, mm	Approximate weight of 1000 m rope, kg	Grade, N/mm^2(kgs/mm^2)			
		1770		1960	
		Breaking force, kN, not less			
		The total of all wires in the rope	Rope as a whole	The total of all wires in the rope	Rope as a whole
30,0	4050,0	743,4	567,0	823,2	628,0
32,0	4650,0	853,7	645,0	945,3	715,0
34,0	5060,0	928,7	728,0	1028,4	807,0
36,0	5740,0	1051,2	817,0	1164,0	904,0
38,0	6430,0	1180,0	910,0	1306,4	1008,0
40,0	7240,0	1330,0	1010,0	1471,5	1120,0
42,0	7820,0	1435,8	1112,0	1590,0	1231,0
44,0	8380,0	1537,3	1220,0	1702,3	1350,0
46,0	9390,0	1723,0	1333,0	-	-
48,0	10260,0	1882,2	1450,0	-	-
50,0	10970,0	2012,2	1575,0	-	-
52,0	11910,0	2185,4	1700,0	-	-
54,0	12930,0	2372,7	1837,0	-	-
56,0	13870,0	2545,5	1980,0	-	-
58,0	15370,0	2821,0	2120,0	-	-
60,0	16490,0	3025,5	2270,0	-	-



Construction:

8x25(1+6;6+12)+6x7(1+6)+1x7(1+6)

8x25F-IWRC; 8x25F-EPIWRC

Excavators (lifting rope, pulling rope, back digging line, shaft ropes). Ropes of main lifting.

Constructional features:

Ropes are manufactured with metal core (IWRC), version 2- with polymer coated metal core (EPIWRC).

Diameter, mm	Approximate weight of 1000 m rope, kg		Grade, N/mm^2(kgs/mm^2)			
			1770		1960	
			Breaking force, kN, not less			
	-	Ver. 2	The total of all wires in the rope	Rope as a whole	The total of all wires in the rope	Rope as a whole
22,0	1970,0	2100,0	410,6	305,0	454,7	338,0
24,0	2340,0	2520,0	492,3	363,0	545,2	402,0
26,0	2750,0	2890,0	559,0	426,0	619,0	472,0
28,0	3190,0	3320,0	644,7	494,0	714,0	547,0
30,0	3660,0	3790,0	736,7	567,0	815,8	628,0
32,0	4170,0	4310,0	842,5	645,0	933,0	715,0
34,0	4705,0	4880,0	947,4	728,0	1049,1	807,0
36,0	5270,0	5430,0	1060,7	817,0	1174,5	904,0
38,0	5877,0	6090,0	1190,0	910,0	1317,1	1010,0
40,0	6510,0	6710,0	1311,0	1010,0	1452,0	1116,0
42,0	7180,0	7460,0	1457,0	1112,0	1613,0	1231,0
44,0	7880,0	8140,0	1591,0	1220,0	-	-
46,0	8612,0	9050,0	1768,0	1333,0	-	-
48,0	9380,0	9800,0	1915,4	1450,0	-	-

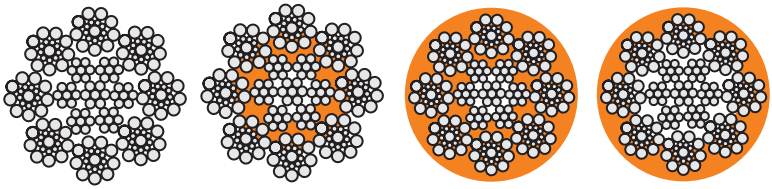
Diameter, mm	Approximate weight of 1000 m rope, kg		Grade, N/mm^2(kgs/mm^2)			
			1770		1960	
			Breaking force, kN, not less			
	-	Ver. 2	The total of all wires in the rope	Rope as a whole	The total of all wires in the rope	Rope as a whole
50,0	10175,0	10680,0	2087,3	1575,0	-	-
52,0	11000,0	11520,0	2251,0	1700,0	-	-
54,0	11870,0	12470,0	2437,0	1840,0	-	-
56,0	12800,0	13280,0	2595,5	1980,0	-	-
58,0	13700,0	14250,0	2784,4	2120,0	-	-
60,0	14700,0	15400,0	3010,4	2511,0	-	-
62,0	15645,0	16860,0	3295,5	2660,0	-	-
64,0	16671,0	17890,0	3496,0	2811,0	-	-
66,0	17729,0	19220,0	3756,4	2966,0	-	-

Ropes, breaking force of which is shown to the left of bold line are manufactured of uncoated and galvanized wire, those to the right of bold line are manufactured of uncoated wire.

Ropes are manufactured with metal core (IWRC):
- version 3 with polymer-coated metal core and rope as a whole (IWRC);
- version 4 with polymer-coated rope as a whole (IWRC).

Diameter, mm	Approximate weight of 1000 m rope, kg	Grade, N/mm^2(kgs/mm^2)			
		1770		1960	
		Breaking force, kN, not less			
		The total of all wires in the rope	Rope as a whole	The total of all wires in the rope	Rope as a whole
22,0	1790,0	324,1	305,0	359,0	338,0
24,0	2270,0	412,1	363,0	456,3	402,0
26,0	2680,0	486,1	426,0	538,3	472,0
28,0	3080,0	559,0	494,0	619,0	547,0
30,0	3600,0	653,2	567,0	527,3	628,0
32,0	4100,0	744,0	645,0	824,0	715,0
34,0	4530,0	822,6	728,0	911,0	807,0
36,0	5090,0	924,1	817,0	1023,3	904,0
38,0	5910,0	1073,1	910,0	1188,3	1010,0
40,0	6610,0	1202,0	1010,0	1331,0	1116,0
42,0	7250,0	1320,0	1112,0	1458,3	1231,0
44,0	7960,0	1447,0	1220,0	-	-
46,0	8700,0	1580,4	1333,0	-	-
48,0	9470,0	1720,0	1450,0	-	-
50,0	10300,0	1872,0	1575,0	-	-
52,0	11320,0	2058,0	1700,0	-	-
54,0	12240,0	2223,7	1840,0	-	-
56,0	13170,0	2394,0	1980,0	-	-
58,0	14100,0	2563,0	2120,0	-	-
60,0	15220,0	2666,2	2511,0	-	-
62,0	16270,0	2957,0	2660,0	-	-
64,0	17320,0	3148,0	2811,0	-	-
66,0	18530,0	3367,0	2966,0	-	-

Ropes, breaking force of which is shown to the left of bold line are manufactured of uncoated and galvanized wire, those to the right of bold line are manufactured of uncoated wire.



Construction:

8x19(1+9+9)+6x7(1+6)+1x7(1+6)
8x19S-IWRC; 8x19S-EPIWRC

Excavators (lifting rope, pulling rope, back digging line, shaft ropes). Ropes of main lifting.

Constructional features:
Ropes are manufactured with metal core (IWRC), version 2- with polymer coated metal core (EPIWRC).

Diameter, mm	Approximate weight of 1000 m rope, kg		Grade, N/mm^2(kgs/mm^2)			
			1770		1960	
			Breaking force, kN, not less			
	-	Ver. 2	The total of all wires in the rope	Rope as a whole	The total of all wires in the rope	Rope as a whole
22,0	1970,0	2130,0	405,5	305,0	449,0	338,0
24,0	2340,0	2500,0	467,9	363,0	518,2	402,0
26,0	2750,0	2890,0	550,2	426,0	609,3	472,0
28,0	3190,0	3340,0	628,2	494,0	695,7	547,0
30,0	3660,0	3800,0	713,7	567,0	790,3	628,0
32,0	4170,0	4340,0	814,4	645,0	901,9	715,0
34,0	4705,0	4870,0	922,4	728,0	1021,4	807,0
36,0	5270,0	5420,0	1027,2	817,0	-	-
38,0	5877,0	6020,0	1161,4	910,0	-	-
40,0	6510,0	6750,0	1289,2	1010,0	-	-
42,0	7180,0	7340,0	1398,9	1112,0	-	-
44,0	7880,0	8080,0	1540,4	1220,0	-	-
46,0	8612,0	8950,0	1659,3	1333,0	-	-
48,0	9380,0	9690,0	1811,3	1450,0	-	-
50,0	10175,0	10550,0	1959,0	1575,0	-	-
52,0	11000,0	11340,0	2096,5	1700,0	-	-

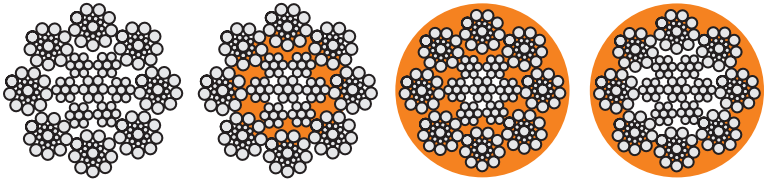
Ropes, breaking force of which is shown to the left of bold line are manufactured of uncoated and galvanized wire, those to the right of bold line are manufactured of uncoated wire.

Ropes are manufactured with metal core (IWRC):
- version 3 with polymer-coated metal core and rope as a whole (IWRC);
- version 4 with polymer-coated rope as a whole (IWRC).

Diameter, mm	Approximate weight of 1000 m rope, kg	Grade, N/mm^2(kgs/mm^2)			
		1770		1960	
		Breaking force, kN, not less			
		The total of all wires in the rope	Rope as a whole	The total of all wires in the rope	Rope as a whole
22,0	2100,0	365,6	305,0	404,8	338,0
24,0	2350,0	423,2	363,0	468,7	402,0
26,0	2700,0	485,7	426,0	537,9	472,0
28,0	3200,0	576,5	494,0	638,4	547,0
30,0	3580,0	650,7	567,0	720,6	628,0
32,0	4050,0	736,1	645,0	815,1	715,0
34,0	4630,0	838,6	728,0	928,6	807,0
36,0	5250,0	951,4	817,0	-	-
38,0	5800,0	1054,0	910,0	-	-
40,0	6550,0	1189,5	1010,0	-	-

Diameter, mm	Approximate weight of 1000 m rope, kg	Grade, N/mm^2(kgs/mm^2)			
		1770		1960	
		Breaking force, kN, not less			
		The total of all wires in the rope	Rope as a whole	The total of all wires in the rope	Rope as a whole
42,0	7280,0	1321,0	1112,0	-	-
44,0	7950,0	1443,8	1220,0	-	-
46,0	8540,0	1551,0	1333,0	-	-
48,0	9350,0	1697,5	1450,0	-	-
50,0	10180,0	1850,0	1575,0	-	-
52,0	11100,0	2001,7	1700,0	-	-

Ropes, breaking force of which is shown to the left of bold line are manufactured of uncoated and galvanized wire, those to the right of bold line are manufactured of uncoated wire.



Construction:
8x19(1+6+6/6)+6x7(1+6)+1x7(1+6)
8x19W-IWRC; 8x19W-EPIWRC

Excavators (lifting rope, pull rope, back digging line, shaft ropes). Ropes of main lifting.

Constructional features:
Ropes are manufactured with metal core (IWRC), version 2- with polymer coated metal core (EPIWRC).

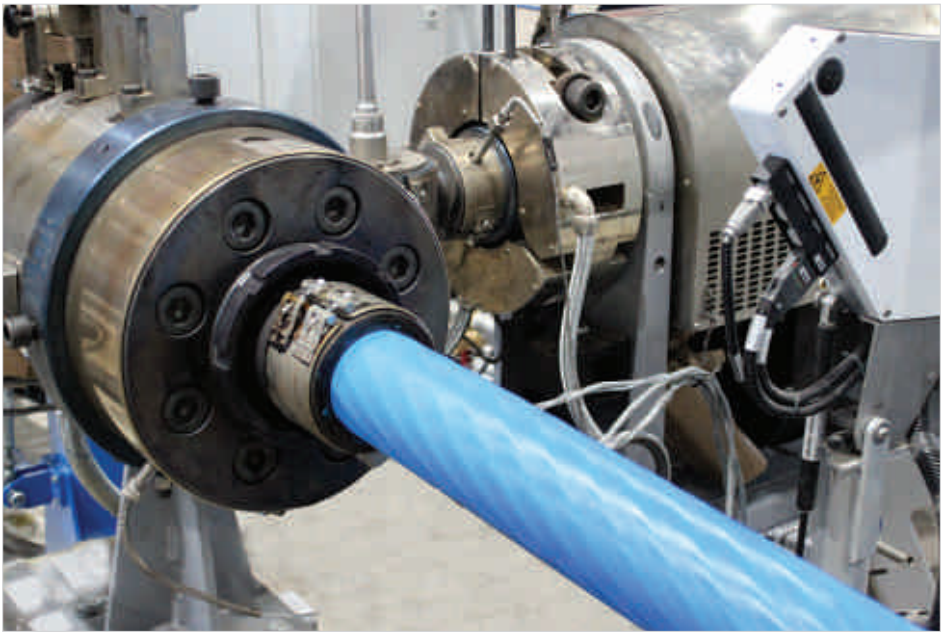
Diameter, mm	Approximate weight of 1000 m rope, kg		Grade, N/mm^2(kgs/mm^2)			
			1770		1960	
			Breaking force, kN, not less			
	-	Ver. 2	The total of all wires in the rope	Rope as a whole	The total of all wires in the rope	Rope as a whole
22,0	1970,0	2130,0	412,3	305,0	456,5	338,0
24,0	2340,0	2500,0	482,5	363,0	534,3	402,0
26,0	2750,0	2850,0	551,8	426,0	611,1	472,0
28,0	3190,0	3240,0	626,0	494,0	693,2	547,0
30,0	3663,0	3700,0	715,3	567,0	792,1	628,0
32,0	4170,0	4240,0	819,4	645,0	907,4	715,0
34,0	4705,0	4750,0	921,5	728,0	1020,4	807,0
36,0	5270,0	5220,0	1015,0	817,0	1123,9	904,0
38,0	5877,0	6000,0	1152,6	910,0	1276,3	1008,0
40,0	6510,0	6550,0	1270,3	1010,0	1406,7	1120,0
42,0	7180,0	7340,0	1425,8	1112,0	-	-
44,0	7880,0	8080,0	1570,6	1220,0	-	-
46,0	8612,0	8950,0	1740,8	1333,0	-	-
48,0	9380,0	9690,0	1885,4	1450,0	-	-
50,0	10175,0	10550,0	2052,4	1575,0	-	-
52,0	11000,0	11340,0	2205,7	1700,0	-	-
54,0	11870,0	12390,0	2410,3	1837,0	-	-
56,0	12800,0	13430,0	2611,5	1980,0	-	-
58,0	13700,0	14280,0	2776,1	2120,0	-	-

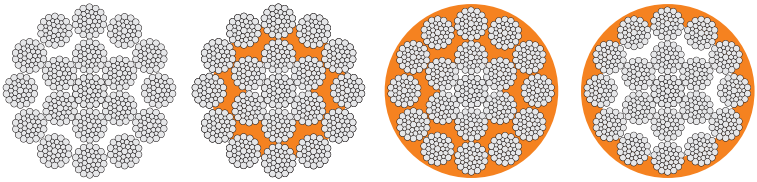
Ropes, breaking force of which is shown to the left of bold line are manufactured of uncoated and galvanized wire, those to the right of bold line are manufactured of uncoated wire.

Ropes are manufactured with metal core (IWRC):
- version 3 with polymer-coated metal core and rope as a whole (IWRC);
- version 4 with polymer-coated rope as a whole (IWRC).

Diameter, mm	Approximate weight of 1000 m rope, kg	Grade, N/mm^2(kgs/mm^2)			
		1770		1960	
		Breaking force, kN, not less			
		The total of all wires in the rope	Rope as a whole	The total of all wires in the rope	Rope as a whole
22,0	2100,0	372,23	305,0	412,19	338,0
24,0	2530,0	454,98	363,0	503,82	402,0
26,0	2900,0	522,56	426,0	578,65	472,0
28,0	3320,0	602,79	494,0	667,50	547,0
30,0	3800,0	688,60	567,0	762,52	628,0
32,0	4300,0	783,40	645,0	867,50	715,0
34,0	4860,0	883,34	728,0	978,16	807,0
36,0	5450,0	990,95	817,0	1097,33	904,0
38,0	6180,0	1123,56	910,0	1244,17	1010,0
40,0	6800,0	1237,28	1010,0	1370,10	1120,0
42,0	7650,0	1391,00	1112,0	-	-
44,0	8350,0	1517,78	1220,0	-	-
46,0	9360,0	1688,53	1330,0	-	-
48,0	10100,0	1831,00	1450,0	-	-
50,0	10800,0	1964,80	1575,0	-	-
52,0	11640,0	2114,82	1700,0	-	-
54,0	12720,0	2311,49	1837,0	-	-
56,0	13780,0	2504,75	1980,0	-	-
58,0	14550,0	2644,94	2120,0	-	-

Ropes, breaking force of which is shown to the left of bold line are manufactured of uncoated and galvanized wire, those to the right of bold line are manufactured of uncoated wire.





Construction:

12x36(1+7+7/7+14)+6x36(1+7+7/7+14)+1x36(1+7+7/7+14)
12x36WS-IWRC; 12x36WS-EPIWRC

Excavators (lifting rope, pulling rope, back digging line, shaft ropes). Ropes of main lifting.

Constructional features:
Ropes are manufactured with metal core (IWRC), version 2- with polymer coated metal core (EPIWRC).

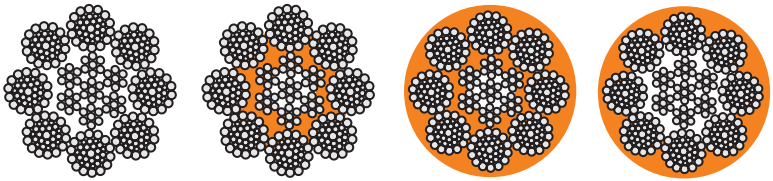
Diameter, mm	Approximate weight of 1000 m rope, kg		Grade, N/mm^2(kgs/mm^2)			
			1770		1960	
			Breaking force, kN, not less			
	-	Ver. 2	The total of all wires in the rope	Rope as a whole	The total of all wires in the rope	Rope as a whole
22,0	2018,0	2150,0	418,5	305,0	463,4	370,7
24,0	2402,0	2550,0	483,6	363,0	535,5	428,4
26,0	2819,0	3000,0	584,0	426,0	646,7	517,4
28,0	3270,0	3630,0	697,2	494,0	772,0	617,6
30,0	3753,0	4100,0	785,5	567,0	869,8	695,9
32,0	4270,0	4590,0	876,6	645,0	970,7	776,6
34,0	4821,0	5145,0	975,3	728,0	1080,0	864,0
36,0	5404,0	5920,0	1133,5	817,0	1255,2	1004,1
38,0	6021,0	6430,0	1254,2	910,0	1388,8	1111,1
40,0	6772,0	7140,0	1365,4	1010,0	1715,4	1372,3
42,0	7356,0	7820,0	1490,1	1111,5	1849,7	1479,8
44,0	8073,0	8740,0	1686,7	1220,0	1883,3	1506,6
46,0	8824,0	9760,0	1842,2	1333,0	-	-
48,0	9608,0	10600,0	2035,0	1450,0	-	-
50,0	10425,0	11400,0	2183,5	1575,0	-	-
52,0	11276,0	12200,0	2331,9	1700,0	-	-
54,0	12160,0	13240,0	2484,0	1837,0	-	-
56,0	13080,0	14520,0	2767,3	1980,0	-	-
58,0	14030,0	15420,0	2930,4	2120,0	-	-
60,0	15953,0	16370,0	3106,3	2511,0	-	-
62,0	17000,0	17330,0	3283,7	2811,0	-	-
64,0	19200,0	18245,0	3469,5	3125,0	-	-
68,0	19550,0	20710,0	3908,8	3460,0	-	-
72,0	21514,0	22180,0	4335,2	3800,0	-	-
76,0	23970,0	25835,0	4912,3	4160,0	-	-
80,0	26560,0	29480,0	5556,4	4531,0	-	-
84,0	29282,0	32000,0	6083,3	4920,0	-	-
88,0	32140,0	35530,0	6683,9	5120,0	-	-
90,0	33615,0	37680,0	7195,7	2811,0	-	-

Ropes, breaking force of which is shown to the left of bold line are manufactured of uncoated and galvanized wire, those to the right of bold line are manufactured of uncoated wire.

Ropes are manufactured with metal core (IWRC):
- version 3 with polymer-coated metal core and rope as a whole (IWRC);
- version 4 with polymer-coated rope as a whole (IWRC).

Diameter, mm	Approximate weight of 1000 m rope, kg	Grade, N/mm^2(kgs/mm^2)			
		1770		1960	
		Breaking force, kN, not less			
		The total of all wires in the rope	Rope as a whole	The total of all wires in the rope	Rope as a whole
22,0	2320,0	365,9	305,0	405,2	324,1
24,0	2760,0	452,5	363,0	501,1	400,9
26,0	3240,0	532,7	426,0	589,9	471,9
28,0	3760,0	622,0	494,0	688,8	551,0
30,0	4315,0	706,5	567,0	782,3	625,9
32,0	4910,0	773,1	645,0	856,1	684,9
34,0	5545,0	865,9	728,0	958,8	767,1
36,0	6215,0	977,6	817,0	1082,5	866,0
38,0	6925,0	1079,2	910,0	1195,0	956,0
40,0	7790,0	1218,8	1010,0	1349,6	1079,7
42,0	8460,0	1331,9	1111,5	1474,9	1179,9
44,0	9280,0	1496,4	1220,0	1657,0	1325,6
46,0	10150,0	1642,5	1333,0	-	-
48,0	11050,0	1768,3	1450,0	-	-
50,0	11990,0	1986,4	1575,0	-	-
52,0	12970,0	2124,9	1700,0	-	-
54,0	13980,0	2312,6	1837,0	-	-
56,0	15040,0	2465,5	1980,0	-	-
58,0	16130,0	2634,0	2120,0	-	-
60,0	18345,0	2839,9	2270,0	-	-
62,0	19550,0	3090,3	2660,0	-	-
64,0	22080,0	3273,0	2811,0	-	-
68,0	22480,0	3616,6	3125,0	-	-
72,0	24740,0	4092,7	3460,0	-	-
76,0	27565,0	4552,4	3800,0	-	-
80,0	30550,0	5103,7	4160,0	-	-
84,0	33675,0	5740,0	4531,0	-	-
88,0	36960,0	6314,0	4920,0	-	-
90,0	38660,0	6877,9	5120,0	-	-

Ropes, breaking force of which is shown to the left of bold line are manufactured of uncoated and galvanized wire, those to the right of bold line are manufactured of uncoated wire.



Construction:
8x36(1+7+7/7+14)+6x7(1+6)+1x7(1+6)
8x36WS-IWRC; 8x36WS-EPIWRC

Excavators (lifting rope, pulling rope, back digging line, shaft ropes). Ropes of main lifting.

Constructional features:
Ropes are manufactured with metal core (IWRC), version 2- with polymer coated metal core (EPIWRC).

Diameter, mm	Approximate weight of 1000 m rope, kg		Grade, N/mm^2(kgs/mm^2)			
			1770		1960	
			Breaking force, kN, not less			
	-	Ver. 2	The total of all wires in the rope	Rope as a whole	The total of all wires in the rope	Rope as a whole
14,0	860,0	930,0	172,6		191,1	
22,0	2020,0	2170,0	401,6	305,0	444,7	338,0
24,0	2400,0	2620,0	450,7	363,0	499,1	402,0
26,0	2820,0	2980,0	539,9	426,0	597,8	472,0
28,0	3270,0	3430,0	624,1	494,0	691,1	547,0
30,0	3753,0	3980,0	734,6	567,1	813,5	628,0
32,0	4270,0	4390,0	847,7	645,0	938,7	715,0
34,0	4821,0	4980,0	960,7	728,4	1063,9	806,6
36,0	5400,0	5650,0	1078,1	817,0	1193,9	904,0
38,0	6021,5	6250,0	1176,1	910,0	1302,3	1010,0
40,0	6670,0	6890,0	1320,0	1010,0	1461,8	1120,0
42,0	7356,0	7480,0	1439,5	1112,0	-	-
44,0	8070,0	8260,0	1582,9	1220,0	-	-
46,0	8824,0	8980,0	1746,7	1333,0	-	-
48,0	9610,0	9790,0	1886,6	1450,0	-	-
50,0	10425,0	10630,0	2028,2	1575,0	-	-
52,0	11300,0	11480,0	2213,0	1700,0	-	-
54,0	12160,0	12310,0	2354,7	1837,0	-	-
56,0	13100,0	13340,0	2553,3	1980,0	-	-
58,0	14028,0	14270,0	2743,2	2120,0	-	-
60,0	15000,0	15250,0	2957,5	2270,0	-	-
62,0	15953,0	16200,0	3151,1	2660,0	-	-
64,0	17000,0	17320,0	3301,7	2811,0	-	-
66,0	18077,0	18240,0	3536,4	2966,0	-	-
68,0	19200,0	19380,0	3763,3	3125,0	-	-

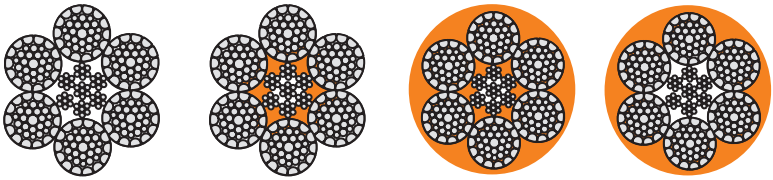
Ropes, breaking force of which is shown to the left of bold line are manufactured of uncoated and galvanized wire, those to the right of bold line are manufactured of uncoated wire.

Ropes are manufactured with metal core (IWRC):
- version 3 with polymer-coated metal core and rope as a whole (IWRC);
- version 4 with polymer-coated rope as a whole (IWRC).

Diameter, mm	Approximate weight of 1000 m rope, kg	Grade, N/mm^2(kgs/mm^2)			
		1770		1960	
		Breaking force, kN, not less			
		The total of all wires in the rope	Rope as a whole	The total of all wires in the rope	Rope as a whole
22,0	2020,0	365,6	305,0	404,8	338,0
24,0	2350,0	426,6	363,0	472,3	402,0
26,0	2700,0	487,8	426,0	540,2	472,0
28,0	3100,0	562,3	494,0	622,6	547,0

Diameter, mm	Approximate weight of 1000 m rope, kg	Grade, N/mm²(kgs/mm²)			
		1770		1960	
		Breaking force, kN, not less			
		The total of all wires in the rope	Rope as a whole	The total of all wires in the rope	Rope as a whole
30,0	3550,0	644,8	567,1	714,0	628,0
32,0	4170,0	757,0	645,0	838,3	715,0
34,0	4770,0	871,1	728,4	964,6	806,6
36,0	5430,0	985,6	817,0	1091,3	904,0
38,0	6080,0	1104,3	910,0	1222,9	1010,0
39,0	6330,0	1149,9	958,4	1273,3	1061,3
40,0	6640,0	1205,8	1010,0	1335,3	1120,0
42,0	7440,0	1351,5	1112,0	-	-
44,0	8090,0	1470,0	1220,0	-	-
46,0	8900,0	1614,7	1333,0	-	-
48,0	9650,0	1753,5	1450,0	-	-
50,0	10400,0	1890,0	1575,0	-	-
52,0	11300,0	2053,0	1700,0	-	-
54,0	12180,0	2212,5	1837,0	-	-
56,0	13180,0	2394,0	1980,0	-	-
58,0	14070,0	2550,0	2120,0	-	-
60,0	15100,0	2745,0	2270,0	-	-
62,0	16360,0	2973,0	2660,0	-	-
64,0	17400,0	3162,0	2811,0	-	-
66,0	18450,0	3347,5	2966,0	-	-
68,0	19540,0	3550,0	3125,0	-	-

Ropes, breaking force of which is shown to the left of bold line are manufactured of uncoated and galvanized wire, those to the right of bold line are manufactured of uncoated wire.



Construction:

6x36(1+7+7/7+14)+6x7(1+6)+1x7(1+6)
6xK36WS-IWRC; 6xK36WS-EPIWRC

Excavators (lifting rope, pulling rope, back digging line, boom lift cable, shaft ropes). Ropes of main lifting.

Constructional features:

Ropes are manufactured with compacted strands of the outer layer (K) with metal core (IWRC), version 2- using compacted strands of the outer layer (K) and with polymer coated metal core (EPIWRC).

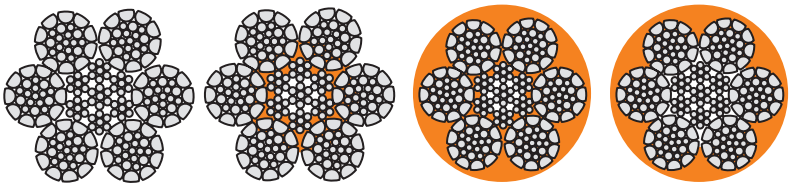
Diameter, mm	Approximate weight of 1000 m rope, kg		Grade, N/mm²(kgs/mm²)			
			1770		1960	
			Breaking force, kN, not less			
	-	Ver. 2	The total of all wires in the rope	Rope as a whole	The total of all wires in the rope	Rope as a whole
22,0	2060,0	2215,0	442,7	345,3	490,2	382,4
24,0	2365,0	2540,0	528,7	412,4	585,5	456,7
26,0	2810,0	3020,0	644,9	503,0	714,1	557,0
28,0	3340,0	3590,0	713,1	556,2	789,6	615,9
30,0	3790,0	4070,0	831,6	648,6	920,9	718,3
32,0	4290,0	4610,0	919,7	717,3	1018,4	794,4
34,0	4840,0	5200,0	1050,7	819,5	1163,5	907,5
36,0	5370,0	5770,0	1170,1	912,6	1295,7	1010,6

Diameter, mm	Approximate weight of 1000 m rope, kg		Grade, N/mm^2(kgs/mm^2)			
			1770		1960	
			Breaking force, kN, not less			
	-	Ver. 2	The total of all wires in the rope	Rope as a whole	The total of all wires in the rope	Rope as a whole
38,0	5990,0	6440,0	1263,1	985,2	1398,7	1091,0
39,0	6280,0	6750,0	1328,6	1036,3	1471,2	1147,6
40,0	6420,0	6900,0	1378,1	1074,9	1526,0	1190,3
42,0	6980,0	7500,0	1473,8	1149,5	-	—
44,0	7510,0	8070,0	1610,4	1256,1	—	—
45,5	8060,0	8665,0	1759,2	1372,2	—	—
46,0	8730,0	9385,0	1902,2	1483,7	—	—
48,0	9410,0	10120,0	2029,4	1582,9	—	—
50,0	10180,0	10940,0	2218,4	1730,4	—	—
52,0	11520,0	12380,0	2356,1	1837,8	—	—
54,0	12090,0	12990,0	2522,7	1967,7	—	—
56,0	12740,0	13700,0	2703,4	2108,6	—	—
57,0	13200,0	14190,0	2835,5	2211,3	—	—
58,0	13990,0	15040,0	2931,8	2286,8	—	—
60,0	15020,0	16150,0	3064,0	2389,9	—	—

Ropes, breaking force of which is shown to the left of bold line are manufactured of uncoated and galvanized wire, those to the right of bold line are manufactured of uncoated wire.

Ropes are manufactured with compacted strands of the outer layer (K) with metal core (IWRC):
- version 3 with polymer-coated metal core and rope as a whole (IWRC);
- version 4 with polymer-coated rope as a whole (IWRC).

Diameter, mm	Approximate weight of 1000 m rope, kg		Grade, N/mm^2(kgs/mm^2)			
			1770		1960	
			Breaking force, kN, not less			
	Ver. 3	Ver. 4	The total of all wires in the rope	Rope as a whole	The total of all wires in the rope	Rope as a whole
22,0	-	2038,8	375,6	293,0	415,9	324,4
24,0	-	2426,8	447,3	348,9	495,3	386,3
26,0	-	2925,2	539,1	420,5	596,9	465,6
28,0	3623,5	3399,8	626,4	488,6	693,4	540,9
30,0	4159,2	3902,4	719,1	560,9	796,3	621,1
32,0	4724,6	4433,0	816,9	637,2	904,6	705,6
34,0	5429,0	5093,9	938,8	732,3	1039,6	810,9
36,0	6073,1	5698,2	1050,3	819,2	1163,1	907,2
38,0	6792,9	6373,6	1174,5	916,1	1300,5	1014,4
39,0	7161,8	6719,7	1238,3	965,9	1371,3	1069,6
40,0	7551,8	7085,7	1305,7	1018,4	1445,9	1127,8
42,0	8259,1	7749,3	1428,2	1114,0	1581,5	1233,6
44,0	9233,5	8663,5	1596,5	1245,3	-	-
45,5	10040,2	9420,4	1736,4	1354,4	-	-
46,0	10289,1	9654,0	1779,1	1387,7	-	-
48,0	11127,0	10440,1	1924,2	1500,9	-	-
50,0	12122,4	11374,1	2096,2	1635,0	-	-
52,0	13019,1	12215,4	2251,6	1756,2	-	-
54,0	14281,8	13400,2	2469,9	1926,5	-	-
56,0	15315,0	14369,6	2648,8	2066,1	-	-
57,0	15757,8	14785,1	2724,9	2125,4	-	-
58,0	16334,0	15325,7	2823,8	2202,6	-	-
60,0	17289,8	16222,5	2989,8	2332,0	-	-
62,0	18417,2	17280,3	3184,7	2484,1	-	-
64,0	19848,7	18623,5	3432,6	2677,4	-	-



Construction:

6x26(1+5+5/5+10)+6x7(1+6)+1x7(1+6)
6xK26WS-IWRC; 6xK26WS-EPIWRC

Excavators (lifting rope, pull rope, back digging line, boom lift cable, shaft ropes). Ropes of main lifting.

Constructional features:

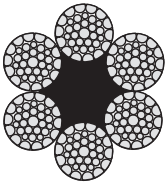
Ropes are manufactured with compacted strands of the outer layer (K) with metal core (IWRC), version 2- using compacted strands of the outer layer (K) with metal core and with polymer-coated metal core (EPIWRC).

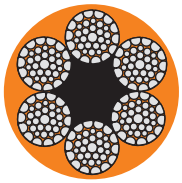
Diameter, mm	Approximate weight of 1000 m rope, kg		Grade, N/mm^2(kgs/mm^2)			
			1770		1960	
			Breaking force, kN, not less			
	-	Ver. 2	The total of all wires in the rope	Rope as a whole	The total of all wires in the rope	Rope as a whole
22,0	2050,0	2200,0	370,6	272,4	393,8	315,0
24,0	2640,0	2840,0	428,7	294,9	433,7	347,0
26,0	2780,0	2990,0	500,9	377,5	517,0	413,6
28,0	3470,0	3730,0	579,1	434,4	624,7	499,7
30,0	4080,0	4390,0	703,6	533,2	742,6	594,1
32,0	4300,0	4620,0	803,7	618,9	880,0	704,0
34,0	4940,0	5310,0	917,7	717,3	981,9	785,5
36,0	5370,0	5770,0	1043,1	801,6	1107,5	886,0
38,0	5800,0	6235,0	1124,1	872,0	1210,4	968,4
39,0	6050,0	6500,0	1278	969,6	1369,8	1095,8
40,0	6400,0	6880,0	1404,5	1073,2	1481,1	1184,9
42,0	6980,0	7500,0	1530,9	1207,9	1649,8	1319,9
44,0	7640,0	8210,0	1692,7	1338,9	1867,8	1494,2
45,5	8110,0	8720,0	1850,6	1420,4	-	-
46,0	8630,0	9280,0	1977,2	1548,9	-	-
48,0	9220,0	9910,0	2180	1696,8	-	-
50,0	9970,0	10720,0	2290,7	1766,1	-	-
52,0	10800,0	11610,0	2474,3	1924,2	-	-
54,0	11780,0	12660,0	2671,2	2048,1	-	-
56,0	12500,0	13440,0	2867,5	2244,4	-	-
57,0	13110,0	14090,0	3054,1	2380,8	-	-
58,0	13840,0	14880,0	3235,7	2501,3	-	-
60,0	14400,0	15480,0	3441,4	2700,3	-	-

Ropes, breaking force of which is shown to the left of bold line are manufactured of uncoated and galvanized wire, those to the right of bold line are manufactured of uncoated wire.

Ropes are manufactured with compacted strands of the outer layer (K) and with metal core (IWRC):
- version 3 with polymer-coated metal core and rope as a whole (IWRC);
- version 4 with polymer-coated rope as a whole (IWRC).

Diameter, mm	Approximate weight of 1000 m rope, kg		Grade, N/mm^2(kgs/mm^2)			
			1770		1960	
			Breaking force, kN, not less			
	Ver. 3	Ver. 4	The total of all wires in the rope	Rope as a whole	The total of all wires in the rope	Rope as a whole
22,0	-	2023,8	373,1	291,0	413,2	322,3
24,0	-	2430,3	448	349,4	491,4	383,3
26,0	-	2865,7	528,4	412,2	585,2	456,5
28,0	3592,4	3370,6	621,5	484,8	688,3	536,9
30,0	4106,3	3852,9	706,6	551,1	782,5	610,4
32,0	4694,4	4404,6	812,2	633,5	899,4	701,5
34,0	5314,9	4986,8	919,7	717,4	1018,4	794,4
36,0	6021,9	5650,2	1042,3	813,0	1154,2	900,3
38,0	6694,3	6281,1	1158,4	903,6	1202,8	938,2
39,0	7143,1	6702,2	1236,2	964,2	-	-
40,0	7559,4	7092,7	1308,6	1020,7	-	-
42,0	8207,2	7700,6	1420,4	1107,9	-	-
44,0	9038,5	8480,6	1564,1	1220,0	-	-
45,5	9778,4	9174,8	1692,3	1320,0	-	-
46,0	10100,3	9476,8	1748	1363,4	-	-
48,0	10783,9	10118,2	1866,4	1455,8	-	-
50,0	11839,7	11108,8	2019,5	1575,2	-	-
52,0	12689,8	11906,5	2196,3	1713,1	-	-
54,0	13957,9	13096,3	2415,7	1884,2	-	-
56,0	14836,4	13920,5	2568	2003,0	-	-
57,0	15757,8	14785,1	2724,9	2125,4	-	-





Construction:
6x36(1+7+7/7+14)+1 fiber core
6xK36WS+FC3

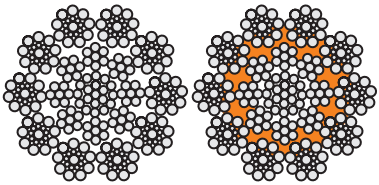
Excavators (lifting rope, back digging line, shaft ropes). Ropes of main lifting, pulling rope.

Constructional features:
Ropes are manufactured with compacted strands with fiber core (FC) and with compacted strands with polymer coating the rope as a whole (version 4).

Diameter, mm	Approximate weight of 1000 m rope, kg		Grade, N/mm^2(kgs/mm^2)			
			1770		1960	
			Breaking force, kN, not less			
	-	Ver. 4	The total of all wires in the rope	Rope as a whole	The total of all wires in the rope	Rope as a whole
22,0	1740,0	1880,0	351,5	281,2	389,2	311,4
24,0	2070,0	2235,0	424,5	339,6	470,1	376,1
26,0	2430,0	2620,0	499,5	399,6	553,1	442,5
28,0	2810,0	3030,0	577,7	462,1	639,7	511,8
30,0	3005,0	3250,0	659,6	527,6	730,4	584,3
32,0	3440,0	3715,0	727,6	582,0	805,7	644,6
34,0	3920,0	4230,0	817,8	654,2	905,6	724,5

Diameter, mm	Approximate weight of 1000 m rope, kg		Grade, N/mm²(kgs/mm²)			
			1770		1960	
			Breaking force, kN, not less			
	-	Ver. 4	The total of all wires in the rope	Rope as a whole	The total of all wires in the rope	Rope as a whole
36,0	4405,0	4760,0	921,7	737,3	1020,6	816,5
38,0	4925,0	5320,0	979,3	783,4	1084,4	867,5
40,0	5485,0	5920,0	1071,0	856,8	1186,0	948,8
42,0	6000,0	6480,0	1169,0	935,2	-	-
44,0	6660,0	7190,0	1273,7	1018,9	-	-
46,0	7224,0	7800,0	1402,1	1121,6	-	-
48,0	7920,0	8550,0	1540,3	1232,2	-	-
50,0	8616,0	9305,0	1677,0	1341,6	-	-
52,0	9307,0	10050,0	1813,0	1450,4	-	-
54,0	10041,0	10840,0	1983,0	1586,4	-	-
56,0	10780,0	11640,0	2140,3	1712,2	-	-
58,0	11584,0	12510,0	2275,5	1820,4	-	-
60,0	12360,0	13350,0	2435,6	1948,4	-	-
62,0	15817,0	17080,0	2577,2	2061,7	-	-
64,0	16920,0	18270,0	2763,0	2210,4	-	-
68,0	19081,0	20600,0	3069,5	2455,6	-	-
72,0	21432,0	23150,0	3435,3	2748,2	-	-
74,0	22614,0	24420,0	3643,0	2914,4	-	-

Ropes, breaking force of which is shown to the left of bold line are manufactured of uncoated and galvanized wire, those to the right of bold line are manufactured of uncoated wire.



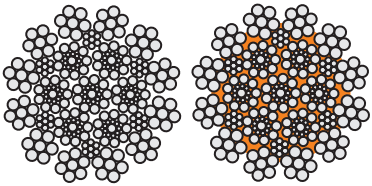
Construction:
10x19(1+9+9)+8x7(1+6)+1x19(1+6+12)
10x19S-IWRC; 10x19S-EPIWRC

Mine rope. Ropes of main lifting.

Constructional features:
Ropes are manufactured with metal core (IWRC), version 2 and with polymer coated metal core (EPIWRC).

Diameter, mm	Approximate weight of 1000 m rope, kg		Grade, N/mm²(kgs/mm²)			
			1770		1960	
			Breaking force, kN, not less			
	-	Ver. 2	The total of all wires in the rope	Rope as a whole	The total of all wires in the rope	Rope as a whole
22,0	1970,0	2130,0	410,7	305,0	454,8	337,7
24,0	2344,0	2530,0	482,4	363,0	534,2	401,9
26,0	2750,0	2970,0	560,0	426,0	620,1	471,7
28,0	3190,0	3445,0	652,3	494,0	722,3	547,0
30,0	4170,0	4500,0	741,1	567,0	820,6	628,0
32,0	3480,0	3760,0	858,7	645,0	950,9	714,5
34,0	4705,0	5080,0	940,8	728,0	1041,8	806,6
36,0	5270,0	5690,0	1117,1	817,0	1201,8	904,3
38,0	5877,0	6350,0	1200,2	910,0	1329,0	1007,6
40,0	6510,0	7030,0	1333,2	1010,0	1476,3	1116,4
42,0	7180,0	7750,0	1493,0	1112,0	-	-
44,0	7880,0	8510,0	1623,6	1220,0	-	-

Ropes, breaking force of which is shown to the left of bold line are manufactured of uncoated and galvanized wire, those to the right of bold line are manufactured of uncoated wire.



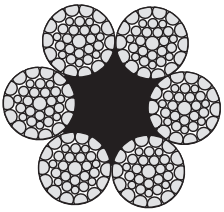
Construction:
12x7(1+6)+6x19(1+9+9);6x7(1+6)+1x19(1+9+9)
12x7-IWRC; 12x7-EPIWRC

Mine ropes. Ropes of main lifting, guide ropes.

Constructional features:
Ropes are manufactured with metal core (IWRC), version 2 with polymer coated metal core (EPIWRC).

Diameter, mm	Approximate weight of 1000 m rope, kg		Grade, N/mm^2(kgs/mm^2)			
			1770		1960	
			Breaking force, kN, not less			
	-	Ver. 2	The total of all wires in the rope	Rope as a whole	The total of all wires in the rope	Rope as a whole
22,0	1940,0	2200,0	437,0	281,0	483,9	311,0
24,0	2310,0	2670,0	525,1	334,0	581,5	370,0
26,0	2710,0	3070,0	603,6	392,0	668,4	435,0
28,0	3140,0	3580,0	703,2	455,0	778,6	504,0
30,0	3610,0	4130,0	811,6	522,5	898,7	579,0
32,0	4106,0	4640,0	911,8	594,5	1010,0	658,3
34,0	4636,0	5300,0	1041,3	671,0	1153,1	743,0
36,0	5200,0	6000,0	1176,4	752,0	1303,0	833,0
38,0	5790,0	6690,0	1313,3	838,0	-	-
40,0	6416,0	7430,0	1459,0	930,0	-	-
42,0	7074,0	8090,0	1589,5	1024,0	-	-
44,0	7763,0	8770,0	1722,3	1124,0	-	-
46,0	8485,0	9470,0	1860,0	1228,5	-	-
48,0	9240,0	10450,0	2052,2	1338,0	-	-
50,0	10025,0	11380,0	2234,6	1451,0	-	-
52,0	10843,0	12350,0	2426,8	1570,0	-	-
54,0	11693,0	13250,0	2602,0	1693,0	-	-
56,0	12575,0	14080,0	2765,4	1821,0	-	-

Ropes, breaking force of which is shown to the left of bold line are manufactured of uncoated and galvanized wire, those to the right of bold line are manufactured of uncoated wire.



Steel ropes using compacted strands in the outer layer

TU 14-173-101-2012

Construction:
6x36(1+7+7/7+14)+1 fiber core

Mine equipment, lifting mechanisms.

Diameter, mm	Approximate weight of 1000 m rope, kg	Grade, N/mm^2(kgs/mm^2)							
		1570 (160)	1570 (160)	1570 (160)	1570 (160)	1570 (160)	1570 (160)	1570 (160)	1570 (160)
		Breaking force, kN, not less							
		The total of all wires in the rope				The total of all wires in the rope			
21,0	1760,0	309,38	329,09	348,80	366,53	253,69	269,85	286,02	300,25
22,0	1900,3	338,08	359,62	381,15	400,53	277,23	294,89	312,54	328,43
23,5	2186,6	389,39	414,19	438,99	461,32	319,30	339,64	359,97	378,28
25,0	2455,3	436,60	464,40	492,20	517,20	358,01	380,81	403,60	424,10
25,5	2500,0	444,48	472,80	501,10	526,58	364,47	387,70	410,90	431,80
26,0	2648,2	470,89	500,88	530,90	557,87	386,13	425,75	468,22	457,45
27,0	2848,5	506,51	538,77	571,00	600,07	415,34	441,79	468,22	492,06
28,0	3002,4	534,11	568,13	602,10	632,77	437,97	465,87	493,72	518,87
29,0	3345,8	594,96	632,86	670,75	704,86	487,87	518,95	550,02	578,00
30,0	3515,1	624,96	664,77	704,60	740,41	512,47	545,11	577,77	607,14
31,0	3802,1	676,12	719,18	762,30	801,00	554,42	589,73	589,73	656,82
32,0	4050,2	720,27	766,14	812,03	853,31	590,62	628,23	665,86	699,71
33,0	4271,2	759,52	807,89	856,30	899,81	622,81	662,47	702,17	737,84
34,0	4524,4	804,58	855,82	907,07	953,19	659,76	701,77	743,80	781,62
35,0	4785,2	850,97	905,17	959,40	1008,16	697,80	742,24	786,71	826,70
36,0	5053,6	898,68	955,92	1013,20	1064,68	736,92	783,85	830,82	873,04
37,0	5382,8	957,13	1018,10	1079,07	1133,93	784,85	834,84	884,84	929,82
38,0	5666,4	1007,60	1071,80	1135,95	-	826,23	878,88	931,48	-
39,0	5916,7	1052,00	1119,00	1186,02	-	862,64	917,58	972,54	-
39,5	6140,0	1092,66	1162,25	1231,85	-	896,00	953,05	1010,12	-
40,0	6213,9	1104,85	1175,23	1245,61	-	905,98	963,69	963,69	-
41,0	6518,6	1159,05	1232,87	1306,71	-	950,42	1010,95	1071,50	-
42,0	6974,7	1239,70	1318,66	1397,63	-	1016,55	1081,30	1146,06	-
43,0	7260,8	1291,04	1373,27	1455,51	-	1058,65	1126,08	1193,52	-
44,0	7697,5	1368,94	1456,14	1543,34	-	1122,53	1194,03	1265,54	-
45,0	7874,7	1400,06	1489,24	1578,42	-	1148,05	1221,18	1294,30	-
46,0	8282,4	1472,77	1566,60	1660,39	-	1207,67	1284,61	1284,61	-
47,0	8597,3	1528,70	1626,06	1723,44	-	1253,53	1333,37	1413,22	-
48,0	9048,3	1608,78	1711,25	1813,71	-	1319,20	1403,23	1487,24	-
49,0	9415,0	1674,00	1780,62	1887,24	-	1372,68	1460,11	1547,54	-
50,0	9775,6	1738,08	1848,80	1959,49	-	1425,22	1516,02	1606,78	-
51,0	10157,0	1805,92	1920,95	2035,98	-	1480,85	1575,18	1669,50	-
52,0	10504,6	1867,67	1986,63	2105,58	-	1531,49	1629,04	1726,58	-
53,0	10899,8	1937,94	2061,40	2184,82	-	1589,11	1690,35	1791,55	-
54,0	11302,5	2009,60	2137,57	2265,56	-	1647,87	1752,81	1857,76	-
55,0	11927,1	2120,80	2255,89	2647,63	-	1739,06	1849,83	2171,06	-
56,0	12344,5	2195,67	2335,53	2741,10	-	1800,45	1915,13	2247,70	-
57,0	12731,2	2263,70	2407,89	2552,07	-	1856,23	1974,47	2092,70	-
58,0	13165,8	2341,01	2490,12	2639,24	-	1919,63	2041,90	2164,18	-
59,0	13548,0	2408,91	2562,35	2715,79	-	1975,31	2101,13	2226,95	-
60,0	13996,2	2488,64	2647,15	2805,66	-	2040,68	2170,66	2300,64	-
61,0	14609,5	2597,70	2763,15	2928,60	-	2130,11	2265,78	401,45	-
62,0	14883,7	2646,42	2814,98	2983,55	-	2170,06	2308,28	246,51	-
63,0	15246,5	2710,65	2883,30	3055,95	-	2222,73	2364,31	505,88	-
65,0	17420,0	2792,10	2969,93	3147,77	-	2289,52	2449,00	581,17	-

✦ Ropes, breaking force of which is shown to the left of bold line are manufactured of uncoated and galvanized wire.
✦ Ropes, breaking force of which is shown to the right of bold line are manufactured of uncoated wire.

Constructional features:
Ropes are manufactured of compacted strands of the outer layer (PK) with wire of one tensile strength grade of 1570 N/mm^2, 1670 N/mm^2, 1770 N/mm^2 and 1860 N/ mm^2.

Advantages:
Increased wear resistance, higher strength and longer service life, increased flexibility (compared to 6-strand wires), wear reduction and increase in the service life of the used block-and-tackle system, blocks and pulley of the excavator.


GMM
TPO 40/40

SPECIAL ROPES FOR OIL- AND -GAS EXTRACTION

There is a wide variety of rope constructions, twisted from steel wires, varying both in cross section and in construction of individual strands and their windings (number of elements twisted in the rope, type of twist, diameter of wire, etc.).

Steel tackle ropes that are used in drilling units for production and deep exploratory drilling in oil and gas wells are only of circular cross section and double lay.

Steel tackle ropes are manufactured of different constructions: cross right and left lay. Strands are twisted in the opposite direction to the rope's twisting.

In tackle systems for production drilling, ropes of the right cross lay are more common ropes with tensile strength of 1570-1960 Nmm².

Strands of ropes should be made of wire without coating of grades B or 1 according to GOST 7372-79 and requirements of regulatory documentation.

Cores:

- metal – made of the wire of grades B and 1 according to GOST 7372-79.

The lay of the core should be one-sided coinciding with the direction of the rope lay.

- fiber – made of sisal according to normative documentation, hemp fiber according to GOST 5269-93, polypropylene film fibrillated yarn according to normative documentation and other materials according to normative documentation.

It is allowed to add individual heels to fiber core in the amount not exceeding the number of heels whose linear density is equal to the difference in the linear density of adjacent core diameters.

Hemp and sisal cores should be lubricated by grease according to regulatory documents.

Steel tackle ropes according to TU 14-173-136-2018 version 2 and 4 are manufactured with metal core made of wire without coating of grades B and 1 according to GOST 7372-79. The core is coated by polymer. Polypropylene is used as polymer coating. Polymer coating from other polymeric materials is allowed.

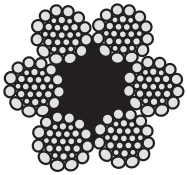
Steel tackle ropes according to TU 14-173-043-2016 and TU 14-173-048-2016 can be manufactured with metal-fiber core.

Metal-fiber cores consist of wire without coating of grades B and 1 according to GOST 7372-79 and fiber aggregates made of single and three-strand lubricated cores according to GOST 5269-93 and other normative documentation.

To ensure a sufficient service life of ropes during their operation, to protect ropes from corrosion during transportation, storage, the rope is coated by greases of various types.

On request, ropes can be manufactured with crimping (terminating) the ends with a steel or aluminum sleeve with a loop.

Steel tackle ropes



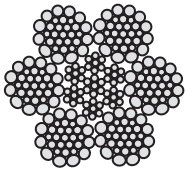
GOST 16853-88

Construction:
6x31(1+6+6/6+12)+1 fiber core

For well drilling units

Diameter, mm	Approximate weight of 1000 m rope, kg	Grade, N/mm^2 (kgs/mm^2)					
		1570 (160)		1670 (170)		1770 (180)	
		Breaking force, kN, no less					
		The total of all wires in the rope	Rope as a whole	The total of all wires in the rope	Rope as a whole	The total of all wires in the rope	Rope as a whole
25,0	2200,0	411,00	349,00	437,00	371,00	462,50	393,00
28,0	2800,0	517,50	439,50	550,00	467,50	582,00	494,50
32,0	3600,0	643,00	546,50	683,00	580,50	723,50	615,00
35,0	4230,0	775,00	658,50	823,50	700,00	872,00	741,00
38,0	5050,0	919,00	781,00	976,50	830,00	1030,00	878,50

Steel tackle ropes of 6x31(1+6+6/6+12) construction with fiber core.



GOST 16853-88

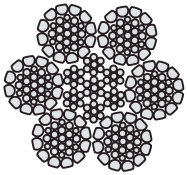
Construction:
6x31(1+6+6/6+12)+6x7(1+6)+1x7(1+6)

For well drilling units

Diameter, mm	Approximate weight of 1000 m rope, kg	Grade, N/mm^2 (kgs/mm^2)					
		1570 (160)		1670 (170)		1770 (180)	
		Breaking force, kN, no less					
		The total of all wires in the rope	Rope as a whole	The total of all wires in the rope	Rope as a whole	The total of all wires in the rope	Rope as a whole
25,0	2530,0	471,50	400,50	501,00	426,00	530,50	451,00
28,0	3200,0	590,50	502,00	627,50	533,00	664,50	564,50
32,0	4060,0	746,00	634,50	792,50	673,50	839,00	713,00
35,0	4920,0	885,00	752,00	940,50	799,00	995,50	846,00
38,0	5690,0	1055,00	896,50	1121,00	952,50	1185,00	100,90

Steel tackle ropes of 6x31(1+6+6/6+12) construction with metal core of 6x7(1+6)+1x7(1+6) construction.

Steel tackle ropes



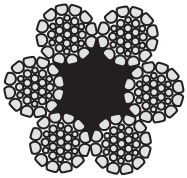
TU 14-173-043-2016

Construction:
6x31(1+6+6/6+12)+6x7(1+6)+1x7(1+6)

For well drilling units

Diameter, mm	Approximate weight of 1000 m rope, kg	Grade, N/mm^2 (kgs/mm^2)					
		1570 (160)		1670 (170)		1770 (180)	
		Breaking force, kN, no less					
		The total of all wires in the rope	Rope as a whole	The total of all wires in the rope	Rope as a whole	The total of all wires in the rope	Rope as a whole
22,0	2073,2	369,60	314,16	393,15	334,17	416,70	354,19
25,0	2697,2	484,97	412,22	515,86	438,48	546,75	464,74
28,0	3465,1	616,22	523,79	655,47	557,15	694,73	590,52
32,0	4323,5	784,95	667,20	834,95	709,70	884,95	752,20
35,0	5305,8	966,02	821,12	1027,55	873,42	1089,08	925,72
38,0	6200,0	1123,73	955,17	1195,30	1016,00	1266,88	1076,85

Steel tackle ropes of 6x31(1+6+6/6+12) construction with metal core of 6x7(1+6)+1x7(1+6) construction with compacted strands.



TU 14-173-043-2016

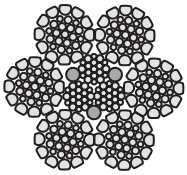
Construction:
6x31(1+6+6/6+12)+1 fiber core

For well drilling units

Diameter, mm	Approximate weight of 1000 m rope, kg	Grade, N/mm^2 (kgs/mm^2)					
		1570 (160)		1670 (170)		1770 (180)	
		Breaking force, kN, no less					
		The total of all wires in the rope	Rope as a whole	The total of all wires in the rope	Rope as a whole	The total of all wires in the rope	Rope as a whole
22,0	1895,0	317,53	270,00	337,76	287,10	358,00	304,28
25,0	2510,0	420,56	357,47	447,34	380,24	474,13	403,00
28,0	3210,0	538,10	457,36	572,34	486,50	606,61	515,62
32,0	3910,0	655,15	556,87	696,87	592,34	738,60	627,81
35,0	4790,0	803,13	683,00	854,30	726,15	905,44	769,63
38,0	5695,0	954,34	811,19	1015,13	862,86	1075,91	914,53

Steel tackle ropes of 6x31(1+6+6/6+12) construction with fiber core and compacted strands.

Steel tackle ropes



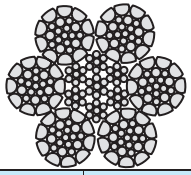
TU 14-173-043-2016

Construction:
6x31(1+6+6/6+12)+3x19(1+6+6/6)+3 fiber cores

For well drilling units

Diameter, mm	Approximate weight of 1000 m rope, kg	Grade, N/mm^2 (kgs/mm^2)					
		1570 (160)		1670 (170)		1770 (180)	
		Breaking force, kN, no less					
		The total of all wires in the rope	Rope as a whole	The total of all wires in the rope	Rope as a whole	The total of all wires in the rope	Rope as a whole
22,0	2100,0	364,41	283,51	387,62	301,57	410,83	319,62
25,0	2770,0	477,64	371,60	508,06	395,27	538,49	418,95
28,0	3500,0	604,39	470,22	642,88	500,16	681,38	530,12
32,0	4500,0	775,74	603,52	825,15	641,97	874,56	680,41
35,0	5500,0	950,98	739,86	1011,55	786,98	1072,12	834,11
38,0	6400,0	1107,21	861,40	1177,73	869,63	1248,26	971,15

Steel tackle ropes of 6x31(1+6+6/6+12) construction with metal-fiber core of 3x19(1+6+6/6)+3 fiber cores construction with compacted strands.



TU 14-173-048-2016

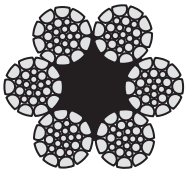
Construction:
6x26(1+5+5/5+10)+6x7(1+6)+1x7(1+6)

For well drilling units

Diameter, mm	Approximate weight of 1000 m rope, kg	Grade, N/mm^2 (kgs/mm^2)					
		1570 (160)		1670 (170)		1770 (180)	
		Breaking force, kN, no less					
		The total of all wires in the rope	Rope as a whole	The total of all wires in the rope	Rope as a whole	The total of all wires in the rope	Rope as a whole
22,0	2050,0	361,37	307,16	384,40	326,74	407,40	346,30
25,0	2750,0	489,09	415,73	520,24	442,20	551,40	468,70
28,0	3470,0	616,22	523,80	655,47	557,15	694,72	590,50
32,0	4400,0	779,54	662,60	829,19	704,81	878,84	747,00
35,0	5250,0	948,15	805,93	1008,55	857,27	1068,94	908,60
38,0	6400,0	1124,12	955,50	1195,72	1016,36	1267,32	1077,22

Steel tackle ropes of 6x26(1+5+5/5+10) construction with metal core of 6x7(1+6)+1x7(1+6) construction with compacted strands.

Steel tackle ropes



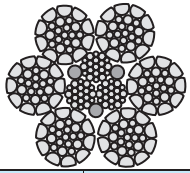
TU 14-173-048-2016

Construction:
6x26(1+5+5/5+10)+1 fiber core

For well drilling units

Diameter, mm	Approximate weight of 1000 m rope, kg	Grade, N/mm^2 (kgs/mm^2)					
		1570 (160)		1670 (170)		1770 (180)	
		Breaking force, kN, no less					
		The total of all wires in the rope	Rope as a whole	The total of all wires in the rope	Rope as a whole	The total of all wires in the rope	Rope as a whole
22,0	1850,0	309,45	263,03	329,16	279,79	348,87	296,54
25,0	2545,0	425,96	362,10	452,99	385,04	480,11	408,10
28,0	3165,0	529,89	450,41	563,64	479,10	597,39	507,78
32,0	4010,0	670,83	570,20	713,56	606,53	756,28	642,84
35,0	4780,0	799,70	679,75	850,63	723,04	901,57	766,33
38,0	5865,0	980,47	833,40	1042,92	886,48	1105,37	939,56

Steel tackle ropes of 6x26(1+5+5/5+10) construction with fiber core and compacted strands.



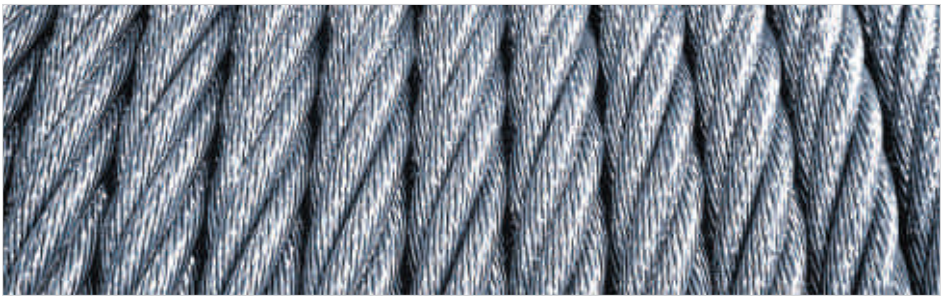
TU 14-173-048-2016

Construction:
6x26(1+5+5/5+10)+3x19(1+6+6/6)+3 fiber cores

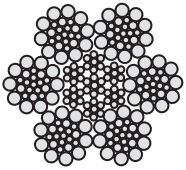
For well drilling units

Diameter, mm	Approximate weight of 1000 m rope, kg	Grade, N/mm^2 (kgs/mm^2)					
		1570 (160)		1670 (170)		1770 (180)	
		Breaking force, kN, no less					
		The total of all wires in the rope	Rope as a whole	The total of all wires in the rope	Rope as a whole	The total of all wires in the rope	Rope as a whole
22,0	2050,0	356,17	295,62	378,86	314,45	401,54	333,28
25,0	2800,0	481,82	399,91	512,51	425,38	543,20	450,86
28,0	3500,0	604,39	501,64	642,88	533,59	681,38	565,55
32,0	4460,0	770,30	639,35	819,37	680,10	868,43	720,80
35,0	5400,0	933,14	774,51	992,58	823,84	1052,02	873,18
38,0	6400,0	1107,60	919,31	1178,15	977,86	1248,70	1036,42

Steel tackle ropes of 6x26(1+5+5/5+10) construction with metal-fiber core of 3x19(1+6+6/6)+3 fiber cores construction with compacted strands.



Steel tackle ropes



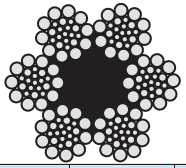
TU 14-173-054-2009

Construction:
6x26(1+5+5/5+10)+6x7(1+6)+1x7(1+6)

For well drilling units

Diameter, mm	Approximate weight of 1000 m rope, kg	Grade, N/mm² (kgs/mm²)							
		1570 (160)		1670 (170)		1770 (180)		1860 (190)	
		Breaking force, kN, no less							
		The total of all wires in the rope	Rope as a whole	The total of all wires in the rope	Rope as a whole	The total of all wires in the rope	Rope as a whole	The total of all wires in the rope	Rope as a whole
25,0	2780,0	493,56	419,53	525,00	446,25	556,43	472,97	584,73	497,02
28,0	3370,0	579,61	492,67	616,53	524,05	653,45	555,43	686,67	583,67
32,0	4250,0	754,24	641,11	802,28	681,94	850,33	722,78	-	-
35,0	5065,0	899,22	764,33	956,49	813,02	1013,77	861,70	-	-
38,0	6115,0	1085,14	922,37	1154,25	981,12	1223,37	1040,0	-	-

Steel tackle ropes of 6x26(1+5+5/5+10) construction with metal core of 6x7(1+6)+1x7(1+6) construction with compacted strands.



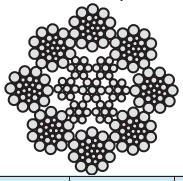
TU 14-173-054-2009

Construction:
6x26(1+5+5/5+10)+1 fiber core

For well drilling units

Diameter, mm	Approximate weight of 1000 m rope, kg	Grade, N/mm² (kgs/mm²)							
		1570 (160)		1670 (170)		1770 (180)		1860 (190)	
		Breaking force, kN, no less							
		The total of all wires in the rope	Rope as a whole	The total of all wires in the rope	Rope as a whole	The total of all wires in the rope	Rope as a whole	The total of all wires in the rope	Rope as a whole
25,0	2490,0	416,49	354,02	443,02	376,56	469,55	399,11	493,42	419,41
28,0	3010,0	504,13	428,51	534,57	454,38	566,58	481,60	595,40	506,10
32,0	3970,0	662,95	563,51	705,17	599,40	747,40	635,30	-	-
35,0	4690,0	784,31	666,66	834,26	709,13	884,22	751,60	-	-
38,0	5650,0	943,88	802,30	1004,00	853,40	1064,12	904,51	-	-

Steel tackle ropes of 6x26(1+5+5/5+10) construction with fiber core and compacted strands.



TU 14-173-136-2018 Version 1

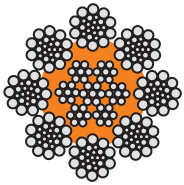
Construction:
8x26(1+5+5/5+10)+6x7(1+6)+1x7(1+6)

For well drilling units

Diameter, mm	Approximate weight of 1000 m rope, kg	Grade, N/mm² (kgs/mm²)							
		1670 (170)		1770 (180)		1860 (190)		1960 (200)	
		Breaking force, kN, no less							
		The total of all wires in the rope	Rope as a whole	The total of all wires in the rope	Rope as a whole	The total of all wires in the rope	Rope as a whole	The total of all wires in the rope	Rope as a whole
25,0	2470,0	465,24	372,20	493,10	394,48	518,18	414,54	546,04	436,83
28,0	3160,0	595,14	476,11	630,77	504,62	662,85	530,28	698,48	558,79
32,0	4045,0	761,94	609,55	807,56	646,05	848,63	678,90	894,25	715,40
35,0	4765,0	898,96	719,17	952,79	762,23	1001,24	800,99	1055,07	844,05

Steel tackle ropes of 6x26(1+5+5/5+10) construction with metal core of 6x7(1+6)+1x7(1+6) construction with compacted strands – Version 1.

Steel tackle ropes



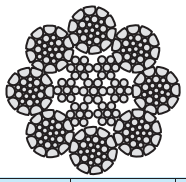
TU 14-173-136-2018 Version 2

Construction:
8x26(1+5+5/5+10)+6x7(1+6)+1x7(1+6)

For well drilling units

Diameter, mm	Approximate weight of 1000 m rope, kg	Grade, N/mm² (kgs/mm²)							
		1670 (170)		1770 (180)		1860 (190)		1960 (200)	
		Breaking force, kN, no less							
		The total of all wires in the rope	Rope as a whole	The total of all wires in the rope	Rope as a whole	The total of all wires in the rope	Rope as a whole	The total of all wires in the rope	Rope as a whole
25,0	2645,0	465,24	372,20	493,10	394,48	518,18	414,54	546,04	436,83
28,0	3180,0	595,14	476,11	630,77	504,62	662,85	530,28	698,48	558,79
32,0	4330,0	761,94	609,55	807,56	646,05	848,63	678,90	894,25	715,40
35,0	5100,0	898,96	719,17	952,79	762,23	1001,24	800,99	1055,07	844,05

Steel tackle ropes of 6x26(1+5+5/5+10) construction with polymer coated metal core – Version 2.



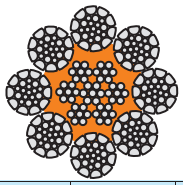
TU 14-173-136-2018 Version 3

Construction:
8x26(1+5+5/5+10)+6x7(1+6)+1x7(1+6)

For well drilling units

Diameter, mm	Approximate weight of 1000 m rope, kg	Grade, N/mm² (kgs/mm²)							
		1670 (170)		1770 (180)		1860 (190)		1960 (200)	
		Breaking force, kN, no less							
		The total of all wires in the rope	Rope as a whole	The total of all wires in the rope	Rope as a whole	The total of all wires in the rope	Rope as a whole	The total of all wires in the rope	Rope as a whole
25,0	2760,0	517,37	413,90	548,35	438,68	576,23	460,98	607,21	485,77
28,0	3550,0	664,63	531,70	704,42	563,54	740,24	592,20	780,04	624,03
32,0	4300,0	822,01	657,61	871,23	696,98	915,53	732,42	964,75	771,80
35,0	5150,0	970,95	776,76	1029,10	823,28	1081,42	865,14	1139,56	911,65

Steel tackle ropes of 6x26(1+5+5/5+10) construction with metal core and with compacted strands – Version 3.



TU 14-173-136-2018 Version 4

Construction:
8x26(1+5+5/5+10)+6x7(1+6)+1x7(1+6)

For well drilling units

Diameter, mm	Approximate weight of 1000 m rope, kg	Grade, N/mm² (kgs/mm²)							
		1670 (170)		1770 (180)		1860 (190)		1960 (200)	
		Breaking force, kN, no less							
		The total of all wires in the rope	Rope as a whole	The total of all wires in the rope	Rope as a whole	The total of all wires in the rope	Rope as a whole	The total of all wires in the rope	Rope as a whole
25,0	2955,0	517,37	413,90	548,35	438,68	576,23	460,98	607,21	485,77
28,0	3800,0	664,63	531,70	704,42	563,54	740,24	592,20	780,04	624,03
32,0	4600,0	822,01	657,61	871,23	696,98	915,53	732,42	964,75	771,80
35,0	5510,0	970,95	776,76	1029,10	823,28	1081,42	865,14	1139,56	911,65

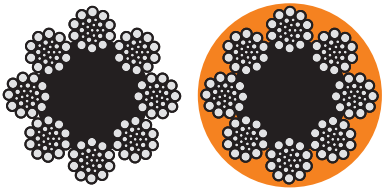
Steel tackle ropes of 6x26(1+5+5/5+10) construction with polymer coated metal core and with compacted strands – Version 4.

Steel ropes with the fiber and metal core of various versions
Construction: 8x26(1+5+5/5+10)
Technical conditions TU 25.93.11-144-00187263-2020

Functionality: for oil- and -gas extraction industry, for equipment of cranes and other lifting mechanisms, for use in mining units etc.

Eight strand steel ropes are manufactured with the fiber and metal core without compacting strands, with compacted of the outer strands (PK) of the following constructions:

- 8x26(1+5+5/5+10)+1 fiber core;
- 8x26(1+5+5/5+10)+6x7(1+6)+1x7(1+6);
- 8x26(1+5+5/5+10)+6x17(1+8+8)+1x17(1+8+8);
- 8x26(1+5+5/5+10)+6x19(1+9+9)+1x19(1+9+9);
- 8x26(1+5+5/5+10)+4x7(1+6)+4x26(1+5+5/5+10)+1x7(1+6).



Construction:
8x26(1+5+5/5+10)+1 fiber core

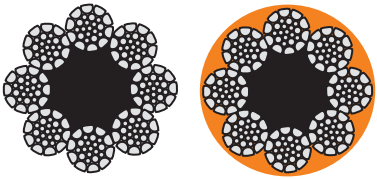
Steel ropes of 8x26(1+5+5/5+10)+1 fiber core construction are manufactured in the following versions:

- without polymer coating with the fiber core (Version 1);
- with polymer coating of the rope with the fiber core (Version 4).

Rope diameter, mm	Estimated weight of 1000 m rope, kg		Version 1			Version 4		
			Marking group, N/mm^2					
			1770	1860	1960	1770	1860	1960
	Ver. 1	Ver. 4	Breaking force, kN, no less					
1	2	3	4	5	6	7	8	9
20	1280	1370	209	220	231	209	220	231
22	1520	1630	253	266	281	253	266	281
24	1820	1950	302	317	334	302	317	334
26	1950	2090	354	372	392	354	372	392
28	2260	2410	411	432	455	411	432	455
30	2550	2720	471	495	522	471	495	522
32	2840	3040	536	563	593	536	563	593
34	3130	3350	605	636	670	605	636	670
36	3480	3720	678	713	751	678	713	751
38	4090	4380	756	794	837	756	794	837
40	4260	4560	838	880	927	838	880	927
42	4680	5010	923	970	1022	923	970	1022
44	5140	5500	1013	1065	1122	1013	1065	1122
46	5420	5800	1107	1163	1226	1107	1163	1226
48	5910	6330	1206	1267	1335	1206	1267	1335
50	6560	7010	1309	1375	1449	1309	1375	1449
52	7150	7650	1415	1487	1567	1415	1487	1567
54	7690	8230	1526	1603	-	1526	1603	-
56	8170	8740	1641	1724	-	1641	1724	-
58	9050	9680	1761	-	-	1761	-	-
60	9360	10020	1884	-	-	1884	-	-
62	10200	10920	2012	-	-	2012	-	-
64	10930	11700	2143	-	-	2143	-	-
65	11330	12120	2211	-	-	2211	-	-

Notes

1. Production of other marking groups is allowed.
2. Production of other diameters is allowed.
3. Ropes, the breaking force of which is given to the left of the fat line, are manufactured of uncoated and galvanized wire, to the right of the fat line of uncoated wire.

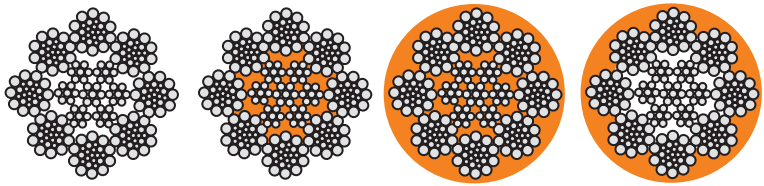


Construction:
8x26(1+5+5/5+10)+1 fiber core
with compacted of the outer strands (PK)

Steel ropes of 8x26(1+5+5/5+10)+1 fiber core construction with compacted the outer strands (PK) are manufactured in the following versions:
- without polymer coating with the fiber core (Version 1);
- with polymer coating of the rope with the fiber core (Version 4).

Rope diameter, mm	Estimated weight of 1000 m rope, kg		Version 1			Version 4		
			Marking group, N/mm^2					
			1770	1860	1960	1770	1860	1960
	Ver. 1	Ver. 4	Breaking force, kN, no less					
1	2	3	4	5	6	7	8	9
20	1300	1380	210	221	233	210	221	233
22	1520	1640	257	270	285	257	270	285
24	1820	1970	307	323	340	307	323	340
26	1950	2110	358	376	396	358	376	396
28	2260	2440	414	435	458	414	435	458
30	2550	2760	474	498	525	474	498	525
32	2840	3070	540	567	598	540	567	598
34	3130	3380	609	640	674	609	640	674
36	3480	3760	682	717	755	682	717	755
38	4090	4420	761	800	843	761	800	843
40	4260	4600	841	884	931	841	884	931
42	4680	5050	927	974	1027	927	974	1027
44	5140	5550	1015	1067	1124	1015	1067	1124
46	5420	5860	1113	1170	1232	1113	1170	1232
48	5910	6383	1208	1269	1338	1208	1269	1338
50	6560	7090	1309	1376	1450	1309	1376	1450
52	7150	7720	1417	1489	1569	1417	1489	1569
54	7690	8310	1529	1607	-	1529	1607	-
56	8170	8820	1643	1727	-	1643	1727	-
58	9050	9780	1764	-	-	1764	-	-
60	9360	10110	1889	-	-	1889	-	-
62	10200	11020	2018	-	-	2018	-	-
64	10930	11800	2148	-	-	2148	-	-
65	11330	12240	2216	-	-	2216	-	-

Notes
1. Production of other marking groups is allowed.
2. Production of other diameters is allowed.
3. Ropes, the breaking force of which is given to the left of the fat line, are manufactured of uncoated and galvanized wire, to the right of the fat line of uncoated wire.



Construction:
8x26(1+5+5/5+10)+6x7(1+6)+1x7(1+6)

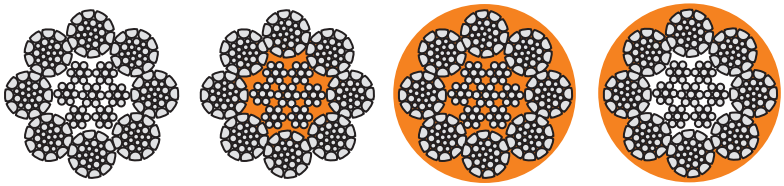
Steel ropes of 8x26(1+5+5/5+10)+6x7(1+6)+1x7(1+6) construction are manufactured in the following versions:

- without polymer coating with the metal core (Version 1);
- with polymer coating of the metal core (Version 2);
- with polymer coating of the metal core and the rope as a whole (Version 3);
- with polymer coating of the rope as a whole with the metal core (Version 4).

Rope diameter, mm	Estimated weight of 1000 m rope, kg				Version 1			Version 2			Version 3			Version 4		
					Marking group, N/mm^2											
					1770	1860	1960	1770	1860	1960	1770	1860	1960	1770	1860	1960
	Ver. 1	Ver. 2	Ver. 3	Ver. 4	Breaking force, kN, no less											
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
20	1636	-	-	1606	263	277	291	-	-	-	-	-	-	254	267	281
22	1987	1979	2039	1924	320	336	354	308	324	341	304	319	337	304	319	337
24	2366	2335	2445	2307	381	400	421	363	382	402	365	383	404	365	383	404
26	2727	2751	2863	2701	439	461	486	428	450	474	427	449	473	427	449	473
28	3210	3301	3382	3191	517	543	572	514	540	569	504	530	558	504	530	558
30	3664	3653	3896	3676	589	619	653	569	597	630	581	611	643	581	611	643
32	4164	4156	4362	4116	670	704	742	647	680	716	650	684	720	650	684	720
34	4814	4676	4962	4681	774	814	858	728	765	806	740	777	819	740	777	819
36	5350	5391	5544	5231	861	905	953	839	882	929	827	869	915	827	869	915
38	5924	5891	6160	5812	953	1002	1056	917	963	1015	918	965	1017	918	965	1017
40	6418	6681	6996	6601	1032	1085	1143	1030	1082	1140	1025	1077	1135	1025	1077	1135
42	7123	7363	7531	7106	1146	1204	-	1146	1204	-	1123	1180	-	1123	1180	-
44	7985	8193	8453	7976	1285	1350	-	1275	1340	-	1260	1324	-	1260	1324	-
46	8818	8813	9273	8748	1419	1491	-	1372	1441	-	1382	1453	-	1382	1453	-
48	9506	9560	10109	9538	1530	1607	-	1488	1564	-	1507	1584	-	1507	1584	-
50	10328	10503	10883	10268	1662	-	-	1635	-	-	1623	-	-	1623	-	-
52	11374	11717	11810	11142	1830	-	-	1824	-	-	1761	-	-	1761	-	-
54	12091	12498	12752	12031	1945	-	-	1945	-	-	1902	-	-	1902	-	-
56	12947	13383	13648	12877	2083	-	-	2083	-	-	2035	-	-	2035	-	-
58	14222	13917	14888	14047	2289	-	-	2166	-	-	2220	-	-	2220	-	-
60	14624	15117	15819	14925	2353	-	-	2353	-	-	2353	-	-	2353	-	-
62	15980	16518	17743	16740	2571	-	-	2571	-	-	2571	-	-	2571	-	-
64	16958	17529	18442	17399	2729	-	-	2729	-	-	2729	-	-	2729	-	-
65	17626	18219	19205	18119	2836	-	-	2836	-	-	2836	-	-	2836	-	-

Notes

1. Production of other marking groups is allowed.
2. Production of other diameters is allowed.
3. Ropes, the breaking force of which is given to the left of the fat line, are manufactured of uncoated and galvanized wire, to the right of the fat line of uncoated wire.



Construction:

8x26(1+5+5/5+10)+6x7(1+6)+1x7(1+6)
with compacted of the outer strands (PK)

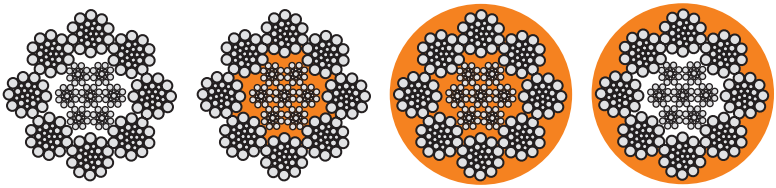
Steel rope of 8x26(1+5+5/5+10)+6x7(1+6)+1x7(1+6) construction with compacted outer strands (PK) are manufactured in the following versions:

- without polymer coating with the metal core (Version 1);
- with polymer coating of the metal core (Version 2);
- with polymer coating of the metal core and the rope as a whole (Version 3);
- with polymer coating of the rope as a whole with the metal core (Version 4).

Rope diameter, mm	Estimated weight of 1000 m rope, kg				Version 1			Version 2			Version 3			Version 4		
					Marking group, N/mm^2											
					1770	1860	1960	1770	1860	1960	1770	1860	1960	1770	1860	1960
	Ver. 1	Ver. 2	Ver. 3	Ver. 4	Breaking force, kN, no less											
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
20	1659	-	-	1950	271	285	300	-	-	-	-	-	-	254	267	281
22	2013	2164	2116	1985	325	342	360	325	342	360	305	321	338	305	321	338
24	2428	2480	2520	2364	387	407	428	387	407	428	363	381	402	363	381	402
26	2822	3034	2988	2804	472	496	523	472	496	523	434	456	481	434	456	481
28	3291	3538	3524	3307	550	578	609	550	578	609	512	538	567	512	538	567
30	3844	3663	4029	3781	604	635	669	604	635	669	567	596	628	567	596	628
32	4364	4691	4657	4370	730	767	809	730	767	809	677	711	750	677	711	750
34	4895	5262	5530	5189	819	860	906	819	860	906	764	803	846	764	803	846
36	5459	5550	5994	5624	871	915	964	871	915	964	817	858	904	817	858	904
38	6242	6710	6838	6416	979	1029	1085	979	1029	1085	971	1020	1075	971	1020	1075
39	6496	6980	7074	6637	1019	1071	1129	1019	1071	1129	1016	1068	1126	1016	1068	1126
40	6782	6983	7602	7133	1064	1118	1178	1064	1118	1178	1058	1112	1172	1058	1112	1172
42	7578	7291	8288	7777	1189	1250	1317	1189	1250	1317	1179	1239	1306	1179	1239	1306
44	8361	8147	8997	8442	1312	1379	1453	1312	1379	1453	1308	1375	1448	1308	1375	1448
45,5	8710	8988	9703	9104	1367	1436	-	1367	1436	-	1303	1369	-	1303	1369	-
46	9046	9725	9879	9269	1419	1491	-	1419	1491	-	1419	1491	-	1419	1491	-
48	10042	10795	10954	10278	1471	-	-	1471	-	-	1450	-	-	1450	-	-
50	10735	11540	11833	11103	1685	-	-	1685	-	-	1589	-	-	1589	-	-
52	11725	12604	12731	11945	1840	-	-	1840	-	-	1709	-	-	1709	-	-
54	12050	12900	13683	12838	1891	-	-	1891	-	-	1837	-	-	1837	-	-
56	13621	14640	14882	13964	2138	-	-	2138	-	-	1999	-	-	1999	-	-
57	14050	15100	14950	14110	2204	-	-	2204	-	-	2121	-	-	2121	-	-
58	14480	15560	15220	14370	2295	-	-	2295	-	-	2171	-	-	2171	-	-
60	16200	17420	16170	15260	2546	-	-	2546	-	-	2296	-	-	2296	-	-
62	16810	18070	17070	16300	2662	-	-	2662	-	-	2452	-	-	2452	-	-
64	18110	19400	18690	17630	2843	-	-	2843	-	-	2653	-	-	2653	-	-

Notes

1. Production of other marking groups is allowed.
2. Production of other diameters is allowed.
3. Ropes, the breaking force of which is given to the left of the fat line, are manufactured of uncoated and galvanized wire, to the right of the fat line of uncoated wire.



Construction:

8x26(1+5+5/5+10)+6x17(1+8+8)+1x17(1+8+8)

Steel rope of 8x26(1+5+5/5+10)+6x17(1+8+8)+1x17(1+8+8) construction are manufactured in the following versions:

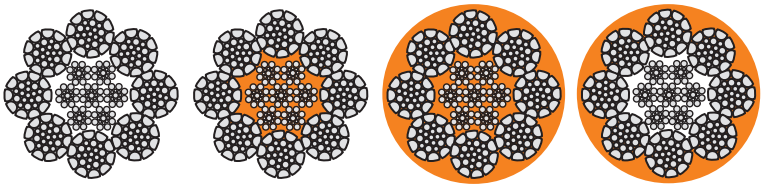
-without polymer coating with the metal core (Version 1);
- with polymer coating of the metal core (Version 2);
- with polymer coating of the metal core and the rope as a whole (Version 3);
- with polymer coating of the rope as a whole with the metal core (Version 4).

Rope diameter, mm	Estimated weight of 1000 m rope, kg				Version 1			Version 2			Version 3			Version 4		
					Marking group, N/mm^2											
					1770	1860	1960	1770	1860	1960	1770	1860	1960	1770	1860	1960
	Ver. 1	Ver. 2	Ver. 3	Ver. 4	Breaking force, kN, no less											
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
20	1740	-	-	1880	280	295	311	-	-	-	-	-	-	261	274	289
22	2100	2170	2220	2090	337	355	374	337	355	374	317	333	351	317	333	351
24	2547	2640	2660	2520	410	431	454	404	425	448	378	398	419	378	398	419
26	2950	3160	3130	2960	475	499	525	475	499	525	447	469	495	447	469	495
28	3449	3660	3610	3410	555	583	614	553	581	612	516	542	572	516	542	572
30	3900	4190	4110	3870	627	659	695	629	661	697	591	621	654	591	621	654

Rope diameter, mm	Estimated weight of 1000 m rope, kg				Version 1			Version 2			Version 3			Version 4		
					Marking group, N/mm^2											
					1770	1860	1960	1770	1860	1960	1770	1860	1960	1770	1860	1960
	Ver. 1	Ver. 2	Ver. 3	Ver. 4	Breaking force, kN, no less											
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
32	4430	4720	4760	4490	713	749	789	713	749	789	679	714	752	679	714	752
34	5095	5380	5350	5050	820	861	908	809	851	896	763	802	845	763	802	845
36	5620	60820	6010	5670	905	951	1002	905	951	1002	859	902	951	859	902	951
38	6240	6670	6680	6300	1004	1055	1112	1004	1055	1112	954	1003	1056	954	1003	1056
40	6940	7420	7410	6990	1117	1174	1237	1117	1174	1237	1057	1111	1170	1057	1111	1170
42	7620	8190	8180	7720	1226	1288	1358	1226	1288	1358	1167	1227	1293	1167	1227	1293
44	8370	8920	8980	8470	1348	1416	1492	1348	1416	1492	1281	1346	1419	1281	1346	1419
46	9110	9780	9860	9300	1467	1541	-	1467	1541	-	1407	1478	-	1407	1478	-
48	9890	10530	10710	10100	1592	1673	-	1592	1673	-	1528	1606	-	1528	1606	-
50	10760	11560	11640	10980	1731	-	-	1731	-	-	1662	-	-	1662	-	-
52	11670	12540	12620	11900	1878	-	-	1878	-	-	1799	-	-	1799	-	-
54	12600	13550	13570	12800	2028	-	-	2028	-	-	1935	-	-	1935	-	-
56	13610	14620	14630	13790	2190	-	-	2190	-	-	2086	-	-	2086	-	-
58	14570	15650	15660	14780	2345	-	-	2345	-	-	2235	-	-	2235	-	-
60	15570	16670	16740	15820	2505	-	-	2505	-	-	2390	-	-	2390	-	-
62	16580	17730	17940	16920	2669	-	-	2669	-	-	2559	-	-	2559	-	-
64	17690	19010	19070	17990	2847	-	-	2847	-	-	2721	-	-	2721	-	-
65	18210	19560	19680	18570	2931	-	-	2931	-	-	2808	-	-	2808	-	-

Notes

1. Production of other marking groups is allowed.
2. Production of other diameters is allowed.
3. Ropes, the breaking force of which is given to the left of the fat line, are manufactured of uncoated and galvanized wire, to the right of the fat line of uncoated wire



Construction:

8x26(1+5+5/5+10)+6x17(1+8+8)+1x17(1+8+8)
with compacted of the outer strands (PK)

Steel rope of 8x26(1+5+5/5+10)+6x17(1+8+8)+1x17(1+8+8) construction with compacted outer strands (PK) are manufactured in the following versions:

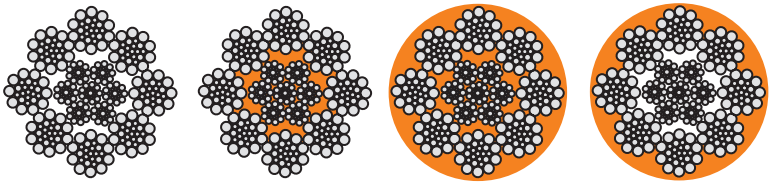
- without polymer coating with the metal core (Version 1);
- with polymer coating of the metal core (Version 2);
- with polymer coating of the metal core and the rope as a whole (Version 3);
- with polymer coating of the rope as a whole with the metal core (Version 4).

Rope diameter, mm	Estimated weight of 1000 m rope, kg				Version 1			Version 2			Version 3			Version 4		
					Marking group, N/mm^2											
					1770	1860	1960	1770	1860	1960	1770	1860	1960	1770	1860	1960
	Ver. 1	Ver. 2	Ver. 3	Ver. 4	Breaking force, kN, no less											
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
20	1760	-	-	1800	289	299	312	-	-	-	-	-	-	272	286	301
22	2150	2230	2330	2200	347	364	384	347	364	384	333	350	369	333	350	369
24	2630	2720	2770	2610	423	445	469	423	445	469	396	416	439	396	416	439
26	3020	3180	3220	3040	485	510	537	485	510	537	461	484	510	461	484	510
28	3540	3680	3810	3590	572	601	633	572	601	633	544	571	602	544	571	602
30	3910	4200	4300	4060	633	665	701	633	665	701	613	644	679	613	644	679
32	4710	4860	4890	4610	759	798	840	759	798	840	698	734	773	698	734	773
34	5250	5540	5560	5260	846	889	936	846	889	936	789	829	874	789	829	874
36	5790	5990	6280	5910	932	980	1032	932	980	1032	897	943	993	897	943	993
38	6210	6530	6900	6510	1010	1060	1127	1010	1060	1127	986	1036	1092	986	1036	1092
40	7170	7550	7670	7240	1154	1213	1278	1154	1213	1278	1096	1152	1214	1096	1152	1214
42	7840	8250	8510	8030	1262	1326	1397	1262	1326	1397	1214	1275	1344	1214	1275	1344

Rope diameter, mm	Estimated weight of 1000 m rope, kg				Version 1			Version 2			Version 3			Version 4		
					Marking group, N/mm^2											
					1770	1860	1960	1770	1860	1960	1770	1860	1960	1770	1860	1960
	Ver. 1	Ver. 2	Ver. 3	Ver. 4	Breaking force, kN, no less											
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
44	8710	9180	9530	8990	1402	1474	1553	1402	1474	1553	1361	1430	1507	1361	1430	1507
46	9450	9960	10260	9680	1522	1600	-	1522	1600	-	1465	1539	-	1465	1539	-
48	10220	10950	11140	10510	1646	1729	-	1646	1729	-	1591	1672	-	1591	1672	-
50	11250	11860	12220	11530	1811	-	-	1811	-	-	1745	-	-	1745	-	-
52	12080	12740	13030	12300	1946	-	-	1946	-	-	1862	-	-	1862	-	-
54	13040	13750	14280	13390	2100	-	-	2100	-	-	2026	-	-	2026	-	-
56	13860	14520	15180	14320	2231	-	-	2231	-	-	2168	-	-	2168	-	-
58	15040	15540	16220	15290	2420	-	-	2420	-	-	2317	-	-	2317	-	-
60	16000	16870	17340	16360	2576	-	-	2576	-	-	2475	-	-	2475	-	-
62	17350	18290	18580	17530	2792	-	-	2792	-	-	2653	-	-	2653	-	-
64	18540	19540	19840	18720	2984	-	-	2984	-	-	2832	-	-	2832	-	-
65	19130	20160	20500	19350	3079	-	-	3079	-	-	2927	-	-	2927	-	-

Notes

1. Production of other marking groups is allowed.
2. Production of other diameters is allowed.
3. Ropes, the breaking force of which is given to the left of the fat line, are manufactured of uncoated and galvanized wire, to the right of the fat line of uncoated wire.



Construction:

8x26(1+5+5/5+10)+6x19(1+9+9)+1x19(1+9+9)

Steel rope of 8x26(1+5+5/5+10)+6x19(1+9+9)+1x19(1+9+9) construction are manufactured in the following versions:

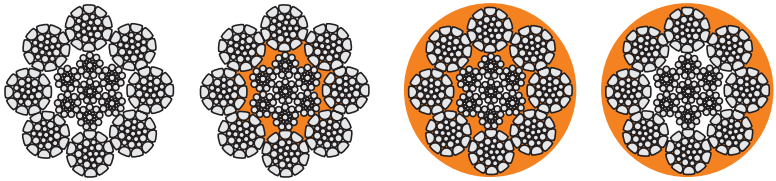
- without polymer coating with the metal core (Version 1);
- with polymer coating of the metal core (Version 2);
- with polymer coating of the metal core and the rope as a whole (Version 3);
- with polymer coating of the rope as a whole with the metal core (Version 4).

Rope diameter, mm	Estimated weight of 1000 m rope, kg				Version 1			Version 2			Version 3			Version 4		
					Marking group, N/mm^2											
					1770	1860	1960	1770	1860	1960	1770	1860	1960	1770	1860	1960
	Ver. 1	Ver. 2	Ver. 3	Ver. 4	Breaking force, kN, no less											
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
20	1900	-	-	1940	291	302	317	-	-	-	-	-	-	273	290	308
22	1990	2060	2200	2070	308	323	341	308	323	341	306	322	339	306	322	339
24	2550	2640	2820	2660	366	384	405	366	384	405	364	383	403	364	383	403
26	2780	2980	2400	2030	430	451	476	430	451	476	428	449	474	428	449	474
28	3110	3210	3430	3240	498	523	552	498	523	552	496	521	549	496	521	549
30	3370	3480	3720	3510	572	601	633	572	601	633	569	598	630	569	598	630
32	3660	3780	4050	3820	650	684	720	650	684	720	648	681	717	648	681	717
34	4060	4200	4490	4240	734	772	813	734	772	813	731	768	810	731	768	810
36	4880	5040	5390	5090	823	865	912	823	865	912	820	861	908	820	861	908
38	5590	5780	6180	5830	917	964	1016	917	964	1016	913	960	1011	913	960	1011
39	5820	6020	6440	6080	966	1015	1070	966	1015	1070	962	1011	1065	962	1011	1065
40	6360	6570	7030	6630	1016	1068	1126	1016	1068	1126	1012	1064	1121	1012	1064	1121
42	6550	6770	7240	6830	1121	1178	1241	1121	1178	1241	1116	1173	1236	1116	1173	1236
44	7380	7630	8160	7700	1230	1292	1362	1230	1292	1362	1225	1287	1356	1225	1287	1356
45,5	8210	8490	9080	8560	1315	1382	1456	1315	1382	1456	1309	1376	1450	1309	1376	1450
46	8840	9140	9780	9230	1344	1412		1344	1412		1338	1406	-	1338	1406	-
48	8880	9180	9820	9270	1464	1538		1464	1538		1457	1531	-	1457	1531	-
50	9700	10030	10710	10120	1588	-	-	1588	-	-	1581	-	-	1581	-	-
52	10640	11000	11770	11110	1718	-	-	1718	-	-	1710	-	-	1710	-	-

Rope diameter, mm	Estimated weight of 1000 m rope, kg				Version 1			Version 2			Version 3			Version 4		
					Marking group, N/mm^2											
					1770	1860	1960	1770	1860	1960	1770	1860	1960	1770	1860	1960
	Ver. 1	Ver. 2	Ver. 3	Ver. 4	Breaking force, kN, no less											
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
54	11530	11920	12750	12030	1852	-	-	1852	-	-	1844	-	-	1844	-	-
56	12360	12770	13660	12890	1992	-	-	1992	-	-	1984	-	-	1984	-	-
57	13390	13840	14810	13970	2064	-	-	2064	-	-	2055	-	-	2055	-	-
58	13890	14350	15350	14490	2137	-	-	2137	-	-	2128	-	-	2128	-	-
60	14520	15010	16060	15150	2502	-	-	2502	-	-	2491	-	-	2491	-	-
62	15200	15910	17020	16060	2590	-	-	2590	-	-	2579	-	-	2579	-	-
64	16050	16800	17970	16950	2632	-	-	2632	-	-	2621	-	-	2621	-	-
65	17100	17980	19240	18150	2871	-	-	2871	-	-	2859	-	-	2859	-	-

Notes

1. Production of other marking groups is allowed.
2. Production of other diameters is allowed.
3. Ropes, the breaking force of which is given to the left of the fat line, are manufactured of uncoated and galvanized wire, to the right of the fat line of uncoated wire.



Construction:

8x26(1+5+5/5+10)+6x19(1+9+9)+1x19(1+9+9)
with compacted of the outer strands (PK)

Steel rope of 8x26(1+5+5/5+10)+6x19(1+9+9)+1x19(1+9+9) construction with compacted outer strands (PK) are manufactured in the following versions:

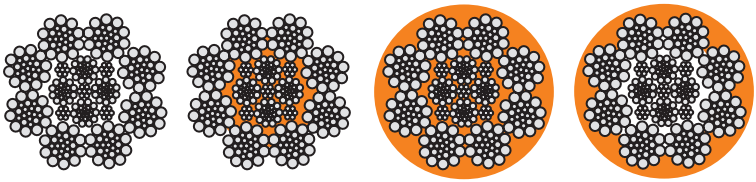
- without polymer coating with the metal core (Version 1);
- with polymer coating of the metal core (Version 2);
- with polymer coating of the metal core and the rope as a whole (Version 3);
- with polymer coating of the rope as a whole with the metal core (Version 4).

Rope diameter, mm	Estimated weight of 1000 m rope, kg				Version 1			Version 2			Version 3			Version 4		
					Marking group, N/mm^2											
					1770	1860	1960	1770	1860	1960	1770	1860	1960	1770	1860	1960
	Ver. 1	Ver. 2	Ver. 3	Ver. 4	Breaking force, kN, no less											
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
20	1960	-	-	1990	300	321	338	-	-	-	-	-	-	282	301	320
22	2540	2730	2110	2020	394	414	436	394	414	436	328	345	363	328	345	363
24	2750	2960	2590	2430	426	448	472	426	448	472	371	403	424	371	403	424
26	3090	3320	3050	2860	494	519	547	494	519	547	438	475	500	438	475	500
28	3350	3600	3580	3370	570	599	631	570	599	631	515	558	588	515	558	588
30	3640	3910	4220	3960	647	680	717	647	680	717	606	658	693	606	658	693
32	4040	4340	4730	4440	755	794	836	755	794	836	679	736	776	679	736	776
34	4850	5210	5410	5070	840	883	930	840	883	930	776	842	887	776	842	887
36	5560	5980	5970	5600	935	982	1035	935	982	1035	857	930	980	857	930	980
38	5790	6230	6790	6380	969	1018	1073	969	1018	1073	960	1009	1063	960	1009	1063
39	6320	6790	7120	6680	1012	1063	1120	1012	1063	1120	1007	1058	1115	1007	1058	1115
40	6510	7320	7490	7030	1124	1182	1245	1124	1182	1245	1076	1166	1229	1076	1166	1229
42	7340	7610	8290	7770	1220	1282	1351	1220	1282	1351	1189	1290	1359	1189	1290	1359
44	8160	8770	9090	8530	1310	1376	1450	1310	1376	1450	1305	1416	1492	1305	1416	1492
45,5	8790	9450	9720	9120	1396	1467	1545	1396	1467	1545	1396	1514	1595	1396	1514	1595
46	8830	9520	10010	9390	1442	1515	-	1442	1515	-	1437	1559	-	1437	1559	-
48	9640	10360	10720	10060	1588	1669	-	1588	1669	-	1539	1669	-	1539	1669	-
50	10580	11370	11640	10930	1695	-	-	1695	-	-	1672	-	-	1672	-	-
52	11460	12290	12620	11840	1821	-	-	1821	-	-	1812	-	-	1812	-	-
54	12280	13200	13840	12980	1960	-	-	1960	-	-	1917	-	-	1917	-	-
56	13310	14300	14890	13970	2082	-	-	2082	-	-	2038	-	-	2038	-	-
57	13800	14840	15710	14740	2159	-	-	2159	-	-	2118	-	-	2118	-	-
58	14430	15410	15990	15000	2257	-	-	2257	-	-	2186	-	-	2186	-	-

Rope diameter, mm	Estimated weight of 1000 m rope, kg				Version 1			Version 2			Version 3			Version 4		
					Marking group, N/mm^2											
					1770	1860	1960	1770	1860	1960	1770	1860	1960	1770	1860	1960
	Ver. 1	Ver. 2	Ver. 3	Ver. 4	Breaking force, kN, no less											
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
60	15300	16450	17200	16140	2518	-	-	2518	-	-	2497	-	-	2497	-	-
62	16150	17360	18620	17470	2676	-	-	2676	-	-	2674	-	-	2674	-	-
64	17290	18580	19700	18490	2865	-	-	2865	-	-	2829	-	-	2829	-	-

Notes

1. Production of other marking groups is allowed.
2. Production of other diameters is allowed.
3. Ropes, the breaking force of which is given to the left of the fat line, are manufactured of uncoated and galvanized wire, to the right of the fat line of uncoated wire.



Construction:

8x26(1+5+5/5+10)+4x7(1+6)+4x26(1+5+5/5+10)+1x7(1+6)

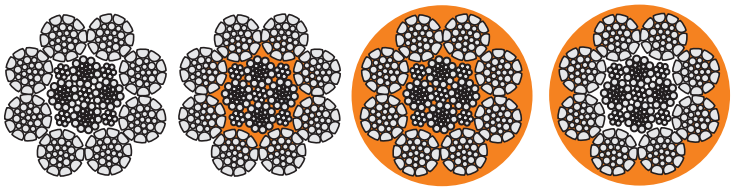
Steel rope of 8x26(1+5+5/5+10)+4x7(1+6)+4x26(1+5+5/5+10)+1x7(1+6) construction are manufactured in the following versions:

- without polymer coating with the metal core (Version 1);
- with polymer coating of the metal core (Version 2);
- with polymer coating of the metal core and the rope as a whole (Version 3);
- with polymer coating of the rope as a whole with the metal core (Version 4).

Rope diameter, mm	Estimated weight of 1000 m rope, kg				Version 1			Version 2			Version 3			Version 4		
					Marking group, N/mm^2											
					1770	1860	1960	1770	1860	1960	1770	1860	1960	1770	1860	1960
	Ver. 1	Ver. 2	Ver. 3	Ver. 4	Breaking force, kN, no less											
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
22	2220	2380	2340	2260	349	367	387	349	367	387	327	344	362	327	344	362
24	2615	2810	2860	2700	412	433	456	412	433	456	400	420	443	400	420	443
26	3050	3280	3310	3120	480	504	531	480	504	531	463	486	512	463	486	512
28	3540	3800	3740	3530	557	586	617	557	586	617	523	549	579	523	549	579
30	4090	4390	4510	4250	644	677	714	644	677	714	630	662	698	630	662	698
32	4620	4970	5140	4850	728	765	806	728	765	806	717	754	794	717	754	794
34	5220	5610	5860	5530	822	864	910	822	864	910	818	859	906	818	859	906
36	5820	6260	6570	6200	916	963	1014	916	963	1014	909	955	1006	909	955	1006
38	6480	6990	7220	6810	1020	1072	1130	1020	1072	1130	1008	1059	1116	1008	1059	1116
40	7200	7740	7950	7500	1133	1191	1255	1133	1191	1255	1110	1166	1229	1110	1166	1229
42	7990	8590	8740	8250	1257	1321	1392	1257	1321	1392	1220	1282	1351	1220	1282	1351
44	8680	9330	9530	8990	1366	1435	1512	1366	1435	1512	1331	1399	1474	1331	1399	1474
46	9470	10180	10760	10150	1491	1566	1651	1491	1566	1651	1461	1535	1618	1461	1535	1618
48	10460	11240	11810	11140	1646	1730	-	1646	1730	-	1598	1679	-	1598	1679	-
50	11330	12180	12420	11720	1783	-	-	1783	-	-	1736	-	-	1736	-	-
52	12200	13110	13720	12940	1920	-	-	1920	-	-	1916	-	-	1916	-	-
54	13240	14230	14870	14030	2084	-	-	2084	-	-	2076	-	-	2076	-	-
56	14310	15380	15930	15020	2252	-	-	2252	-	-	2224	-	-	2224	-	-
58	15220	16360	17250	16280	2395	-	-	2395	-	-	2311	-	-	2311	-	-
60	13650	17570	18330	17290	2573	-	-	2573	-	-	2558	-	-	2558	-	-
62	17400	18700	19570	18470	2738	-	-	2738	-	-	2732	-	-	2732	-	-
64	18540	19930	20820	19640	2987	-	-	2987	-	-	2946	-	-	2946	-	-
65	19180	20480	21630	20140	3093	-	-	3093	-	-	3030	-	-	3030	-	-

Notes

1. Production of other marking groups is allowed.
2. Production of other diameters is allowed.
3. Ropes, the breaking force of which is given to the left of the fat line, are manufactured of uncoated and galvanized wire, to the right of the fat line of uncoated wire.



Construction:

8x26(1+5+5/5+10)+ 4x7(1+6)+4x26(1+5+5/5+10)+1x7(1+6)
with compacted of the outer strands (PK)

Steel rope of 8x26(1+5+5/5+10)+4x7(1+6)+4x26(1+5+5/5+10)+1x7(1+6) construction with compacted outer strands (PK) are manufactured in the following versions:

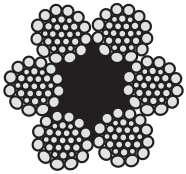
- without polymer coating with the metal core (Version 1);
- with polymer coating of the metal core (Version 2);
- with polymer coating of the metal core and the rope as a whole (Version 3);
- with polymer coating of the rope as a whole with the metal core (Version 4).

Rope diameter, mm	Estimated weight of 1000 m rope, kg				Version 1			Version 2			Version 3			Version 4		
					Marking group, N/mm^2											
					1770	1860	1960	1770	1860	1960	1770	1860	1960	1770	1860	1960
	Ver. 1	Ver. 2	Ver. 3	Ver. 4	Breaking force, kN, no less											
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
22	2220	2380	2340	2260	349	367	387	349	367	387	327	344	362	327	344	362
24	2615	2810	2860	2700	412	433	456	412	433	456	400	420	443	400	420	443
26	3050	3280	3310	3120	480	504	531	480	504	531	463	486	512	463	486	512
28	3540	3800	3740	3530	557	586	617	557	586	617	523	549	579	523	549	579
30	4090	4390	4510	4250	644	677	714	644	677	714	630	662	698	630	662	698
32	4620	4970	5140	4850	728	765	806	728	765	806	717	754	794	717	754	794
34	5220	5610	5860	5530	822	864	910	822	864	910	818	859	906	818	859	906
36	5820	6260	6570	6200	916	963	1014	916	963	1014	909	955	1006	909	955	1006
38	6480	6990	7220	6810	1020	1072	1130	1020	1072	1130	1008	1059	1116	1008	1059	1116
40	7200	7740	7950	7500	1133	1191	1255	1133	1191	1255	1110	1166	1229	1110	1166	1229
42	7990	8590	8740	8250	1257	1321	1392	1257	1321	1392	1220	1282	1351	1220	1282	1351
44	8680	9330	9530	8990	1366	1435	1512	1366	1435	1512	1331	1399	1474	1331	1399	1474
46	9470	10180	10760	10150	1491	1566	1651	1491	1566	1651	1461	1535	1618	1461	1535	1618
48	10460	11240	11810	11140	1646	1730	-	1646	1730	-	1598	1679	-	1598	1679	-
50	11330	12180	12420	11720	1783	-	-	1783	-	-	1736	-	-	1736	-	-
52	12200	13110	13720	12940	1920	-	-	1920	-	-	1916	-	-	1916	-	-
54	13240	14230	14870	14030	2084	-	-	2084	-	-	2076	-	-	2076	-	-
56	14310	15380	15930	15020	2252	-	-	2252	-	-	2224	-	-	2224	-	-
58	15220	16360	17250	16280	2395	-	-	2395	-	-	2311	-	-	2311	-	-
60	13650	17570	18330	17290	2573	-	-	2573	-	-	2558	-	-	2558	-	-
62	17400	18700	19570	18470	2738	-	-	2738	-	-	2732	-	-	2732	-	-
64	18540	19930	20820	19640	2987	-	-	2987	-	-	2946	-	-	2946	-	-
65	19180	20480	21630	20140	3093	-	-	3093	-	-	3030	-	-	3030	-	-

Notes

1. Production of other marking groups is allowed.
2. Production of other diameters is allowed.
3. Ropes, the breaking force of which is given to the left of the fat line, are manufactured of uncoated and galvanized wire, to the right of the fat line of uncoated wire.

Technical specifications for wire ropes
Standard API 9A



Construction:
6x31(1+6+6/6+12)+1 fiber core
6x31WS-FC

For well drilling units

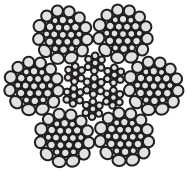
Diameter, mm	Approximate weight of 1000 m rope, kg	Grade, N/mm^2 (kgs/mm^2)			
		1770 (180)		1960 (200)	
		Breaking force, kN, no less			
		The total of all wires in the rope	Rope as a whole (IPS)	The total of all wires in the rope	Rope as a whole (EIP)
(15,9)	940,0	184,3	149,0	204,1	164,0
16,0	940,0	184,3	150,0	204,1	166,0
18,0	1190,0	233,4	189,0	258,4	210,0
19,0	1320,0	266,3	211,0	295,0	233,0
(19,1)	1320,0	266,3	212,0	295,0	233,0
20,0	1470,0	289,8	234,0	321,0	259,0
22,0	1780,0	350,6	283,0	388,2	313,0
(22,2)	1780,0	350,6	286,0	388,2	315,0
24,0	2110,0	423,1	336,0	468,5	373,0
(25,4)	2368,0	473,0	372,0	523,8	409,0
26,0	2480,0	490,4	395,0	543,0	437,0
28,0	2880,0	574,3	458,0	635,9	507,0
(28,6)	2880,0	574,3	468,0	635,9	515,0
(31,8)	3760,0	735,6	575,0	814,6	633,0
32,0	3760,0	735,6	598,0	814,6	662,0
(34,9)	4500,0	888,4	691,0	983,8	761,0
35,0	4500,0	888,4	716,0	983,8	792,0
36,0	4760,0	952,3	757,0	1054,5	838,0
38,0	5300,0	1052,2	843,0	1165,2	934,0
(38,1)	5300,0	1052,2	818,0	1165,2	898,0
40,0	5870,0	1154,2	935,0	1278,1	1040,0
(41,3)	6260,0	1192,5	952,0	1320,5	1050,0
44,0	7110,0	1400,3	1130,0	-	-
(44,5)	7110,0	1400,3	1100,0	-	-
45,0	7430,0	1486,7	1180,0	-	-
(47,6)	8460,0	1677,2	1250,0	-	-
48,0	8460,0	1677,2	1350,0	-	-
(50,8)	9550,0	1897,5	1420,0	-	-
51,0	9550,0	1897,5	1520,0	-	-
52,0	9920,0	2002,5	1580,0	-	-
(54,0)	10700,0	2002,5	1590,0	-	-
56,0	11500,0	2249,3	1830,0	-	-

Steel tackle ropes of 6x31(1+6+6/6+12) with fiber core.

Ropes, breaking force of which is shown to the left of bold line are manufactured of uncoated and galvanized wire.

Ropes, breaking force of which is shown to the right of bold line are manufactured of uncoated wire.

Technical specifications for wire ropes
Standard API 9A



Construction:
6x31(1+6+6/6+12)+6x7(1+6)+1x7(1+6)
6x31WS-IWRC

For well drilling units

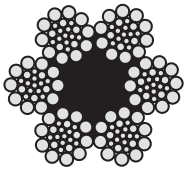
Diameter, mm	Approximate weight of 1000 m rope, kg	Grade, N/mm^2 (kgs/mm^2)			
		1770 (180)		1960 (200)	
		Breaking force, kN, no less			
		The total of all wires in the rope	Rope as a whole (IPS)	The total of all wires in the rope	Rope as a whole (EIP)
18,0	1330,0	252,2	204,0	279,2	226,0
19,0	1480,0	287,3	227,0	318,2	252,0
(19,1)	1480,0	287,3	228,0	318,2	262,0
20,0	1640,0	314,9	252,0	348,7	279,0
22,0	1980,0	385,9	305,0	427,3	338,0
(22,2)	1980,0	385,9	308,0	427,3	354,0
24,0	2360,0	453,0	363,0	501,6	402,0
(25,4)	2639,0	519,8	399,0	575,6	460,0
26,0	2760,0	537,8	426,0	595,6	472,0
28,0	3210,0	622,1	494,0	688,9	547,0
(28,6)	3345,5	629,1	503,0	696,6	578,0
(31,8)	4190,0	798,7	617,0	884,5	711,0
32,0	4190,0	798,7	645,0	884,5	715,0
(34,9)	5010,0	950,5	743,0	1052,5	854,0
35,0	5010,0	950,5	772,0	1052,5	855,0
36,0	5300,0	1042,9	817,0	1154,9	904,0
38,0	5910,0	1144,7	910,0	1267,6	1010,0
(38,1)	5910,0	1144,7	880,0	1267,6	1010,0
40,0	6540,0	1251,7	1010,0	1386,1	1120,0
(41,3)	6976,0	1338,5	1020,0	1482,1	1170,0
44,0	7920,0	1558,6	1220,0	-	-
(44,5)	7920,0	1558,6	1180,0	-	-
45,0	8280,0	1600,7	1280,0	-	-
(47,6)	9420,0	1791,0	1350,0	-	-
48,0	9420,0	1791,0	1450,0	-	-
(50,8)	1060,0	2062,6	1530,0	-	-
51,0	1060,0	2062,6	1640,0	-	-
52,0	1110,0	2135,2	1700,0	-	-
(54,0)	1193,0	2247,0	1710,0	-	-
56,0	1280,0	2454,6	1980,0	-	-
(57,2)	1340,0	2499,4	1910,0	-	-

Steel tackle ropes of 6x31(1+6+6/6+12) construction with metal core of 6x7(1+6)+1x7(1+6) construction with compacted strands.

Ropes, breaking force of which is shown to the left of bold line are manufactured of uncoated and galvanized wire.

Ropes, breaking force of which is shown to the right of bold line are manufactured of uncoated wire.

Technical specifications for wire ropes
Standard API 9A



Construction:
6x26(1+5+5/5+10)+1 fiber core
6x26WS-FC

For well drilling units

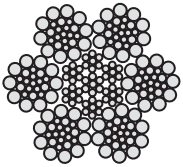
Diameter, mm	Approximate weight of 1000 m rope, kg	Grade, N/mm^2 (kgs/mm^2)			
		1770 (180)		1960 (200)	
		Breaking force, kN, no less			
		The total of all wires in the rope	Rope as a whole (IPS)	The total of all wires in the rope	Rope as a whole (EIP)
18,0	1160,0	236,4	189,0	261,8	210,0
19,0	1300,0	262,9	211,0	291,1	233,0
(19,1)	1300,0	262,9	212,0	291,1	233,0
20,0	1440,0	285,9	234,0	316,6	259,0
22,0	1740,0	345,9	283,0	383,0	313,0
(22,2)	1740,0	345,9	286,0	383,0	315,0
24,0	2070,0	402,0	336,0	445,2	373,0
(25,4)	2316,0	454,9	372,0	503,7	409,0
26,0	2430,0	485,0	395,0	537,1	437,0
28,0	2810,0	562,2	458,0	622,5	507,0
(28,6)	2810,0	562,2	468,0	622,5	515,0
(31,8)	3680,0	724,4	575,0	802,1	633,0
32,0	3680,0	724,4	598,0	802,1	662,0
(34,9)	4400,0	865,1	691,0	957,9	761,0
35,0	4400,0	865,1	716,0	957,9	792,0
36,0	4650,0	922,4	757,0	-	-
38,0	5180,0	1027,9	843,0	-	-
(38,1)	5180,0	1027,9	818,0	-	-
40,0	5740,0	1152,0	935,0	-	-
(41,3)	5740,0	1152,0	952,0	-	-
44,0	6950,0	1374,0	1130,0	-	-
(44,5)	6950,0	1374,0	1100,0	-	-
45,0	7270,0	1434,0	1180,0	-	-
(47,6)	8270,0	1621,7	1250,0	-	-
48,0	8270,0	1621,7	1350,0	-	-

Steel tackle ropes of 6x26(1+5+5/5+10) with fiber core.

Ropes, breaking force of which is shown to the left of bold line are manufactured of uncoated and galvanized wire.

Ropes, breaking force of which is shown to the right of bold line are manufactured of uncoated wire.

Technical specifications for wire ropes
Standard API 9A



Construction:
6x26(1+5+5/5+10)+6x7(1+6)+1x7(1+6)
6x26WS-IWRC

For well drilling units

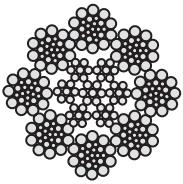
Diameter, mm	Approximate weight of 1000 m rope, kg	Grade, N/mm^2 (kgs/mm^2)			
		1770 (180)		1960 (200)	
		Breaking force, kN, no less			
		The total of all wires in the rope	Rope as a whole (IPS)	The total of all wires in the rope	Rope as a whole (EIP)
18,0	1300,0	252,5	204,0	279,6	226,0
19,0	1440,0	282,6	227,0	313,0	252,0
(19,1)	1440,0	282,6	228,0	313,0	262,0
20,0	1600,0	311,5	252,0	344,9	279,0
22,0	1940,0	382,4	305,0	423,4	338,0
(22,2)	1940,0	382,4	308,0	423,4	354,0
24,0	2300,0	450,0	363,0	498,2	402,0
(25,4)	2581,0	506,3	399,0	560,7	460,0
26,0	2700,0	536,6	426,0	594,2	472,0
28,0	3140,0	609,1	494,0	674,5	547,0
(28,6)	3272,0	639,1	503,0	707,7	578,0
(31,8)	4100,0	799,0	617,0	884,8	711,0
32,0	4100,0	799,0	645,0	884,8	715,0
(34,9)	4900,0	951,3	743,0	1053,4	854,0
35,0	4900,0	951,3	772,0	1053,4	855,0
36,0	5180,0	1020,5	817,0	1130,0	904,0
38,0	5780,0	1130,3	910,0	-	-
(38,1)	5780,0	1130,3	880,0	-	-
40,0	6400,0	1252,1	1010,0	-	-
(41,3)	6823,0	1310,4	1020,0	-	-
44,0	7740,0	1541,7	1220,0	-	-
(44,5)	7740,0	1541,7	1180,0	-	-
45,0	8100,0	1598,3	1280,0	-	-
(47,6)	9220,0	1772,0	1350,0	-	-
48,0	9220,0	1772,0	1450,0	-	-
(50,8)	10400,0	2039,3	1530,0	-	-
51,0	10400,0	2039,3	1640,0	-	-

Steel tackle ropes of 6x26(1+5+5/5+10) with metal core of 6x7(1+6)+1x7(1+6) construction.

Ropes, breaking force of which is shown to the left of bold line are manufactured of uncoated and galvanized wire.

Ropes, breaking force of which is shown to the right of bold line are manufactured of uncoated wire.

Technical specifications for wire ropes
Standard API 9A



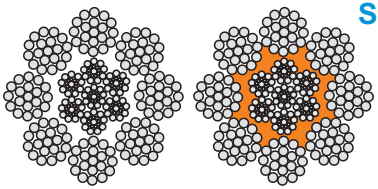
Construction:
8x26(1+5+5/5+10)+6x7(1+6)+1x7(1+6)
8x26WS-IWRC

For well drilling units

Diameter, mm	Approximate weight of 1000 m rope, kg	Grade, N/mm^2 (kgs/mm^2)			
		1770 (180)		1960 (200)	
		Breaking force, kN, no less			
		The total of all wires in the rope	Rope as a whole (IPS)	The total of all wires in the rope	Rope as a whole (EIP)
20,0	1630,0	327,6	252,0	362,7	279,0
22,0	1970,0	392,4	305,0	434,6	338,0
(22,2)	1970,0	392,4	308,0	434,6	354,0
24,0	2340,0	464,7	363,0	514,6	402,0
(25,4)	2626,0	507,3	399,0	561,8	460,0

Steel tackle ropes of 8x26(1+5+5/5+10) with metal core of 6x7(1+6)+1x7(1+6) construction.

Technical specifications for wire ropes Standard API 9A



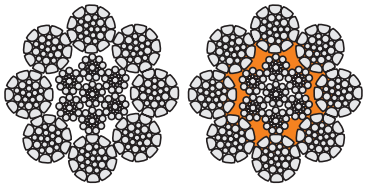
Construction:

8x25(1+6;6+12)+6x19(1+9+9)+1x19(1+9+9)
8x25F-IWRC; 8x25F-EPIWRC

For well drilling units

Diameter, mm	Approximate weight of 1000 m rope, kg		Grade, N/mm^2 (kgs/mm^2)			
			1770 (180)		1960 (200)	
			Breaking force, kN, no less			
			The total of all wires in the rope	Rope as a whole	The total of all wires in the rope	Rope as a whole
22,0	2015,0	2165,0	405,1	305,0	448,6	337,7
25,0	2520,0	2620,0	509,1	393,8	563,7	436,1
26,0	2710,0	2910,0	565,6	426,0	626,3	471,7
28,0	3190,0	3430,0	641,9	494,0	710,8	547,0
29,0	3500,0	3760,0	703,3	529,9	779,7	586,8
30,0	3690,0	3970,0	741,2	567,1	820,7	628,0
32,0	4120,0	4430,0	827,2	645,2	916,0	714,5
35,0	5000,0	5380,0	1004,2	771,9	1112,0	854,8
38,0	5920,0	6360,0	1188,9	909,9	1316,6	1007,6

Constructional features:
Ropes are manufactured with metal core (IWRC). Version 2 – ropes are manufactured with polymer coated metal core (EPIWRC).



Construction:

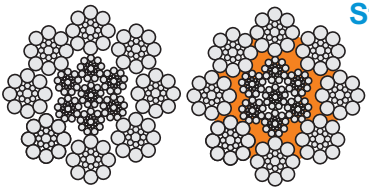
8x26(1+5+5/5+10)+6x19(1+9+9)+1x19(1+9+9)
8x26WS-IWRC; 8x26WS-EPIWRC

For well drilling units

Diameter, mm	Approximate weight of 1000 m rope, kg		Grade, N/mm^2 (kgs/mm^2)			
			1770 (180)		1960 (200)	
			Breaking force, kN, no less			
			The total of all wires in the rope	Rope as a whole	The total of all wires in the rope	Rope as a whole
22,0	1980,0	2130,0	398,5	305,0	441,3	337,7
25,0	2540,0	2730,0	509,6	393,8	564,3	436,1
26,0	5750,0	2960,0	552,6	426,0	611,9	471,7
28,0	3090,0	3320,0	620,6	494,0	687,3	547,0
29,0	3350,0	3600,0	673,3	529,9	745,9	586,8
30,0	3640,0	3910,0	731,5	567,1	810,0	628,0
32,0	4040,0	4340,0	811,7	645,2	898,9	714,5
35,0	4850,0	5210,0	974,4	771,9	1079,0	854,8
38,0	5790,0	6230,0	1164,1	909,9	1289,1	1007,6

Constructional features:
Ropes are manufactured with metal core (IWRC). Version 2 – ropes are manufactured with polymer coated metal core (EPIWRC).

Technical specifications for wire ropes Standard API 9A

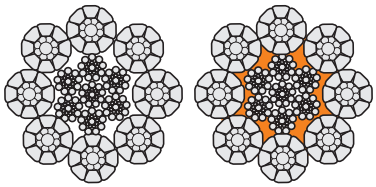


Construction:
8x17(1+8+8)+6x19(1+9+9)+1x19(1+9+9)
8x17S-IWRC; 8x17S-EPIWRC

For well drilling units

Diameter, mm	Approximate weight of 1000 m rope, kg		Grade, N/mm^2 (kgs/mm^2)			
			1770 (180)		1960 (200)	
			Breaking force, kN, no less			
			The total of all wires in the rope	Rope as a whole	The total of all wires in the rope	Rope as a whole
22,0	1990,0	2140,0	402,3	305,0	445,5	337,7
25,0	2460,0	2640,0	495,3	393,8	548,4	436,1
26,0	2690,0	2890,0	541,1	426,0	599,2	471,7
28,0	3020,0	3250,0	608,0	494,0	673,3	547,0
29,0	3250,0	3490,0	653,2	529,9	723,3	586,8
30,0	3580,0	3850,0	720,9	567,1	798,3	628,0
32,0	4030,0	4330,0	811,5	645,2	898,6	714,5
35,0	4930,0	5300,0	991,1	771,9	—	—
38,0	5570,0	5990,0	1120,5	909,9	—	—

Constructional features:
Ropes are manufactured with metal core (IWRC). Version 2 – ropes are manufactured with polymer coated metal core (EPIWRC).

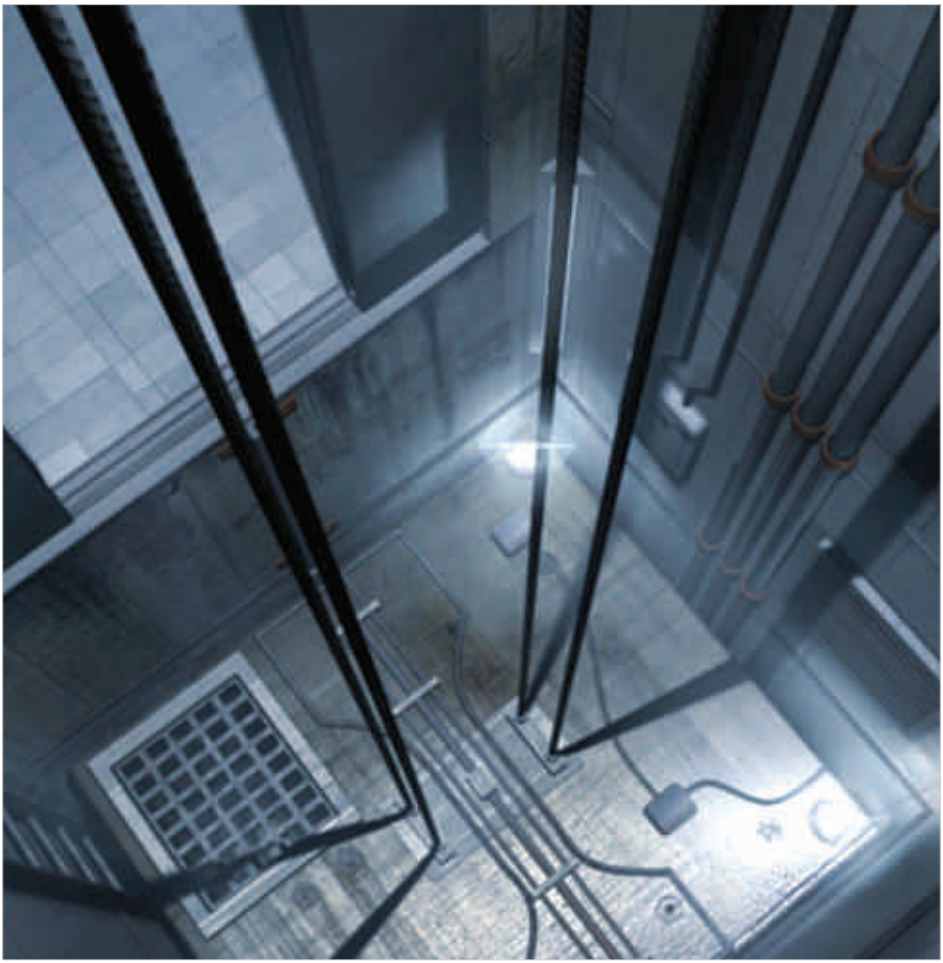


Construction:
8x17(1+8+8)+6x19(1+9+9)+1x19(1+9+9)
8xK17S-IWRC; 8xK17S-EPIWRC

For well drilling units

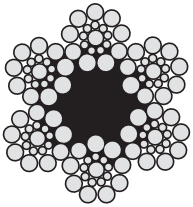
Diameter, mm	Approximate weight of 1000 m rope, kg		Grade, N/mm^2 (kgs/mm^2)			
			1770 (180)		1960 (200)	
			Breaking force, kN, no less			
			The total of all wires in the rope	Rope as a whole	The total of all wires in the rope	Rope as a whole
22,0	2120,0	2280,0	427,8	342,24	473,7	378,96
25,0	2590,0	2780,0	523,4	418,72	579,6	463,68
26,0	2830,0	3040,0	570,3	456,24	631,5	505,2
28,0	3250,0	3490,0	654,3	523,44	724,5	579,6
29,0	3480,0	3740,0	700,4	560,32	775,5	620,4
30,0	3830,0	4120,0	771,3	617,04	854,1	683,28
32,0	4210,0	4530,0	846,8	677,44	937,7	750,16
35,0	5190,0	5580,0	1045,2	836,16	—	—
38,0	5750,0	6180,0	1155,9	924,72	—	—

Constructional features:
Ropes are manufactured with compacted strands of an external winding (K) and metal core (IWRC). Version 2 – ropes are manufactured with compacted strands of an external winding (K) and polymer coated metal core (EPIWRC).



SPECIAL ROPES FOR LIFTS

Stranded ropes for general lifting purposes
DIN EN 12385 class of ropes 6x19

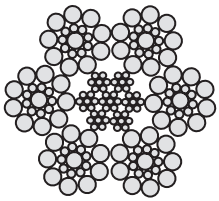


Construction:
6x19(1+9+9)+1 fiber core
6x19S-FC

For lifts

Diameter, mm	Approximate weight of 1000 m rope, kg	Grade, N/mm^2(kgs/mm^2)			
		1770 (180)		1960(200)	
		Breaking force, kN, not less			
		The total of all wires in the rope	Rope as a whole	The total of all wires in the rope	Rope as a whole
4,9	86,2	17,3	14,0	19,2	15,5
12,5	561,0	107,9	91,3	119,4	109,9
18,5	1230,0	247,2	199,9	273,8	221,4
26,0	2430,0	489,2	395,0	541,7	437,0

Ropes can be manufactured of other grades wire.
Ropes, breaking force of which is shown to the left of bold line are manufactured of uncoated and galvanized wire, those to the right of bold line are manufactured of uncoated wire.



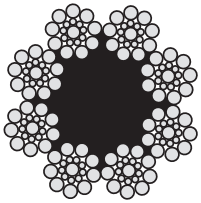
Construction:
6x19(1+9+9)+6x7(1+6)+1x7(1+6)
6x19S-IWRC

For lifts

Diameter, mm	Approximate weight of 1000 m rope, kg	Grade, N/mm^2(kgs/mm^2)			
		1770 (180)		1960(200)	
		Breaking force, kN, not less			
		The total of all wires in the rope	Rope as a whole	The total of all wires in the rope	Rope as a whole
8,0	256,0	50,5	40,3	56,0	44,7
9,0	324,0	65,1	51,0	72,1	56,5
10,0	400,0	77,2	63,0	85,5	69,8
12,0	576,0	111,7	90,7	123,7	100,0
18,0	1300,0	258,5	204,0	286,3	226,0
20,0	1600,0	326,9	252,0	362,0	279,0
24,0	2300,0	450,4	363,0	498,7	402,0
26,0	2700,0	529,3	426,0	586,1	472,0
29,0	3364,0	650,9	529,9	720,7	586,8
30,0	3600,0	709,0	567,1	-	-
31,5	3970,0	769,4	625,2	-	-
32,0	4100,0	808,5	645,0	-	-

Ropes can be manufactured of other grades wire.
Ropes, breaking force of which is shown to the left of bold line are manufactured of uncoated and galvanized wire, those to the right of bold line are manufactured of uncoated wire.

Stranded ropes for general lifting purposes
DIN 3062 8x19S-FC



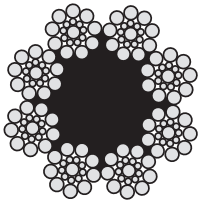
Construction:
8x19(1+9+9)+1 fiber core
8x19S-FC

For lifts

Diameter, mm	Approximate weight of 1000 m rope, kg	Grade, N/mm^2(kgs/mm^2)			
		1570 (160)		1770(180)	
		Breaking force, kN, not less			
		The total of all wires in the rope	Rope as a whole	The total of all wires in the rope	Rope as a whole
6,0	130,0	21,9	18,4	24,7	20,7
6,4	135,0	23,2	19,5	26,2	22,0
8,0	220,0	37,4	31,4	42,2	35,4
9,0	290,0	49,0	41,2	55,2	46,4
10,0	348,0	59,4	45,1	67,0	50,8
11,0	422,0	72,2	54,5	81,4	61,5
12,0	502,0	85,7	64,9	96,6	73,2
13,0	589,0	132,4	76,1	149,2	85,9
15,0	784,0	129,6	101,0	146,1	114,0
16,0	892,0	153,6	115,0	173,2	130,0
18,0	1130,0	180,2	146,0	203,2	165,0

Ropes can be manufactured of other grades wire.

Stranded ropes for general lifting purposes
DIN 3062 8x19S-FC

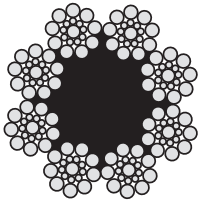


Construction:
8x19(1+9+9)+1 fiber core
8x19S-FC

For lifts

Diameter, mm	Approximate weight of 1000 m rope, kg	The total breaking force of all wire in therope, kN	Breaking force of rope as a whole, kN
8,0	226,0	35,6	27,8
10,0	348,0	56,5	44,6
12,0	502,0	81,3	63,5

Ropes are manufactured using two strength grades of 1770/1370:
- inner wires of strand with tensile strength of 1770 N/mm^2
- outer wires of strand with tensile strength of 1370 N/mm^2

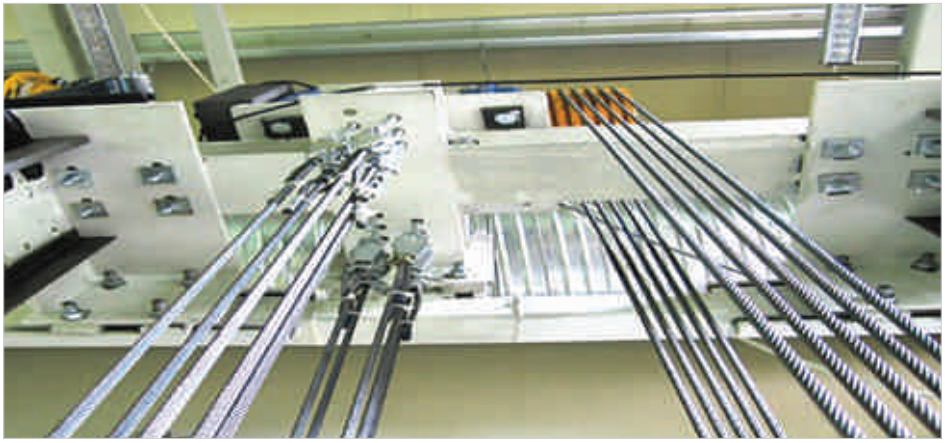


Construction:
8x19(1+9+9)+1 fiber core
8x19S-FC

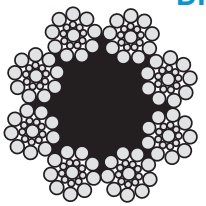
For lifts

Diameter, mm	Approximate weight of 1000 m rope, kg	The total breaking force of all wire in therope, kN	Breaking force of rope as a whole, kN
8,0	226,0	38,0	31,9
10,0	348,0	60,3	50,6
12,0	502,0	86,9	73,0

Ropes are manufactured using three strength grades of 1370/1770/1570:
- central wire with tensile strength of 1370 N/mm^2
- inner wires of strand with tensile strength of 1770 N/mm^2
- outer wires of strand with tensile strength of 1370 N/mm^2



Ropes layed of strands for lifts
DIN EN 12385 class of ropes 8x19S-FC

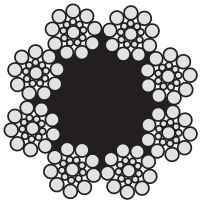


Construction:
8x19(1+9+9)+1 fiber core
8x19S-FC

For lifts

Diameter, mm	Approximate weight of 1000 m rope, kg	Grade, N/mm^2(kgs/mm^2)			
		1570 (160)		1770 (180)	
		Breaking force, kN, not less			
		The total of all wires in the rope	Rope as a whole	The total of all wires in the rope	Rope as a whole
8,0	218,0	37,4	29,4	42,2	33,2
10,0	340,0	59,4	46,0	67,0	51,9

Note: Ropes can be manufactured of other wire grades.

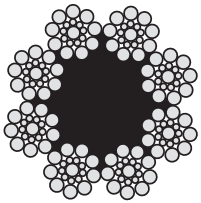


Construction:
8x19(1+9+9)+1 fiber core
8x19S-FC

For lifts

Diameter, mm	Approximate weight of 1000 m rope, kg	Grade, N/mm^2(kgs/mm^2)					
		1570 (160)		1770 (180)		1570/1770 (160/180)	
		Breaking force, kN, not less					
		The total of all wires in the rope	Rope as a whole	The total of all wires in the rope	Rope as a whole	The total of all wires in the rope	Rope as a whole
12,0	490,0	83,7	66,2	94,3	74,7	87,1	69,0

Note: Ropes can be manufactured using strength grades of 1570/1770/1570 and of other grades wire.
Also ropes are manufactured using two strength grades of 1570/1770:
- inner wires of strand with tensile strength of 1770 N/mm^2
- outer wires of strand with tensile strength of 1570 N/mm^2



Construction:
8x19(1+9+9)+1 fiber core
8x19S-FC

For lifts

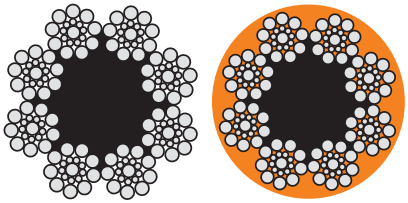
Diameter, mm	Approximate weight of 1000 m rope, kg	Grade, N/mm^2(kgs/mm^2)	
		1370/1770 (140/180)	
		Breaking force, kN, not less	
		The total of all wires in the rope	Rope as a whole
16,0	870,0	145,7	113,0

Note: Ropes are manufactured using 2 strength grades of 1370/1770:
- inner wires of strand with tensile strength of 1770 N/mm^2
- outer wires of strand with tensile strength of 1370 N/mm^2

Steel ropes with the fiber and metal core of various versions
Constructions: 8x19(1+9+9) and 8x19(1+6+6/6)
TU 25.93.11-147-00187263-2020

Eight strand steel ropes are manufactured with the fiber and metal core without compacting strands, with compacted of the outer strands (PK) of the following constructions:

- 8x19(1+9+9)+1 fiber core;
- 8x19(1+9+9)+6x7(1+6)+1x7(1+6);
- 8x19(1+6+6/6)+1 o.c.;
- 8x19(1+6+6/6)+6x7(1+6)+1x7(1+6).



Construction:
8x19(1+9+9)+1 fiber core

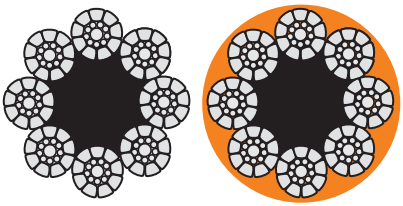
For lifts

Steel ropes of 8x19(1+9+9)+1 fiber core construction are manufactured in the following versions:
- without polymer coating with the fiber core (Version 1);
-with polymer coating of the rope as a whole with the fiber core (Version 4).

Rope diameter, mm	Estimated weight of 1000 m rope, kg		Version 1			Version 4		
			Marking group, N/mm^2					
			1770	1860	1960	1770	1860	1960
	Ver. 1	Ver. 4	Breaking force, kN, no less					
1	2	3	4	5	6	7	8	9
20	1590	1710	210	221	233	209	219	231
22	1650	1770	255	268	282	253	266	280
24	1960	2100	304	319	336	301	316	333
26	2300	2470	357	375	395	354	372	391
28	2670	2870	413	435	458	410	431	454
30	3060	3290	474	499	525	470	494	521
32	3480	3740	539	567	597	535	562	592
34	3930	4230	610	641	675	604	635	669
36	4410	4740	683	717	-	677	711	-
38	4910	5280	762	801	-	755	794	-
40	5440	5850	843	886	-	836	878	-
42	6000	6450	930	-	-	922	-	-
44	6580	7070	1016	-	-	1007	-	-
46	7194	7740	1114	-	-	1105	-	-
48	7830	8420	1219	-	-	1209	-	-
50	8500	9140	1321	-	-	1309	-	-
52	9190	9880	1422	-	-	1410	-	-

Notes

1. Production of other marking groups is allowed.
2. Production of other diameters is allowed
3. Ropes, the breaking force of which is given to the left of the fat line, are manufactured of uncoated and galvanized wire, to the right of the fat line of uncoated wire.



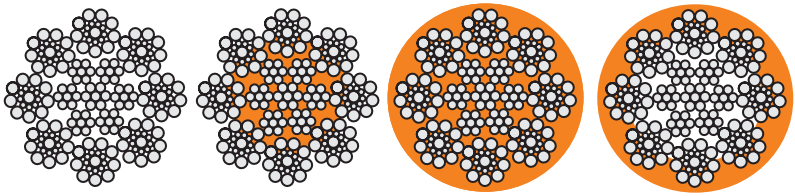
Construction:
8x19(1+9+9)+1 fiber core
with compacted of the outer strands (PK)

For lifts

Steel rope of 8x19(1+9+9)+1 fiber core construction with compacted outer strands (PK) are manufactured in the following versions:
-without polymer coating with the fiber core (Version 1);
- with polymer coating of the rope as a whole with the fiber core (Version 4).

Rope diameter, mm	Estimated weight of 1000 m rope, kg		Version 1			Version 4		
			Marking group, N/mm^2					
			1770	1860	1960	1770	1860	1960
	Ver. 1	Ver. 4	Breaking force, kN, no less					
20	1610	1740	213	224	236	209	220	232
22	1670	1800	257	271	285	254	266	281
24	1990	2140	306	322	339	302	317	335
26	2330	2510	360	378	398	355	373	393
28	2710	2910	417	438	462	411	432	455
30	3110	3340	479	503	530	472	496	522
32	3530	3800	545	572	603	536	564	594
34	3990	4290	615	646	681	606	637	671
36	4470	4810	689	724	-	679	713	-
38	4980	5360	768	807	-	758	796	-
40	5520	5940	851	-	-	838	881	-
42	6090	6540	938	-	-	924	-	-
44	6680	7180	1029	-	-	1010	-	-
46	7300	7850	1125	-	-	1108	-	-
48	7950	8540	1225	-	-	1212	-	-
50	8620	9270	1329	-	-	1313	-	-
52	9330	10020	1438	-	-	1414	-	-

Notes
1. Production of other marking groups is allowed.
2. Production of other diameters is allowed.
3. Ropes, the breaking force of which is given to the left of the fat line, are manufactured of uncoated and galvanized wire, to the right of the fat line of uncoated wire.



Construction:
8x19(1+9+9)+6x7(1+6)+1x7(1+6)

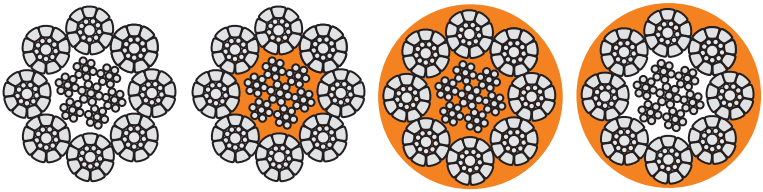
For lifts

Steel rope of 8x19(1+9+9)+6x7(1+6)+1x7(1+6) construction are manufactured in the following versions:
- without polymer coating with the metal core (Version 1);
- with polymer coating of the metal core (Version 2);
- with polymer coating of the metal core and the rope as a whole (Version 3);
- with polymer coating of the rope as a whole with the metal core (Version 4).

Rope diameter, mm	Estimated weight of 1000 m rope, kg				Version 1			Version 2			Version 3			Version 4		
					Marking group, N/mm^2											
					1770	1860	1960	1770	1860	1960	1770	1860	1960	1770	1860	1960
	Ver. 1	Ver. 2	Ver. 3	Ver. 4	Breaking force, kN, no less											
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
20	1630	-	-	1940	254	267	281	-	-	-	-	-	-	254	267	281
22	1970	2130	2100	2100	307	323	340	307	323	340	307	323	340	307	323	340
24	2340	2500	2350	2350	366	384	405	366	384	405	366	384	405	366	384	405
26	2750	2850	2700	2700	429	451	475	429	451	475	429	451	475	429	451	475
28	3190	3240	3200	3200	498	523	551	498	523	551	498	523	551	498	523	551
30	3660	3700	3580	3580	571	600	633	571	600	633	571	600	632	571	600	632
32	4170	4240	4050	4050	650	683	720	650	683	720	650	683	719	650	683	719
34	4705	4750	4630	4630	734	771	812	734	771	812	733	770	812	733	770	812
36	5270	5220	5250	5250	823	865	912	823	865	912	823	865	911	823	865	911
38	5877	6000	5800	5800	917	964	-	917	964	-	916	963	-	916	963	-
40	6510	6550	6550	6550	1018	1069	-	1018	1069	-	1017	1069	-	1017	1069	-
42	7180	7340	7280	7280	1120	1177	-	1120	1177	-	1120	1177	-	1120	1177	-
44	7880	8080	7950	7950	1229	-	-	1229	-	-	1229	-	-	1229	-	-
46	8612	8950	8540	8540	1343	-	-	1343	-	-	1342	-	-	1342	-	-
48	9380	9690	9350	9350	1461	-	-	1461	-	-	1460	-	-	1460	-	-
50	10175	10550	10180	10180	1587	-	-	1587	-	-	1586	-	-	1586	-	-
52	11000	11340	11100	11100	1713	-	-	1713	-	-	1712	-	-	1712	-	-

Notes

1. Production of other marking groups is allowed.
2. Production of other diameters is allowed
3. Ropes, the breaking force of which is given to the left of the fat line, are manufactured of uncoated and galvanized wire, to the right of the fat line of uncoated wire.



Construction:

8x19(1+9+9)+ 6x7(1+6)+1x7(1+6)
with compacted of the outer strands (PK)

For lifts

Steel rope of 8x19(1+9+9)+6x7(1+6)+1x7(1+6) construction with compacted outer strands (PK) are manufactured in the following versions:

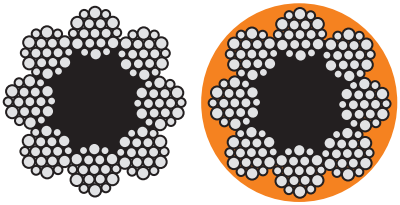
- without polymer coating with the metal core (Version 1);
- with polymer coating of the metal core (Version 2);
- with polymer coating of the metal core and the rope as a whole (Version 3);
- with polymer coating of the rope as a whole with the metal core (Version 4).

Rope diameter, mm	Estimated weight of 1000 m rope, kg				Version 1			Version 2			Version 3			Version 4		
					Marking group, N/mm^2											
					1770	1860	1960	1770	1860	1960	1770	1860	1960	1770	1860	1960
	Ver. 1	Ver. 2	Ver. 3	Ver. 4	Breaking force, kN, no less											
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
20	1650	-	-	1790	257	269	284	-	-	-	-	-	-	255	268	282
22	1980	2130	2280	2180	312	327	345	312	327	345	308	324	342	308	324	342
24	2450	2630	2810	2700	368	387	408	368	387	408	367	386	406	367	386	406
26	2800	3010	3220	3090	439	461	486	439	461	486	431	453	477	431	453	477
28	3300	3550	3800	3640	515	541	570	515	541	570	499	525	553	499	525	553
30	3800	4090	4380	4190	578	608	640	578	608	640	573	602	635	573	602	635
32	4360	4690	5020	4810	654	687	724	654	687	724	652	685	722	652	685	722
34	4840	5200	5560	5330	740	778	820	740	778	820	736	773	815	736	773	815
36	5480	5890	6300	6040	844	887	-	844	887	-	820	861	-	820	861	-
38	6170	6630	7100	6800	954	1002	-	954	1002	-	927	974	-	927	974	-

Rope diameter, mm	Estimated weight of 1000 m rope, kg				Version 1			Version 2			Version 3			Version 4		
					Marking group, N/mm^2											
					1770	1860	1960	1770	1860	1960	1770	1860	1960	1770	1860	1960
	Ver. 1	Ver. 2	Ver. 3	Ver. 4	Breaking force, kN, no less											
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
40	6900	7420	7940	7610	1071	-	-	1071	-	-	1040	-	-	1040	-	-
42	7600	8180	8750	8390	1154	-	-	1154	-	-	1121	-	-	1121	-	-
44	8290	8910	9530	9130	1266	-	-	1266	-	-	1230	-	-	1230	-	-
46	9030	9710	10390	9950	1373	-	-	1373	-	-	1334	-	-	1334	-	-
48	9930	10680	11430	10950	1514	-	-	1514	-	-	1470	-	-	1470	-	-
50	10760	11570	12380	11860	1648	-	-	1648	-	-	1601	-	-	1601	-	-
52	11590	12460	13330	12780	1788	-	-	1788	-	-	1737	-	-	1737	-	-

Notes

1. Production of other marking groups is allowed.
2. Production of other diameters is allowed
3. Ropes, the breaking force of which is given to the left of the fat line, are manufactured of uncoated and galvanized wire, to the right of the fat line of uncoated wire.



Construction:
8x19(1+6+6/6)+1 fiber core

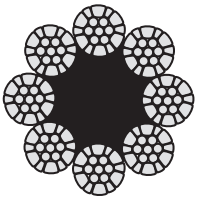
For lifts

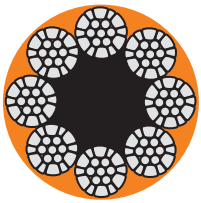
Steel rope of 8x19(1+6+6/6)+1 fiber core construction are manufactured in the following versions:
- without polymer coating with the fiber core (Version 1);
- with polymer coating of the rope as a whole with the fiber core (Version 4).

Rope diameter, mm	Estimated weight of 1000 m rope, kg		Version 1			Version 4		
			Marking group, N/mm^2					
			1770	1860	1960	1770	1860	1960
	Ver. 1	Ver. 4	Breaking force, kN, no less					
1	2	3	4	5	6	7	8	9
20	1317	1215	211	222	234	-	-	-
22	1602	1448	257	270	285	-	-	-
24	1879	1728	301	317	334	-	-	-
26	2208	2102	355	373	393	-	-	-
28	2598	2446	417	438	462	-	-	-
30	2954	2951	474	498	525	-	-	-
32	3387	3271	544	571	602	-	-	-
34	3772	3658	605	636	670	-	-	-
36	4252	4068	682	717	755	-	-	-
38	4681	4499	751	790	832	-	-	-
40	5285	5295	848	892	939	814	855	901
42	5785	5814	928	976	1028	894	939	990
44	6286	6297	1009	1060	1117	968	1017	1072
46	7004	7237	1124	1181	-	1113	1169	-
48	7481	7840	1201	1262	-	1200	1267	-
50	8265	8434	1326	1394	-	1297	-	-
52	8742	9273	1403	-	-	1400	-	-

Notes

1. Production of other marking groups is allowed.
2. Production of other diameters is allowed.
3. Ropes, the breaking force of which is given to the left of the fat line, are manufactured of uncoated and galvanized wire, to the right of the fat line of uncoated wire.





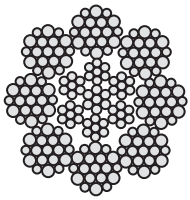
Construction:
8x19(1+6+6/6)+1 fiber core
with compacted of the outer strands (PK)

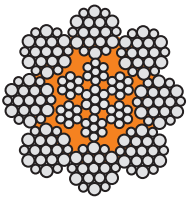
For lifts

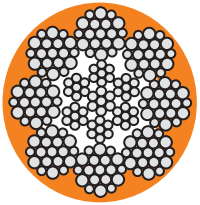
Steel rope of 8x19(1+6+6/6)+1 fiber core construction with compacted outer strands (PK) are manufactured in the following versions:
-without polymer coating with the fiber core (Version 1);
- with polymer coating of the rope as a whole with the fiber core (Version 4).

Rope diameter, mm	Estimated weight of 1000 m rope, kg		Version 1			Version 4		
			Marking group, N/mm^2					
			1770	1860	1960	1770	1860	1960
	Ver. 1	Ver. 4	Breaking force, kN, no less					
1	2	3	4	5	6	7	8	9
20	1332	1340	215	226	238	-	-	-
22	1711	1593	275	289	305	-	-	-
24	1953	1926	314	330	348	301	316	333
26	2299	2343	370	389	410	367	385	406
28	2689	2696	433	455	479	421	443	467
30	3093	3050	498	523	552	477	502	528
32	3531	3559	569	598	630	557	585	617
34	3926	3964	633	665	701	620	651	686
36	4382	4481	706	741	781	701	737	776
38	4957	4947	799	839	884	774	813	857
40	5299	5378	854	897	945	841	884	932
42	5929	6272	955	1004	1058	932	979	1032
44	6579	6858	1060	1114	-	1021	1073	-
46	7205	7317	1162	1221	-	1146	1204	-
48	7842	7992	1264	1328	-	1251	1315	-
50	8305	8746	1338	-	-	1329	-	-
52	9197	9391	1482	-	-	1469	-	-

Notes
1. Production of other marking groups is allowed.
2. Production of other diameters is allowed.
3. Ropes, the breaking force of which is given to the left of the fat line, are manufactured of uncoated and galvanized wire, to the right of the fat line of uncoated wire.







Construction:
8x19(1+6+6/6)+6x7(1+6)+1x7(1+6)

For lifts

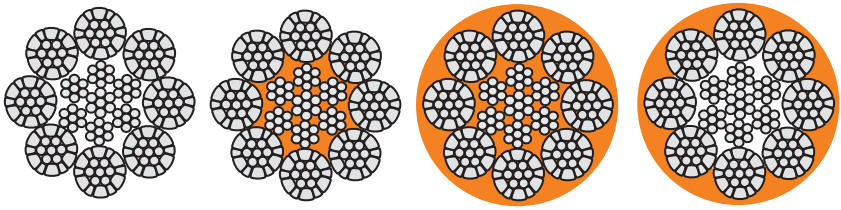
Steel rope of 8x19(1+6+6/6)+6x7(1+6)+1x7(1+6) construction are manufactured in the following versions:
- without polymer coating with the metal core (Version 1);
- with polymer coating of the metal core (Version 2);

- with polymer coating of the metal core and the rope as a whole (Version 3);
- with polymer coating of the rope as a whole with the metal core (Version 4).

Rope diameter, mm	Estimated weight of 1000 m rope, kg				Version 1			Version 2			Version 3			Version 4		
					Marking group, N/mm^2											
					1770	1860	1960	1770	1860	1960	1770	1860	1960	1770	1860	1960
	Ver. 1	Ver. 2	Ver. 3	Ver. 4	Breaking force, kN, no less											
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
20	1630	-	-	1960	256	269	283	-	-	-	-	-	-	255	268	283
22	1970	2130	2100	2100	310	325	343	310	325	343	309	325	342	309	325	342
24	2340	2500	2530	2530	368	387	408	368	387	408	368	387	407	368	387	407
26	2750	2850	2900	2900	432	454	479	432	454	479	432	454	478	432	454	478
28	3190	3240	3320	3320	501	527	555	501	527	555	501	526	554	501	526	554
30	3663	3700	3800	3800	575	605	637	575	605	637	575	604	636	575	604	636
32	4170	4240	4300	4300	655	688	725	655	688	725	654	687	724	654	687	724
34	4705	4750	4860	4860	739	776	818	739	776	818	738	775	817	738	775	817
36	5270	5220	5450	5450	829	871	918	829	871	918	828	870	917	828	870	917
38	5877	6000	6180	6180	923	970	1023	923	970	1023	922	969	1021	922	969	1021
40	6510	6550	6800	6800	1025	1077	1135	1025	1077	1135	1024	1076	1134	1024	1076	1134
42	7180	7340	7650	7650	1128	1186	-	1128	1186	-	1127	1184	-	1127	1184	-
44	7880	8080	8350	8350	1238	1301	-	1238	1301	-	1237	1299	-	1237	1299	-
46	8612	8950	9360	9360	1353	1422	-	1353	1422	-	1351	1420	-	1351	1420	-
48	9380	9690	10100	10100	1471	1546	-	1471	1546	-	1470	1544	-	1470	1544	-
50	10175	10550	10800	10800	1598	-	-	1598	-	-	1596	-	-	1596	-	-
52	11000	11340	11640	11640	1725	-	-	1725	-	-	1723	-	-	1723	-	-
54	11868	12390	12720	12720	1864	-	-	1864	-	-	1862	-	-	1862	-	-
56	12800	13430	13780	13780	2009	-	-	2009	-	-	2007	-	-	2007	-	-
58	13692	14280	14550	14550	2151	-	-	2151	-	-	2149	-	-	2149	-	-

Notes

1. Production of other marking groups is allowed.
2. Production of other diameters is allowed.
3. Ropes, the breaking force of which is given to the left of the fat line, are manufactured of uncoated and galvanized wire, to the right of the fat line of uncoated wire.



Construction:

8x19(1+6+6/6)+ 6x7(1+6)+1x7(1+6)
with compacted of the outer strands (PK)

For lifts

Steel rope of 8x19(1+6+6/6)+6x7(1+6)+1x7(1+6) construction with compacted outer strands (PK) are manufactured in the following versions:

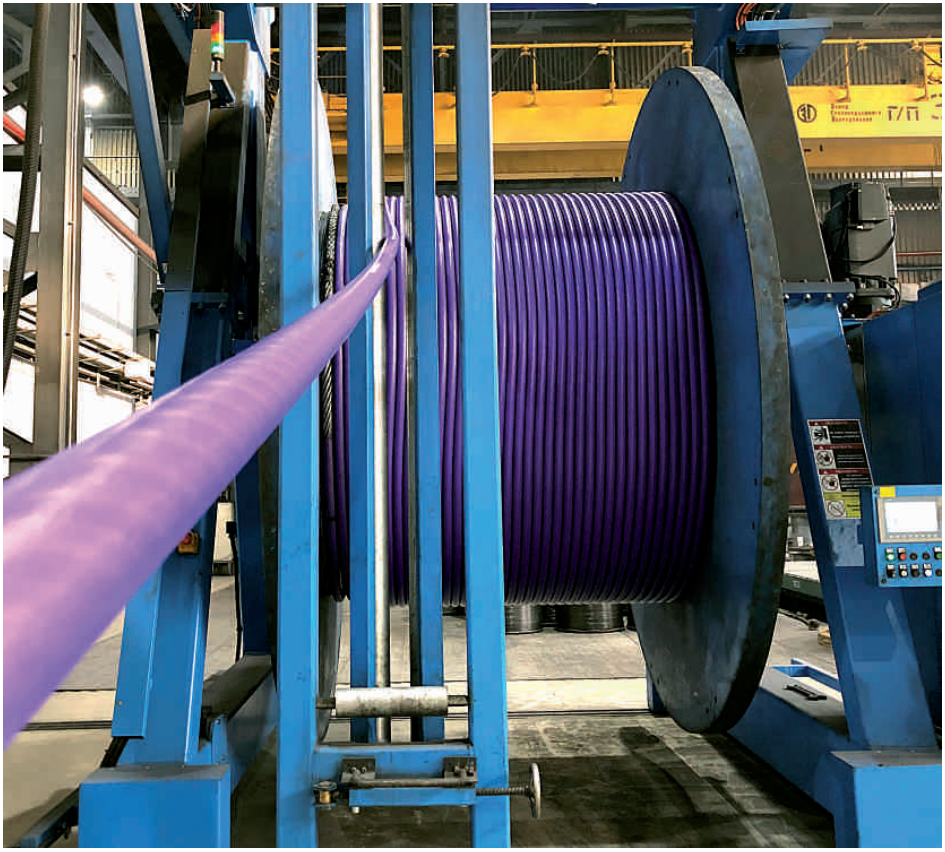
- without polymer coating with the metal core (Version 1);
- with polymer coating of the metal core (Version 2);
- with polymer coating of the metal core and the rope as a whole (Version 3);
- with polymer coating of the rope as a whole with the metal core (Version 4).

Rope diameter, mm	Estimated weight of 1000 m rope, kg				Version 1			Version 2			Version 3			Version 4		
					Marking group, N/mm^2											
					1770	1860	1960	1770	1860	1960	1770	1860	1960	1770	1860	1960
	Ver. 1	Ver. 2	Ver. 3	Ver. 4	Breaking force, kN, no less											
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
20	1680	-	-	1830	267	279	296	-	-	-	-	-	-	258	271	285
22	1900	2040	2180	2060	312	328	344	312	328	344	312	328	345	312	328	345
24	2280	2440	2580	2480	372	391	412	372	391	412	371	390	411	371	390	411
26	2690	2880	2960	2920	435	457	482	435	457	482	435	458	482	435	458	482

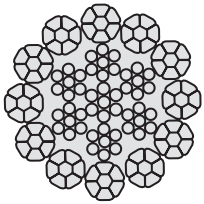
Rope diameter, mm	Estimated weight of 1000 m rope, kg				Version 1			Version 2			Version 3			Version 4		
					Marking group, N/mm^2											
					1770	1860	1960	1770	1860	1960	1770	1860	1960	1770	1860	1960
	Ver. 1	Ver. 2	Ver. 3	Ver. 4	Breaking force, kN, no less											
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
28	3120	3390	3410	3390	508	534	561	508	534	561	505	531	559	505	531	559
30	3610	3870	3990	3920	582	612	643	582	612	643	579	609	642	579	609	642
32	3980	4260	4380	4330	662	696	731	662	696	731	659	693	730	659	693	730
34	4630	4970	5110	5040	747	785	825	747	785	825	744	782	824	744	782	824
36	5140	5500	5470	5580	838	881	926	838	881	926	835	877	925	835	877	925
38	5780	6190	6290	6270	940	987	1038	940	987	1038	930	977	1030	930	977	1030
40	6340	6790	6900	6880	1048	1100	1162	1048	1100	1162	1032	1085	1143	1032	1085	1143
42	7100	7600	7850	7710	1141	1199	-	1141	1199	-	1137	1194	-	1137	1194	-
44	7820	8370	8560	8490	1252	1316	-	1252	1316	-	1247	1310	-	1247	1310	-
46	8530	9140	9380	9260	1366	1435	-	1366	1435	-	1362	1432	-	1362	1432	-
48	9290	9940	10220	10080	1488	1564	-	1488	1564	-	1482	1557	-	1482	1557	-
50	10060	10770	11080	10920	1614	-	-	1614	-	-	1610	-	-	1610	-	-
52	10890	11660	11970	11830	1753	-	-	1753	-	-	1737	-	-	1737	-	-
54	11700	12530	12810	12690	1891	-	-	1891	-	-	1878	-	-	1878	-	-
56	12680	13570	13950	13760	2032	-	-	2032	-	-	2024	-	-	2024	-	-
58	13100	14040	14680	14220	2160	-	-	2160	-	-	2154	-	-	2154	-	-

Notes

1. Production of other marking groups is allowed.
2. Production of other diameters is allowed.
3. Ropes, the breaking force of which is given to the left of the fat line, are manufactured of uncoated and galvanized wire, to the right of the fat line of uncoated wire.



SPECIAL ROPES FOR CRANES AND OTHER LIFTING MECHANISMS



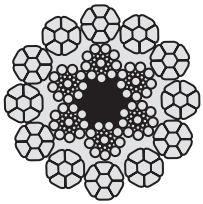
TU 14-173-030-2015

Construction:
12x7(1+6)+6x7(1+6)+1x7(1+6)

For lifting mechanisms

Diameter, mm	Approximate weight of 1000 m rope, kg	Grade, N/mm² (kgs/mm²)									
		1570 (160)		1670 (170)		1770 (180)		1860 (190)		1960 (200)	
		Breaking force, kN, no less									
		The total of all wires in the rope	Rope as a whole	The total of all wires in the rope	Rope as a whole	The total of all wires in the rope	Rope as a whole	The total of all wires in the rope	Rope as a whole	The total of all wires in the rope	Rope as a whole
8,0	291,0	51,5	41,2	54,7	43,7	58,0	46,4	61,0	48,8	64,2	51,4
10,0	451,3	79,8	63,8	84,9	67,9	90,0	72,0	94,5	75,6	99,6	79,7
12,0	625,0	110,4	88,3	117,5	94,0	124,5	99,6	130,8	104,6	137,9	110,3
14,0	850,0	149,6	119,7	159,1	127,3	168,7	135,0	177,2	141,8	186,8	149,4
15,0	980,0	172,6	138,1	183,5	146,8	194,5	155,6	204,4	163,5	215,4	172,3
16,0	1110,0	196,3	157,0	208,8	167,0	221,3	177,0	232,6	186,1	245,1	196,0
18,0	1390,0	246,5	197,2	262,2	209,8	277,9	222,3	292,1	233,7	307,8	246,2
19,0	1529,0	270,3	216,2	287,5	230,0	304,7	243,8	320,2	256,2	337,4	270,0
20,0	1757,0	310,7	248,6	330,4	264,3	350,2	280,2	368,1	294,4	387,8	310,2
22,0	2050,0	362,4	289,9	385,4	308,3	408,5	326,8	429,3	343,4	452,4	362,0
24,0	2462,0	435,2	348,2	463,0	370,4	490,7	392,6	515,6	412,5	543,4	434,7

Steel ropes of 12x7(1+6)+6x7(1+6)+7(1+6) construction with compacted strands.



TU 14-173-110-2012 Version 1

Construction:
12x7(1+6)+6x19(1+9+9)+1 fiber core

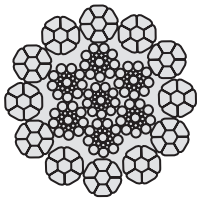
For lifting mechanisms

Diameter, mm	Approximate weight of 1000 m rope, kg	Grade, N/mm² (kgs/mm²)									
		1570 (160)		1670 (170)		1770 (180)		1860 (190)		1960 (200)	
		Breaking force, kN, no less									
		The total of all wires in the rope	Rope as a whole	The total of all wires in the rope	Rope as a whole	The total of all wires in the rope	Rope as a whole	The total of all wires in the rope	Rope as a whole	The total of all wires in the rope	Rope as a whole
8,0	234,0	42,8	34,2	45,5	36,4	48,3	38,6	50,7	40,6	53,5	42,8
10,0	378,0	69,2	55,4	73,6	58,9	78,1	62,4	82,0	65,6	86,4	69,1
13,0	643,0	118,1	94,4	125,6	100,5	133,1	106,5	139,9	111,9	147,4	117,9
14,0	735,0	134,7	107,7	143,3	114,6	151,8	121,5	159,6	127,6	168,1	134,5
15,0	825,0	151,6	121,3	161,2	129,0	170,9	136,7	179,6	143,7	189,2	151,4
16,0	925,0	169,4	135,5	180,2	144,2	191,0	152,8	200,7	160,6	211,5	169,2
18,0	1210,0	219,2	175,4	233,2	186,5	247,1	197,7	259,7	207,8	273,7	218,9
19,0	1320,0	242,0	193,6	257,4	205,9	272,8	218,3	286,7	229,4	302,1	241,7
21,0	1640,0	300,9	240,7	320,1	256,0	339,2	271,4	356,5	285,2	375,7	300,5
23,5	2040,0	375,2	300,1	399,1	319,3	423,0	338,4	444,5	355,6	468,4	374,7
25,5	2360,0	433,3	346,6	460,9	368,7	488,5	390,8	513,4	410,7	541,0	432,8
27,0	2685,0	492,9	394,3	524,2	419,4	555,6	444,5	583,9	467,1	615,3	492,2

Steel ropes of version 1 of 12x7(1+6)+6x19(1+9+9)+7(1+6) construction +1 fiber core with compacted strands of the outer layer and with uncompacted strands of core.

Ropes, breaking force of which is shown to the left of bold line are manufactured of uncoated and galvanized wire.

Ropes, breaking force of which is shown to the right of bold line are manufactured of uncoated wire.



TU 14-173-110-2012 Version 1

Construction:

12x7(1+6)+6x19(1+9+9)+1x19(1+9+9)

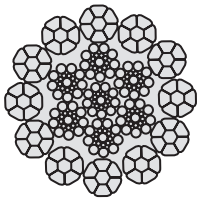
For lifting mechanisms

Diameter, mm	Approximate weight of 1000 m rope, kg	Grade, N/mm^2 (kgs/mm^2)									
		1570 (160)		1670 (170)		1770 (180)		1860 (190)		1960 (200)	
		Breaking force, kN, no less									
		The total of all wires in the rope	Rope as a whole	The total of all wires in the rope	Rope as a whole	The total of all wires in the rope	Rope as a whole	The total of all wires in the rope	Rope as a whole	The total of all wires in the rope	Rope as a whole
8,0	250,0	46,2	36,9	49,1	39,3	52,1	41,7	54,7	43,8	57,7	46,1
10,0	405,0	74,6	59,7	79,3	63,5	84,1	67,3	88,4	70,7	93,1	74,5
12,0	567,5	104,3	83,5	111 ,0	88,8	117,6	94,1	123,6	98,9	130,3	104,2
13,0	690,0	127,4	101,9	135,5	108,4	143,6	114,9	150,9	120,7	159,0	127,2
14,0	790,0	145,1	116,1	154,4	123,5	163,6	130,9	172,0	137,6	181,2	145,0
15,0	890,3	163,6	130,9	174,0	139,2	184,5	147,6	193,8	155,1	204,3	163,4
16,0	995,0	183,3	146,6	195,0	156,0	206,7	165,3	217,2	173,7	228,8	183,1
18,0	1300,0	237,2	189,8	252,3	201,9	267,5	214,0	281,1	224,8	296,2	236,9
19,0	1420,0	261,8	209,4	278,4	222,7	295,1	236,1	310,1	248,1	326,8	261,4
21,0	1770,0	326,1	260,9	346,9	277,5	367,6	294,1	386,3	309,1	407,1	325,7
23,5	2185,0	403,1	322,5	428,8	343,0	454,5	363,6	477,6	382,1	503,3	402,6
25,5	2540,0	468,2	374,6	498,1	398,4	527,9	422,3	554,7	443,8	584,6	467,6
27,0	2875,0	529,8	423,9	563,6	450,9	597,3	477,9	627,7	502,2	661,5	529,2
32,0	4000,0	738,7	591,0	785,8	628,6	832,8	666,3	875,2	700,1	922,2	737,8
34,0	4490,0	827,5	662,0	880,2	704,1	932,2	746,3	980,3	784,2	1033,0	826,4

Steel ropes of version 1 of 12x7(1+6)+6x19(1+9+9)+1x19(1+9+9) construction with compacted strands of the outer layer and with uncompacted strands of core.

Ropes, breaking force of which is shown to the left of bold line are manufactured of uncoated and galvanized wire.

Ropes, breaking force of which is shown to the right of bold line are manufactured of uncoated wire.



TU 14-173-110-2012 Version 2

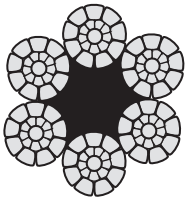
Construction:

12x7(1+6)+6x19(1+9+9)+1x19(1+9+9)

For lifting mechanisms

Diame-ter, mm	Approximate weight of 1000 m rope, kg	Grade, N/mm^2 (kgs/mm^2)									
		1570 (160)		1670 (170)		1770 (180)		1860 (190)		1960 (200)	
		Breaking force, kN, no less									
		The total of all wires in the rope	Rope as a whole	The total of all wires in the rope	Rope as a whole	The total of all wires in the rope	Rope as a whole	The total of all wires in the rope	Rope as a whole	The total of all wires in the rope	Rope as a whole
8,0	300,0	51,89	41,51	55,19	44,15	58,50	49,18	61,47	49,18	64,78	51,82
12,0	636,0	112,57	90,10	119,74	95,80	126,91	101,53	133,36	106,70	140,53	112,42
15,0	990,0	173,80	139,04	184,87	147,90	195,92	156,74	205,90	164,72	216,97	173,58

Ropes with compacted strands of the outer layer and with uncompacted strands of core.



TU 14-173-039-2009

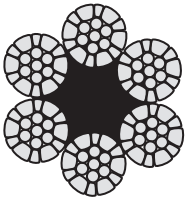
Construction:

6x19(1+9+9)+1 fiber core

For lifting mechanisms

Diameter, mm	Approximate weight of 1000 m rope, kg	Grade, N/mm^2 (kgs/mm^2)							
		1470 (150)		1570 (160)		1670 (170)		1770 (180)	
		Breaking force, kN, no less							
		Breaking force, kN, no less	Rope as a whole	Breaking force, kN, no less	Rope as a whole	Breaking force, kN, no less	Rope as a whole	Breaking force, kN, no less	Rope as a whole
10,5	377,0	62,42	53,06	66,66	56,66	70,91	60,27	75,15	63,88
11,5	493,0	77,73	66,07	83,02	70,57	88,31	75,06	93,60	79,56
12,0	535,0	84,29	71,65	90,02	76,52	95,76	81,40	101,49	86,27
13,0	601,0	94,77	80,55	101,22	86,04	107,66	91,51	114,11	96,99
14,0	726,0	114,41	97,25	122,19	103,86	129,98	110,48	137,76	117,10
15,0	862,5	135,92	115,53	145,16	123,39	154,41	131,25	163,65	139,10
16,5	1004,0	158,32	134,57	168,93	143,59	179,69	152,74	190,63	162,04
17,5	1148,0	180,96	153,82	193,27	164,28	205,58	174,74	217,89	185,21
19,5	1353,0	213,22	181,24	227,73	193,57	242,73	206,32	256,74	218,23
20,5	1567,0	248,28	211,04	265,17	225,39	282,06	239,75	298,95	254,11
30,5	3614,0	603,05	494,50	644,08	528,15	685,10	561,78	726,12	595,42

Steel ropes of 6x19(1+9+9) construction +1 fiber core using compacted strands of the outer layer.



TU 14-173-056-2010

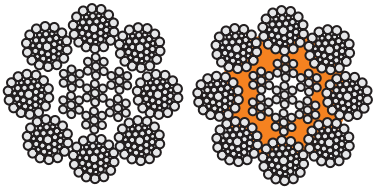
Construction:
6x19(1+6+6/6)+1 fiber core

For lifting mechanisms

Diameter, mm	Approximate weight of 1000 m rope, kg	Grade, N/mm^2 (kgs/mm^2)					
		1570 (160)		1670 (170)		1770 (180)	
		Breaking force, kN, no less					
		Breaking force, kN, no less	Rope as a whole	Breaking force, kN, no less	Rope as a whole	Breaking force, kN, no less	Rope as a whole
11,0	468,30	78,14	66,42	83,12	70,65	88,10	74,89
12,0	533,00	88,89	75,56	94,56	80,38	100,22	85,19
13,0	630,00	109,27	92,88	116,23	98,80	123,19	104,71
14,0	758,00	126,46	107,49	134,52	114,34	142,57	121,18
15,0	872,80	145,62	123,78	154,89	131,66	164,17	139,54
16,5	1051,10	175,37	149,10	186,54	168,10	197,71	168,10
18,0	1287,45	214,81	182,59	228,49	194,22	242,17	205,84
19,5	1436,10	239,60	203,66	254,86	216,63	270,12	229,60
21,0	1703,20	284,17	241,54	302,27	256,93	320,37	272,31
22,5	1873,50	312,59	265,70	332,50	282,63	352,41	299,55
24,0	2090,50	362,75	308,34	385,85	327,97	408,96	347,62
25,5	2521,40	420,68	357,58	447,48	380,36	474,27	403,13

Steel ropes of 6x19(1+6+6/6) construction +1 fiber core with compacted strands of the outer layer.

Stranded ropes for general lifting purposes
DIN EN 12385-4



Construction:
8x36(1+7+7/7+14)+6x7(1+6)+1x7(1+6)
8x36WS-IWRC; 8x36WS-EPIWRC

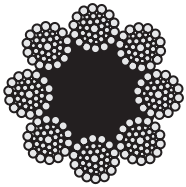
Container, mobile caterpillar, grab, frame, overhead cranes.

Constructional features:
Ropes are manufactured with metal core (IWRC), version 2- with polymer-coated metal core (EPIWRC).

Diameter, mm	Approximate weight of 1000 m rope, kg		Grade, N/mm^2 (kgs/mm^2)			
			1770		1960	
			Breaking force, kN, not less			
	-	Ver. 2	The total of all wires in the rope	Rope as a whole	The total of all wires in the rope	Rope as a whole
14,0	860,0	930,0	172,6	124,0	191,1	137,0
22,0	2020,0	2170,0	401,6	305,0	444,7	338,0
24,0	2400,0	2620,0	450,7	363,0	499,1	402,0
26,0	2820,0	2980,0	539,9	426,0	597,8	472,0
28,0	3270,0	3430,0	624,1	494,0	691,1	547,0
30,0	3753,0	3980,0	734,6	567,1	813,5	628,0
32,0	4270,0	4390,0	847,7	645,0	938,7	715,0
34,0	4821,0	4980,0	960,7	728,4	1063,9	806,6
36,0	5400,0	5650,0	1078,1	817,0	1193,9	904,0
38,0	6021,5	6250,0	1176,1	910,0	1302,3	1010,0
40,0	6670,0	6890,0	1320,0	1010,0	1461,8	1120,0
42,0	7356,0	7480,0	1439,5	1112,0	-	-
44,0	8070,0	8260,0	1582,9	1220,0	-	-
46,0	8824,0	8980,0	1746,7	1333,0	-	-
48,0	9610,0	9790,0	1886,6	1450,0	-	-
50,0	10425,0	10630,0	2028,2	1575,0	-	-
52,0	11300,0	11480,0	2213,0	1700,0	-	-
54,0	12160,0	12310,0	2354,7	1837,0	-	-
56,0	13100,0	13340,0	2553,3	1980,0	-	-
58,0	14028,0	14270,0	2743,2	2120,0	-	-
60,0	15000,0	15250,0	2957,5	2270,0	-	-
62,0	15953,0	16200,0	3151,1	2660,0	-	-
64,0	17000,0	17320,0	3301,7	2811,0	-	-
66,0	18077,0	18240,0	3536,4	2966,0	-	-
68,0	19200,0	19380,0	3763,3	3125,0	-	-

Ropes, breaking force of which is shown to the left of bold line are manufactured of uncoated and galvanized wire, those to the right of bold line are manufactured of uncoated wire.

Stranded ropes for general lifting purposes
DIN EN 12385-4



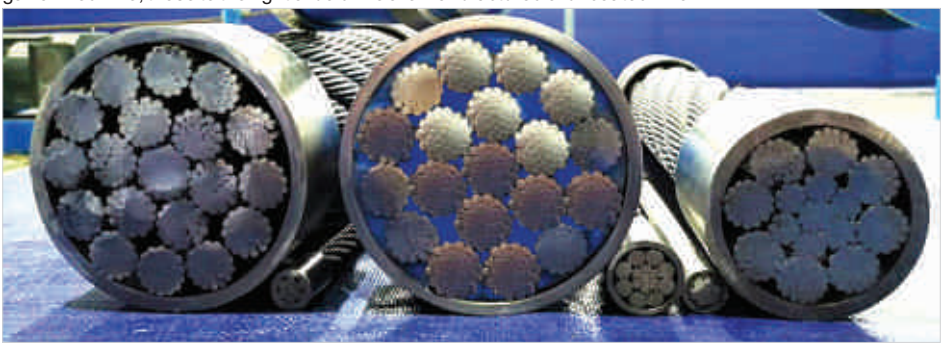
Construction:
8x36(1+7+7/7+14)+1 fiber core
8x36WS-FC

Container, mobile caterpillar (boom rope), grab (basket pressure) cranes.

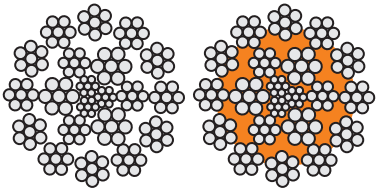
Constructional features:
Ropes are manufactured with fiber core (FC).

Diameter, mm	Approximate weight of 1000 m rope, kg	Grade, N/mm^2 (kgs/mm^2)			
		1770		1960	
		Breaking force, kN, not less			
		The total of all wires in the rope	Rope as a whole	The total of all wires in the rope	Rope as a whole
22,0	2020,0	304,5	251,0	337,2	278,0
24,0	2000,0	371,5	299,0	411,3	331,0
26,0	2350,0	445,5	351,0	493,3	388,0
28,0	2730,0	519,7	407,0	575,5	450,0
30,0	3130,0	608,6	467,0	674,0	517,0
32,0	3560,0	679,6	531,0	752,6	588,0
34,0	4023,0	762,8	599,5	844,7	664,0
36,0	4510,0	867,7	672,0	960,9	744,0
38,0	5025,0	929,3	749,0	1029,1	830,0
40,0	5570,0	1020,0	830,0	1129,4	919,0
42,0	6139,0	1115,0	915,0	1234,7	1013,0
44,0	6740,0	1214,7	1000,0	1345,1	1110,0
46,0	7364,0	1351,1	1097,0	1496,1	1215,0
48,0	8020,0	1489,3	1200,0	1649,2	1320,0
50,0	8700,0	1620,0	1297,0	-	-
52,0	9410,0	1756,0	1400,0	-	-
54,0	10150,0	1925,0	1512,0	-	-
56,0	10900,0	2089,3	1630,0	-	-
58,0	11707,0	2225,5	1745,0	-	-
60,0	12500,0	2383,6	1870,0	-	-
62,0	15953,0	2529,2	2000,0	-	-
64,0	17000,0	2712,0	2130,0	-	-
68,0	19200,0	3017,5	2400,0	-	-
72,0	21514,0	3377,3	2690,0	-	-
74,0	22725,0	3594,0	2840,0	-	-

Ropes, breaking force of which is shown to the left of bold line are manufactured of uncoated and galvanized wire, those to the right of bold line are manufactured of uncoated wire.



Stranded ropes for general lifting purposes
DIN EN 12385-4



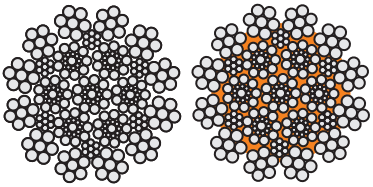
Construction:
12x7(1+6)+3x7(1+6)/3x7(1+6)+3x7(1+6)
12x7-IWRC; 12x7-EPIWRC

Container, mobile caterpillar, grab, frame, overhead cranes.

Constructional features:
Ropes are manufactured with metal core (IWRC), version 2- with polymer-coated metal core (EPIWRC).

Diameter, mm	Approximate weight of 1000 m rope, kg		Grade, N/mm^2 (kgs/mm^2)			
			1770		1960	
			Breaking force, kN, not less			
	-	Ver. 2	The total of all wires in the rope	Rope as a whole	The total of all wires in the rope	Rope as a whole
22,0	1940,0	2030,0	384,8	281,0	426,1	311,0
24,0	2310,0	2350,0	451,9	334,0	500,4	370,0
26,0	2710,0	2830,0	524,7	392,0	581,0	435,0
28,0	3140,0	3260,0	601,4	455,0	666,0	504,0
30,0	3610,0	3790,0	690,5	522,5	764,6	579,0
32,0	4100,0	4230,0	773,8	594,5	856,8	658,0
34,0	4635,0	4790,0	880,9	671,1	-	-
36,0	5190,0	5310,0	974,4	752,0	-	-
38,0	5790,0	5860,0	1083,3	838,0	-	-
40,0	6420,0	6650,0	1184,4	930,0	-	-
42,0	7074,0	7210,0	1348,5	1024,0	-	-
44,0	7710,0	7810,0	1464,0	1124,0	-	-
46,0	8485,0	8670,0	1589,2	1228,5	-	-
48,0	9240,0	9490,0	1714,4	1338,0	-	-
50,0	10025,0	10240,0	1913,0	1451,0	-	-
52,0	10843,0	11140,0	2056,5	1570,0	-	-

Ropes, breaking force of which is shown to the left of bold line are manufactured of uncoated and galvanized wire, those to the right of bold line are manufactured of uncoated wire.



Construction: :
12x7(1+6)+6x19(1+9+9);6x7(1+6)+1x19(1+9+9)
12x7-IWRC; 12x7-EPIWRC

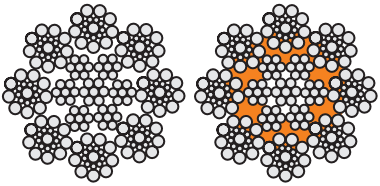
Container, mobile caterpillar, grab, frame, overhead cranes.

Constructional features:
Ropes are manufactured with metal core (IWRC), version 2- with polymer-coated metal core (EPIWRC).

Diameter, mm	Approximate weight of 1000 m rope, kg		Grade, N/mm^2 (kgs/mm^2)			
			1770		1960	
			Breaking force, kN, not less			
	-	Ver. 2	The total of all wires in the rope	Rope as a whole	The total of all wires in the rope	Rope as a whole
22,0	1940,0	2200,0	437,0	281,0	483,9	311,0
24,0	2310,0	2670,0	525,1	334,0	581,5	370,0
26,0	2710,0	3070,0	603,6	392,0	668,4	435,0

Diameter, mm	Approximate weight of 1000 m rope, kg		Grade, N/mm^2 (kgs/mm^2)			
			1770		1960	
			Breaking force, kN, not less			
	-	Ver. 2	The total of all wires in the rope	Rope as a whole	The total of all wires in the rope	Rope as a whole
28,0	3140,0	3580,0	703,2	455,0	778,6	504,0
30,0	3610,0	4130,0	811,6	522,5	898,7	579,0
32,0	4106,0	4640,0	911,8	594,5	1010,0	658,3
34,0	4636,0	5300,0	1041,3	671,0	1153,1	743,0
36,0	5200,0	6000,0	1176,4	752,0	1303,0	833,0
38,0	5790,0	6690,0	1313,3	838,0	-	-
40,0	6416,0	7430,0	1459,0	930,0	-	-
42,0	7074,0	8090,0	1589,5	1024,0	-	-
44,0	7763,0	8770,0	1722,3	1124,0	-	-
46,0	8485,0	9470,0	1860,0	1228,5	-	-
48,0	9240,0	10450,0	2052,2	1338,0	-	-
50,0	10025,0	11380,0	2234,6	1451,0	-	-
52,0	10843,0	12350,0	2426,8	1570,0	-	-
54,0	11693,0	13250,0	2602,0	1693,0	-	-
56,0	12575,0	14080,0	2765,4	1821,0	-	-

Ropes, breaking force of which is shown to the left of bold line are manufactured of uncoated and galvanized wire, those to the right of bold line are manufactured of uncoated wire.



Construction:
8x19(1+9+9)+6x7(1+6)+1x7(1+6)
8x19S-IWRC; 8x19S-EPIWRC

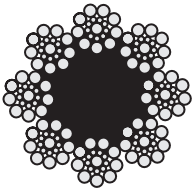
Container, mobile caterpillar, grab, frame, overhead cranes.

Constructional features:
Ropes are manufactured with metal core (IWRC), version 2- with polymer-coated metal core (EPIWRC).

Diameter, mm	Approximate weight of 1000 m rope, kg		Grade, N/mm^2 (kgs/mm^2)			
			1770		1960	
			Breaking force, kN, not less			
	-	Ver. 2	The total of all wires in the rope	Rope as a whole	The total of all wires in the rope	Rope as a whole
22,0	1970,0	2130,0	405,5	305,0	449,0	338,0
24,0	2340,0	2500,0	467,9	363,0	518,2	402,0
26,0	2750,0	2890,0	550,2	426,0	609,3	472,0
28,0	3190,0	3340,0	628,2	494,0	695,7	547,0
30,0	3660,0	3800,0	713,7	567,0	790,3	628,0
32,0	4170,0	4340,0	814,4	645,0	901,9	715,0
34,0	4705,0	4870,0	922,4	728,0	1021,4	807,0
36,0	5270,0	5420,0	1027,2	817,0	-	-
38,0	5877,0	6020,0	1161,4	910,0	-	-
40,0	6510,0	6750,0	1289,2	1010,0	-	-
42,0	7180,0	7340,0	1398,9	1112,0	-	-
44,0	7880,0	8080,0	1540,4	1220,0	-	-
46,0	8612,0	8950,0	1659,3	1333,0	-	-
48,0	9380,0	9690,0	1811,3	1450,0	-	-
50,0	10175,0	10550,0	1959,0	1575,0	-	-
52,0	11000,0	11340,0	2096,5	1700,0	-	-

Ropes, breaking force of which is shown to the left of bold line are manufactured of uncoated and galvanized wire, to the right of bold line are manufactured of uncoated wire.

Stranded ropes for general lifting purposes
DIN EN 12385-4



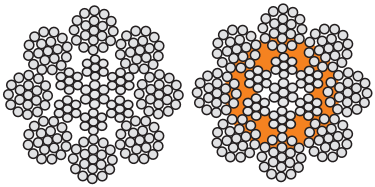
Construction:
8x19(1+9+9)+1 fiber core
8x19S-FC

Container, mobile caterpillar (boom rope), grab (basket pressure) cranes.

Constructional features:
Ropes are manufactured with organic core (FC).

Diameter, mm	Approximate weight of 1000 m rope, kg	Grade, N/mm^2 (kgs/mm^2)			
		1770		1960	
		Breaking force, kN, not less			
		The total of all wires in the rope	Rope as a whole	The total of all wires in the rope	Rope as a whole
22,0	1650,0	314,9	251,0	348,7	278,0
24,0	1960,0	357,6	299,0	396,0	331,0
26,0	2300,0	405,1	351,0	448,6	388,0
28,0	2670,0	473,4	407,0	524,3	450,0
30,0	3060,0	558,0	467,0	618,0	517,0
32,0	3480,0	649,6	531,0	719,3	588,0
34,0	3930,0	710,3	599,5	770,3	664,0
36,0	4410,0	776,7	672,0	-	-
38,0	4910,0	860,0	750,0	-	-
40,0	5440,0	954,8	830,0	-	-
42,0	6000,0	1061,8	915,0	-	-
44,0	6580,0	1158,4	1000,0	-	-
46,0	7194,0	1322,5	1097,0	-	-
48,0	7830,0	1430,0	1200,0	-	-
50,0	8500,0	1556,2	1300,0	-	-
52,0	9190,0	1706,8	1400,0	-	-

Ropes, breaking force of which is shown to the left of bold line are manufactured of uncoated and galvanized wire, those to the right of bold line are manufactured of uncoated wire.



Construction:
8x25(1+6;6+12)+6x7(1+6)+1x7(1+6)
8x25F-IWRC; 8x25F-EPIWRC

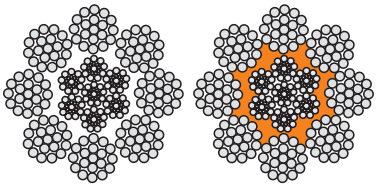
Container, mobile caterpillar, grab, frame, overhead cranes.

Constructional features:
Ropes are manufactured with metal core (IWRC), version 2-with polymer coated metal core (EPIWRC).

Diameter, mm	Approximate weight of 1000 m rope, kg		Grade, N/mm^2 (kgs/mm^2)			
			1770		1960	
			Breaking force, kN, not less			
	-	Ver. 2	The total of all wires in the rope	Rope as a whole	The total of all wires in the rope	Rope as a whole
22,0	1970,0	2100,0	410,6	305,0	454,7	338,0
24,0	2340,0	2520,0	492,3	363,0	545,2	402,0
26,0	2750,0	2890,0	559,0	426,0	619,0	472,0
28,0	3190,0	3320,0	644,7	494,0	714,0	547,0
30,0	3660,0	3790,0	736,7	567,0	815,8	628,0
32,0	4170,0	4310,0	842,5	645,0	933,0	715,0

Diameter, mm	Approximate weight of 1000 m rope, kg		Grade, N/mm^2 (kgs/mm^2)			
			1770		1960	
			Breaking force, kN, not less			
	-	Ver. 2	The total of all wires in the rope	Rope as a whole	The total of all wires in the rope	Rope as a whole
34,0	4705,0	4880,0	947,4	728,0	1049,1	807,0
36,0	5270,0	5430,0	1060,7	817,0	1174,5	904,0
38,0	5877,0	6090,0	1190,0	910,0	1317,1	1010,0
40,0	6510,0	6710,0	1311,0	1010,0	1452,0	1116,0
42,0	7180,0	7460,0	1457,0	1112,0	1613,0	1231,0
44,0	7880,0	8140,0	1591,0	1220,0	-	-
46,0	8612,0	9050,0	1768,0	1333,0	-	-
48,0	9380,0	9800,0	1915,4	1450,0	-	-
50,0	10175,0	10680,0	2087,3	1575,0	-	-
52,0	11000,0	11520,0	2251,0	1700,0	-	-
54,0	11870,0	12470,0	2437,0	1840,0	-	-
56,0	12800,0	13280,0	2595,5	1980,0	-	-
58,0	13700,0	14250,0	2784,4	2120,0	-	-
60,0	14700,0	15400,0	3010,4	2511,0	-	-
62,0	15645,0	16860,0	3295,5	2660,0	-	-
64,0	16671,0	17890,0	3496,0	2811,0	-	-
66,0	17729,0	19220,0	3756,4	2966,0	-	-

Ropes, breaking force of which is shown to the left of bold line are manufactured of uncoated and galvanized wire, those to the right of bold line are manufactured of uncoated wire.



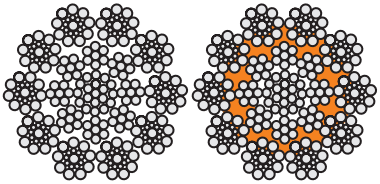
Construction:
8x25(1+6;6+12)+6x19(1+9+9)+1x19(1+9+9)
8x25F-IWRC; 8x25F-EPIWRC

Container, mobile caterpillar, grab, frame, overhead cranes.

Constructional features:
Ropes are manufactured with metal core (IWRC), version 2-with polymer-coated metal core (EPIWRC).

Diameter, mm	Approximate weight of 1000 m rope, kg		Grade, N/mm^2 (kgs/mm^2)			
			1770		1960	
			Breaking force, kN, not less			
	-	Ver. 2	The total of all wires in the rope	Rope as a whole	The total of all wires in the rope	Rope as a whole
22,0	2015,0	2165,0	405,1	305,0	448,6	337,7
24,0	2260,0	2410,0	482,3	363,0	537,9	402,0
25,0	2520,0	2620,0	509,1	393,8	563,7	436,1
26,0	2710,0	2910,0	565,6	426,0	626,3	471,7
28,0	3190,0	3430,0	641,9	494,0	710,8	547,0
29,0	3500,0	3760,0	703,3	529,9	779,7	586,8
30,0	3690,0	3970,0	741,2	567,1	820,7	628,0
32,0	4120,0	4430,0	827,2	645,2	916,0	714,5
34,0	4670,0	4810,0	917,3	728,0	1022,8	807,0
35,0	5000,0	5380,0	1004,2	771,9	1112,0	854,8
36,0	5220,0	5390,0	1042,1	817,0	1194,0	904,0
38,0	5920,0	6360,0	1188,9	909,9	1316,6	1007,6
40,0	6470,0	6700,0	1328,4	1010,0	1471,0	1120,0
42,0	7080,0	7360,0	1411,2	1112,0	1562,7	1230,8
44,0	7920,0	8180,0	1576,4	1220,0	-	-
46,0	8540,0	8870,0	1796,7	1333,0	-	-
48,0	9120,0	9630,0	1874,1	1450,0	-	-

Stranded ropes for general lifting purposes
DIN EN 12385-4



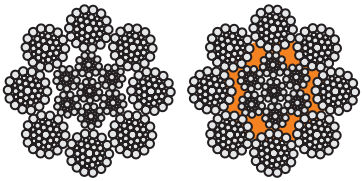
Construction:
10x19(1+9+9)+8x7(1+6)+1x19(1+6+12)
10x19S-IWRC; 10x19S-EPIWRC

Container, mobile caterpillar, grab, frame, overhead cranes.

Constructional features:
Ropes are manufactured with metal core (IWRC), version 2-with polymer-coated metal core (EPIWRC).

Diameter, mm	Approximate weight of 1000 m rope, kg		Grade, N/mm^2 (kgs/mm^2)			
			1770		1960	
			Breaking force, kN, not less			
	-	Ver. 2	The total of all wires in the rope	Rope as a whole	The total of all wires in the rope	Rope as a whole
22,0	1970,0	2130,0	410,7	305,0	454,8	337,7
24,0	2344,0	2530,0	482,4	363,0	534,2	401,9
26,0	2750,0	2970,0	560,0	426,0	620,1	471,7
28,0	3190,0	3445,0	652,3	494,0	722,3	547,0
30,0	4170,0	4500,0	741,1	567,0	820,6	628,0
32,0	3480,0	3760,0	858,7	645,0	950,9	714,5
34,0	4705,0	5080,0	940,8	728,0	1041,8	806,6
36,0	5270,0	5690,0	1117,1	817,0	1201,8	904,3
38,0	5877,0	6350,0	1200,2	910,0	1329,0	1007,6
40,0	6510,0	7030,0	1333,2	1010,0	1476,3	1116,4
42,0	7180,0	7750,0	1493,0	1112,0	-	-
44,0	7880,0	8510,0	1623,6	1220,0	-	-

Ropes, breaking force of which is shown to the left of bold line are manufactured of uncoated and galvanized wire, those to the right of bold line are manufactured of uncoated wire.



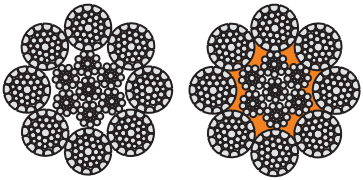
Construction:
8x36(1+7+7/7+14)+6x19(1+9+9)+1x19(1+9+9)
8x36WS-IWRC; 8x36WS-EPIWRC

Container, mobile caterpillar, grab, frame, overhead cranes.

Constructional features:
Ropes are manufactured with metal core (IWRC), version 2- with polymer-coated metal core (EPIWRC).

Diameter, mm	Approximate weight of 1000 m rope, kg		Grade, N/mm^2 (kgs/mm^2)			
			1770		1960	
			Breaking force, kN, not less			
	-	Ver. 2	The total of all wires in the rope	Rope as a whole	The total of all wires in the rope	Rope as a whole
14,0	830,0	890,0	166,4	124,0	184,2	137,2
16,0	967,0	1040,0	202,1	151,1	223,5	179,0
18,0	1260,0	1354,0	263,2	204,7	292,4	226,4
20,0	1548,0	1664,0	323,9	252,4	358,6	279,3
22,0	2020,0	2100,0	403,5	305,0	446,8	338,0
24,0	2400,0	2470,0	475,2	363,0	526,2	402,0
26,0	2517,0	2705,0	526,5	426,2	583,6	472,0
28,0	3106,0	3339,0	649,1	494,6	719,1	547,4

Diameter, mm	Approximate weight of 1000 m rope, kg		Grade, N/mm^2 (kgs/mm^2)			
			1770		1960	
			Breaking force, kN, not less			
	-	Ver. 2	The total of all wires in the rope	Rope as a whole	The total of all wires in the rope	Rope as a whole
30,0	3501,0	3764,0	732,9	567,1	810,5	628,0
32,0	4102,0	4409,0	847,7	645,1	958,8	715,2
36,0	5530,0	5940,0	1109,9	817,8	1229,1	904,1
38,0	5620,0	6041,0	1175,4	910,1	1302,2	1007,7
40,0	6488,0	6975,0	1357,6	1010,2	1502,1	1120,0



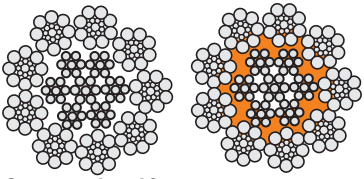
Construction:
8x36(1+7+7/7+14)+6x19(1+9+9)+1x19(1+9+9)
8xK36WS-IWRC; 8xK36WS-EPIWRC

Container, mobile caterpillar, grab, frame, overhead cranes.

Constructional features:
Ropes are manufactured with compacted strands of the outer layer (K) with metal core (IWRC), version 2- with compacted outer strands ropes (K) with polymer-coated metal core (EPIWRC).

Diameter, mm	Approximate weight of 1000 m rope, kg		Grade, N/mm^2 (kgs/mm^2)			
			1770		1960	
			Breaking force, kN, not less			
	-	Ver. 2	The total of all wires in the rope	Rope as a whole	The total of all wires in the rope	Rope as a whole
22,0	2040,0	2190,0	423,6	338,9	464,7	371,7
24,0	2380,0	2560,0	467,7	374,2	524,1	419,2
26,0	2790,0	3000,0	576,9	461,5	635,8	508,6
28,0	3300,0	3550,0	656,1	524,8	717,1	573,6
30,0	3760,0	4040,0	769,6	615,6	859,5	687,6
32,0	4240,0	4560,0	867,7	694,1	972,7	778,1
34,0	4780,0	5140,0	997,7	798,1	1093,9	875,1
36,0	5420,0	5830,0	1108,1	886,4	1231,9	985,5
38,0	6080,0	6540,0	1197,1	924,8	1304,3	1012,3
39,0	6350,0	6800,0	1259,9	958,4	1395,1	1061,3
40,0	6420,0	6760,0	1327,1	1061,7	1469,6	1175,6
42,0	7020,0	7310,0	1416,8	1133,4	1568,9	1255,1
44,0	8030,0	8290,0	1510,4	1208,3	1672,5	1338,0
45,5	8650,0	8970,0	1714,9	1304,5	1899,0	1444,5
46,0	8810,0	9120,0	1797,2	1437,8	1990,1	1592,1
48,0	9470,0	9890,0	1914,4	1531,5	2119,9	1695,9
50,0	10240,0	10670,0	2101,4	1681,1	2327,0	1801,6
52,0	11300,0	12100,0	2239,9	1703,8	2480,3	1886,7
54,0	12040,0	12460,0	2407,7	1926,1	—	—
56,0	12800,0	13210,0	2589,4	2003,5	—	—
57,0	13500,0	14500,0	2691,3	2089,3	—	—
58,0	14050,0	14490,0	2816,8	2174,4	—	—
60,0	15000,0	16100,0	2982,1	2268,4	—	—

Stranded ropes for general lifting purposes
DIN EN 12385-4

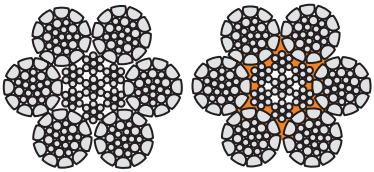


Construction:
9x17(1+8+8)+6x7(1+6)+1x7(1+6)
9xK17S-IWRC; 9xK17S-EPIWRC

Container, mobile caterpillar, grab, frame, overhead cranes.

Constructional features:
Ropes are manufactured with compacted strands of the outer layer (K) with metal core (IWRC), version 2- with compacted outer strands ropes (K) with polymer-coated metal core (EPIWRC).

Diameter, mm	Approximate weight of 1000 m rope, kg		Grade, N/mm^2 (kgs/mm^2)			
			1770		1960	
			Breaking force, kN, not less			
	-	Ver. 2	The total of all wires in the rope	Rope as a whole	The total of all wires in the rope	Rope as a whole
14,0	830,0	890,0	166,4	124,0	184,2	137,2
16,0	1140,0	1225,0	228,6	161,3	253,1	178,6
18,0	1260,0	1354,0	263,2	204,2	292,0	226,1
20,0	1548,0	1664,0	323,1	252,0	358,0	279,1
22,0	2020,0	2100,0	403,5	304,9	446,8	337,7
24,0	2400,0	2470,0	475,2	362,9	526,2	401,9
26,0	2517,0	2705,0	526,1	425,9	583,0	471,7
28,0	3106,0	3339,0	649,0	494,0	719,0	547,0
30,0	3501,0	3764,0	732,6	567,1	810,0	628,0
32,0	4102,0	4409,0	847,7	645,1	958,0	715,2
36,0	5530,0	5940,0	1109,9	817,8	1229,1	904,1
38,0	5620,0	6041,0	1175,2	910,1	1302,0	1007,7
40,0	6488,0	6975,0	1357,9	1010,2	1502,0	1120,0



Construction:
6x26(1+5+5/5+10)+6x7(1+6)+1x7(1+6)
6xK26WS-IWRC; 6xK26WS-EPIWRC

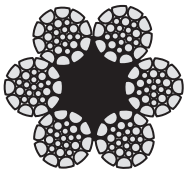
Cargo winch of cranes, container, mobile caterpillar (boom rope), grab (bucket pressure), frame, overhead cranes.

Constructional features:
Ropes are manufactured with compacted strands of the outer layer (K) with metal core (IWRC), version 2- with compacted outer strands ropes (K) with polymer-coated metal core (EPIWRC).

Diameter, mm	Approximate weight of 1000 m rope, kg		Grade, N/mm^2 (kgs/mm^2)			
			1770		1960	
			Breaking force, kN, not less			
	-	Ver. 2	The total of all wires in the rope	Rope as a whole	The total of all wires in the rope	Rope as a whole
22,0	2050,0	2200,0	370,6	272,4	393,8	315,0
24,0	2640,0	2840,0	428,7	294,9	433,7	347,0
26,0	2780,0	2990,0	500,9	377,5	517,0	413,6
28,0	3470,0	3730,0	579,1	434,4	624,7	499,7
30,0	4080,0	4390,0	703,6	533,2	742,6	594,1
32,0	4300,0	4620,0	803,7	618,9	880,0	704,0
34,0	4940,0	5310,0	917,7	717,3	981,9	785,5
36,0	5370,0	5770,0	1043,1	801,6	1107,5	886,0
38,0	5800,0	6235,0	1124,1	872,0	1210,4	968,4
39,0	6050,0	6500,0	1278,0	969,6	1369,8	1095,8
40,0	6400,0	6880,0	1404,5	1073,2	1481,1	1184,9
42,0	6980,0	7500,0	1530,9	1207,9	1649,8	1319,9

Diameter, mm	Approximate weight of 1000 m rope, kg		Grade, N/mm^2 (kgs/mm^2)			
			1770		1960	
			Breaking force, kN, not less			
	-	Ver. 2	The total of all wires in the rope	Rope as a whole	The total of all wires in the rope	Rope as a whole
44,0	7640,0	8210,0	1692,7	1338,9	1867,8	1494,2
45,5	8110,0	8720,0	1850,6	1420,4	-	-
46,0	8630,0	9280,0	1977,2	1548,9	-	-
48,0	9220,0	9910,0	2180,0	1696,8	-	-
50,0	9970,0	10720,0	2290,7	1766,1	-	-
52,0	10800,0	11610,0	2474,3	1924,2	-	-
54,0	11780,0	12660,0	2671,2	2048,1	-	-
56,0	12500,0	13440,0	2867,5	2244,4	-	-
57,0	13110,0	14090,0	3054,1	2380,8	-	-
58,0	13840,0	14880,0	3235,7	2501,3	-	-
60,0	14400,0	15480,0	3441,4	2700,3	-	-

Ropes, breaking force of which is shown to the left of bold line are manufactured of uncoated and galvanized wire, those to the right of bold line are manufactured of uncoated wire.



Construction:
6x26(1+5+5/5+10)+1 fiber core
6xK26WS-FC

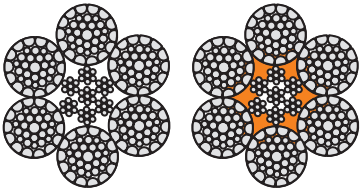
Container, mobile caterpillar (boom rope), grab (bucket pressure) cranes.

Constructional features:
Ropes are manufactured with compacted strands of the outer layer (K) with fiber core (FC).

Diameter, mm	Approximate weight of 1000 m rope, kg	Grade, N/mm^2 (kgs/mm^2)			
		1770		1960	
		Breaking force, kN, not less			
		The total of all wires in the rope	Rope as a whole	The total of all wires in the rope	Rope as a whole
22,0	1930,0	346,5	277,2	383,7	307,0
24,0	1927,0	431,5	345,2	477,8	382,3
26,0	2256,0	505,5	404,4	559,8	447,8
28,0	2637,0	574,7	459,8	636,4	509,1
30,0	3058,0	649,6	519,7	719,3	575,5
32,0	3469,0	727,6	582,1	805,7	644,6
34,0	3931,0	821,8	657,4	910,0	728,0
36,0	4413,0	918,7	735,0	1017,3	813,9
38,0	4926,0	994,3	795,4	1101,0	880,8
40,0	5407,0	1083,2	866,6	1199,5	959,6
42,0	5985,0	1186,8	949,4	1314,2	1051,4
44,0	6593,0	1277,7	1022,2	-	-
46,0	7200,0	1402,1	1121,7	-	-
48,0	7918,0	1549,3	1239,4	-	-
50,0	8610,0	1698,0	1358,4	-	-
52,0	9290,0	1831,4	1465,1	-	-
54,0	9994,0	1985,1	1588,1	-	-
56,0	10766,0	2180,3	1744,2	-	-
58,0	11551,0	2327,5	1862,0	-	-
60,0	12339,0	2482,6	1986,1	-	-
62,0	15765,0	2639,2	2111,4	-	-
64,0	16836,0	2801,6	2241,3	-	-
68,0	19067,0	3122,5	2498,0	-	-
72,0	21328,0	3479,3	2783,4	-	-
74,0	22576,0	3676,2	2941,0	-	-

Ropes, breaking force of which is shown to the left of bold line are manufactured of uncoated and galvanized wire, those to the right of bold line are manufactured of uncoated wire.

Stranded ropes for general lifting purposes
DIN EN 12385-4



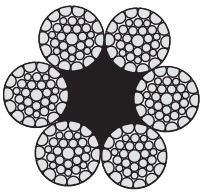
Construction:
6x36(1+7+7/7+14)+6x7(1+6)+1x7(1+6)
6xK36WS-IWRC; 6xK36WS-EPIWRC

Cargo winch of cranes, container, mobile caterpillar (boom rope), grab (bucket pressure), frame, overhead cranes.

Constructional features:
Ropes are manufactured with compacted strands of the outer layer (K) with metal core (IWRC), version 2- with compacted outer strands ropes (K) with polymer-coated metal core (EPIWRC).

Diameter, mm	Approximate weight of 1000 m rope, kg		Grade, N/mm^2 (kgs/mm^2)			
			1770		1960	
			Breaking force, kN, not less			
	-	Ver. 2	The total of all wires in the rope	Rope as a whole	The total of all wires in the rope	Rope as a whole
22,0	2060,0	2215,0	442,7	345,3	490,2	382,4
24,0	2365,0	2540,0	528,7	412,4	585,5	456,7
26,0	2810,0	3020,0	644,9	503,0	714,1	557,0
28,0	3340,0	3590,0	713,1	556,2	789,6	615,9
30,0	3790,0	4070,0	831,6	648,6	920,9	718,3
32,0	4290,0	4610,0	919,7	717,4	1018,4	794,4
34,0	4840,0	5200,0	1050,7	819,5	1163,5	907,5
36,0	5370,0	5770,0	1170,1	912,7	1295,7	1010,6
38,0	5990,0	6440,0	1263,1	985,2	1398,7	1091,0
39,0	6280,0	6750,0	1328,6	1036,3	1471,2	1147,6
40,0	6420,0	6900,0	1378,1	1074,9	1526,0	1190,3
42,0	6980,0	7500,0	1473,8	1149,6	—	—
44,0	7510,0	8070,0	1610,4	1256,1	—	—
45,5	8060,0	8665,0	1759,2	1372,2	—	—
46,0	8730,0	9385,0	1902,2	1483,7	—	—
48,0	9410,0	10120,0	2029,4	1582,9	—	—
50,0	10180,0	10940,0	2218,4	1730,4	—	—
52,0	11520,0	12380,0	2356,1	1837,8	—	—
54,0	12090,0	12990,0	2522,7	1967,7	—	—
56,0	12740,0	13700,0	2703,4	2108,7	—	—
57,0	13200,0	14190,0	2835,0	2211,3	—	—
58,0	13990,0	15040,0	2931,8	2286,8	—	—
60,0	15020,0	16150,0	3064,0	2389,9	—	—

Ropes, breaking force of which is shown to the left of bold line are manufactured of uncoated and galvanized wire, those to the right of bold line are manufactured of uncoated wire.



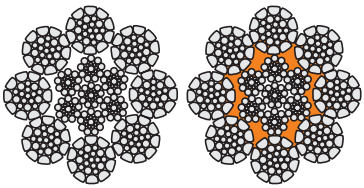
Construction:
6x36(1+7+7/7+14)+1 fiber core
6xK36WS+FC

Container, mobile caterpillar (boom rope), grab (bucket pressure) cranes.

Constructional features:
Ropes are manufactured with compacted strands of the outer layer (K) with fiber core (FC).

Diameter, mm	Approximate weight of 1000 m rope, kg	Grade, N/mm^2 (kgs/mm^2)			
		1770		1960	
		Breaking force, kN, not less			
		The total of all wires in the rope	Rope as a whole	The total of all wires in the rope	Rope as a whole
22,0	1740,0	351,5	281,2	389,2	311,4
24,0	2070,0	424,5	339,6	470,1	376,1
26,0	2430,0	499,5	399,6	553,1	442,5
28,0	2810,0	577,7	462,1	639,7	511,8
30,0	3005,0	659,6	527,6	730,4	584,3
32,0	3440,0	727,6	582,0	805,7	644,6
34,0	3920,0	817,8	654,2	905,6	724,5
36,0	4405,0	921,7	737,3	1020,6	816,5
38,0	4925,0	979,3	783,4	1084,4	867,5
40,0	5485,0	1071,0	856,8	1186,0	948,8
42,0	6000,0	1169,0	935,2	-	-
44,0	6660,0	1273,7	1018,9	-	-
46,0	7224,0	1402,1	1121,6	-	-
48,0	7920,0	1540,3	1232,2	-	-
50,0	8616,0	1677,0	1341,6	-	-
52,0	9307,0	1813,0	1450,4	-	-
54,0	10041,0	1983,0	1586,4	-	-
56,0	10780,0	2140,3	1712,2	-	-
58,0	11584,0	2275,5	1820,4	-	-
60,0	12360,0	2435,6	1948,4	-	-
62,0	15817,0	2577,2	2061,7	-	-
64,0	16920,0	2763,0	2210,4	-	-
68,0	19081,0	3069,5	2455,6	-	-
72,0	21432,0	3435,3	2748,2	-	-
74,0	22614,0	3643,0	2914,4	-	-

Ropes, breaking force of which is shown to the left of bold line are manufactured of uncoated and galvanized wire, those to the right of bold line are manufactured of uncoated wire.



Construction:

8x26(1+5+5/5+10)+ 6x19(1+9+9)+1x19(1+9+9)
8xK26WS-IWRC; 8xK26WS-EPIWRC

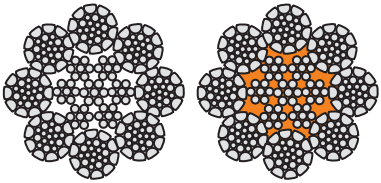
Container, mobile caterpillar, grab, frame, overhead cranes.

Constructional features:

Ropes are manufactured with compacted strands of the outer layer (K) with metal core (IWRC), version 2- with compacted outer strands ropes (K) with polymer-coated metal core (EPIWRC).

Diameter, mm	Approximate weight of 1000 m rope, kg		Grade, N/mm^2 (kgs/mm^2)			
			1770		1960	
			Breaking force, kN, not less			
	-	Ver. 2	The total of all wires in the rope	Rope as a whole	The total of all wires in the rope	Rope as a whole
22,0	1980,0	2130,0	398,5	305,0	441,3	337,7
25,0	2540,0	2730,0	509,6	393,8	564,3	436,1
26,0	5750,0	2960,0	552,6	426,0	611,9	471,7
28,0	3090,0	3320,0	620,6	494,0	687,3	547,0
29,0	3350,0	3600,0	673,3	529,9	745,9	586,8
30,0	3640,0	3910,0	731,5	567,1	810,0	628,0
32,0	4040,0	4340,0	811,7	645,2	898,9	714,5
35,0	4850,0	5210,0	974,4	771,9	1079,0	854,8
36,0	5560,0	5980,0	1118,7	894,9	1238,8	991,0
38,0	5790,0	6230,0	1164,1	909,9	1289,1	1007,6

Stranded ropes for general lifting purposes
DIN EN 12385-4

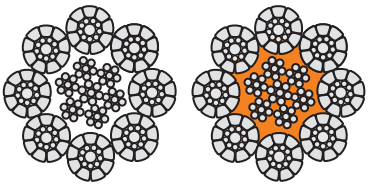


Construction:
8x26(1+5+5/5+10)+ 6x7(1+6)+1x7(1+6)
8xK26WS-IWRC; 8xK26WS-EPIWRC

Cargo winch of cranes, container, mobile caterpillar, grab, frame, overhead cranes.

Constructional features:
Ropes are manufactured with compacted strands of the outer layer (K) with metal core (IWRC), version 2- with compacted outer strands ropes (K) with polymer-coated metal core (EPIWRC).

Diameter, mm	Approximate weight of 1000 m rope, kg		Grade, N/mm^2 (kgs/mm^2)			
			1770		1960	
			Breaking force, kN, not less			
	-	Ver. 2	The total of all wires in the rope	Rope as a whole	The total of all wires in the rope	Rope as a whole
14,0	748,1	-	150,4	117,3	166,6	129,9
16,0	1023,2	-	205,7	160,4	227,8	177,7
18,0	1320,8	-	265,7	207,2	294,2	229,5
20,0	1658,7	-	333,6	260,2	369,4	288,1
22,0	2013,3	2164,3	404,9	315,8	448,4	349,8
24,0	2428,4	2610,5	488,4	381,0	540,9	421,9
25,0	2595,1	2789,7	521,8	407,0	577,9	450,8
26,0	2822,0	3033,7	567,8	442,9	628,7	490,4
28,0	3291,3	3538,1	661,9	516,3	732,9	571,7
29,0	3438,2	3696,1	691,4	539,3	765,7	597,2
30,0	3843,8	4132,1	773,1	603,0	856,1	667,8
32,0	4363,6	4690,9	877,8	684,7	972,1	758,2
34,0	4895,2	5262,3	984,8	768,1	1090,5	850,6
35,0	5201,1	5591,2	1046,1	816,0	1158,5	903,6
36,0	5458,5	5867,9	1097,9	856,4	1215,8	948,3
38,0	6242,0	6710,1	1255,5	979,3	1390,6	1084,7
39,0	6495,9	6983,1	1306,7	1019,2	1447,0	1128,7
40,0	6782,3	7290,9	1364,3	1064,2	1510,8	1178,4
42,0	7578,2	8146,5	1524,5	1189,1	1688,1	1316,7
44,0	8360,6	8987,6	1681,9	1311,9	1862,4	1452,7
46,0	9046,4	9724,9	1819,0	1418,8	-	-
48,0	10042,1	10795,3	2020,5	1576,0	-	-
50,0	10735,3	11540,4	2159,6	1684,5	-	-
52,0	11724,9	12604,2	2358,9	1839,9	-	-

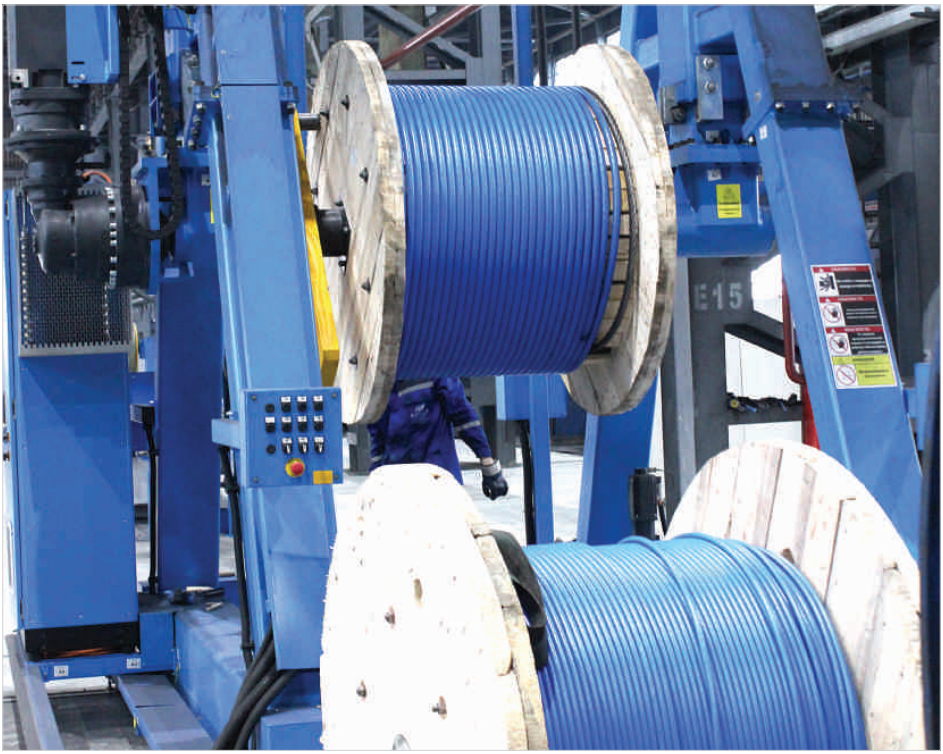


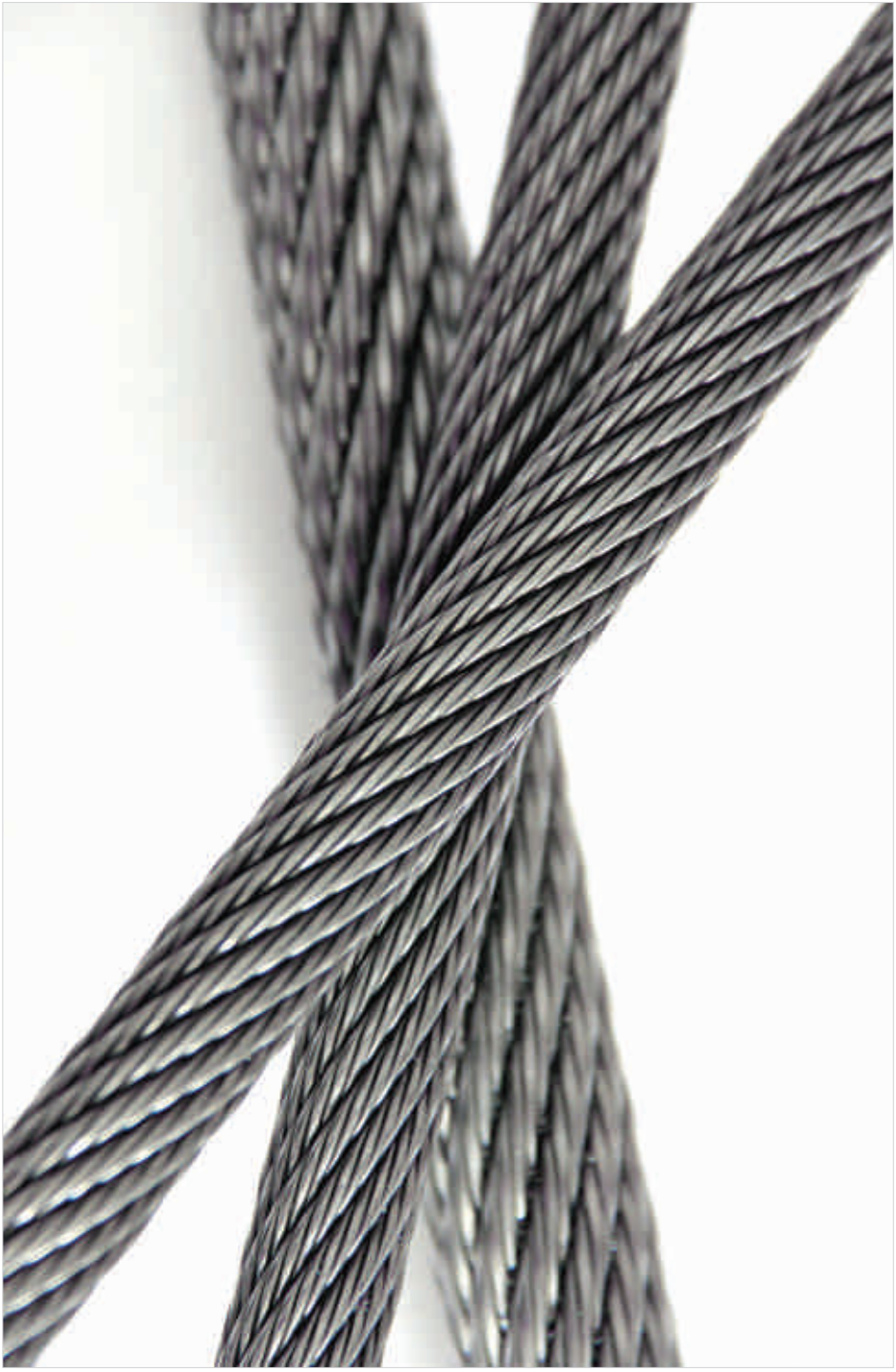
Construction:
8x19(1+9+9)+6x7(1+6)+1x7(1+6)
8xK19S-IWRC; 8xK19S-EPIWRC

Cargo winch of cranes, container, mobile caterpillar, grab, frame, overhead cranes.

Constructional features:
Ropes are manufactured with compacted strands of the outer layer (K) with metal core (IWRC), version 2- with compacted outer strands ropes (K) with polymer-coated metal core (EPIWRC).

Diameter, mm	Approximate weight of 1000 m rope, kg		Grade, N/mm^2 (kgs/mm^2)			
			1770		1960	
			Breaking force, kN, not less			
	-	Ver. 2	The total of all wires in the rope	Rope as a whole	The total of all wires in the rope	Rope as a whole
14,0	793,94	-	157,1	122,5	173,9	135,6
16,0	1027,42	-	206,7	161,2	228,9	178,5
18,0	1324,96	-	256,5	200,1	284,1	221,6
20,0	1650,17	-	316,4	246,8	350,4	273,3
22,0	1984,11	2132,92	399,4	311,5	434,5	338,9
24,0	2452,42	2636,35	472,3	368,4	523,1	408,0
26,0	2798,74	3008,65	562,2	438,5	622,5	485,6
28,0	3299,19	3546,63	660,0	514,8	730,9	570,1
30,0	3804,01	4089,31	741,3	578,2	820,9	640,3
32,0	4359,78	4686,77	823,2	642,1	911,5	710,9
34,0	4840,58	5203,62	948,9	740,1	1050,8	819,6
36,0	5476,02	5886,72	1081,7	843,7	-	-
38,0	6165,74	6628,18	1223,0	953,9	-	-
40,0	6898,84	7416,25	1373,1	1071,0	-	-
42,0	7604,38	8174,70	1479,6	1154,0	-	-
44,0	8286,62	8908,11	1623,5	1266,3	-	-
46,0	9033,86	9711,40	1760,7	1373,3	-	-
48,0	9929,19	10673,88	1940,6	1513,6	-	-
50,0	10757,45	11564,26	2113,3	1648,3	-	-
52,0	11588,82	12457,99	2291,9	1787,6	-	-





SPECIAL ROPES MADE OF STAINLESS STEEL GRADES

Steel ropes are manufactured of wire of high-alloy corrosion-resistant steel grades 12x18H9, 12x18H9T, 12x18H10T, 10x17H13M3T according to GOST 5632, of high-alloy steel 04h19N11MZ with chemical composition according to GOST 2246.

Chief advantage of ropes manufactured of high alloy steel grades is increased resistance to aggressive environments.

Rules for packaging, transportation and storage of ropes of high alloy steel grades.

Ropes are wound on wooden drums according to GOST 11127, as well as on return drums as and where prescribed. The side of the drum should protrude above the outer layer of the wound rope by a space at least equal to the double diameter of the rope. The end of the rope is tied by waste strands or fiber core according to GOST 5269 or other regulatory documents, or by wire according to GOST 3282 or other regulatory documents and fastened by a nail to the inner side of the drum. On the drum, the rope should be laid evenly along the length of the neck, without pinching, to ensure free unwinding the rope from the drum.

Ropes can be wound on metal drums or in coils by agreement between the manufacturer and the customer.

Ropes are delivered ungreased. Ropes can be lubricated by ПВК grease according to GOST 19537 at the request of the customer. Cores and discs of drums are covered by impervious cardboard according to GOST 6659 or by wrapping paper according to GOST 8828, or by anticorrosive grease with which the rope was lubricated. The wound ropes on the drum are additionally packed: they are wrapped by one layer of paper according to GOST 8828 or by polymer membrane according to GOST 10354, or GOST 16272, or normative documentation and boarded by boards with an allowable maximum gap between them of no more than 50 mm.

Transport markings are made according to GOST 14192.

Every drum has its metal label, ensuring the safety of marking and reflecting the strength of the rope.

The label is attached to the outer side of the drum. It may be marked with indelible paint on a drum surface on a stencil.

Ropes are transported by all types of transport according to rules for the carriage of goods in force on this type of transport and technical conditions of loading and securing cargo.

Ropes are transported by railway in wagons, by small shipments.

Rope is stored according to conditions 5 of GOST 15150.

The ropes received for storage are subject to inspection and application or coating by rope grease of rope sections exposed during transportation and loading/unloading.

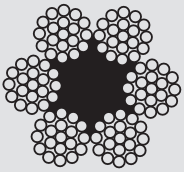
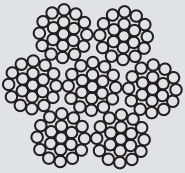
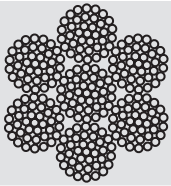
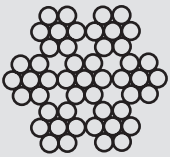
During long-term storage, the ropes should be inspected at least once a year along the outer layer and lubricated by rope grease.

Packaging ropes shipped to the Far North and equivalent areas is made according to GOST 15846.

Stainless steel ropes

TU 14-4-278-73

For use in aggressive environments

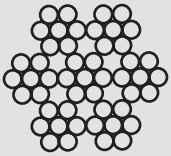
	**Construction:** 1x19(1+6+12) Diameter: 0,9; 1,6 mm
	**Construction:** 1x7(1+6) Diameter: 0,66; 2,4; 5,4; 1,02 mm
	**Construction:** 6x19(1+6+12)+1 fiber core Diameter: 3,40; 4,40 mm
	**Construction:** 6x19(1+6+12)+1x19(1+6+12) Diameter: 3,60; 5,10; 6,00; 8,25; 16,50; 18,00 mm
	**Construction:** 6x37(1+6+12+18)+1 fiber core Diameter: 11,00; 13,00; 24,00 mm
	**Construction:** 6x37(1+6+12+18)+1x37(1+6+12+18) Diameter: 7,14; 10,50 mm
	**Construction:** 6x7(1+6)+1x7(1+6) Diameter: 1,80; 2,16; 2,52; 3,06; 3,60; 4,50; 5,40 mm

Steel ropes are manufactured of wire of high-alloy corrosion-resistant steel grades 12x18H9T, 12x18H10T, in compliance with TU 14-4-278-73.

Stainless steel ropes for contact system elements

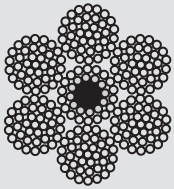
TU 14-173-105-2000

For contact system elements of electrified railways



Construction:
6x7(1+6)+1x7(1+6)

Diameter: 3,0; 6,0 mm



Construction:
6x37(1+6+12+18)+1x30(0+12+18)

Diameter: 9,0; 11,0 mm

Steel ropes are manufactured of wire of high-alloy corrosion-resistant steel grades 12x18H9T, 12x18H10T in compliance with TU 14-173-105-2000.

Stainless steel one lay rope type ЛК-О

TU 14-173-46-2006

For car alarm systems

Construction:
1x7(1+6)

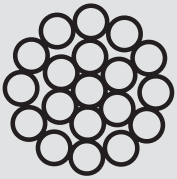
Diameter: 0,60; 0,80 mm

Steel ropes are manufactured of wire of high-alloy corrosion-resistant steel grades 12x18H9T, 12x18H10T in compliance with TU 14-173-46-2006.

Stainless steel rope

TU 14-173-53-2006

For special products



Construction:
1x19(1+6+12)

Diameter: 1,20 mm

Steel ropes are manufactured of the wire of high-alloy corrosion-resistant steel grades 12x18H9T, 12x18H10T in compliance with TU14-173-53-2006.

Stainless steel one lay rope type ЛК-О

TU 14–173–132–2003

For the assembly of mirrors of VAZ cars of new modifications

Construction:
1x7(1+6)

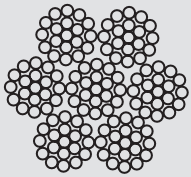
Diameter: 0,8 mm

Steel ropes are manufactured of the wire of high-alloy corrosion-resistant steel grades 12x18H9T or 12X18H9, 12x18H10T in compliance with TU 14-173-132-2003.

Steel two lay ropes made of high-alloyed steel grade 04X19N11MZ (AISI 316)

TU 14-173-102-2012

For special work conditions



Construction:
6x19(1+6+12)1x19(1+6+12)

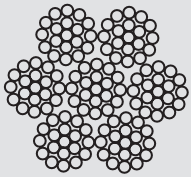
Diameter: 5,00; 6,00 mm

Steel ropes are manufactured of wire of high-alloy steel grade 04X19N11MZ (AISI 316) in compliance with TU 14-173-102-2012.

Steel corrosion-resistant double lay rope type ТК

TU 14-173-117-2002

For use in hydrogen sulfide environments



Construction:
6x19(1+6+12)1x19(1+6+12)

Diameter: 15,00 mm

Ropes are made of wire grade 10X17H13MT.

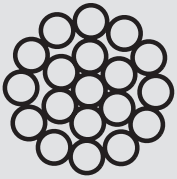
Stainless steel ropes

TU 14-173-134-2005

For special devices

Construction:
1x7(1+6)

Diameter: 1,0 mm



Construction:
1x19(1+6+12)

Diameter: 1,0 mm

Steel ropes are manufactured of wire of high-alloy corrosion-resistant steel grades 12x18H9T, 12x18H10T in compliance with TU 14-173-134-2005.

Special stainless steel ropes

TU 14-4-1306-85

For special working conditions

Construction:
1x7(1+6)

Diameter: 0,6 mm

Steel ropes are manufactured of wire of high-alloy corrosion-resistant steel grades 12x18H9T or 12X18H9, 12x18H10T in compliance with TU 14-4-1306-85.

AIRCRAFT ROPES

Steel aircraft ropes are two lay ropes, manufactured by two layers around the core. Cores can be metallic and fiber.

Ropes laid with wires of the same diameter are listed with ropes with point contact of wire in strands between adjacent layers and indicated as type ТК. Strands woven of wire of various diameters and during one technological operation are called ЛК (linear contact of wire between adjacent layers). If on outer layer strands of wire have different diameters, the strand is called ЛК-Р, and with the same diameter - LC-O.

ТК-type ropes are strands with point contact of wires. They are manufactured during several technological operations: wires located in adjacent layers have a contact between each other with point contact regardless of whether the direction of lay of the contacting layers of the wire is the same or different, which is less effective compared to liner contact ropes, which are manufactured during a single technological operation. Wires on layers have different lay lengths, and as a result wires are crossed. It increases the wear of wires during operation, makes contact stresses, which contributes to the development of fatigue breaks in wires.

The ratio of metal filling of the rope with linear contact in strands is more than in ropes of point contact. Therefore the breaking strength of the rope with linear contact of wires is higher than the breaking strength of rope with point contact of wires in strands (with the same nominal diameter).

Ropes with linear contact in strands have the best operating abilities, increased flexibility, less galling on bends during operation and longer service life as opposed to ropes with point contact in strands.

Steel aircraft ropes of Beloretsk Metallurgical Plant AO are divided into:

- ropes for aircraft industry;
- galvanized aircraft ropes according to GOST 2172;
- stainless aircraft ropes of steel grades of 12Х18Н9Т and 12Х18Н10Т;
- ropes for aircraft and helicopter control systems;
- non-twisting ropes «KSAN»;
- aircraft ropes with fiber core.

Rules for packaging, transportation and storage of aircraft ropes

Ropes are wound on wooden drums according to GOST 11127, as well as on return drums used as prescribed. The side of the drum should protrude above the outer layer of the wound rope at least by an amount equal to the double diameter of the rope. The end of the rope is tied by waste strands or fiber core according to GOST 5269 or other regulatory documents, or by wire according to GOST 3282 or other regulatory documents and fastened by a nail to the inner side of the drum. On the drum, the rope should be laid evenly along the length of the neck, without pinching, to ensure free unwinding of the rope.

Ropes can be wound on metal drums or coils by agreement between the manufacturer and the customer.

Cores and discs of drums are covered by impervious cardboard according to GOST 6659 or by wrapping paper according to GOST 8828, or by anticorrosive grease with which the rope was lubricated. The wound ropes on the drum are additionally packed: they are wrapped in a layer of paper according to GOST 8828 or in polymer membrane according to GOST 10354, or GOST 16272, or normative documentation and boarded by boards with an allowable maximum gap between them of no more than 50 mm.

Transport markings are made according to GOST 14192.

Every drum has its metal label, ensuring the safety of marking and indicating the strength of the rope.

The label is attached to the outer side of the drum. It is marked with indelible paint on a drum surface on a stencil.

Rope are transported by all types of transport according to rules for the carriage of goods in force on this type of transport and technical conditions of loading and securing cargo.

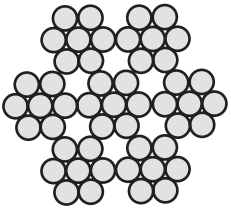
Transportation of ropes by railway transport is made in wagon, low-tonnage and small shipment.

Ropes are stored according to conditions 5 of GOST 15150.

The ropes received for storage are subject to inspection and application or coating by rope grease of rope sections exposed during transportation and loading/unloading.

During long-term storage, the ropes' outer layer should be inspected at least once a year and lubricated by rope grease.

Packaging of ropes shipped to the Far North and equivalent areas is made according to GOST 15846.



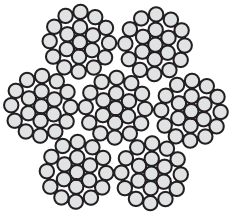
Steel aircraft ropes

GOST 2172-80

Construction:
6x7(1+6)+1x7(1+6) type ЛК-О

Ropes for aircraft and helicopter control systems

Diameter, mm			Approximate weight of 1000 m rope, kg	Breaking force as a whole, N, not less		
				for carbon steel		high-alloy, anticorrosion steel
Nominal	Min.	Max.		high quality	normal quality	
1,60	1,60	1,80	13,2	2220	2150	1605
1,80	1,75	1,90	16,0	2740	2640	1965
2,20	2,15	2,35	23,7	3920	3780	2945
2,40	2,40	2,70	29,4	4900	4780	3820
2,50	2,50	2,70	31,4	5190	5130	4105



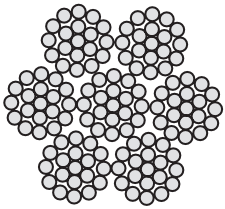
Steel aircraft ropes

GOST 2172-80

Construction:
6x19(1+6+12)+1x19(1+6+12) type ТК

Ropes for aircraft and helicopter control systems

Diameter, mm			Approximate weight of 1000 m rope, kg	Breaking force as a whole, N, not less		
				for carbon steel		high-alloy, anticorrosion steel
Nominal	Min.	Max.		high quality	normal quality	
3,20	3.20	3,50	54,0	9075	8900	6910
3,60	3,50	3,95	64,1	10750	9660	8200
4,00	4,00	4,40	81,2	13700	12450	10350
4,50	4,45	4,90	97,8	16650	15000	12250
4,80	4,80	5,20	113,5	18950	18600	13950
5,00	5,00	5,60	129,3	20050	19250	15950
5,60	5,60	6,00	159,6	25450	24900	19900
6,00	5,95	6,60	175,5	27400	26590	20900
6,40	6,40	6,80	197,5	31350	31200	23350
7,50	7,50	8,10	277,0	41550	39550	32750
8,00	8,00	8,60	309,1	46300	44150	36550
9,50	9,50	10,20	436,0	65400	64100	51550



Steel aircraft ropes

TU 14-173-019-2015

Construction:
6x19(1+6+6/6)+1x19(1+6+12) type ЛК-Р -ТК

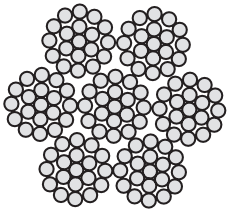
Ropes for aircraft and helicopter control systems

Diameter, mm			Approximate weight of 1000 m rope, kg	Breaking force as a whole, N, not less
Nominal	Min.	Max.		Grade, N/mm2
				2160
4,00	4,00	4,40	76,0	13720

Ropes made in compliance with TU 14-173-019-2015 are industrial and technological products. They are used in steering systems of civil and military helicopters. Ropes differ from those previously produced by type of lay strands and diameter of wire. It gives them increased endurance and increases the accuracy of helicopter tail rotor control.

Endurance of the rope manufactured according to TU 14-173-019-2015 is higher than specified by GOST 2172-80. Breaking force as a whole according to TU 14-173-019-2015 is higher than specified by GOST 2172-80 after durability tests.

Ropes manufactured according to TU 14-173-019-2015 have more hardness (less elongation) than prescribed by GOST 2172-80. Hardness of ropes will improve the accuracy of the tail rotor control.



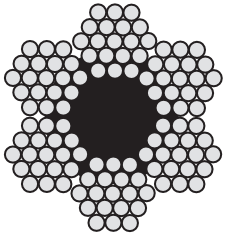
Steel aircraft nonspinning rope «KSAN»

TU 14-4-425-73

Construction:
6x19(1+6+12)+1x19(1+6+12) type ТК

Ropes for aircraft systems

Diameter, mm			Approximate weight of 1000 m rope, kg	Breaking force as a whole, N, not less
Nominal	Min.	Max.		
5,00	4,95	5,45	110,0	20580



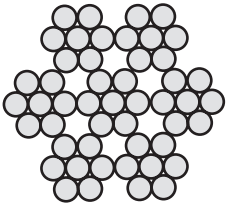
Steel aircraft ropes with organic core

TU 14-4-426-73

Construction:
6x19(1+6+12)+1 fiber core type ТК

Ropes for aircraft and helicopter control systems

Diameter, mm	Approximate weight of 1000 m rope, kg	Breaking force as a whole, N, not less	
		Grade, N/mm^2	
		1770	2160
3,0	40,0	-	6,37
5,1	115,0	15,68	-



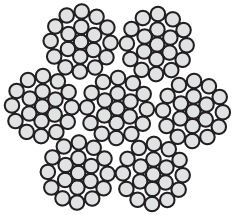
Steel aircraft nonspinning rope «KSAN»

TU 14-4-1266-83

Construction:
6x7(1+6)+1x7(1+6) type ЛК-О

Ropes for aircraft systems

Diameter, mm			Approximate weight of 1000 m rope, kg	Breaking force as a whole, N, not less	
Nominal	Min.	Max.		normal quality	high quality
1,8	1,76	1,9	14,14	2210 (225)	2260 (230)
2,5	2,4	2,7	25,28	4370 (445)	4470 (455)



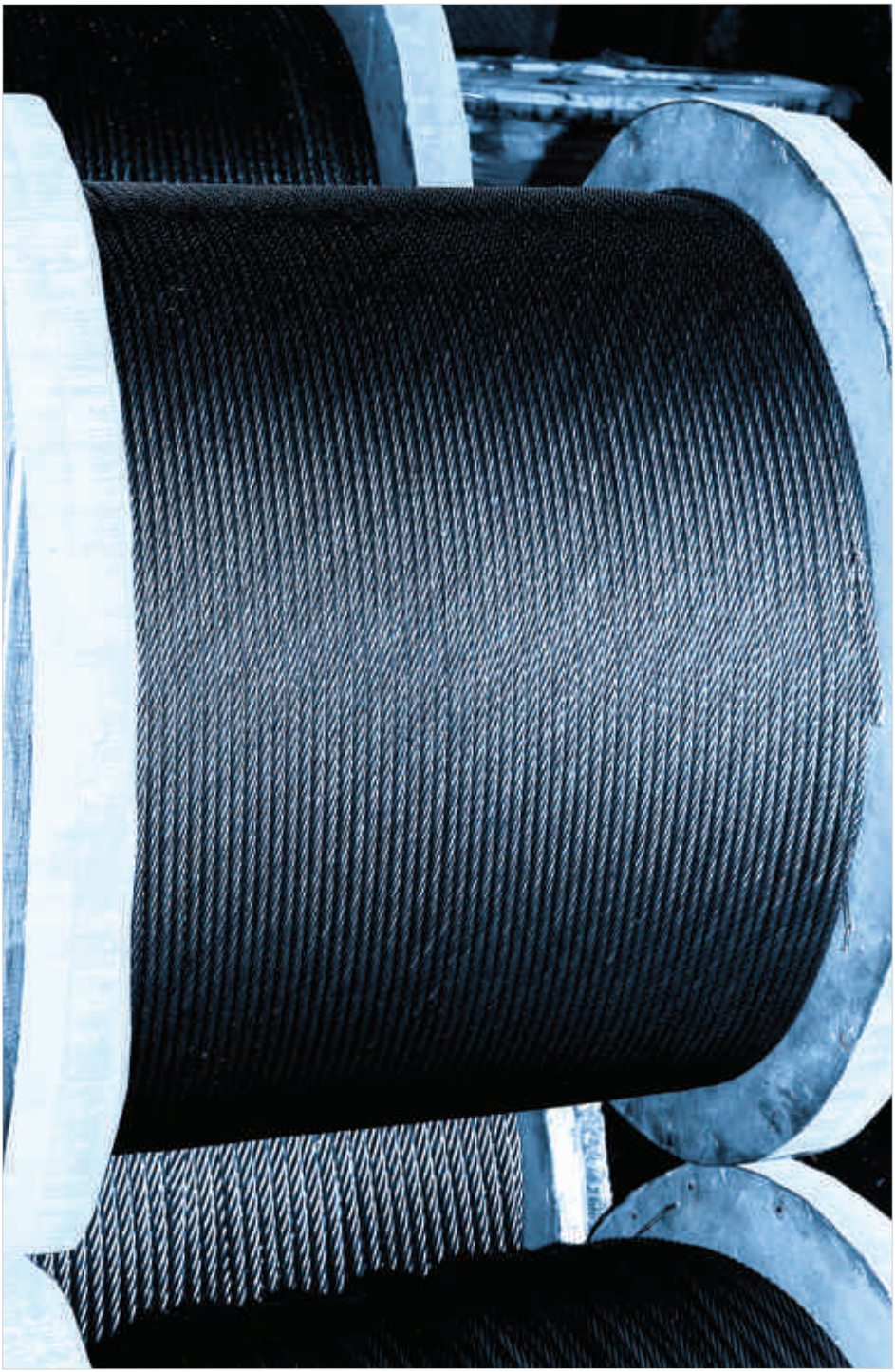
Steel aircraft nonspinning rope «KSAN»

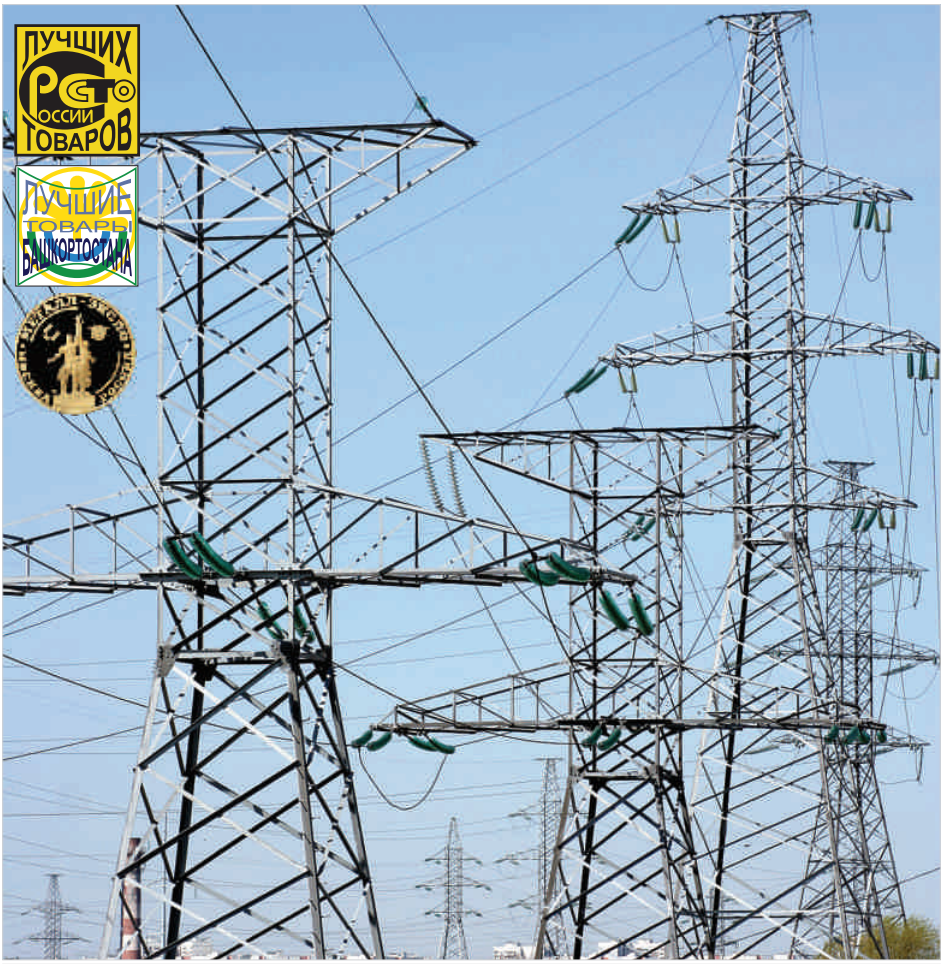
TU 14-4-1266-83

Construction:
6x19(1+6+12)+1x19(1+6+12) type ТК

Ropes for aircraft systems

Diameter, mm			Approximate weight of 1000 m rope, kg	Breaking force as a whole, N, not less	
Nominal	Min.	Max.		normal quality	high quality
3,5	3,30	3,65	5,30	8280 (845)	8380 (855)
4,5	4,45	4,90	9,72	15980 (1630)	16080 (1640)





GROUND WIRE FOR PROTECTION OF OVERHEAD LINES FROM DIRECT LIGHTNING STRIKES

Ground wire is an element of an overhead line designed to protect it from direct lightning strikes. The rope is grounded or isolated from the body of the support (earth) and is located above the wires of phases, poles. Ground wires are steel ropes. Mechanical tensile strength is the minimum tensile strength of ground wire, set by the manufacturer by calculation based on test results of wires that make up the rope.

Ground wire is classified by material used in its making, design, corrosion protection. Ground wire is made entirely of steel wires.

The construction of ground wire proposed by the manufacturer should ensure its physicomechanical and electrical parameters in specified technical conditions for external influences in appropriate climatic conditions, after its suspension on an overhead line, throughout the entire service life. The wire's service life is confirmed by technical documentation and the manufacturer's calculations, and must be no less than 40 years if vibrations are properly dealt with.

The ground wire should be non-spinning, with wires in the ground wire preformed and breaking out of the winding by no more than two steps of lay. By degree of twist these ropes are classified as low twisting.

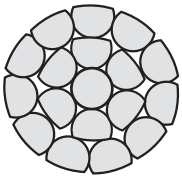
- During long-term operation, the ground wire is subjected to various workloads, for example, that which causes vibration and galloping of the rope, and which can contribute to the appearance of fatigue changes in the steel structure. In addition, icing on cables can increase the total mechanical tensile load. Also, the effect of lightning discharges should not lead to the destruction of individual wires and the entire rope. Exposure to atmospheric precipitation requires significant corrosion protection to increase life of the rope.
- The construction of the ground wire 1x18(1+6+11) and compaction of rope and its core allow the use larger diameter wire in lay, which increases the resistance to lightning and short circuit currents.
- Ground wire has an increased total breaking strength in comparison with a similar rope according to GOST 3063-80.
- Ropes of 1+18(1+6+11) construction are more balanced and nonspinning due to opposite directions of wire lay along the rope layers.
- Ropes of 1x26(1+5+5/5+10) with compacted strands let use wire of large diameter on the outer layer, which increases resistance to lightning and short circuit currents. The second layer consists of wires of different diameters, which increases the structural density of the rope. Also the increase in the cross-sectional area increases total breaking force, breaking force as a whole and the specific strength of the ground wire (the ratio of breaking force of the rope as a whole to the mass per unit length). The ground wire of this construction is more flexible and has greater resistance to Aeolian vibration and galloping (dancing).

Testing of ropes manufactured according to TU 14-173-035-2010 and TU 14-173-042-2010 showed that ropes have:

- an increased cross-sectional area, higher total and aggregate breaking force due to use of strand compaction;
- higher corrosion resistance due to use of zinc coating in the group «ОЖ»;
- higher resistance to lightning strike, due to use of wire of enlarged diameter in the outer layer;
- low twisting due to use of enlarged diameter in the outer layer.

The ropes (ground wire) underwent a full cycle of tests for resistance to effects of Aeolian vibration, effects of holing (dancing), short-circuit currents and direct lightning current, which indicates their compliance with the requirements of STO 56947007-29.060.50.015-2008 «Lightning protection ropes for overhead power lines».

Beloretsk ropes are included in the register of equipment approved for use at all facilities under construction at Rosseti, one of the largest electric grid companies in the world.



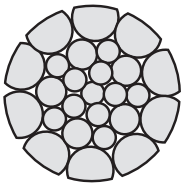
TU 14-173-035-2010

Construction:
1x18(1+6+11)

Ground wire

Diameter, mm	Approximate weight of 1000 m rope, kg	Grade, N/mm^2 (kgs/mm^2)									
		1370 (140)		1470 (150)		1570 (160)		1670 (170)		1770 (180)	
		Breaking force, kN, no less									
		The total of all wires in the rope	Rope as a whole	The total of all wires in the rope	Rope as a whole	The total of all wires in the rope	Rope as a whole	The total of all wires in the rope	Rope as a whole	The total of all wires in the rope	Rope as a whole
9,20	441,68	75,08	66,07	80,56	70,89	86,04	75,72	91,52	80,54	97,00	85,36
11,0	635,00	107,96	95,00	115,84	101,94	123,72	108,87	131,60	115,81	139,48	122,74
13,0	878,50	149,33	131,41	160,23	141,00	171,13	150,59	182,03	160,19	192,93	169,78

Steel ropes (ground wire) – compacted (ПК), lightning protected (М3), made of galvanized wire surface density of zinc (ОЖ).



TU 14-173-042-2010

Construction:
1x26(1+5+5/5+10)

Ground wire

Diameter, mm	Approximate weight of 1000 m rope, kg	Grade, N/mm^2 (kgs/mm^2)									
		1370 (140)		1470 (150)		1570 (160)		1670 (170)		1770 (180)	
		Breaking force, kN, no less									
		The total of all wires in the rope	Rope as a whole	The total of all wires in the rope	Rope as a whole	The total of all wires in the rope	Rope as a whole	The total of all wires in the rope	Rope as a whole	The total of all wires in the rope	Rope as a whole
9,20	461,5	78,71	69,26	84,45	74,32	90,20	79,38	95,94	84,43	101,70	89,50
11,0	673,5	114,22	100,51	122,55	107,84	130,89	115,18	139,23	122,52	147,60	129,90

Steel ropes (ground wire) – compacted (ПК), lightning protected (М3), made of galvanized wire surface density of zinc (ОЖ).

MANUAL
for operation and installation of the ground wire for overhead power lines protection from direct lightning strikes

The operability of steel ropes depends not only on correct technology for their manufacture, but also on timely and thorough care of ropes, the rational mode of their operation, providing the required reliability and the necessary durability of the rope.

Transportation and storage of ropes

Transportation is carried out by any type of transport in accordance with the cargo transportation rules applicable to each type of transport.

During transportation, wooden drums with the ground wire should be firmly fixed in transport container. The fastening of drums with the ground wire should exclude the possibility of deformation of drums and ground wire during transportation and loading/unloading.

The ground wire should be stored in packaged form both in warehouses and in open areas. In the air there should be no acid or alkaloid fumes or other aggressive environments.

Ropes rewinding

The following rules must be observed during ropes rewinding:

- ropes should be unwound from the drum mounted on a horizontal shaft;
- in order to avoid the formation of loops, local creases, «kicks», the unwinding and hanging of ropes should be done only under the tension;
- it is necessary to equip the rewinding device with a brake for formation of a constant tension of the rewinding rope.

The rope should rewind from the top of one drum to the top of another drum.

Ground wire installation

The ground wire should be mounted in accordance with the project of suspension on overhead lines, Electrical Installations Code, operating and maintenance rules and technical documentation, agreed in determinate order.

Installation of the ground wire should be carried out in accordance with operation manual for ground wire, technological chart and project for work production developed by the contractor that performs the installation of ground wire on power lines.

Following rules should be observed during installation the ground wire on overhead lines:

- the unwinding device should be equipped by appropriate braking device, which should provide the given constant tension during pulling and to prevent further spinning of the drum when the unwinding is abruptly stopped or slowed down. In this regard, the use of an unsuitable brake with a friction beam or similar device is absolutely not permissible;
- in the circuit of braking device, it should be made provision for possibility to control the braking force, preferably in automatic mode, because the force changes as the wire is unwound from the drum;
- the unwinding device should be installed so that during pulling the wire does not come into contact with the inner side of the drum flange and does not rub against it;
- to install the drum on the unwinder, a crane or forklift should be used. The unwinding device should be properly fixed on the ground, grounded and located at a sufficient distance from the tensioner. Ideally, this distance should be at least 30 m.

To maintain wire tension and to avoid obstacles, it is recommended to use the following devices:

Ancillary line should be placed in tension blocks.

Ancillary line pull heavier tag ropes, which pull the wire. The use of twisted tag ropes is preferable because they do not twist. When using standard wires, the twist direction of the tag ropes should be the same as the pulling wire.

Swivel should be located between wire and tag rope.

It should be made on basis of a ball bearing and have sufficient mechanical strength comparable to the cable tension forces.

Wire tension and pulling devices. These devices should be aligned along the axis of the line laying path. The use of drum machines with sequential pulley arrangement is recommended. Machines should be equipped by tension control sensors and mechanical tension regulators. They must ensure a constant and uniform «jerkless» tension during tensioning.

It is recommended, the tensioning and braking devices should be located at a sufficient distance from the first support, taking into account two mutually contradictory factors.

On the one hand, this distance should not be too short, otherwise the vertical component of the force applied to the first tension block will be too high and the wire will run along the tension block along a longer part of the arc. On the other hand, this distance should not be too large, in order to exclude the possibility of the wire touching the ground under the action of the applied pulling force.

As a general rule, this tension is 4/3 of height difference between the tension block of the first support and the tension and brake installation in accordance with static calculations of the bracket.

Braking to a stop or increasing speed to maximum should be carried out gradually and without jerking. The tensile force on the tensioner must be maintained unchanged during any accidental stop.

There must be 5 or more pulley grooves on drums. There should be no roughness, which could damage the rope.

The diameter of drum of the tension device should be at least 0.8 m. The pulling speed should be constantly monitored, jerking should be avoided, because they could damage the rope.

The connecting and tensioning clamps must be of a compressible type. They must be installed in strict accordance with the instructions of the clamp and equipment manufacturer.

Recommended tensioning clamps – HC-70-3M, connecting clamps – CBC-70-3M of OAO «EVA Aston-Energo».

Connecting and tensioning clamps should be installed as straight as possible.

Slack of connections should not exceed one quarter of wire diameter. The end of wire must be thoroughly cleaned before inserting it into the connection. In particular, all traces of grease and dirt must be removed from it.

Touching the ground of wire or connectors is not allowed.

Place clean, dry boards or tarps on the ground to prevent such cases..

It is interdict to throw the rope from the drum to the ground, create tension by braking the rope itself.

Cutting of ropes is carried out after application of a strong knitting of soft wire to the end of rope. Cutting can be done either by autogenous welding, or on special scissors with a metal or reinforced disc.

Operation of ground wire

To reduce an aeolian vibration in spans longer than 100 meters, multi-frequency vibration dampers should be installed on the ground wire.

The remaining requirements for the operation of ropes are set in accordance with operating rules approved in determined order.

TECHNICAL INFORMATION

CLASSIFICATION OF ROPES

According to GOST 3241-91 «Steel ropes. Technical conditions» ropes are divided:

By construction:

- one lay – consist of wires laid in a spiral into one or several concentric layers;
- two lay – consist of wires laid into one or several concentric layers;
- three lay – consist of two lay ropes laid into concentric layer.

By cross-section form: round.

By cross-section form of strands: round-strand.

By the lay type of strands and one lay ropes:

- with the point contact of wires between layers – ТК;
- with the linear contact of wires between layers – ЛК;
- with the linear contact of wires between layers, with the same diameter of wires on layers of the strand – ЛК-О;
- with the linear contact of wires between layers, with the different diameter of wires in outer layer of the strand – ЛК-Р;
- with the linear contact of wires between layers and fill wires ЛК-З;
- with the linear contact of wires between layers and having layers in the strand, with wires of different diameters and layers with wires of the same diameter – ЛК-РО;
- with the combine point-linear contact of wires – ТЛК;
- with the bandpass contact of wires – ПК.

By material of the core:

- with the fiber core: made of natural or chemical fibers, hard polymer fiber;
- with the metal core;
- with the metal-fiber core: made of metal and nature or chemical fibers, metal and hard polymer fiber.

By method of the lay: nonspinning, spinning.

By balance: planishing – Р, unplanishing.

By the lay direction of the rope: right, left.

Direction of rope lay is:

- for one lay ropes – direction of the wire lay of outer layer;
- for two lay ropes – direction of the wire lay of outer layer;
- for three lay ropes direction of strand lay in the rope.

By combination of directions of lay ripe and its elements in two and three lay ropes:

- regular lay (lay direction of the rope and lay direction of strands are opposite);
- alternate lay (lay direction of the strand and lay direction of the wires in strands are the same);
- combine lay (ropes, laid of the same quantity right and left strands - three right strands and three left strand lays located with alternation).

By the degree of torsion:

- spinning (with the same lay direction in single lay ropes, strands);
- low-spinning (multilayed multi-stranded and one lays with opposite the lay direction of elements in layers).

By mechanical characteristics of grades: ВК, В, 1.

By the type of coating:

- wire surface in the rope: of uncoated wire, galvanized wire: depends on the surface density of the zinc – С, Ж, ОЖ;
- rope surface or its elements: uncoated wire, coated surface with polymer materials – П.

By purpose: human cargo (grade ВК, В) – ГЛ, cargo – Г.

By the accuracy of manufacturing: particular accuracy – Т, normal.

Construction, main characteristics and diameters of ropes are indicated in relevant standards for assortments.

At the request of the consumer, it is allowed to manufacture ropes of intermediate diameters or strong characteristics not provided for in standards for the assortment.

Diameter of the rope, its purpose, grade, type of surface, lay direction, combination of lay direction, lay way, balance degree, torsion degree, accuracy of manufacturing, grade, indication of the relevant standard for assortments are specified by the customer and included in the symbolic notation of the rope.

GENERAL REQUIREMENTS FOR PROPER OPERATION OF STEEL ROPES

TRANSPORTATION AND STORAGE

Service life of steel ropes during operation depends not only on correct technology of their manufacture and reasonable choice of the rope construction for specific operating conditions, but also on the correct organization of transportation and storage of ropes, correct implementation of their installation, timely, close control and care of ropes during their operation and also on the rational regime of their work provided the required safety and increased the service life of the rope.

The main task of caring for ropes in operation is preservation of form and structure of the rope and protection from mechanical and corrosion damages. This calls for compliance of following basic rules of selection, transportation, storage, preparation to installation and operation of ropes.

During transportation and loading/unloading the ropes, measures should be taken against damage of the upper layer of rope and for the prevention at least local removal of lubricant.

At the place of receipt of the ropes, it is necessary to have the necessary lifting equipment for their unloading. Do not drop wooden drums with ropes even from an insignificant height.

The ropes received for storage are subject to immediate inspection and lubrication of the exposed sections of the ropes that arose during transportation and loading /unloading.

Storage of ropes must meet the Conditions 5 of GOST 15150-69. According to these standards, ropes should be stored in rooms or under a shed, where fluctuations of temperature and humidity are not significantly different from fluctuations in the open air (for example, tents, metal storage without thermal insulation) located in macroclimatic conditions with moderate and cold climate in the atmosphere of any type.

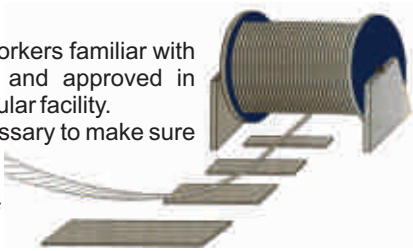
Drums are placed on cradles or supports and protect from influence of rainfall in case of storage of ropes out of warehouse.

The ropes's external layer should be periodically inspected and lubricated during continuous storage no less than once in 6 months.

PREPARATION FOR ROPES INSTALLATION

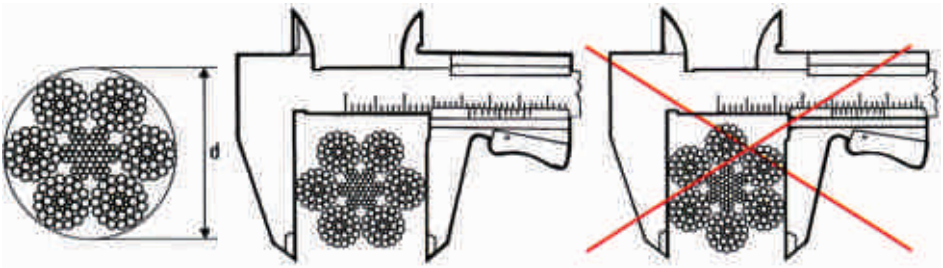
Ropes installation should be made by a crew of workers familiar with the installation manual, as well as developed and approved in accordance with established procedure for a particular facility.

During installation or replacement works, it is necessary to make sure no abrasive and polluting materials are allowed on rope surface. To ensure this, we recommend that all works be carried out on a special stand of boards.

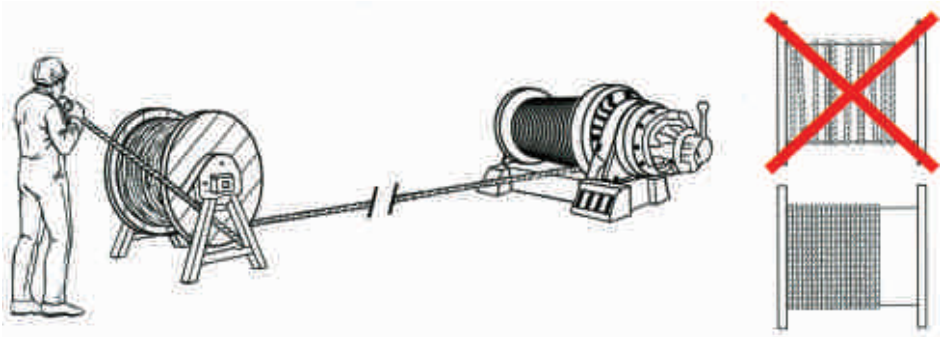


It is necessary to check the condition of block grooves system and drum grooves of respective winch before the rope installation. Groove diameter should be 5%-7.5% more than the nominal diameter. Too narrow block grooves catch and deform the rope, break its structural integrity, which can lead to premature failure of the rope. Too large block grooves create insufficient support for the rope, which leads to an increase in contact pressures and premature damage of rope wires.

Rope diameter is measured by trammel according to GOST 166 with the grating period no more than 0.1 mm or by micrometer according to GOST 6507 with the grating period no more than 0.01 mm or at distance not less than 5 m from the rope end in the empty state.



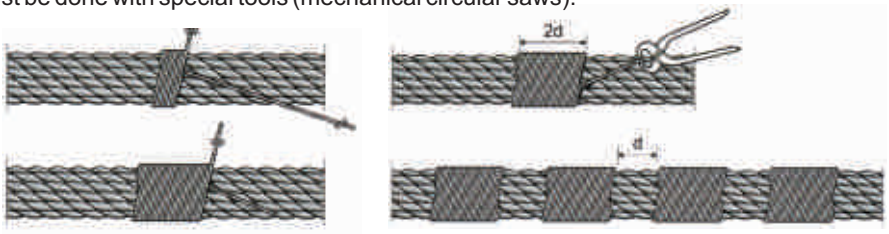
Before unwinding, the drum with rope should be installed on an unwinding device, which ensures the horizontal location of the drum axis and is equipped with a break device to create the necessary rope tension and avoid formation of loops and creases. Slack or inequality of rope winding leads to excessive wear crushing and deformation of the rope.



A drum should be installed on an unwinding device so as to exclude formation of alternating bends. For example, for a drum with winch with the top rope winding it is necessary to unwind the rope from the top of the transportation drum.

In case the rope is unwound from the drum of pre-cut piece, it is necessary to install it on a turning unwinder and to pull the outer end of the rope, rotating the drum.
It is forbidden to unwind the rope from a fixed drum because this can lead to a rope twist and loop formation that can lead to structural defects in the rope and a significant decrease in the rope's service life.

If it is necessary to cut a rope, at least three dressings of a length equal to two or three rope diameters should be applied to it from each side of the cut from a soft wire. Cutting the rope must be done with special tools (mechanical circular saws).



RUNNING AND STRETCHING OF THE ROPE

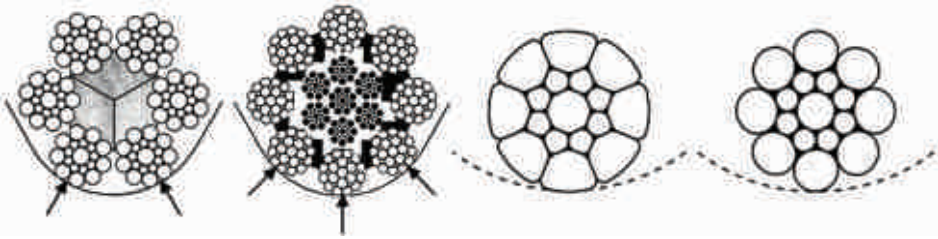
Due to the fact that during an initial period of operation there is a constructive elongation of the rope and redistribution of stresses in the rope, it is necessary to do running and stretching of the new rope after its installation. It is recommended to run and stretch the rope at the same time, starting with low speed and work load and working up. This will provide a gradual stabilization of internal stresses in the rope and allow it to adapt to working conditions.

INCREASING THE NUMBER OF STRANDS IN THE ROPE

Lately there has been a trending demand for an increase in the rope service life. One of the ways to increase the service life of ropes was to manufacture ropes with the number of strands from eight and upwards (multi-strand ropes).

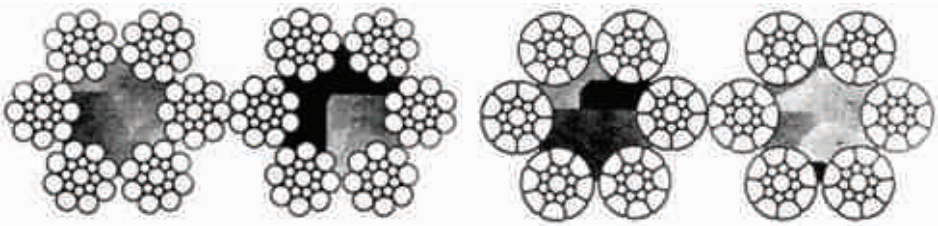
In comparison with six-strands multi-strand ropes have the following advantages:

1. Increase in number of contact points with block groove which leads to decrease in contact stresses and the wear rope and block (shaft) (see picture 1).



Picture 1. Scheme of contact points with block groove of different constructions.

2. Increased flexibility which enables these ropes to use blocks of small diameters which is important for multi-block pulleys and other rope-block systems.
3. Increase of their technical resource in comparison with six-strand ropes by 1,5-2 times and more in the main areas of application.
4. Multi-strand construction ropes are more balanced due to opposite directions of the lay on the layers.
5. Increased strength of steel ropes due to increasing the filling factor of metal section of the rope.
6. With multilayer winding ropes of compacted strands are less susceptible to damage from neighboring wraps (see picture 2).



Picture 2. Scheme of interaction of neighboring wraps
within multilayer ropes winding of different versions.

Multi-strand ropes provide reliable and stable operation on mechanisms with free suspension of the load, and a large support surface and lower specific pressures on the external wires allow to achieve a comparatively high performance of the rope. In addition, multi-strand constructions help solve special tasks in the first place, ensuring unspinning of ropes and pulleys.

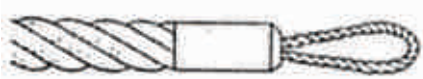
Multi-strand ropes require a more qualified approach in their installation and operation.

While used on mobile cranes and crane manipulator equipment, lifting ropes are subject to various types of wear, depending on the nature of workload, ratio of block diameter to the rope diameter, safety margin, state of environment.

The most efficient technology to improve the operational characteristics of steel ropes are various methods of power processing of ropes. These methods, used for ropes with linear contact in strands, lead to deep plastic deformation of rope elements, accompanied by a

significant change in the structure, mutual position and interaction in the rope. This increases the rope service life by 1.5-2 times. The main method of power handling is round compaction of strands (ПК-planar contact) carried out by drawing through a monolithic hardbanding die or roller cartridge.

For installation a new rope with the help of an old one the following types of sealing off and connections are recommended:



Loop sealing

Sealing for standarts ropes

Ropes sealing with shackle for removing the spinning

«pulling grip»

The use of ropes manufactured with a loop at the end allows to significantly reduce the complexity of replacing ropes and the likelihood of rope damage during the installation process.

A shackle is recommended for use when replacing ropes. When etching an old rope, the spinning from the friction of wraps winding on a drum is extinguished by the shackle and is not transferred to the new rope, which helps maintain the structural rope density and eliminate the possibility of the tackle block spinning.

When replacing the ropes manufactured without a loop at the end, it is recommended to use a pulling grip.

After winding the first layer rope on the winch drum, taking into account the necessary lifting of the tackle block to the required height, fix the motionless branch of the rope on its fixing mechanism.

Subsequent operations include only tackle block lifting, setting up the damper, adjusting the weight of its loads, installing a traveling-block limit switch. After that, the work of the weight indicator with the installation of the sensor on the rope is adjusted in cases when it is not included in the design of the fixing mechanism of the fixed branch of the rope.

After fixing the branch tackle rope on the drum winch, fix the motionless rope branch in clamps of the fixing mechanism, fix the position of the cage or its drum, and adjust the weight indicator, the sensor and the traveling-block limit switch.

It is absolutely forbidden to drop the motionless end (cage) of the rope wraps from the plant-supplied drum or from the drum for fixing during replacement or restart.

After pulling and fixing the ends of the tackle rope, the tickle block should be raised slowly and only after annealing the tension of the individual branches of the tackle rope you can arise the tackle block from the floor.

The new rope on the winch drum should be wound tight, eliminating the possibility of the rope becoming embedded between wraps of the previous layer.

RUNNING AND STRETCHING OF ROPES

As in the initial period of operation there is a constructive elongation of the rope and redistribution of stresses in the rope, after installation it is necessary to run and stretch it. We recommend that running and stretching of the rope are done simultaneously, beginning with low speed and work load which are then increased. This will provide a gradual stabilization of internal stresses in the rope and allow it to adapt to working conditions.

Recommended running and stretching regimes:

1 Running and stretching of the rope without load:
- 2-3 cycles with minimum speed (a cycle includes winding the rope on the winch drum and unwinding the rope in reverse);
- 2 - 3 cycles with nominal speed.

2 Running and stretching of the rope at load on ¼:
- 2-3 cycles with minimum speed;
- 2 - 3 cycles with nominal speed.

3 Running and stretching of the rope at load on ½:
- 2-3 cycles with minimum speed;
- 2 - 3 cycles with nominal speed.

4 Running and stretching of the rope at full load:e:
- 2-3 cycles with minimum speed;
- further work at full load with nominal speed.

After installing, running and stretching, inspect the ropes and fixing points and carry on operations in the normal mode if there are no deviations.
During operation, the ends of the dangling outer wires must be removed from the rope by bending them back and forth with pliers until the wires break deep in the gap between the two outer strands.

During the operation, the rope must be lubricated regularly at equal intervals. The service lubricant must be compatible with the type of rope lubricant applied during manufacture, which is specified in the rope certificate.

- Before applying a fresh coat of lubricant on the rope, it is necessary to clean it from foreign elements such as dust, sand, rock pieces, etc.
- The type and method of application of the lubricant must ensure equal coverage of all rope wires with a thin layer.
- Crude or used lubricants may not be used, because they can be contaminated with caked particles or acids, which can also have a negative impact on the rope.

It is necessary to monitor the condition of grooves on drums and blocks. Working the rope with worn grooves leads to a decrease of the contact area and as a consequence to deformation and destroying rope structure. During the operation, rope-block systems can have the following faults: loss of the rope from the groove block; hanging of the rope on blocks; winding of tackle rope; fraying of ropes; breaks of wires, strands and rope as a whole, wear of the groove and edges of blocks; breakage of blocks.

If the rope slips from the groove of blocks leads to its grinding against the sharp edges of the metal structures, breaking and falling of the load. The rope may fall out if the enclosing devices are bent, the rope is slanted and skewed in relation to the block or incorrectly stored. In the latter case, the rope, wedged between the flange and the fence, bends it.

Jamming of ropes on the blocks can occur if the block's bearings are jammed or the rope touches the protection device of the block. As these malfunctions lead to intensive wear of block grooves and the rope, they must be immediately eliminated. If protection is bent, it should be repaired or straightened, ensuring free passage of the rope. Block bearings must be cleaned and filled by clean grease or replaced by new ones.

Wear of groove and flange of blocks, as a rule, occurs if bearings of the block is jammed or the rope is skewed. When the bearings are poorly lubricated and jammed, the rope slides along the block, which in an abrasive environment (dust, sand) leads to the rapid development of a stream or block flanges. Blocks are especially quickly worn out with a small angle of their coverage by the rope, because the pressure force of the rope is insufficient for block rotation. With the skewed direction of rope, one-sided wear of side surface of block flanges occurs. To prevent this, work that causes oblique rope tension should be avoided.

Twisting of the rope usually occurs if the rope was unwound incorrectly from the bay during its storage on blocks. This can be prevented by untwisting the rope or by using an anti-twist tool.

Abraison of ropes occurs, as a rule, when they are not properly stored. In this case, during operation, the ropes touch each other and metal structures. The ropes are also braised when an attempt is made to lift the load with a twisted rope.

DEFECTS OF STEEL ROPES FORMED DURING OPERATION PROCESS

Wire buckling
Poor lubrication during operation.

Core bulging
Instability to torsion and/or shock load.

Local diameter reduction
Core damage.

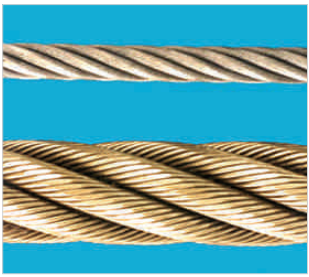
Strand swelling
Mechanical damage during rope installation, improper multi-layer winding on the drum.

Localized wear
The effect of abrasion on supporting structure.

Kinking
Wrong unwinding, installation.

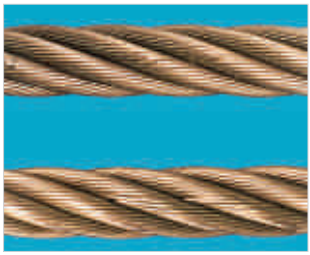
Formation of wave or corkscrew defects in ropes
The radius of pulley grooves and drum cutting do not correspond to nominal rope diameter + 5%.

Bird cage
Rope twisting during installation, impact on rope of shock load, violation of the rules of felling during installation, wear of grooves of cutting on drum and grooves of pulleys.



External wear

Surface corrosion
Poor lubrication, presence of corrosive substances and moisture on rope surface.



Wire gusts
The result of bending with increasing load and a decrease in the radius of bending; drum diameter mismatch.

Core buckling
Torsion accumulation.

Local increase in rope diameter
Core disorder.

Loop
Incorrect unwinding, rope installation.

Significant wear of wires in rope
Large angle deviation; high reference pressure; abrasive wear; pulley jamming.

PACKAGING

Finished ropes are wound on wooden drums in accordance with GOST 11127-78 «Wooden drums for steel ropes».

In accordance with the requirements of GOST 3241-91 «Steel ropes. Technical conditions» the diameter of drum core must be at least 15 nominal diameters of the rope. The drum flange should protrude above the outer layer of the wound rope by at least two rope diameters with a diameter of 25 mm or less and 50 mm with a rope diameter of more than 25 mm.

It is allowed to wind several segments of a rope of the same size onto the drum. The ends of the rope are firmly fixed. The outer end of the rope is tied by fiber core in accordance with GOST 5269 or other regulatory documents, or by wire in accordance with GOST 3282, or by strand, rope, or tape in accordance with GOST 3560, and is attached to the inside of a drum flange.

Upon the customer's request drums with cargo-human purpose ropes are sheathed by boards, with a maximum gap of no more than 50 mm, or the rope is wrapped by a polypropylene fabric or other material according to regulatory documents.

Ropes shipped to the Far North and remote areas, as well as ropes shipped by sea, are packaged in accordance with GOST 15846-2002 «Products shipped to the Far North and equivalent areas. Packaging, labeling, transportation and storage». A rope wound on a wooden or metal drum is wrapped by polypropylene-new cloth or other material according to regulatory documentation. Drums are sheathed by boards (formwork).

It is allowed, by agreement between manufacturer and customer, to wind the ropes on metal, plywood drums.

RECOMMENDATIONS FOR USE OF STEEL ROPES IN VARIOUS INDUSTRIES

Recommendations for use of steel ropes in various industries

№	Standard	Rope construction	Rope type	USE AND DIAMETER OF THE ROPE				
				Hoisting-and-transport machines: crane, lift, for hoists, etc.	**Shaft hoisting devices:** for vertical hoisting devices, brake, balancing ropes, on cutting machines and combines, etc.	**Earth moving and road machinery:** for excavators, road machines, etc.	**Cable roads and cable cranes:** carrier, traction, tension ropes, for contact network elements, etc.	**Lifting installations of the metallurgical industry:** skip hoist ropes for cranes, for car dumper
1	2	3	4	5	6	7	8	9
1	**2688-80**	6x19(1+6+6/6)+1 fiber core	ЛК-Р	4,1-32,0	8,3-32,0	12,0-21,0	11,0-32,0	16,5-32,0
2	**3062-80**	1x7(1+6)	ЛК-О					
3	**3063-80**	1x19(1+6+12)	ТК				4,6-11,0	
4	**3064-80**	1x37(1+6+12+18)	ТК				4,6-10,5	
5	**3066-80**	6x7(1+6)+1x7(1+6)	ЛК-О				4,6-10,0	
6	**3067-88**	6x19(1+6+12)+1x19(1+6+12)	ТК					
7	**3068-88**	6x37(1+6+12+18)+1x37(1+6+12+18)	ТК				2,7-13,0	
8	**3069-80**	6x7(1+6)+1 fiber core	ЛК-О	3,3-5,9			13,5-16,5	
9	**3070-88**	6x19(1+6+12)+1 fiber core	ТК				3,3-9,7	
10	**3071-88**	6x37(1+6+12+18)+1 fiber core	ТК				5,0-13,5	
11	**3077-80**	6x19(1+9+9)+1 fiber core	ЛК-О	11,5-25,5	17,5-32,5		16,5-32,5	
12	**3079-80**	6x37(1+6+15+15)+1 fiber core	ТЛК-О	17,0-47,0	17,0-54,0		17,0-33,0	17,0-39,0
13	**3081-80**	6x19(1+9+9)+7x7(1+6)	ЛК-О			12,5-20,5		
14	**3083-80**	6x30(0+15+15)+7 fiber core	ЛК-О					
15	**3088-80**	18x19(1+6+6/6)+1 fiber core	ЛК-Р		20,0-24,5			
16	**3093-80**	3x7(1+6); 3x27(3+9+15)	ТК; ТК					
17	**3097-80**	8x16(0+5+11)+9 fiber core ; 8x6(0+6)+9 fiber core	ТК; ЛК-О					
18	**7665-80**	6x25(1+6; 6+12)+1 fiber core	ЛК-3	17,5-25,5			24,0-42,0	24,0-42,0
19	**7667-80**	6x25(1+6; 6+12)+7x7(1+6)	ЛК-3		17,0-37,0	17,0-25,0	17,0-41,0	17,0-41,0
20	**7668-80**	6x36(1+7+7/7+14)+1 fiber core	ЛК-РО	18,0-60,5	16,5-60,5	18,0-60,5	16,5-46,5	16,5-46,5
21	**7669-80**	6x36(1+7+7/7+14)+7x7(1+6)	ЛК-РО		16,0-57,0	17,5-60,5	16,0-42,0	16,0-42,0
22	**7681-80**	18x7(1+6)+1 fiber core	ЛК-О		6,5-24,0			
23	**14954-80**	6x19(1+6+6/6)+7x7(1+6)	ЛК-Р			12,0-20,5		
24	**16853-88**	6x31(1+6+6/6+12)+1 fiber core	ЛК-РО					
25	**16828-81**	12x7(1+6)+6x19(1+6+6/6)+1 fiber core	ЛК-О; ЛК-Р		20,0-25,0			
26	**2172-80**	6x7(1+6)+1x7(1+6); 6x19(1+6+12)+1x19	ЛК-О; ТК	1,6;1,8;2,2;2,4;2,5; 3,2;3,6;4,0;4,5;4,8; 5,0;5,6;6,0;6,4;7,5; 8,0;9,5	Used in control systems for aircraft and helicopters. Used for tackles equipping, rigging of yachts, automotive industry			
27	**13840-68**	1x7(1+6)		6,0;9,0;12,0; 15,0	Used as reinforcement for prestressed concrete structures			
28	**30055**	Ropes hemp-steel, polypropylene-steel		14,0-29,0	Used for sea trawls			

Recommendations for use of steel ropes in various industries

№	Standard	Rope construction	Rope type	USE AND DIAMETER OF THE ROPE			
				Oil and gas drilling equipment: for drilling wells	**Ship lifting equipment:** mooring and towing, for standing rigging, ship hoisting devices, trawls, benzels, etc.	**Ropes for the forest woodworking industry:** skidding checkers, traction ropes, sheyms, drekt, fastening rafts, etc	**Ropes type TK for operation on short-term mechanisms or working on blocks:** tensile, guy ropes, transport, etc.
1	2	3	4	10	11	12	13
1	**2688-80**	6x19(1+6+6/6)+1 fiber core	ЛК-Р		8,3-32,0	9,1-32,0	
2	**3062-80**	1x7(1+6)	ЛК-О		1,8-4,0		0,65-8,0
3	**3063-80**	1x19(1+6+12)	ТК		1,0-11,0		1,5-11,0
4	**3064-80**	1x37(1+6+12+18)	ТК				1,6-15,5
5	**3066-80**	6x7(1+6)+1x7(1+6)	ЛК-О		1,9-22,0		1,9-22,0
6	**3067-88**	6x19(1+6+12)+1x19(1+6+12)	ТК			3,1-10,5	3,1-18,5
7	**3068-88**	6x37(1+6+12+18)+1x37(1+6+12+18)	ТК				4,7-13,0
8	**3069-80**	6x7(1+6)+1 fiber core	ЛК-О		2,2-29,0		
9	**3070-88**	6x19(1+6+12)+1 fiber core	ТК				3,3-13,0
10	**3071-88**	6x37(1+6+12+18)+1 fiber core	ТК				5,0-15,0
11	**3077-80**	6x19(1+9+9)+1 fiber core	ЛК-О		4,6-32,5	16,5-32,5	
12	**3079-80**	6x37(1+6+15+15)+1 fiber core	ТЛК-О			21,5-54,0	
13	**3081-80**	6x19(1+9+9)+7x7(1+6)	ЛК-О		6,4-31,5		
14	**3083-80**	6x30(0+15+15)+7 fiber core	ЛК-О		15,0-46,0	15,0-46,0	
15	**3088-80**	18x19(1+6+6/6)+1 fiber core	ЛК-Р				
16	**3093-80**	3x7(1+6); 3x27(3+9+15)	ТК; ТК		3,0;12,0;14,5;17,0		
17	**3097-80**	8x16(0+5+11)+9 fiber core; 8x6(0+6)+9 fiber	ТК; ЛК-О	4,6;10,2			
18	**7665-80**	6x25(1+6; 6+12)+1 fiber core	ЛК-3			17,5-21,0	
19	**7667-80**	6x25(1+6; 6+12)+7x7(1+6)	ЛК-3				
20	**7668-80**	6x36(1+7+7/7+14)+1 fiber core	ЛК-РО		16,5-60,5	16,5-42,0	
21	**7669-80**	6x36(1+7+7/7+14)+7x7(1+6)	ЛК-РО				
22	**7681-80**	18x7(1+6)+1 fiber core	ЛК-О				
23	**14954-80**	6x19(1+6+6/6)+7x7(1+6)	ЛК-Р		25,0-33,0	9,7-31,0	
24	**16853-88**	6x31(1+6+6/6+12)+1 fiber core	ЛК-РО	25,0-38,0			
25	**16828-81**	12x7(1+6)+6x19(1+6+6/6)+1 fiber core	ЛК-О; ЛК-Р				
26	**2172-80**	6x7(1+6)+1x7(1+6); 6x19(1+6+12)+1x19	ЛК-О; ТК	Used in control systems for aircraft and helicopters. Used for tackles equipping, rigging of yachts, automotive industry			
27	**13840-68**	1x7(1+6)		Used as reinforcement for prestressed concrete structures			
28	**30055**	Ropes hemp-steel, polypropylene-steel		Used for sea trawls			

TABLE OF USE OF STEEL ROPES

The correct choice of steel rope construction for the given operating conditions have the great importance.

Purpose for ropes	Cranes										Excavators, mining machinery				Trawlers		Fishing
	Lifting ropes for pillar cranes	Lifting ropes for mobile cranes	Lifting ropes for overhead cranes	Lifting ropes for shipboard cranes	Lifting ropes for port cranes	Lifting ropes for metallurgical cranes	Telpher ropes	Derricking ropes	Grab ropes	Stretchers, guys	Excavator lifting ropes	Excavator pull ropes	Ropes for winches	Screper ropes	Warp ropes	Ropes for fitting-out trawls	Ropes for fishing industry
DIN 3061	■	■	■	■	■		■	■	■				■			■	
DIN 3062	■	■	■	■	■		■	■	■							■	
DIN 3063	■	■	■	■	■		■	■	■							■	
DIN 3071	■	■	■	■	■		■	■	■				■	■		■	
DIN 3069	■	■	■	■	■		■	■	■				■	■		■	
GOST 2688	■	■	■	■	■		■	■	■				■	■		■	
GOST 3062										■							
GOST 3063										■							
GOST 3064										■							
GOST 3066										■							
GOST 3069																■	
GOST 3070							■									■	
GOST 3071							■									■	
GOST 3077	■	■		■			■		■				■	■			
GOST 3081		■								■							
GOST 3088																	
GOST 3089																	
GOST 7665															■		
GOST 7667						■				■					■		
GOST 7668	■	■	■	■	■			■			■		■		■		
GOST 7669						■		■		■	■	■			■		
GOST 14954						■		■		■							
GOST 16853																	

TABLE OF USE OF STEEL ROPES

In the table are given recommendations of the use of ropes of domestic production based on the analysis of practical experience.

Purpose for ropes	Drilling machines		Railways		Shaft lifting machines					Building structures			Cordage		Lifts		
	Work lines	Ropes for drilling	Pull ropes	Carrier ropes	Lifting ropes for vertical lifting	Lifting ropes for inclining lifting	Balancing ropes (tail rope)	Driving ropes	Guide ropes (guiders)	Guide ropes and guys for bridge	Guide ropes etc. for suspended desk	Stretches for stacks	Baskets	Stretches	Ropes fot friction pulley	Ropes for winch drums	Ropes for hydraulic lifts
DIN 3061	■	■	■	■	■		■	■	■				■			■	
DIN 3062	■	■	■	■	■		■	■	■							■	
DIN 3063	■	■	■	■	■		■	■	■							■	
DIN 3071	■	■	■	■	■		■	■	■				■	■		■	
DIN 3069	■	■	■	■	■		■	■	■				■	■		■	
GOST 2688	■	■	■	■	■		■	■	■				■	■		■	
GOST 3062										■							
GOST 3063										■							
GOST 3064										■							
GOST 3066										■							
GOST 3069																■	
GOST 3070							■									■	
GOST 3071							■									■	
GOST 3077	■	■		■			■		■				■	■			
GOST 3081		■								■							
GOST 3088																	
GOST 3089																	
GOST 7665															■		
GOST 7667						■				■					■		
GOST 7668	■	■	■	■	■			■			■		■		■		
GOST 7669						■		■		■	■	■			■		
GOST 14954						■		■		■							
GOST 16853																	

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