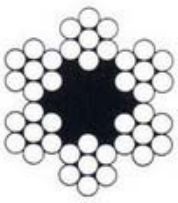
WIRE ROPE

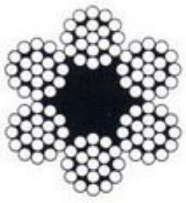
J-WITEX CORPORATION

TYPICAL ROPE CONSTRUCTIONS

Point Contact Lay Rope



JIS
6 × 7 FC

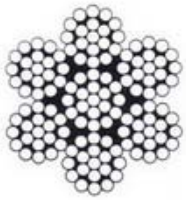


JIS
6 × 19 FC

JIS
6 × 37 FC

Steel Core Rope

7 × 7
WSC

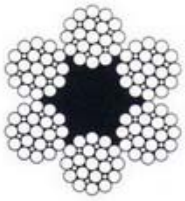


7 × 19
WSC

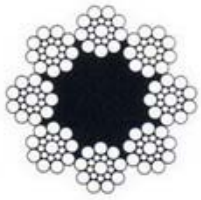
Marine Rope

JIS
6 × 24 FC

Elevator Rope

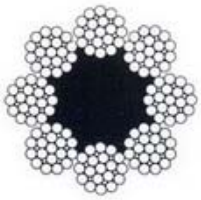


JIS
6 × Fi(25) FC



JIS
8 × S(19) FC

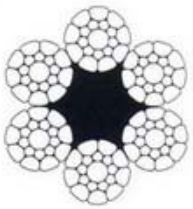
JIS
8 × W(19) FC



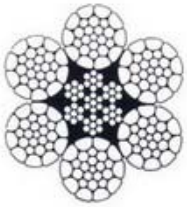
JIS
8 × Fi(25) FC

Plane Contact Lay Rope

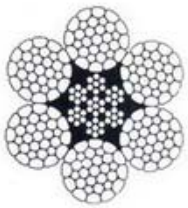
Forming
6 × 7 FC



Forming
6 × S(19) FC

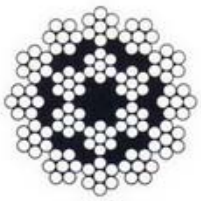


Forming
6 × WS(26) IWRC



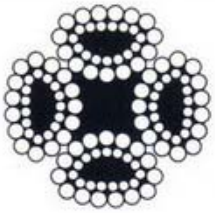
Forming
6 × WS(31) IWRC

Non-Rotating Rope

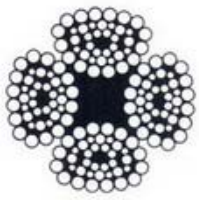


JIS
Hercules
19 × 7

Torqueless
4 × RF(24)

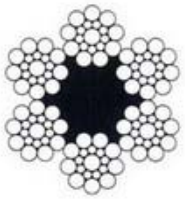


Torqueless
4 × RF-S(30)

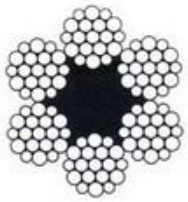


Torqueless
4 × RF-WS(40)

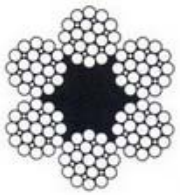
Linear Contact Lay Rope 6 × 19 Class



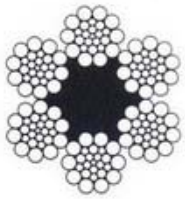
JIS
6 × S(19) FC



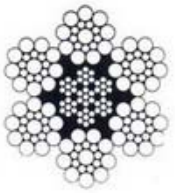
JIS
6 × W(19) FC



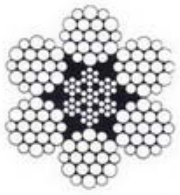
JIS
6 × Fi(25) FC



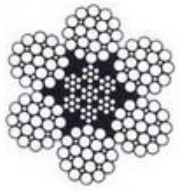
JIS
6 × WS(26) FC



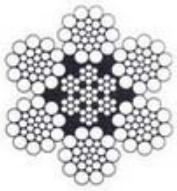
JIS
6 × S(19) IWRC



JIS
6 × W(25) IWRC

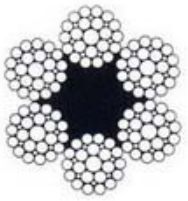


JIS
6 × Fi(25) IWRC

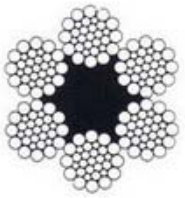


JIS
6 × WS(25) IWRC

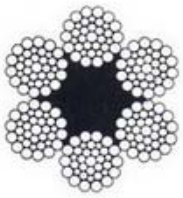
Linear Contact Lay Rope 6 × 37 Class



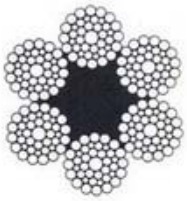
JIS
6 × Fi(29) FC



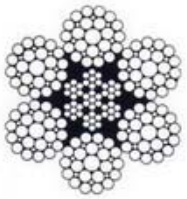
JIS
6 × WS(31) FC



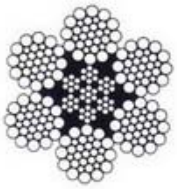
JIS
6 × WS(36) FC



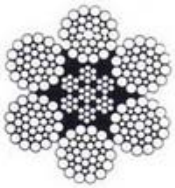
JIS
6 × WS(41) FC



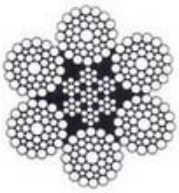
JIS
6 × Fi(29) IWRC



JIS
6 × WS(31) IWRC



JIS
6 × WS(36) IWRC



JIS
6 × WS(41) IWRC

SELECTION OF WIRE ROPE

As the modern industry becomes more and more complicated, various types of wire rope have been required in accordance with respective purposes. Accordingly, it has been divided into many types and grades. Best selection of wire rope to your requirements is most important in consideration of safety, economy and efficiency.
The following five factors are considered to decide the service life of wire rope.

(1) Tensile Loading
(2) Bending Fatigue
(3) Abrasive Wear
(4) Corrosion
(5) Deformation and Crushing

It is quite essential to select the most suitable type of wire rope taking it into consideration which one of the above five factors will be most important to affect the service life of wire rope in its working condition and atmosphere. Right selection, correct application and careful handling will give the wire rope long service life. Here is the brief explanation for your references and study. Experienced KKK sales staffs and engineers are ready to help your best selection of wire rope, and your informations and inquiries about the selection together with the details of operating conditions of wire rope will be welcomed.

CONSTRUCTION OF WIRE ROPE

Construction is indicated in terms of number of strands and wires per strand, e.g. 6 × 7 and 6 × 37. Concerning linear-contact-lay rope, the symbol (S for Seale type, W for Warrington type, Fi for Filler type) is often put before number of wires, for identification of wire rope construction, e.g. 6 × S(19) and 6 × Fi(25).

Where abrasion is an important factor for its usage, we have to use a rope having strand with larger outer wires allowing for much surface wear of wire rope. Flexibility of wire rope is obtained by our using a rope with a number of small size wires in strand or increasing the number of strands in the rope.

TYPE OF LAY

RIGHT (Z) REGULAR LAY

LEFT (S) REGULAR LAY

In a Regular Lay Rope (either right or left), the individual wires in the strand are laid in the opposite direction to the lay of the strands.

RIGHT (Z) LANG LAY

LEFT (S) LANG LAY

In a Lang Lay Rope (either right or left), the individual wires in the strand are laid in the same direction as the lay of the strands.
Lang Lay rope has more resistance to abrasion and bending fatigue than Regular Lay rope, but it easily rotates when one end of the line is not fixed and it has less resistance to deformation and kink.

KINDS OF CORE

FC (HC) Standard Fiber (Hemp) Cores of wire rope are made of hard fibers such as Manila, Sizal or Polypropylene and Jute (only for fine size rope). Fiber core supports the strand tightly and makes the rope flexible and elastic, and has a role for lubrication in the strand of rope. Therefore, fiber cored rope is used when elasticity and pliability is required.
IWRC Rope with Independent Wire Rope Core is able to withstand the crushing action resulted from severe bending or shock when rope is subjected to considerably heavy load. Breaking strength of IWRC rope is approx. 7.5% stronger than that of FC rope in the same diameter and strand construction. Because of its smaller degree of stretch, IWRC rope is used when less elasticity is required. IWRC rope has more resistance to heat influence and deformation by bending than FC rope, but it is stiffer.
WSC Rope with Wire Strand Core is strong against compressive action of the outer strands having high strength and small elongation, but it is stiffer than FC rope. Therefore, it is used only for static purposes such as guy or stay rope and rope for suspension of bridge.

SHEAVE AND DRUM

When a rope is bent around the sheave or drum individual wires in the strand are subjected to bending stress and repeated bending fatigue. To obtain smooth operaiton and keep longer life for wire rope line, it is necessary to keep the diameter of sheave and drum above the recommendable figures of the Table and to keep the surface of the grooves sharp and smooth.

Minimum Diameter of Sheave and Drum (D = Wire Rope Dia.)

Construction	Min. Dia.	Recommendable Dia.
6 × 7	45 × D	70 × D
6 × 19	30 × D	45 × D
6 × 37	20 × D	30 × D
6 × S(19)	33 × D	50 × D
6 × Fi(25)	26 × D	39 × D
6 × Fi(29)	24 × D	35 × D
8 × S(19)	27 × D	40 × D
18 × 7	35 × D	50 × D

SAFETY FACTOR OF WIRE ROPE

It is difficult to fix the safety factor for each type of wire rope to be used for various equipments, as this factor depends not only on the load carried, but also on the speed of rope working, the kinds of fittings used for rope ends, the acceleration and deacceleration, length of rope, the number, size and arrangements of sheave and drums etc. The following safety factors are minimum requirements for safety and economy in the common installation.

Safety Factor of Wire Rope

Purpose	Min. S.F.
Elevator	10
Crane, Hoist Derrick, Sling	6
Guy or Stay, Horizontal Pull or Traction	4
Main Wire of Aerial Rope Way	3

MUST AVOID FOR LONGER LIFE OF ROPE

- Twist, Loop or Kink of wire rope.
- Moisture, Dust and Acid or Sulphuric hume gas.
- Overload.
- Crushing or hammering.
- Severe or reverse bending (S-Bending).
- Too small Sheaves, Drums and Guide Rollers.
- Hard rolling of Sheaves and Guide Rollers.
- Worn Groove, Broken or Soft Sheaves and Rollers.
- Poor or No Lubrication.
- Heat Influence.
- Wrong Fitting and Spooling on the Drum.
- Excessive Fleet Angle.
- Vibration.
- Obstacles, Sand and Grit on the surface of operating line.
- Shock-Too fast start or Stop.

NECESSARY INFORMAITON IN INQUIRING AND ORDERING

	EXAMPLE
SPECIFICATION	
1. Specification	JIS G 3525
2. Grade of Steel and/or Breaking Strength	Grade B 265 kN
CONSTRUCTION	
3. Number of Strands	6
4. Number of Wires per Strand	25
5. Type	Filler Type
6. Kind of Core	IWRC
7. Lay	Right Regular Lay
8. Fabrication	Preformed
DIMENSIONS	
9. DIAMETER	20 mm
10. Length	1,000 m
COATING	Ungalvanized
PURPOSE	Hoist Line of Motor Shovel

JIS G 3525-2006 WIRE ROPE

Grade of wire rope and nominal tensile strength of wires

Coating	Ungalv'd	Galvanized	Ungalv'd and Drawn Galv.	
Grade	E	G	A	B
Nominal Tensile Strength (N/mm^2)	1320 (for Elevator)	1470	1620	1770

The tolerance on diameter of wire rope

less than 10 mm ..... $^{+10}_{-0}$ %
10 mm and more ..... $^{+7}_{-0}$ %

Minimum torsion value of round strand rope

Wire diameter mm	Ungalv'd			Galvanized		
	Grade E	Grade A	Grade B	Grade G	Grade A	Grade B
over 0.20 to 1.00	29	28	27	21	28	26
over 1.00 to 2.24	28	27	26	20	27	25
over 2.24 to 2.80	—	26	25	18	26	—
over 2.80 to 3.75	—	26	25	18	—	—
over 3.75 to 4.50	—	25	24	17	—	—

Wrapping and unwrapping test

Wires shall withstand wrapping in a close helix for eight complete turns around a mandrel of the same dia. as the wire dia., followed by unwrapping without breakage or fracture of the wire.

Minimum weight of zinc coating

Wire diameter mm	Minimum weight g/m^2		
	Grade G	Grade A	Grade B
over 0.20 to 0.25	15	15	15
over 0.25 to 0.40	20	20	20
over 0.40 to 0.50	40	30	30
over 0.50 to 0.63	60	50	50
over 0.63 to 0.80	70	60	60
over 0.80 to 1.00	85	70	70
over 1.00 to 1.25	95	80	80
over 1.25 to 1.40	110	90	90
over 1.40 to 1.60	135	100	100
over 1.60 to 2.00	165	110	110
over 2.00 to 2.24	190	110	110
over 2.24 to 2.50	220	110	—
over 2.50 to 2.80	230	125	—
over 2.80 to 3.15	230	—	—
over 3.15 to 4.50	250	—	—

6 × 19 FC

Rope diameter	Breaking load kN			Approximate mass
	Ordinary lay			
	Galvanized	Ungalv'd and galvanized	Ungalv'd	
mm	Grade G	Grade A	Grade B	kg/m
4	8.03	8.64	9.22	0.058
5	12.5	13.5	14.4	0.091
6.3	19.9	21.4	22.9	0.144
8	32.1	34.6	36.9	0.233
9	40.7	43.8	46.7	0.295
10	50.2	54.0	57.6	0.364
11.2	63.0	67.8	72.3	0.457
(12)	(72.3)	(77.8)	(83.0)	(0.524)
12.5	78.4	84.4	90.0	0.569
14	98.4	106	113	0.713
16	128	138	148	0.932
18	163	175	187	1.18
20	201	216	230	1.46
22.4	252	271	289	1.83
25	314	338	360	2.28
28	393	424	452	2.85
30	452	486	519	3.28

6 × 24 FC

Rope diameter	Breaking load kN		Approximate mass
	Ordinary lay		
	Galvanized	Ungalv'd and galvanized	
mm	Grade G	Grade A	kg/m
8	29.3	31.6	0.212
9	37.1	39.9	0.269
10	45.8	49.3	0.332
11.2	57.4	61.8	0.416
(12)	(65.9)	(71.0)	(0.478)
12.5	71.5	77.0	0.519
14	89.7	96.6	0.651
16	117	126	0.850
18	148	160	1.08
20	183	197	1.33
22.4	230	247	1.67
(24)	(264)	—	(1.91)
25	286	308	2.08
28	359	387	2.60
30	412	444	2.99
31.5	454	489	3.29
33.5	514	553	3.73
35.5	577	621	4.18
37.5	644	693	4.67
40	732	789	5.31
42.5	827	890	6.00
45	927	998	6.72
47.5	1,030	1,110	7.49
50	1,140	1,230	8.30

6 × 37 FC

Rope diameter	Breaking load kN			Approximate mass
	Ordinary lay			
	Galvanized	Ungalv'd and galvanized	Ungalv'd	
mm	Grade G	Grade A	Grade B	kg/m
6.3	19.6	21.1	22.5	0.143
8	31.6	34.0	36.2	0.230
9	40.0	43.0	45.9	0.291
10	49.4	53.1	56.6	0.359
11.2	61.9	66.6	71.0	0.451
(12)	(71.1)	(76.5)	(81.5)	(0.517)
12.5	77.1	83.0	88.5	0.561
14	96.7	104	111	0.704
16	126	136	145	0.920
18	160	172	183	1.16
20	197	212	227	1.44
22.4	248	266	284	1.80
(24)	(284)	—	—	(2.07)
25	308	332	354	2.25
28	387	416	444	2.82
30	444	478	510	3.23
31.5	490	527	562	3.57
33.5	554	596	636	4.03
35.5	622	669	714	4.53
37.5	694	747	796	5.05
40	790	850	906	5.75
42.5	892	959	1,020	6.49
45	1,000	1,080	1,150	7.28
47.5	1,110	1,200	1,280	8.11
50	1,230	1,330	1,420	8.98
53	1,390	1,490	1,590	10.1
56	1,550	1,670	1,780	11.3
60	1,780	1,910	2,040	12.9
63	1,960	2,110	2,250	14.3

19 × 7

Rope diameter	Breaking load kN	Approximate mass
	Ordinary lay	
	Galvanized	
mm	Grade A	kg/m
12	84.7	0.612
14	115	0.833
16	151	1.09
18	191	1.38
20	235	1.70
22	285	2.06

Remark: Rope diameters given in parentheses are due to be examined as to their abolition at the time of next review of this Standard.

6 × S(19) FC, 6 × W(19) FC
6 × Fi(25) FC, 6 × WS(26) FC

Rope diameter	Breaking load kN				Approximate mass
	Ordinary lay		Ordinary and Lang's lay		
	Ungalv'd	Galvanized	Ungalv'd and galvanized		
mm	Grade E	Grade G	Grade A	Grade B	kg/m
4	—	7.91	8.71	9.29	0.062
5	—	12.4	13.6	14.5	0.096
6.3	—	19.6	21.6	23.0	0.153
8	28.6	31.6	34.9	37.2	0.247
9	36.2	40.0	44.1	47.0	0.312
10	44.7	49.4	54.5	58.1	0.386
11.2	56.1	62.0	68.3	72.8	0.484
(12)	(64.4)	(71.2)	(78.4)	(83.6)	(0.556)
12.5	69.9	77.2	85.1	90.7	0.603
14	87.7	96.9	107	114	0.756
16	115	127	139	149	0.988
18	145	160	176	188	1.25
20	179	198	218	232	1.54
22.4	224	248	273	291	1.94
25	280	309	340	363	2.41
28	—	387	427	455	3.02
30	—	445	490	523	3.47
31.5	—	490	540	576	3.83
33.5	—	555	611	652	4.33
35.5	—	623	686	732	4.86
37.5	—	695	766	816	5.43
40	—	791	871	929	6.17
42.5	—	893	984	1,050	6.97
45	—	1,000	1,100	1,180	7.81
47.5	—	1,120	1,230	1,310	8.70
50	—	1,240	1,360	1,450	9.65
53	—	1,390	1,530	1,630	10.8
56	—	1,550	1,710	1,820	12.1
60	—	1,780	1,960	2,090	13.9

6 × S(19) IWRC, 6 × W(19) IWRC
6 × Fi(25) IWRC, 6 × WC(26) IWRC

Rope diameter	Breaking load kN		Approximate mass
	Ordinary and Lang's lay		
	Ungalv'd and galvanized		
mm	Grade A	Grade B	kg/m
10	62.2	66.2	0.430
11.2	78.0	83.0	0.539
12.5	97.1	103	0.672
14	122	130	0.843
16	159	169	1.10
18	201	214	1.39
20	249	265	1.72
22.4	312	332	2.16
25	389	414	2.69
28	487	519	3.37
30	560	596	3.87
31.5	617	657	4.27
33.5	698	743	4.83
35.5	783	834	5.42
37.5	874	931	6.05
40	995	1,060	6.88
42.5	1,120	1,200	7.77
45	1,260	1,340	8.71
47.5	1,400	1,490	9.70
50	1,550	1,650	10.8
53	1,750	1,860	12.1
56	1,950	2,080	13.5
60	2,240	2,380	15.5

6 × Fi(29) FC, 6 × WS(31) FC, 6 × WS(36) FC
6 × WS(41) FC, 6 × SeS(37) FC

Rope diameter	Breaking load kN			Approximate mass
	Ordinary lay	Ordinary and Lang's lay		
	Galvanized	Ungalv'd and galvanized	Ungalv'd	
mm	Grade G	Grade A	Grade B	kg/m
8	32.3	35.6	37.9	0.253
9	40.9	45.0	48.0	0.321
10	50.4	55.6	59.2	0.396
11.2	63.3	69.7	74.3	0.496
12.5	78.8	86.9	92.5	0.618
14	98.9	109	116	0.776
16	129	142	152	1.01
18	163	180	192	1.28
20	202	222	237	1.58
22.4	253	279	297	1.99
25	315	348	370	2.47
28	396	436	464	3.10
30	454	500	533	3.56
31.5	501	552	588	3.93
33.5	566	624	665	4.44
35.5	636	701	746	4.99
37.5	709	782	833	5.57
40	807	890	948	6.33
42.5	911	1,000	1,070	7.15
45	1,020	1,130	1,200	8.01
47.5	1,140	1,250	1,340	8.93
50	1,260	1,390	1,480	9.90
53	1,420	1,560	1,660	11.1
56	1,580	1,740	1,860	12.4
60	1,820	2,000	2,130	14.2

6 × Fi(29) IWRC, 6 × WS(31) IWRC, 6 × WS(36) IWRC,
6 × WS(41) IWRC, 6 × SeS(37) IWRC

Rope diameter	Breaking load kN		Approximate mass
	Ordinary and Lang's lay		
	Ungalv'd and galvanized		
mm	Grade A	Grade B	kg/m
10	63.6	67.7	0.440
11.2	79.8	84.9	0.552
12.5	99.4	106	0.688
14	125	133	0.863
16	163	173	1.13
18	206	219	1.43
20	254	271	1.76
22.4	319	340	2.21
25	398	423	2.75
28	499	531	3.45
30	573	609	3.96
31.5	631	672	4.37
33.5	714	760	4.94
35.5	802	853	5.55
37.5	895	952	6.19
40	1,020	1,080	7.04
42.5	1,150	1,220	7.95
45	1,290	1,370	8.91
47.5	1,440	1,530	9.93
50	1,590	1,690	11.0
53	1,790	1,900	12.4
56	2,000	2,120	13.8
60	2,290	2,440	15.8

Remark: Rope diameters given in parentheses are due to be examined as to their abolition at the time of next review of this Standard.

SPECIAL PRODUCTS (1)

KALS (Kokoku Aluminized Steel) WIRE ROPE
Approved by NK, Lloyd and AB

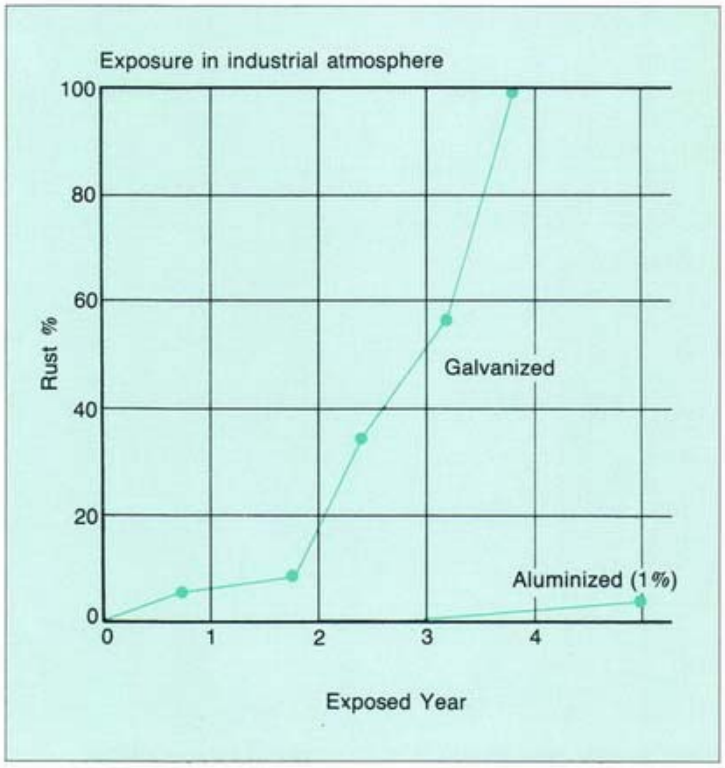
In 1961 KKK developed a product of aluminized steel wire rope. The combination of the excellent corrosion-resistance of aluminum and the high strength and economical advantage of steel is a dream for many engineers. KKK researched into and developed aluminizing method to make this dream possible and finally got success to produce Aluminum-Coated Steel Wire under the technical collaboration with American Chain & Cable Co., Inc.

The protective mechanism of aluminum coating comes from the double effect of the covering protection of the aluminum oxide film and the electrochemical protection of the metallic aluminum layer on the base steel.

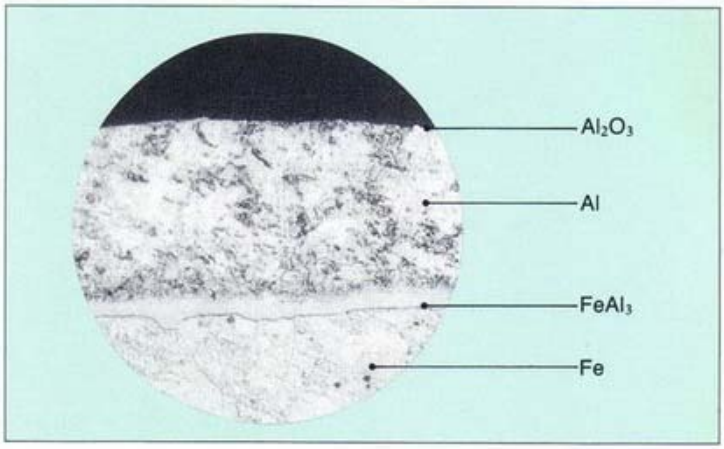
The wire rope made of KALS Wire is widely in use in many fields as an epoch-making new product and is enjoying a good reputation. Above all, its excellent corrosion and weathering resistance is effective in marine atmosphere and sulphurous environment. Thus, it has obtained a good result when it is used for marine and fishery purposes and in industrial atmosphere, exhaust gas, etc.

Characteristics of KALS Wire Rope

- High resistance to corrosion and weathering under any circumstances such as the air, marine atmosphere, sulphurous gas, etc.
- High tensile strength maintaining excellent corrosion resistance.
- High resistance to abrasion.
- High resistance to bending fatigue.
- High resistance against heat and cold temperature.



Micro Photograph of Aluminized layer



Construction	Dia. of wire rope (mm)	Breaking strength Aluminized Grade 1670 N/mm² kN	Approximate mass kg/m
6 × Fi(29) FC	16	146	0.961
	18	186	1.22
	20	229	1.50
	22.4	286	1.88
	25	360	2.34
	28	450	2.94
	30	517	3.38
	31.5	569	3.72
	(32)	(587)	(3.84)
	(33)	(627)	(4.06)
	33.5	644	4.21
	(34)	(664)	(4.34)
	35.5	723	4.73
	(36)	(743)	(4.86)
	37.5	807	5.27
	(38)	(827)	(5.42)
	40	918	6.00
6 × WS(26) FC	14	110	0.70
	16	143	0.92
	18	181	1.16
	20	225	1.43
	(22)	(272)	(1.73)
	22.4	280	1.80
	(24)	(324)	(2.06)
	25	350	2.24
	(26)	(379)	(2.42)
	28	439	2.81
6 × WS(31) FC	30	517	3.29
	31.5	569	3.62
	(32)	(587)	(3.74)
	(33)	(627)	(3.95)
	33.5	644	4.10
	(34)	(664)	(4.22)
	35.5	723	4.60
	(36)	(743)	(4.73)
	37.5	807	5.13
	(38)	(827)	(5.27)
	40	918	5.84

Remark: Rope diameters given in parentheses are due to be examined as to their abolition at the time of next review of JIS G3525.

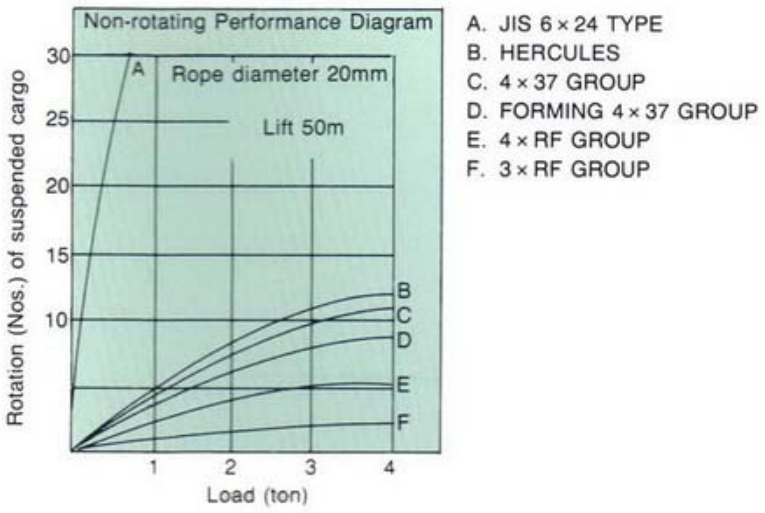
SPECIAL PRODUCTS (2)

Torqueless Rope

A wire rope is a collective composition of tough steel wires. It has various usages in a wide range of fields due to its properties of "High strength" and "Flexibility", being worthy of an important mechanical element of modern industry.
At the same time, with advanced techniques in the developed industries, there has been a strong desire for development of wire ropes which are most suitable to the respective services.
Generally speaking; a wire rope in its nature tends to rotate to an untwisting direction when loaded. It follows that a suspended cargo also makes a rotation when a single-suspension rope is employed, and that multi-rope suspension makes a work difficult or damages ropes because the ropes are entangled each other.
Accordingly, non-rotating Hercules-type rope has mainly been used in such services. However, this rope, having multi-laid strands, has some difficulty in use: under some conditions in use, the rope is liable to produce such deformation as inner strand protrusion, bird-caging, slackening of ropes, and so on.
Increasing demands are evident for such ropes as have high strength and make no rotation to suspended cargoes, or are not entangled, which are used in the tower crane, mobile crane in high lift, ultra-high-voltage transmission line, etc. as employed in currently increased superhighrised buildings.
To meet these demands, we made research and development and manufactured wire ropes of excellent "Non-rotating" property. These products are herein introduced which we name "Torqueless rope".

Features of Torqueless Ropes

The following is comparable performance between Torqueless Rope and common or conventional non-rotating wire ropes (Hercules rope).

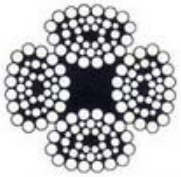


A. JIS 6 × 24 TYPE
B. HERCULES
C. 4 × 37 GROUP
D. FORMING 4 × 37 GROUP
E. 4 × RF GROUP
F. 3 × RF GROUP

Torqueless 4 × RF-(24) FC

a + 9/15

Torqueless 4 × RF-WS(40) FC



a + 8 + (8 + 8) + 16

Torqueless 4 × RF-(24)

Rope dia. D (mm)	Breaking strength (kN)		Approx. mass (kg/m)
	Galvanized	Bright	
	Grade G	Grade A	
8	32.7	35.9	0.255
9	41.4	45.5	0.322
10	51.1	56.2	0.398
11.2	64.0	70.4	0.499
(12)	73.5	80.9	0.573
12.5	79.7	87.8	0.622
14	100	110	0.780
16	130	144	1.02
18	166	182	1.29
20	204	225	1.59
22.4	256	281	2.00
25	319	351	2.49
28	400	440	3.12
30	459	505	3.58

Torqueless 4 × RF-WS(40)

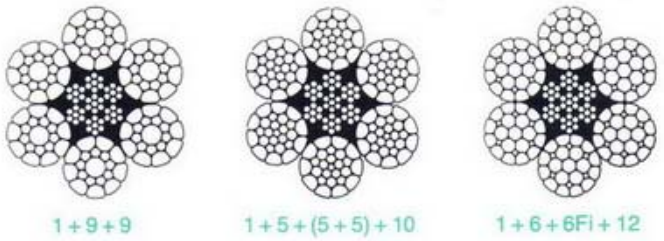
Rope dia. D (mm)	Breaking strength (kN)				Approx. mass (kg/m)
	Galvanized	Bright			
	Grade G	Grade A	Grade B	Grade T	
10	56.2	61.8	67.5	73.1	0.402
11.2	70.5	77.6	84.6	91.7	0.504
(12)	80.9	89.0	97.1	105	0.578
12.5	87.9	96.6	105	114	0.627
14	110	122	132	143	0.787
16	144	158	173	187	1.03
18	182	200	219	236	1.30
20	225	247	270	292	1.61
(22)	272	299	327	354	1.94
22.4	282	310	338	367	2.01
(24)	324	356	388	421	2.31
25	351	386	422	457	2.51
(26)	380	418	456	494	2.71
28	440	484	529	573	3.14
30	506	556	607	658	3.61
31.5	558	614	669	725	3.98
33.5	631	694	757	820	4.51
35.5	708	780	850	921	5.06
37.5	790	870	948	1030	5.65
40	899	990	1080	1170	6.42
42.5	1010	1120	1220	1320	7.25
45	1140	1260	1360	1480	8.13

Remark: Rope diameters given in parentheses are due to be examined as to their abolition at the time of next review of JIS G3525.

SPECIAL PRODUCTS (3)

Forming Rope

As rope strands are drawn respectively in the process of strand-fabricating to the external surfaces of rope strands respectively flat formed by die-drawing, this type of wire rope has about 10% larger metallic cross section and, hence, has about 10% stronger breaking load than any standard rope of equal size. Characteristically, because of larger and smooth surfaces of this wire rope, it has a superiority in its abrasion, so that it is the best for cableways.



Rope diameter in mm	Dia. of outer wires			Breaking strength (kN)				Approx. mass
	S (19)	WS (26)	Fi (25)	Galvanized	Bright			
				Grade G	Grade A	Grade B	Grade T	kg/m
8	0.65	0.60	0.52	41.5	45.6	49.1	53.2	0.302
9	0.73	0.68	0.57	52.5	57.8	62.2	67.4	0.383
10	0.81	0.75	0.65	64.7	71.3	76.8	83.2	0.473
11.2	0.90	0.84	0.73	81.3	89.3	96.3	104	0.593
12.5	1.01	0.94	0.82	101	112	121	130	0.738
14	1.12	1.05	0.90	126	139	151	164	0.926
16	1.30	1.20	1.04	166	182	196	213	1.21
18	1.45	1.35	1.17	210	230	249	270	1.53
20	1.60	1.50	1.30	259	285	307	332	1.89
22.4	1.80	1.68	1.45	325	358	385	418	2.37
25	2.03	1.88	1.63	405	445	481	520	2.95
28	2.27	2.10	1.83	508	562	606	657	3.70
30	2.40	2.25	1.94	583	641	691	748	4.25
31.5	2.55	2.36	2.05	642	707	762	826	4.69
33.5	2.70	2.51	2.18	727	799	862	934	5.30
35.5	2.86	2.66	2.30	816	898	968	1050	5.95
37.5	3.03	2.81	2.44	911	1000	1080	1170	6.64
38	3.08	2.85	2.47	936	1030	1110	1200	6.82
40	3.20	3.00	2.59	1040	1140	1230	1330	7.56
42.5	3.45	3.19	2.78	1170	1280	1380	1500	8.53

Remark: Outer wire dia. of round wire is stated herein, for reference only.

Safe-Lock

The Safe-Lock, mechanical high-press-splicing, is superior to the hand splice as the end splicing of wire rope sling and other wire rope usages.

Characteristics:

- 100% breaking load of wire rope ensured.
- Reliability obtained by uniform and safe mechanical splicing.
- Aluminum Alloy Clamp makes splicing stronger, safe and easier in operation.

Safe-Lock

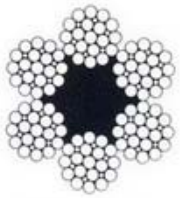
ELEVATOR ROPE

Technical Cooperation with USX Corp.

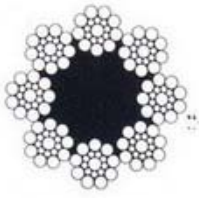
Our company has been carrying out research and development of elevator wire ropes. In this connection, the company in 1973 concluded a technical agreement with USX Corporation of U.S.A. in order to improve technical standards and to obtain confirmation of the quality. USX, is one of the major elevator rope manufacturers in the United States with a history of more than 100 years. This tie-up has enabled us to become acquainted with its renowned technology and experience.
In addition to the mastery of this imported technology, we also carried out our own research studies for a period of about one year. Hence, we have already been able to start production of elevator ropes of excellent reliability and performance on a commercial basis.

Necessary Qualities of Elevator Ropes

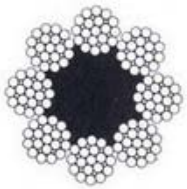
1) Must be of superior quality to withstand continuous bending fatigue.
2) The decrease ratio of the rope diameter must be small when under load tension.
3) The creep while the elevator is in operation must be small.
4) The rope grease used must be such that the grease will not be discharged during operation, that it will not reduce the driving power of the sheave, that it completely fulfills its function as a rust-proofing and lubricating agent.



Fiber Core
6 × 25 Filler Wire



Fiber Core
8 × 19 Seale



Fiber Core
8 × 25 Filler Wire

Specification for Elevator Rope

Rope diameter (in.)	6 × 19 classification			8 × 19 classification		
	Breaking strength in pounds		Approx. Weight/Ft. (Lb.)	Breaking sterngth in pounds		Approx. Weight/Ft. (Lb.)
	Grade 40 Extra high strength traction steel	Grade 20 Traction steel		Grade 40 Extra high strength traction steel	Grade 20 Traction steel	
1/4	5,200	3,600	0.1	4,500	3,600	0.09
5/16	8,100	5,600	0.16	6,900	5,600	0.14
3/8	11,600	8,200	0.23	9,900	8,200	0.2
7/16	15,700	11,000	0.31	13,500	11,000	0.28
1/2	20,400	14,500	0.4	17,500	14,500	0.36
9/16	25,700	18,500	0.51	22,100	18,500	0.46
5/8	31,600	23,000	0.63	27,200	23,000	0.57
11/16	38,200	27,000	0.76	32,800	27,000	0.69
3/4	45,200	32,000	0.9	38,900	32,000	0.82
13/16	52,900	37,000	1.06	46,000	37,000	0.96
7/8	61,200	42,000	1.23	52,600	42,000	1.11
15/16	70,000	48,000	1.41	60,000	48,000	1.27
1	79,500	54,000	1.6	68,400	54,000	1.45
1-1/16	89,400	61,000	1.81	77,000	61,000	1.64

JIS G 3525-2006 ELEVATOR ROPE

6 × 19 Classification

6 × S(19) FC, 6 × W(19) FC, 6 × Fi(25) FC		
Dia. of wire rope (mm)	Breaking strength (kN) Bright Grade E	Approx. mass (kg/m)
8	28.6	0.247
9	36.2	0.312
10	44.7	0.386
11.2	56.1	0.484
(12)	(64.4)	(0.556)
12.5	69.9	0.603
14	87.7	0.756
16	115	0.988
18	145	1.25
20	179	1.54
22.4	224	1.94
25	280	2.41

8 × 19 Classification

8 × S(19) FC, 8 × W(19) FC, 8 × Fi(25) FC				
Dia. of wire rope (mm)	Breaking strength (kN) Bright			Approx. mass (kg/m)
	Grade E	Grade A	Grade B	
8	26.0	30.8	32.8	0.220
10	40.6	48.1	51.3	0.343
11.2	51.0	60.3	64.3	0.430
(12)	(58.5)	(69.2)	(73.8)	(0.494)
12.5	63.5	75.1	80.1	0.536
14	79.6	94.3	100	0.672
16	104	123	131	0.878
18	132	156	166	1.11
20	162	192	205	1.37
22.4	204	241	257	1.72
25	254	301	320	2.14

Remark: Rope diameters given in parentheses are due to be examined as to their abolition at the time of next reviw of JIS G3525.

J-WITEX CORPORATION

Hansin International Trading (Shanghai) Co,Ltd
16F, Information Tower, No 1403 Minshen Road
Shanghai, China
Tel: +86-21-3392-6688 Fax: +86-21-3392-7045
E-mail: hansin@hansin.com.cn
WEB: http://www.hansin.com.cn