GÜVEN

STEEL WIRE ROPE & LIFTING TECHNOLOGIES

We offer solutions to all elevator companies with our technological **products used in elevator sector.**

www.guvencelikhalat.com.tr

ELEVATOR SECTOR

THERE IS GÜVEN
IN THE BUSINESS!

www.guvencelikhalat.com.tr

ABOUT US

Accompanied by the well-known commercial purposes, honoring human being is set as a fundamental goal by our company.

Because we know that society will become civilized at the rate of human-oriented life opportunities provided to individuals and consequently the earth will become much more livable for humanity.

WHO WE ARE?

In this frame GÜVEN is a company;

- Serving in lifting and lashing business,
- Keeping the overall customer costs at minimum and maximizing the customer performance through the instrument of distinctive products and services,
- Using accurate analysis and matching methods to understand the customer, Regarding economic products as key and offering them as an alternative as well as highperformance products,
- Delivering its products timely and seamlessly by means of its efficient stock structure and organization.

GÜVEN WITH FIGURES

- Serving for more than 30 years.
- Providing accurate solutions to 22 different sectors.
- Carrying on business at its 5 different premises covering 6000 m^2 closed area.
- Serving with the staff of 50 employees.
- Continuing marketing and sales activities in Turkey's 7 regions covering 81 provinces.
- Exporting to around 20 countries in Europe and the Middle East.
- Supplying materials from its 2.000 tons of special and general purpose steel wire rope stock to sectors.
- Providing services to approximately 2500 registered partners.
- Having 16 quality, utility model and trademark registration certificates.
- Having 50 domestic and foreign suppliers.

APPLICATION FIELDS AND SECTORS

With the right supply chain management and advanced operation capability, we serve in the “steel rope and lifting technologies” sector where development, innovation and rapid changes are all essential.

With our supplier brand profile; we take an active role in many different sectors such as elevator, port, mine, iron steel, fishing, construction, crane manufacturing, drilling, marble, suspended scaffold, project cargo transportation, mobile crane, tower crane, marine, cement, cable car and oil – gas. We also offer reliable and immediate solutions to all of our business partners.

While we procure high performance products from global business partners, we acquire the general purpose product from the well-known suppliers of Turkey.

“We offer solutions to 22 different sectors”

CONTENTS

OVERVIEW

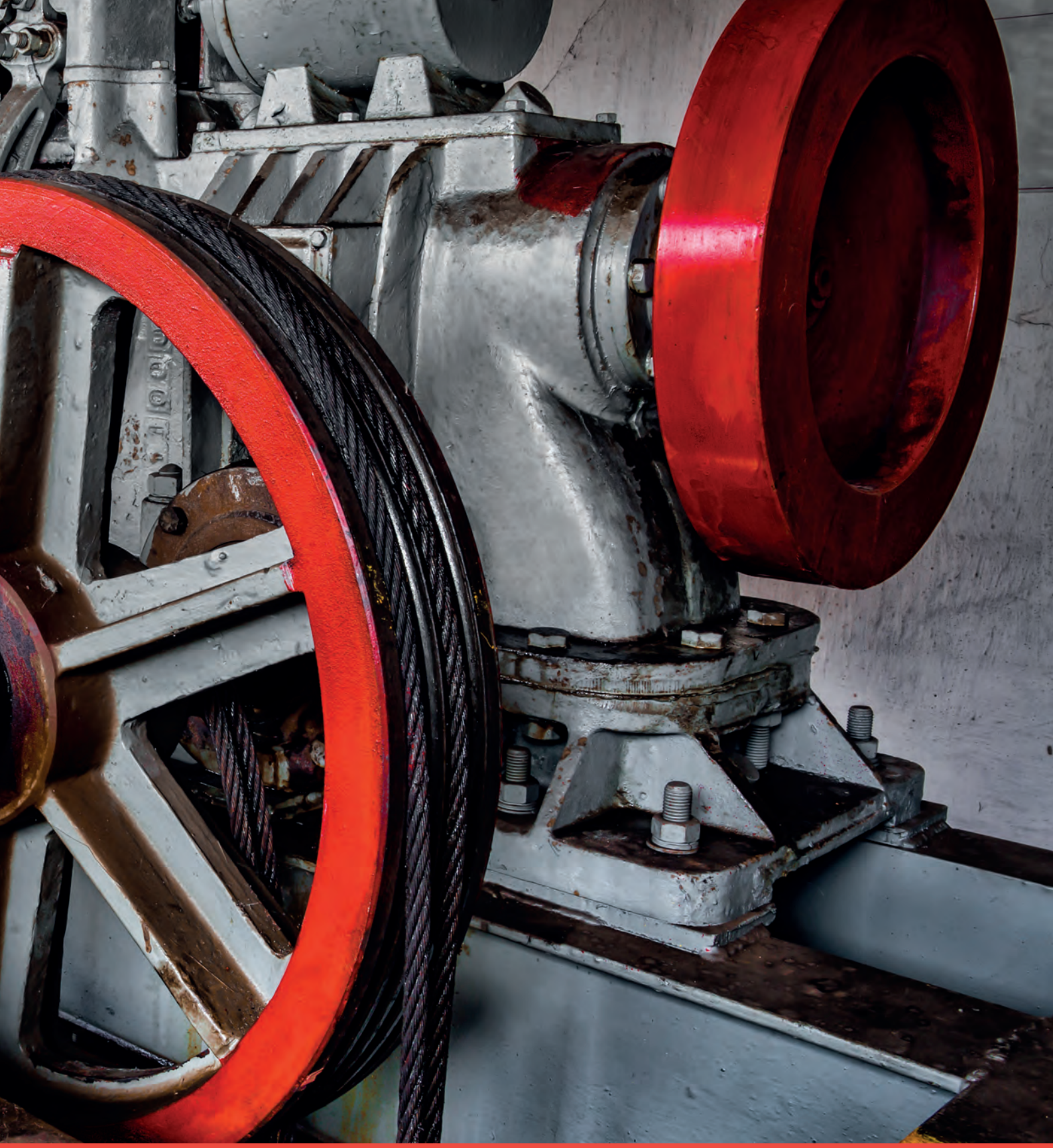
Elevator sector, gained movement in Turkey after the 1950's, it has been transformed into a sector structure where has gradually increased assembly and spare parts production in domestic production by removing from a sector structure where needs are met through imports. Especially after the 1990s, it continues to grow and develop in return to increasing on demand.

In Turkey, the elevator sector needs to be considered in conjunction with the construction sector, which shows direct urbanization and correspondingly development. In the coming period, it will continue the process of urbanization in Turkey. Earthquake resistant buildings will be constructed instead of old buildings. Considering above points, it is inevitable that the growth in the elevator sector will continue in parallel with the activities in the construction sector.

Our company, which is one of the leading organization in the its sector, has more than 30 years' experience and background, offers high quality products to your service. In addition, we contribute to the elevator sector with ourDD production high quality G-Flex brand balance chain.
As Güven Çelik Halat, we attach great importance to responding to the needs and demands of the sector quickly with our expert team. We closely follow technological developments and continue to provide high-performance products to the offer the sector.

" We contribute to sectoral development "

GENERAL INFORMATION



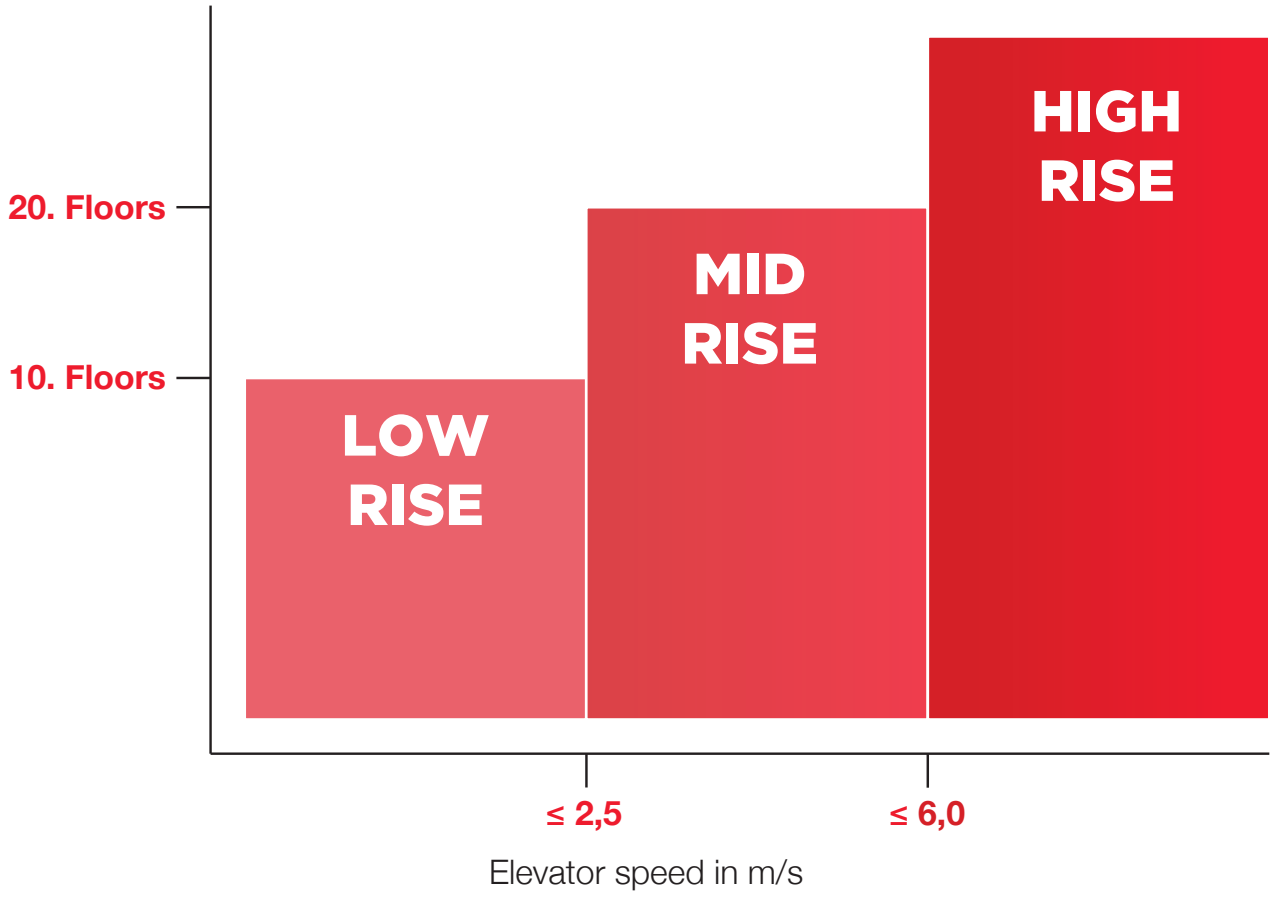
- Selection of Wire Ropes
- Rope Reeving
- Types of Grooves
- Rope Elongation
- Importance of Rope Tension Affect

SELECTION OF WIRE ROPES

In the various elevator designs the rope is subjected to very different loads. The choice of the correct rope construction results from the optimization among:

- High resistance to fatigue
- High wear resistance
- Low elongation

	Travel Height (m)		
	< 30	≤ 60	> 60
Drako 8x19 S - FC	x	-	-
210 TF IWRC	x	x	-
210 TFS IWRC	x	x	-
250 T IWRC	x	x	x
300 T IWRC	x	x	x

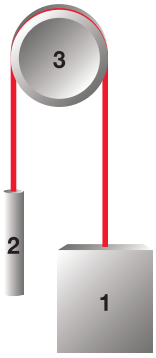


Note: The recommendations stated here are based on a basic overhead machine with a traction sheave and a D/d ratio = 40 using a V-groove and 1:1 reeving.

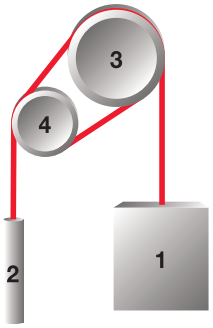
ROPE REEVING

Passenger, freight, hospital, car elevators are made one of the following rope reeving are used.

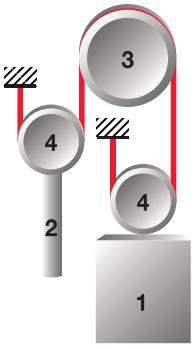
1. Cabin
2. Counterweight
3. Traction sheave
4. Rope pulley



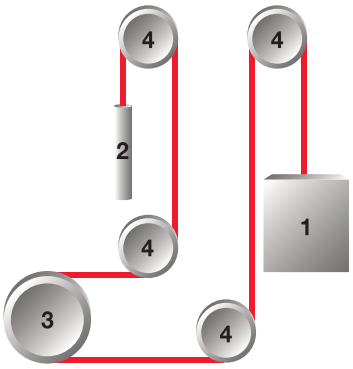
a. Overhead single wrap 1:1



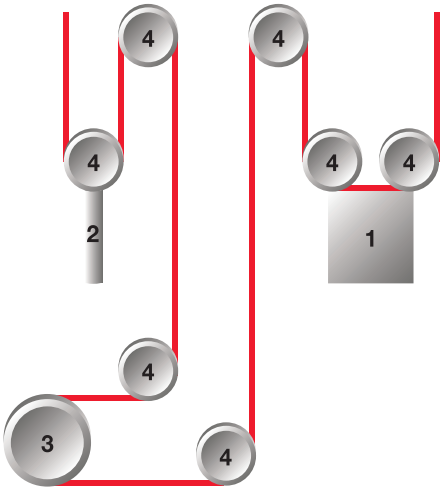
b. Overhead double wrap 1:1



c. Overhead single wrap 2:1



d. Basement machine single wrap 1:1



e. Basement machine single wrap 2:1

Various types of ropes that can be used in different rope reeving systems:

	Overhead Single Wrap 1:1	Overhead Double Wrap 1:1	Overhead Single Wrap 2:1	Basement Machine Single Wrap 1:1	Basement Machine Single Wrap 2:1
8x19 W-FC	✔	✔	✔		
8x19 S-FC	✔				
Drako 210 TFS	✔	✔	✔	✔	
Drako 210 TF	✔	✔			
Drako 250 T	✔	✔	✔	✔	✔
Drako 300 T	✔	✔	✔	✔	✔

TYPES OF GROOVES

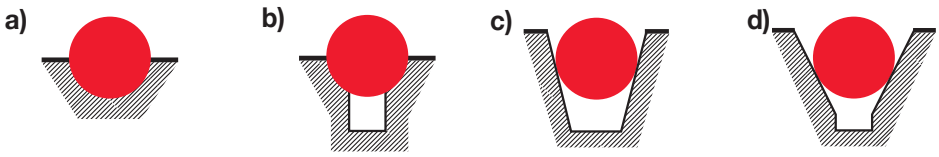
Traction sheaves are generally made of either hardened or unhardened cast iron. Depending on the required traction different drive sheave groove designs may be employed.

a. Round groove without undercut

b. Undercut round groove

c. V-groove

d. Undercut V-groove



The following table shows the pulley stiffnesses according to the rope strengths.

Tensile strength of the outer wires N/mm²		1180	1370	1570	1670	1770	1960
Hardness of Traction Sheave	Brinell-HB	180 - 200	200 - 230	220 - 240	230 - 250	240 - 260	270 - 290
	Rockwell-HRC	19	22	24	25	26	28

ROPE ELONGATION

Rope elongation is one of the most frequently misunderstood terms and the cause of much confusion. This is due to there being no unequivocal elasticity module that exists for ropes that can predict the elongation of the rope over its complete service life. Since the concept of “elasticity module” is normally only used in connection with the elongation behaviour of work materials and also due to the redundant arrangement of the carrying wires, we will here use the term of “rope elongation module” for the steel wire rope component.

The issue is further complicated by factors such as;

- Rope shortening in connection with initial elongation,
- Levelling in respect of loading and unloading the car to ensure floor level
- Bouncing of car (or counterweight) and
- In the context of acceleration / deceleration.

When under load, ropes are subject to elongation. Fiber - core ropes will stretch more in comparison to steel - core ropes. The more compact and stable the rope is made, the less the rope will stretch.

As to elongation, one differentiates between;

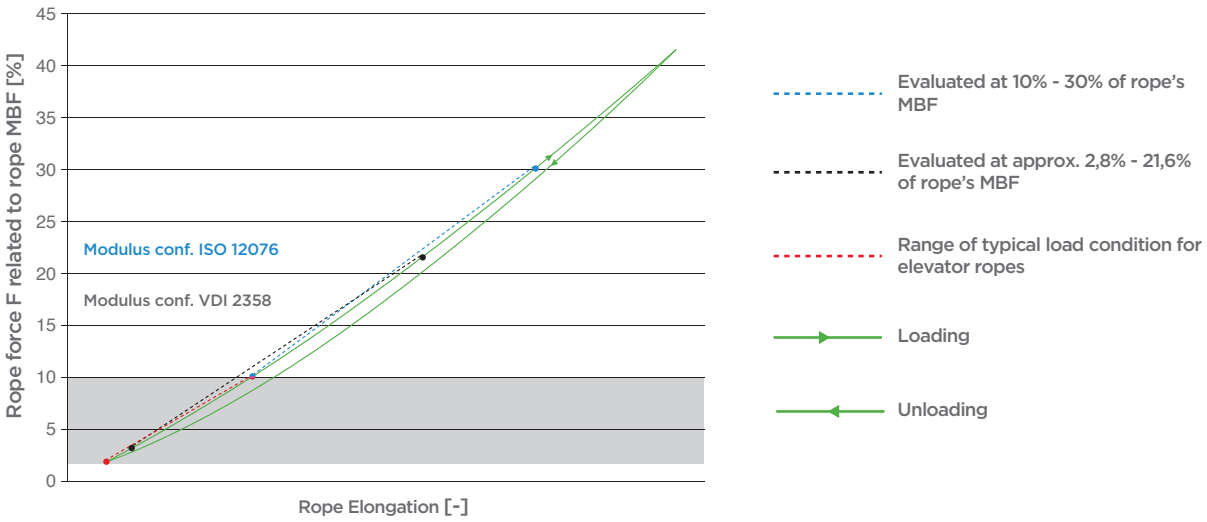
a) Constructional stretch

Constructional stretch originates from the settling of the core and strands within the rope when a load is applied. Most construction stretch occurs shortly after the new rope is put into service.

b) Elastic stretch

Elastic stretch is caused by applying additional forces such as loading and unloading and/or acceleration and deceleration of the cabin. There are different approaches to establishing the E - Modulus. Depending on the method chosen, the E - Moduli will noticeably vary and thus also the results for the calculated elongation. The higher the E - Modulus, the lower the calculated elongation will be.

The graph below shows that the typical load range in elevator design varies between approx. 2 to 10% of the rope’s minimum breaking force, which can be. The graph below shows that the typical load range in elevator design varies between approx. 2 to 10% of the rope’s minimum breaking force, which can be attributed to the high safety factors in the fi eld of passenger transportation. An E - Modulus established in this load range is usually lower in comparison to increased load ranges, while the expected elongation per load increment will be higher.



Note: To establish an anticipated elongation of a rope in service based on an elasticity modulus, knowledge about the load range of the specific installation is a pre - requisite.

The characteristic and elongation information of Drako ropes is indicated symbols in the product information sections by the following.

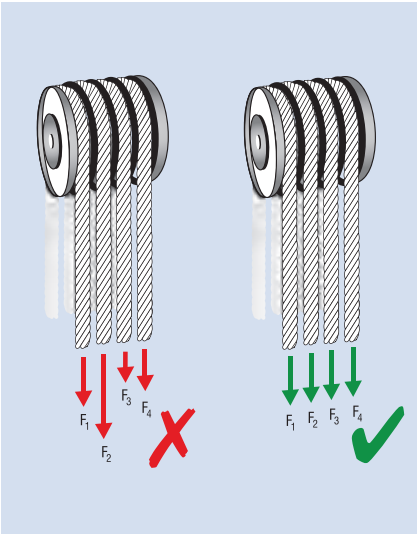
Characteristics

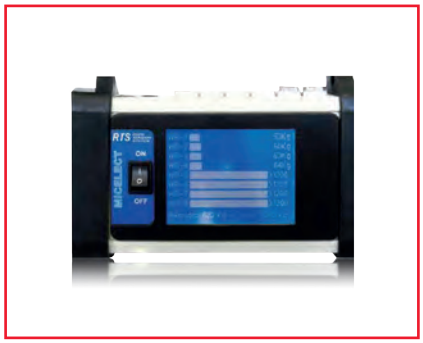
Elastic elongation – at 10% of the minimum breaking strength F_{min}

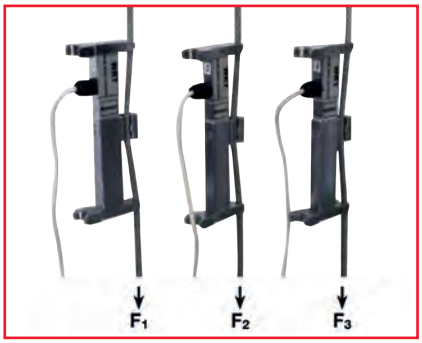
Permanent elongation – acc. to DIN 51201

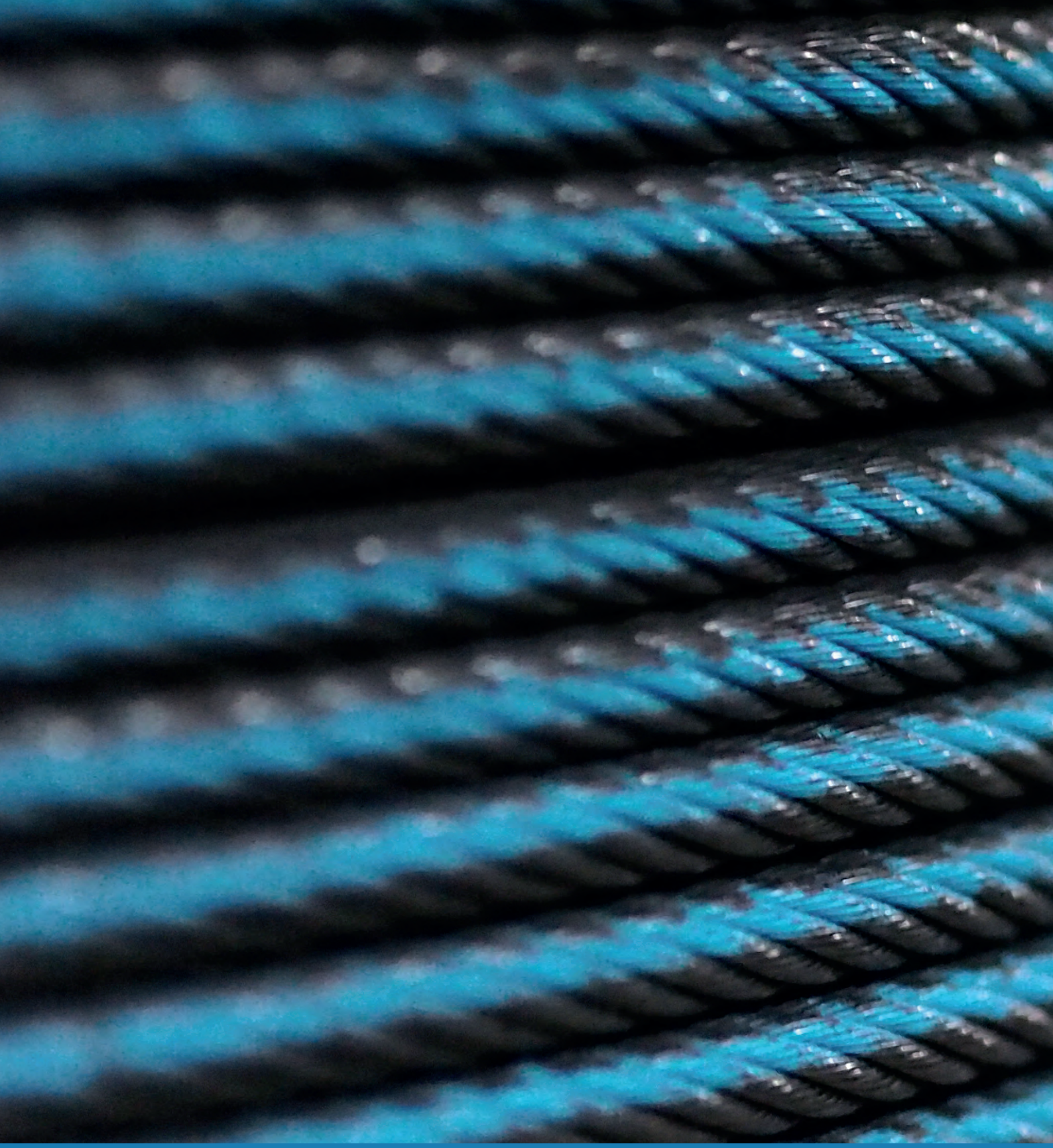
IMPORTANCE OF ROPE TENSION AFFECT

When designing and calculating elevators, the assumption is made that all the ropes proportionally transfer the same tensile force.In practice, this hardly ever happens. Deviating relative rope tensile forces are practically unavoidable. In installations involving great shaft heights, the frequently deployed method of pulling or pushing on the rope is no longer adequate. Special rope tension measuring devices provide assistance here, offering a method of adjusting the rope tensile force to an approximately even level. If ropes of equal tension are not used; Uneven tension levels bring about different degrees of contact pressure on the grooves of the traction sheave, resulting in corresponding differences in rope slippage. In some cases, this brings about uneven wear in the grooves and ropes. Consequently, all ropes should be tested after an initial operation phase for even load. Experience has shown that this inspection should be carried out after 4 – 6 weeks. In some cases, delaying this inspection has resulted in premature wear of ropes and/or sheaves.





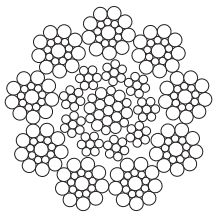




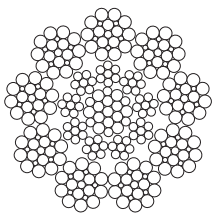
STEEL WIRE ROPES

- > Traction Ropes
  - High Rise
  - Mid Rise
  - Low Rise
- > Patented Polyurethane Coated Steel Belts
- > Ropes for Compensation
- > Governor Ropes
- > Door Rope
- > Track Rope

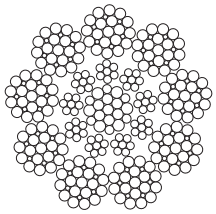
STEEL WIRE ROPES



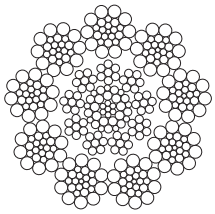
9x19 S – IWRC



9x21 F – IWRC



9x25 F – IWRC



9x26 WS – IWRC

DRAKO 300 T

- 9 - strand heavy duty rope.
- Very round cross - section.
- Many thin wires, hence very flexible with good bending performance.
- High flexural performance.
- Low elastic and plastic elongation.
- Marking line for an easy installation.

Preformed, pre - stretched.
Bright design.
Galvanized upon request.

≤ % 0.11

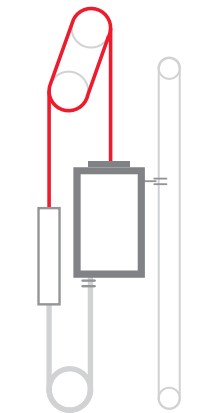
≤ % 0.15

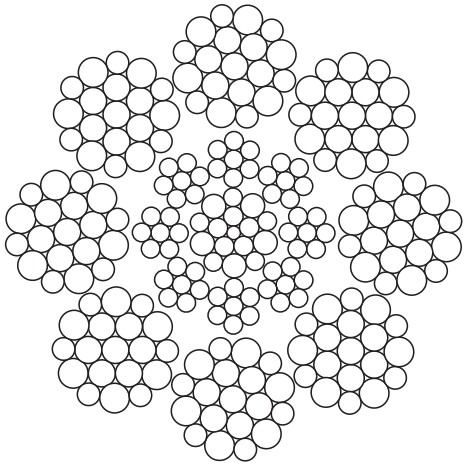
Applications:

Traction ropes for high - rise elevators.

GENERAL VIEW

Diameter (mm)	Rope Construction	Minimum Breaking Load, kN (1570 N/mm²)	Metallic Area (Approx) (mm²)	Weight (kg/100 m)
8	9x19 S - IWCR	42,10	30,80	26,10
9	9x19 S - IWCR	53,30	39,00	33,10
9,5	9x19 S - IWCR	59,40	43,50	36,80
10	9x21 F - IWCR	66,00	49,70	42,80
11	9x21 F - IWCR	79,90	60,10	51,80
12	9x21 F - IWCR	95,10	71,60	61,60
13	9x21 F - IWCR	111,6	84,00	72,30
14	9x25 F - IWCR	133,0	96,60	84,00
15	9x25 F - IWCR	153,0	110,9	96,00
15,5	9x25 F - IWCR	163,0	118,4	103,0
16	9x25 F - IWCR	174,0	126,2	110,0
17,5	9x25 F - IWCR	208,0	151,0	131,0
18	9x25 F - IWCR	220,0	159,7	139,0
19	9x25 F - IWCR	245,0	178,0	154,0
20	9x25 F - IWCR	272,0	197,2	171,0
22	9x26 WS - IWCR	333,0	243,5	215,0





DRAKO 250 T

- 8x19 Warrington construction.
- TÜV Süd certificate CA067 (Ø 6.0 – 8.0).
- Very low D/d ratio of up to 8 mm in diameter.
- Required drive torque is greatly reduced.
- Cost saving drives possible.
- Flexible with good bending endurance.
- Low elastic and plastic elongation.
- High breaking strength in relation to diameter.
- Marking line for an easy installation.

Preformed, pre - stretched.
Bright design.
Right hand, ordinary lay.

≤ % 0.12

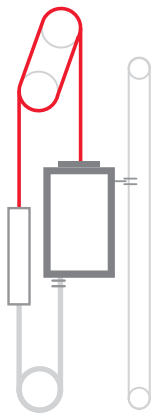
≤ % 0.15

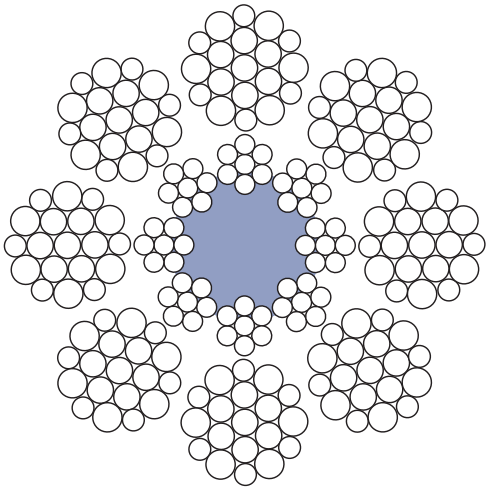
Applications:

Traction ropes for mid - rise elevators.

GENERAL VIEW

Diameter (mm)	Minimum Breaking Load, kN (1570 N/mm²)	Minimum Breaking Load, kN (1770 N/mm²)	Metallic Area (Approx) (mm²)	Weight (kg/100 m)
6	-	26,80	18,50	16,40
6,5	-	31,50	20,60	17,90
8	43,30	46,60	31,60	27,30
9	54,80	-	40,00	34,30
10	67,70	72,70	49,40	42,30
11	81,90	-	59,70	51,20
12	97,40	-	71,10	61,00
13	114,0	-	83,40	71,50
14	133,0	-	96,70	82,90
16	173,0	-	126,0	108,3





DRAKO 210 TF

- 8x19 Warrington construction.
- High breaking strength in relation to diameter.
- Low elastic and plastic elongation.
- Slightly more deformable cross - section.
- Combined steel and fiber core.
- Marking line for an easy installation.

Preformed, pre - stretched (medium).
Bright design.
Right hand, ordinary lay.

≤ % 0.12

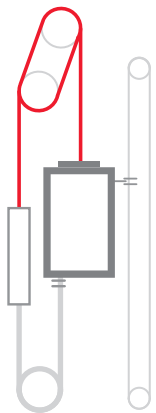
≤ % 0.15

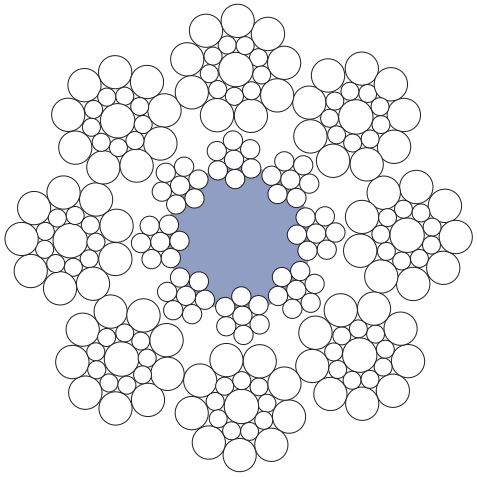
Applications:

Traction ropes for mid - rise elevators.

GENERAL VIEW

Diameter (mm)	Minimum Breaking Load, kN (1570 N/mm²)	Metallic Area (Approx) (mm²)	Weight (kg/100 m)
8	40,00	28,50	25,00
10	61,30	44,50	39,00
11	76,10	53,80	47,00
12	88,30	64,10	56,00
13	106,0	75,20	66,00
15	137,0	99,00	86,00
16	156,0	113,9	100,0





DRAKO 210 TFS

- 8x19 Seale construction
- High breaking strength in relation to diameter.
- Low elastic and plastic elongation.
- Slightly more deformable cross - section.
- Combined steel and fiber core.
- Marking line for an easy installation.

Preformed, pre - stretched (medium).
Bright design.
Right hand, ordinary lay.

≤ % 0.15

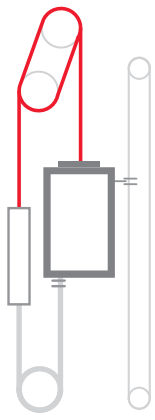
≤ % 0.15

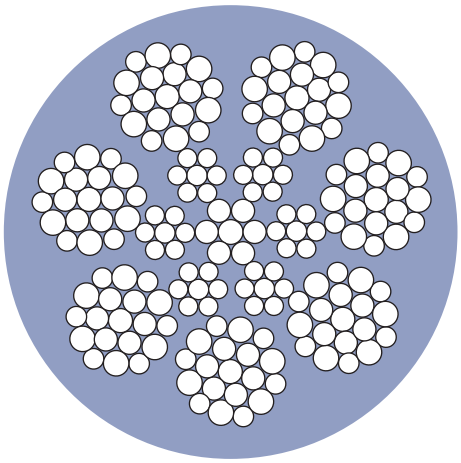
Applications:

Traction ropes for mid - rise elevators.

GENERAL VIEW

Diameter (mm)	Minimum Breaking Load, kN (1570 N/mm² and 1370/1770 N/mm²)	Metallic Area (Approx) (mm²)	Weight (kg/100 m)
8	38,70	27,90	25,00
10	60,50	43,60	40,00
13	102,2	73,70	67,00
16	154,9	113,5	100,0





DRAKO PTX 300

- 7x19 W – IWRC construction
- Plastic - sheathed traction rope with high strength wires
- High breaking strength in relation to diameter.
- Steel core rope

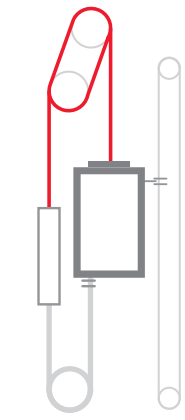
Applications:

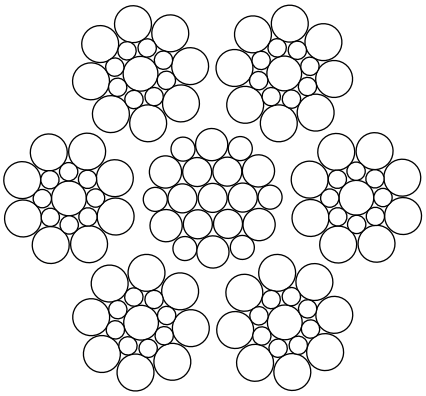
Traction ropes for mid - rise elevators.

Right hand, ordinary lay.

GENERAL VIEW

Diameter (mm)	Minimum Breaking Load, kN (2700 N/mm²)	Metallic Area (Approx) (mm²)	Weight (kg/100 m)
6	28,0	12,1	11,3
6,5	28,0	12,1	12,0





DRAKO STX

- 6x17 S – WSC construction.
- High breaking strength.
- Durable round - rope form suitable for the use in V - grooves.
- Low rope diameter change under load
- Low permanent and elastic elongation.
- Cost saving drives.

Preformed, pre - stretched.
Bright design.
Right hand, ordinary lay.

≤ % 0.10

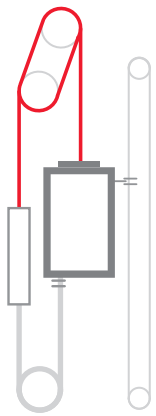
≤ % 0.12

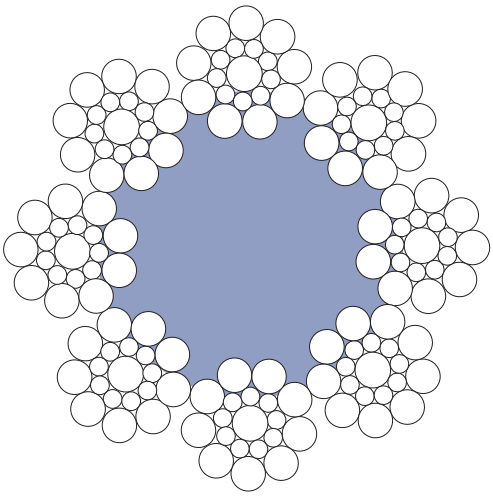
Applications:

Traction ropes for mid - rise elevators.

GENERAL VIEW

Diameter (mm)	Minimum Breaking Load, kN (1960 N/mm²)	Metallic Area (Approx) (mm²)	Weight (kg/100 m)
4	12,6	7,90	6,90
5	20,0	12,5	10,9





DRAKO
8x19 S-FC

- Easy to install.
- Marking line for an easy installation
- Rounder than 6 - strand ropes, more contact points rope to groove.

Preformed, pre - stretched.
Bright design.
Right hand, ordinary lay.

≤ % 0.20

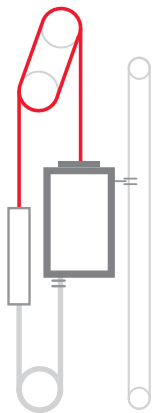
≤ % 0.40

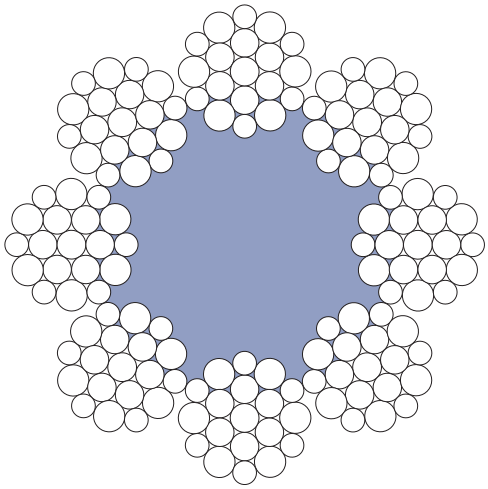
Applications:

Traction ropes for low - rise elevators.

GENERAL VIEW

Diameter (mm)	Minimum Breaking Load, kN (1570 N/mm² and 1370/1770 N/mm²)	Metallic Area (Approx) (mm²)	Weight (kg/100 m)
8	30,40	22,50	21,50
9	38,40	28,40	27,30
9,5	42,80	31,70	30,40
10	47,40	35,10	33,70
11	57,40	42,50	40,70
12	68,30	50,60	48,50
13	80,20	59,30	56,90
14	93,00	68,80	66,00
15	107,0	79,00	75,70
15,5	114,0	84,40	80,80
16	121,0	89,90	86,10
18	154,0	114,0	109,0
19	171,0	127,0	121,0





DRAKO
8x19 W-FC

- Easy to install.
- Marking line for an easy installation.
- Rounder than 6 - strand ropes, more contact points rope to groove.

Preformed, pre - stretched.
Bright design.
Right hand, ordinary lay.

≤ % 0.20

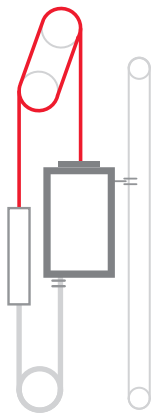
≤ % 0.40

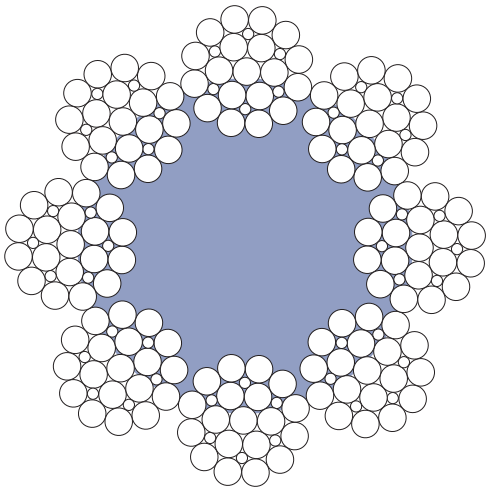
Applications:

Traction ropes for low - rise elevators.

GENERAL VIEW

Diameter (mm)	Minimum Breaking Load, kN (1570 N/mm² and 1370/1770 N/mm²)	Metallic Area (Approx) (mm²)	Weight (kg/100 m)
8	31,6	23,4	22,2
9	40,0	29,6	28,1
10	49,4	36,5	34,7
11	59,7	44,2	42,0
12	71,1	52,6	50,0
13	83,4	61,7	58,6
16	126	93,5	88,8





DRAKO
8x25 F-FC

- Easy to install.
- Marking line for an easy installation.
- Rounder than 6 - strand ropes, more contact points rope to groove.

Preformed, pre - stretched.
Bright design.
Right hand, ordinary lay.

≤ % 0.20

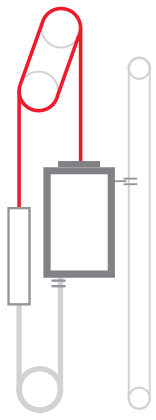
≤ % 0.40

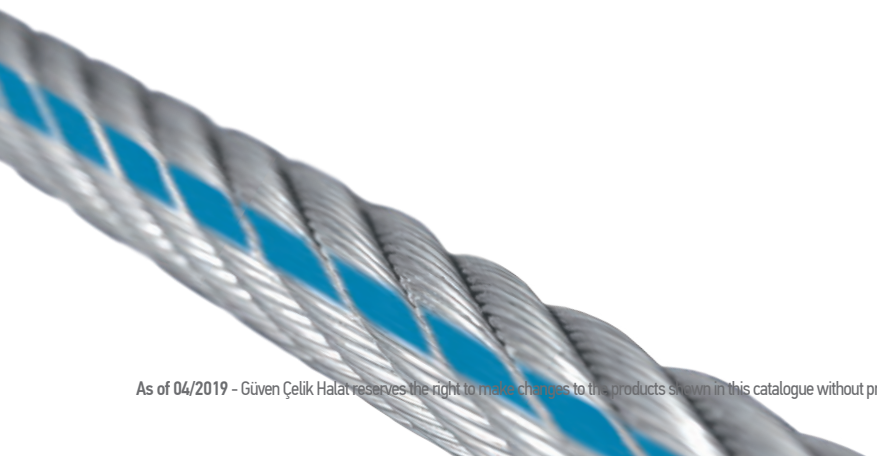
Applications:

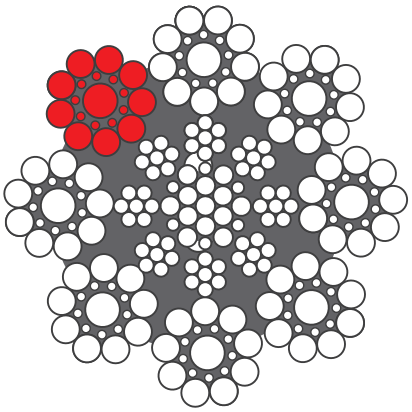
Traction ropes for low - rise elevators.

GENERAL VIEW

Diameter (mm)	Minimum Breaking Load, kN (1570 N/mm² and 1370/1770 N/mm²)	Metallic Area (Approx) (mm²)	Weight (kg/100 m)
13	81,00	60,00	59,00
15	108,0	80,00	78,00
16	122,0	91,00	89,00
18	155,0	115,0	112,0
19	173,0	128,0	125,0

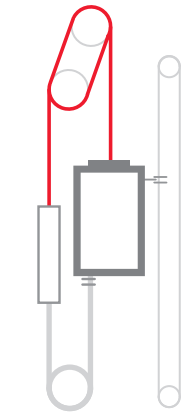






TS EN 12385-5 8x19 CLASS

- Galvanized and bright design.
- Resistant to corrosion.
- Resistant to salty sea water.
- Resistant to fatigue.
- Available in right hand and left hand.



Applications:

Traction ropes for elevators in low speed.

TS EN 12385-5 8x19 SEALE FIBER CORE CLASS

Diameter (mm)	Minimum Breaking Load, (kN)			Approximate Weight of 100 Mtrs. (kg)
	Dual Tensile Rope Grade		Mono Tensile Rope Grade	
	Dual Tensile Rope Grade Class (1180/1770 N/mm²)	Mono Tensile Rope Grade Class (1370/1770 N/mm²)	Mono Tensile Rope Grade Class (1570 N/mm²)	
8	25,70	28,10	29,40	21,80
9	32,50	35,60	37,30	27,50
10	40,10	44,00	46,00	34,00
11	48,60	53,20	55,70	41,10
12	57,80	63,30	66,20	49,00
13	67,80	74,30	77,70	57,50
14	78,70	86,10	90,20	66,60
16	103,0	113,0	118,0	87,00

TS EN 12385-5 8x19 SEALE IWRC CLASS

Diameter (mm)	Minimum Breaking Load, (kN)				Approximate Weight of 100 Mtrs. (kg)
	Dual Tensile Rope Grade		Mono Tensile Rope Grade		
	Dual Tensile Rope Grade Class (1180/1770 N/mm²)	Dual Tensile Rope Grade Class (1370/1770 N/mm²)	Mono Tensile Rope Grade Class (1570 N/mm²)	Mono Tensile Rope Grade Class (1770 N/mm²)	
8	35,80	38,00	35,80	40,30	26,00
9	45,30	48,20	45,30	51,00	33,00
10	55,90	59,50	55,90	63,00	40,70
11	67,60	71,90	67,60	76,20	49,20
12	80,50	85,60	80,50	90,70	58,60
13	94,50	100,0	94,50	106,0	68,70
14	110,0	117,0	110,0	124,0	79,80
16	143,0	152,0	143,0	161,0	104,0

Conti Polyrope® 50-12x2.0

Conti Polyrope® 50-12x2.0 DP

PATENTED POLYURETHANE COATED STEEL BELTS

CONTI POLYROPE® 50-12x2.0

CONTI POLYROPE® 50-12x2.0 DP

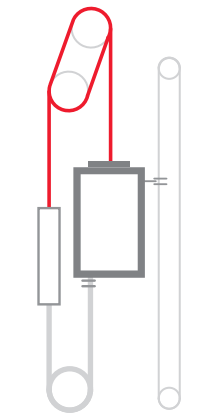
- Enables compact drive systems – less space needed.
- Lasts up to two to three times longer than a steel rope.
- Maintenance - and lubrication-free operation.
- Self guiding system on traction pulley with POLYROPE.
- Self guiding system on traction and deflection pulley with POLYROPE DP.
- No vibration means silent system.
- Easy and safe installation.
- Energy - saving.
- Cost - saving.

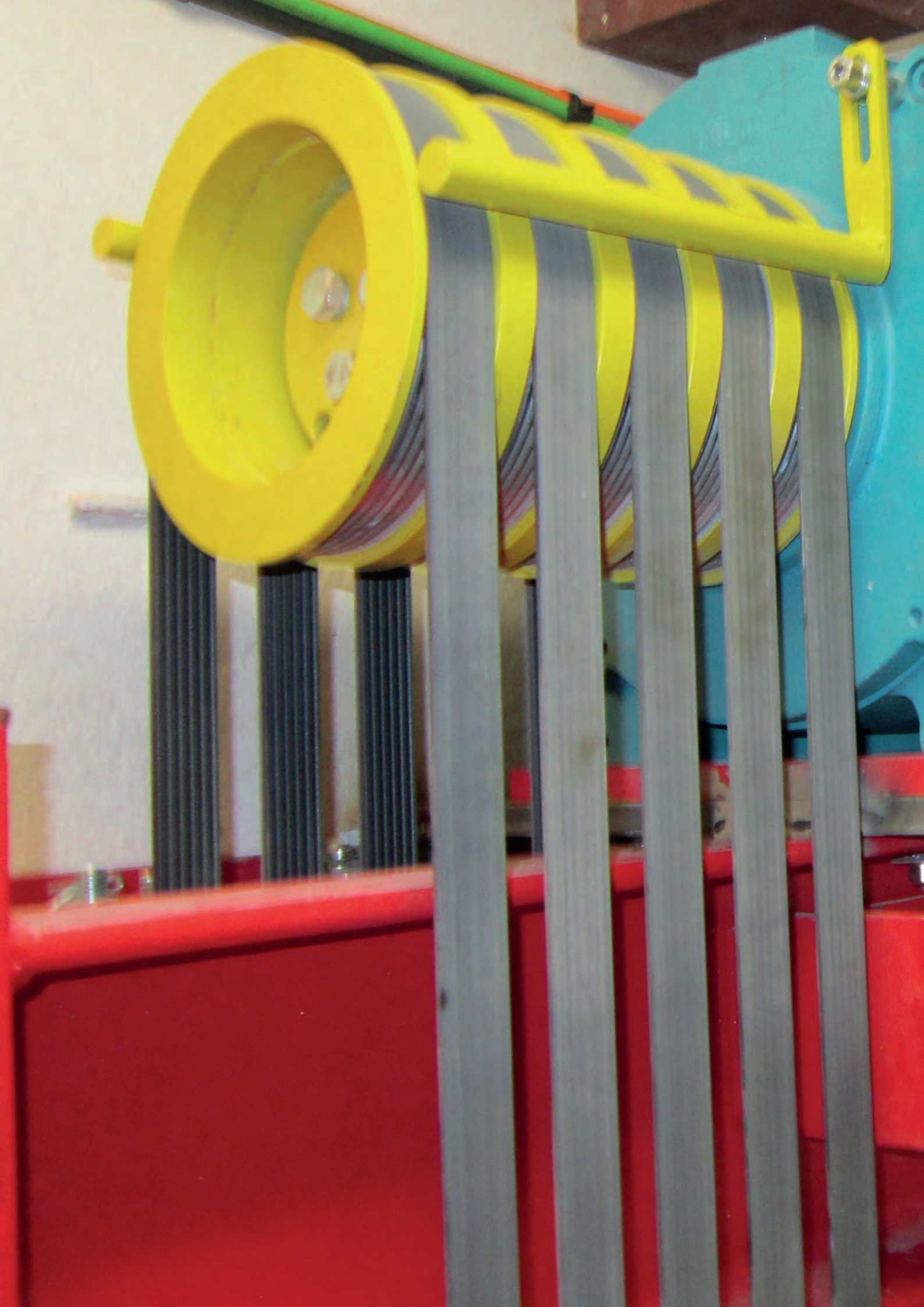
Applications:

Used as a suspension belt in elevator systems.

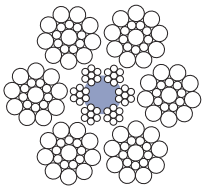
GENERAL VIEW

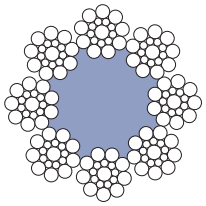
	50 - 12 x 2.0	50 - 12 x 2.0 DP
Width	49,50 mm +/-1 mm	
Thickness	3,7 mm +/- 0,15 mm	5,2 mm +/- 0,15 mm
Weight	0,36 kg/m	0,42 kg/m
Pitch of Ropes	4,12 mm +/- 0,1 mm (Not accumulative)	
Body Material	PU black, Conti Compound	
Body Hardness	92 +/-3 Sh A	
Cord	12 x 0,2 mm Steel, Galvanized	
Minimum Breaking Force	5000 N	
Nominal Breaking Force	12 x 5000 N = 60 kN	
Elongation at Break	Approx %2	
Driving Pulley D_{min}	85 mm	100 mm
Idler Pulley D_{min}	100 mm	100 mm
Temperature Elongation	For Steel	
Working Temperature	Approx -10 °C to 60 °C	
Storage Temperature	Approx -30 °C to 60 °C	

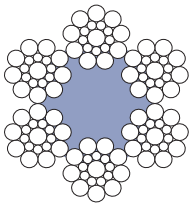


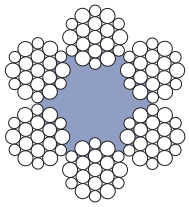


STEEL WIRE ROPES


6x19 S – IWRC


8x19 S – FC


6x19 S – FC


6x19 W – FC

DRAKO
(6x19 S, 6x19 W, 8x19 S)

- Right hand ordinary lay.
- Greater reliability and system availability
- Lower susceptibility to breakdown.
- Higher breaking strengths.
- Length and form stability in all environments.

Preformed, pre - stretched.
Bright design.
Galvanized upon request.

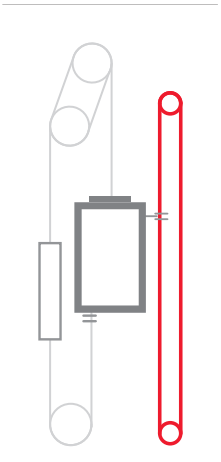
8x19 S – FC ≤ % 0.40
6x19 S – FC ≤ % 0.30
6x19 W – FC ≤ % 0.30
6x19 S – IWRC ≤ % 0.15

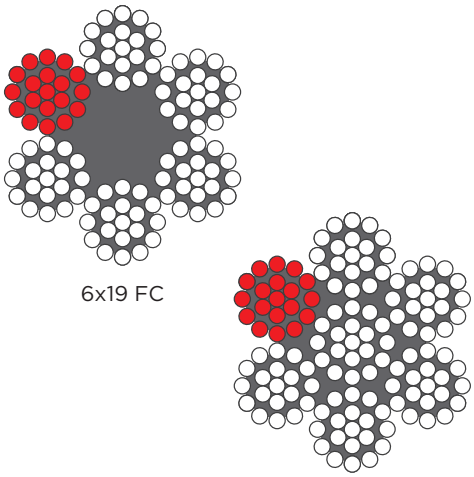
Applications:

It can be used as elevator governor rope.

GENERAL VIEW

Diameter (mm)	Minimum Breaking Load, kN (1370/1770 N/mm²)	Minimum Breaking Load, kN (1570 N/mm²)	Minimum Breaking Load, kN (1770 N/mm²)	Minimum Breaking Load, kN (1960 N/mm²)	Weight (kg/100 m)
DRAKO 6x19 S - IWRC					
8	-	35,9	-	-	26,2
DRAKO 8x19 S - FC					
6,5	-	19,0	-	-	14,6
8	-	-	34,2	-	21,5
9,5	-	-	48,3	-	30,4
10	47,4	47,4	-	-	33,7
12,7	76,5	-	-	-	54,3
DRAKO 6x19 S - FC					
6	-	19,0	21,4	23,3	13,0
DRAKO 6x19 W - FC					
5	-	-	14,6	-	9,50
6	-	19,8	-	24,7	13,2
6,3	-	-	-	27,2	14,6
6,5	23,2	23,2	26,2	-	15,5
7	-	-	28,6	-	18,0
8	-	-	39,6	-	23,6





6x19 FC

6x19 IWRC

6x19 GOVERNOR ROPE

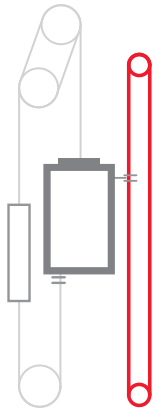
- Galvanized and bright design.
- Resistant to abrasion.
- Available in right hand and left hand.

Applications:

It can be used as elevator governor rope.

GENERAL VIEW

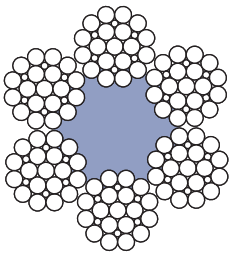
Diameter (mm)	Minimum Breaking Load (kN)				Approximate Weight of 100 Mtrs. (kg)	
	1770 N/mm²		1960 N/mm²			
	Fiber Core	Steel Core	Fiber Core	Steel Core	Fiber Core	Steel Core
3	4,89	5,77	5,42	6,39	3,11	3,43
4	8,69	10,3	9,63	11,4	5,54	6,10
5	13,6	16,0	15,0	17,7	8,65	9,53
6	19,6	23,1	21,7	25,5	12,5	13,7
7	26,6	31,4	29,5	34,8	17,0	18,7



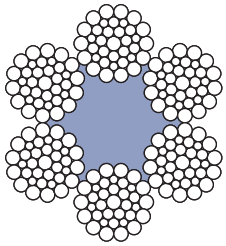
Warning!

Governor ropes

a. The speed regulator must be tracted with the rope wire specified in EN 12385-5
b. Minimum breaking load of rope; considering the maximal friction factor Q = 0,2 for the rope traction speed controller when the speed regulator is activated, the tensile strength of the rope must be calculated with at least 8 safety factors.
c. Rate between diameter of pulley in speed regulator and the nominal diameter of the rope should be at least 30.



6x25 F – FC



6x36 WS – FC

DRAKO 180 B

- Made with a synthetic fibre core (SFC)
- Rope composition varies according to nominal anchor to optimize performance.
- It has a long service life.
- Quiet operation.

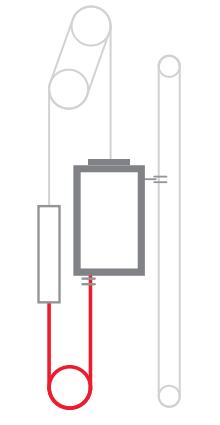
Applications:

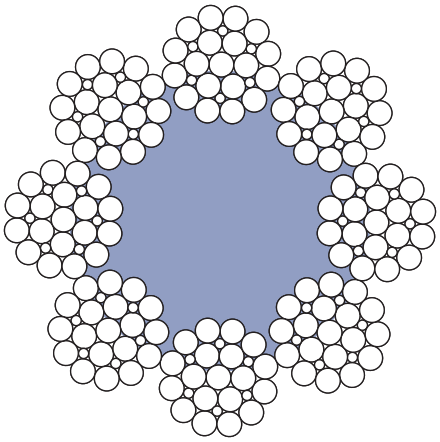
It is used as balance rope in elevator systems exceeding speed of 3 m/s.

Preformed, bright.
Right hand, ordinary lay.

GENERAL VIEW

Diameter (mm)	Minimum Breaking Load, kN (1370/1770 or 1570 N/mm²)	Weight (Approx) (kg/100 m)
DRAKO 6x25 F - FC		
13	83,70	60,70
16	127,0	92,00
18	160,0	116,0
19	179,0	130,0
20	198,0	144,0
22	240,0	174,0
DRAKO 6x36 WS - FC		
24	292,0	211,0
26	342,0	248,0
32	518,0	376,0
36	656,0	476,0
38	731,0	530,0





DRAKO 200 B

- Made with a synthetic fibre core (SFC)
- Rope composition varies according to nominal anchor to optimize performance.
- It has a long service life.
- Quiet operation.

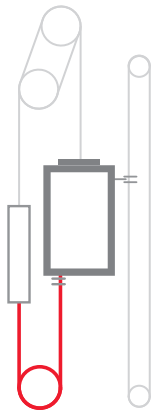
Applications:

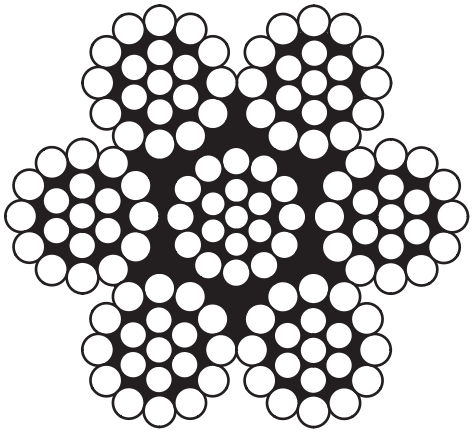
It is used as balance rope in elevator systems exceeding speed of 3 m/s.

Preformed, bright.
Right hand, ordinary lay.

GENERAL VIEW

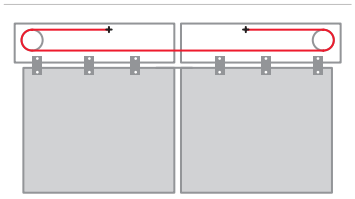
Diameter (mm)	Minimum Breaking Load, kN (1370/1770 or 1570 N/mm²)	Weight (Approx) (kg/100 m)
13	74,30	57,50
16	113,0	87,00
18	142,0	110,0
19	159,0	123,0
22	213,0	165,0





STAINLESS DOOR ROPE

- Material: AISI 316 stainless steel
- Production: acc. to DIN 3055
- Resistant to corrosion

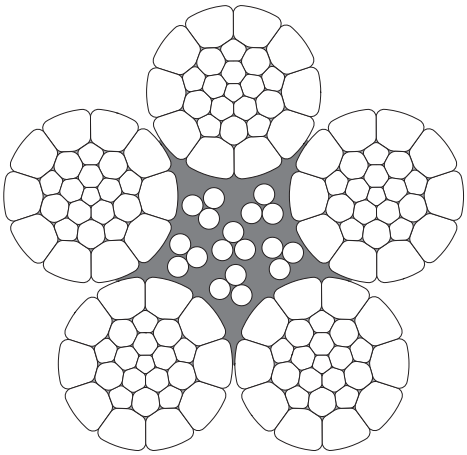


Applications:

Used as a door rope in elevator systems.

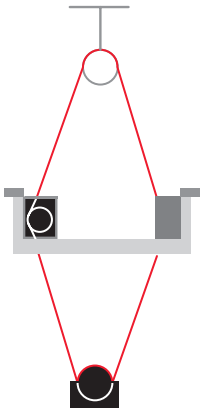
GENERAL VIEW

Diameter (mm)	Minimum Breaking Load (kg)	Weight (kg/m)
2	212,0	0,017
3	477,0	0,034
4	849,0	0,061
5	1.326	0,095
6	1.960	0,138



TRACK ROPE

- Galvanized design (Class-B).
- Available in only ordinary lay.
- Compacted rope.



Applications:

Used as track rope for suspending elevators.

GENERAL VIEW

Diameter (mm)	Rope Construction	Core	Surface	Minimum Breaking Load, kN (1960 N/mm²)
8,3	5xK26 WS	SFC	Galvanized	52,2
10,2	5xK26 WS	SFC	Galvanized	78,3

BALANCE CHAIN AND ACCESSORIES

- > Balance Chain
- > Balance Chain Roller
- > Installation Kit
- > U - Bolt
- > Angle Bracket
- > Shackle
- > Swivel

BALANCE CHAIN AND ACCESSORIES

G-Flex which is a Güven Çelik Halat brand, is a balance chain which is produced utilizing the method of coating the high quality electric arc - welded chain with liquid PVC. G-Flex which is used in elevator systems, safely performs the duty of balancing the rope weight while moving upwards and downwards along the cabin space shaft.

WHY G-FLEX?

Especially, when high rise elevators (generally exceeding 30 meters and up to 3,5 mt/sec speed) are concerned, due to the weight of suspension ropes and travelling cables.

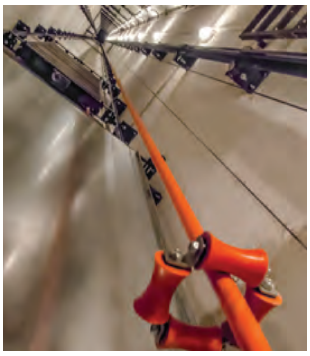
Balance chain;

- The rope tension on driving sheave fluctuates
- The load on the sheave and motor is varying.

Compensation chains are mainly used;

- To minimize rope tension fluctuations on driving sheave and
- To make constant the load applied on to the sheave and the motor regardless of car position.

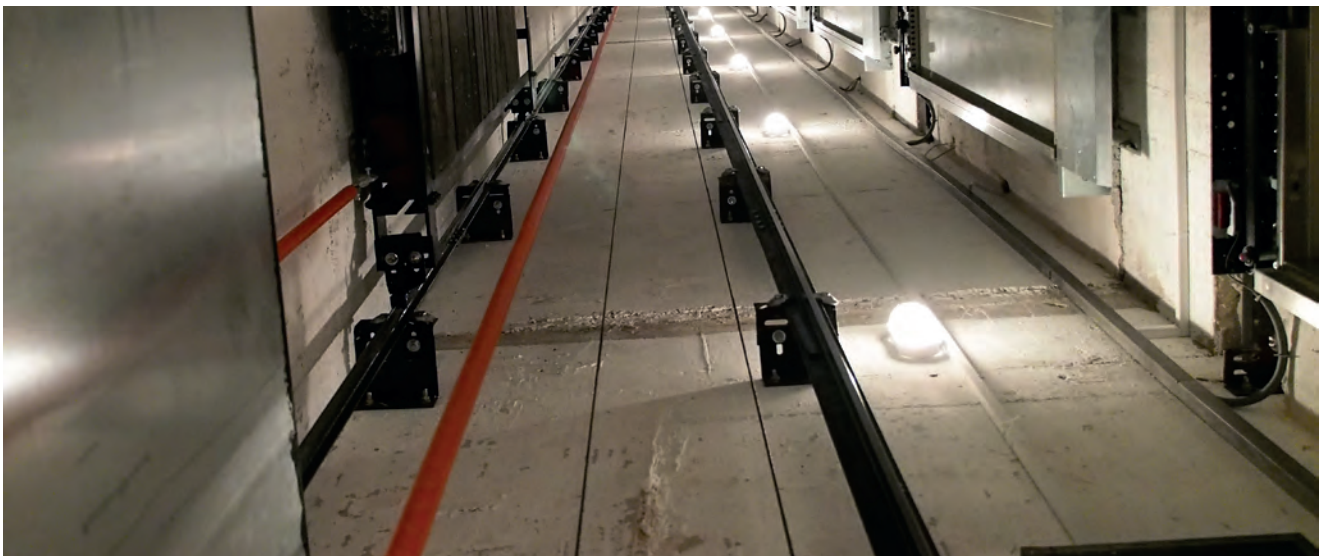
Indeed, as a brief expression, compensation chains are used to balance the dynamic load varying of elevators which is caused by suspension ropes weight.



G-FLEX

ELEVATOR BALANCE CHAIN

Model	Weight (kg/m)	Outside Diameter (mm)	Loop Diameter (mm)	Chain Diameter (mm)	Breaking Load (kN)	Max. Suspension Length (m)
GF075	1,12 ±0,20	24,0 ±2,00	610	6,0 ±0,50	≥ 15,63	160
GF100	1,49 ±0,20	27,0 ±2,10	610	6,0 ±0,50	≥ 15,63	160
GF125	1,88 ±0,20	30,0 ±2,20	610	7,0 ±0,50	≥ 18,13	147
GF150	2,24 ±0,20	32,0 ±2,30	610	7,8 ±0,50	≥ 23,68	130
GF175	2,63 ±0,20	35,0 ±2,20	660	8,5 ±0,50	≥ 29,97	145
GF200	2,98 ±0,20	38,0 ±2,50	660	9,5 ±0,50	≥ 29,97	160
GF250	3,73 ±0,20	42,0 ±2,50	660	10,0 ±0,50	≥ 37,00	142
GF300	4,47 ±0,20	44,0 ±2,70	660	11,0 ±0,50	≥ 44,70	153
GF350	5,22 ±0,20	48,0 ±2,80	690	12,0 ±0,50	≥ 52,28	150
GF400	5,96 ±0,20	52,0 ±2,90	690	13,0 ±0,50	≥ 62,53	150

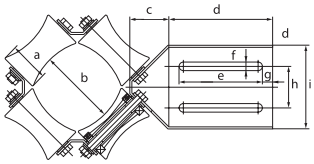


WHAT ARE THE BENEFITS OF G-FLEX?

- Balanced rope tension on sheave,
- Constant load on sheave and motor,
- Avoiding from dangerous cases might result because of excessive traction force differentiations,
- Easy installation opportunity for more precise and smooth elevator,
- Opportunity to use low torque motor i.e. low cost of motor and energy and smaller room need,
- Noiseless,
- Cheap and simple installation.

BALANCE CHAIN ROLLER

- Quartet consists of parallel plastic reels.
- Its use reduce vibration.
- It moves along with chain during use and eliminates friction.
- Its gapless structure prevents jamming



a (mm)	b (mm)	c (mm)	d (mm)	e (mm)	f (mm)	g (mm)	h (mm)	i (mm)
57,0	108	59,0	150	120	12,0	15,0	60,0	120

ANGLE BRACKET

It used to install the balance chain reel on the wall. It have a fixing equipment with adjustable ports on it.

GRIP

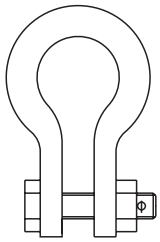
- It's the connection link that allow the installation kit to be connected under the elevator cabin.

Chain Code	Installation Kit
GF 075	Installation Kit- 1,12 kg/m
GF 100	Installation Kit - 1,49 kg/m
GF 125	Installation Kit - 1,88 kg/m
GF 150	Installation Kit - 2,24 kg/m
GF 200	Installation Kit - 2,63 kg/m
GF 250	Installation Kit - 2,98 kg/m
GF 300	Installation Kit - 4,47 kg/m
GF 350	Installation Kit - 5,22 kg/m
GF 400	Installation Kit - 5,96 kg/m

BALANCE CHAIN AND ACCESSORIES

U - BOLT

U bolt is a connection element that allows the mounting kit to be connected under the cabinet.



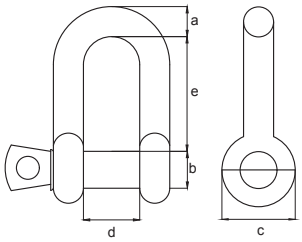
SHACKLE

Shackle is a connection element that allows the mounting kit to be connected under the cabinet.

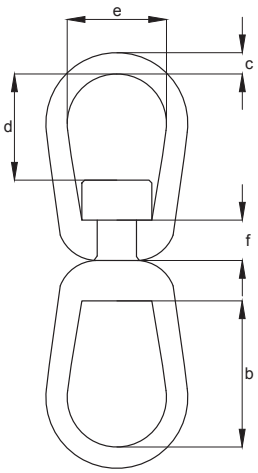
★ **One set consists of 1 piece grip, 3 pieces U - Bolt and 1 shackle.**

SHACKLE - U TYPE

- ★ Mild steel and untreated.
- ★ Class; grade 3.
- ★ Not to be used for lifting applications.
- ★ Electro-galvanized plating.



a (mm)	b (mm)	c (mm)	d (mm)	e (mm)	Weight (kg)
5,00	5,00	10,0	10,0	20,0	1,40
6,00	6,00	12,0	12,0	24,0	2,20
8,00	8,00	16,0	16,0	32,0	5,20
10,0	10,0	20,0	20,0	40,0	11,8
11,0	11,0	22,0	22,0	44,0	14,0
12,0	12,0	24,0	24,0	48,0	20,5
14,0	14,0	28,0	28,0	56,0	29,4
16,0	16,0	32,0	32,0	64,0	42,6



EYE – EYE SWIVEL

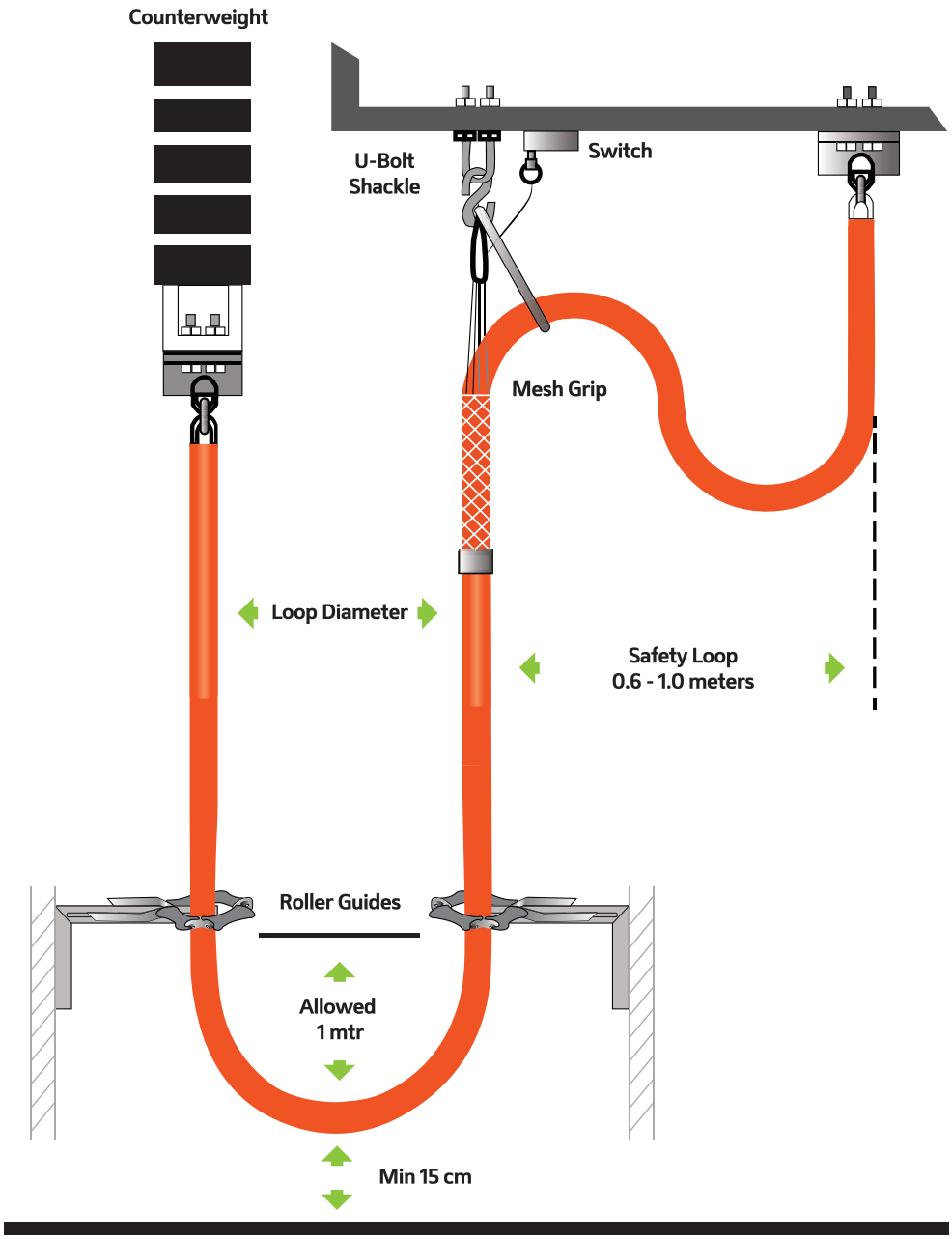
Diameter (mm)	Working Load (ton)	b (mm)	c (mm)	d (mm)	e (mm)	f (mm)
17	2,50	63,0	17,0	44,0	39,0	20,0
21	3,20	74,0	21,0	49,0	50,0	22,0
25	5,40	81,0	25,0	53,0	65,0	25,0
27	8,00	92,0	27,0	60,0	62,5	33,0
35	11,5	105	35,0	67,0	79,0	40,0
39	16,0	115	39,0	67,0	97,0	42,0
44	22,0	150	44,0	95,0	123	48,0
52	30,0	165	52,0	103	128	55,0

HOW TO INSTALL?

Generally compensation chains are installed in a way that one end is attached to the bottom of the car frame and the other end by passing through the chain roller guide which is at the bottom of the well and then fixed to the buttom of the counterweight frame. During installation, it should be provided that compensation chain will run with its natural bending loop diameter. Otherwise if the installation bending loop diameter is bigger than the natural one, this will cause while elevator runs the chain will weave.

In this case, because of weaving the chain might hang out to other parts inside the well and then naturally might harm them. As a result may damage the overall operation of the system. Therefore, fixing point of the compensation chain should be the point where the natural loop matchs. This is highly important for the run of the elevator in a safe way.

When you fixed compensation chain according to its natural loop, the one end of the chain fixed to the car bottom frame might be at the edge. This might result in distortion of the alignment of the car. In such a case, car should be aligned. Elevator manufacturers sometimes by placing some additional hanging stable weights to car frame bottom or by other methods but should set the needed compensation.



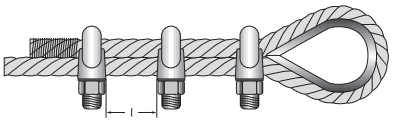
ACCESSORIES FOR ELEVATOR ROPES

- Wire Rope Clips
- Wire Rope Lubricants
- Wedge Sockets
- Rope Tension Measurement Machine
- Magnetic Rope Testing Equipment
- Chain Blocks

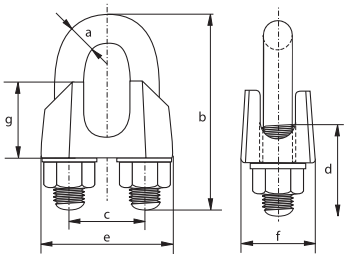
WIRE ROPE CLIPS

Applications:

It is the connection element used in steel ropes where socket installation, bonding and pressing are not possible or temporary connection is required.

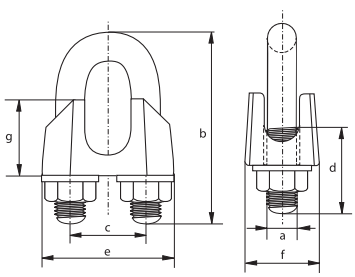


- Introductory information should be legible.
- There should not be any cracks, broken and hollow on the wire rope clip.
- The diameter of the rope to be used should be selected as appropriate sizes of wire rope clip.
- Should not be subjected to any heat treatment.
- When the rope ends with the wire rope clips, the connection must be made as shown.



DIN 1142

Wire Rope Diameter (mm)	a (mm)	b (mm)	c (mm)	d (mm)	e (mm)	f (mm)	g (mm)
5,00	5,00	25,0	12,0	14,0	25,0	13,0	13,0
6,50	6,00	32,0	14,0	17,0	30,0	16,0	14,0
8,00	8,00	41,0	18,0	20,0	39,0	20,0	18,0
10,0	8,00	46,0	20,0	24,0	40,0	20,0	21,0
13,0	12,0	64,0	29,0	30,0	55,0	28,0	29,0
16,0	14,0	76,0	34,0	35,0	64,0	32,0	35,0
19,0	14,0	83,0	37,0	36,0	68,0	32,0	40,0
22,0	16,0	96,0	41,0	40,0	74,0	34,0	44,0



DIN 741

Wire Rope Diameter (mm)	a (mm)	b (mm)	c (mm)	d (mm)	e (mm)	f (mm)	g (mm)
3,00	4,00	20,0	9,00	12,0	21,0	10,0	10,0
5,00	5,00	24,0	11,0	13,0	23,0	11,0	10,0
6,00	5,00	28,0	13,0	15,0	26,0	12,0	11,0
8,00	6,00	34,0	16,0	19,0	30,0	14,0	15,0
10,0	8,00	42,0	19,0	22,0	34,0	18,0	17,0
11,0	8,00	44,0	20,0	22,0	36,0	19,0	18,0
13,0	10,0	55,0	24,0	30,0	42,0	23,0	21,0
14,0	10,0	57,0	25,0	30,0	44,0	23,0	22,0
16,0	12,0	63,0	29,0	33,0	50,0	26,0	26,0
19,0	12,0	75,0	32,0	38,0	54,0	29,0	30,0
22,0	14,0	85,0	37,0	44,0	61,0	33,0	34,0

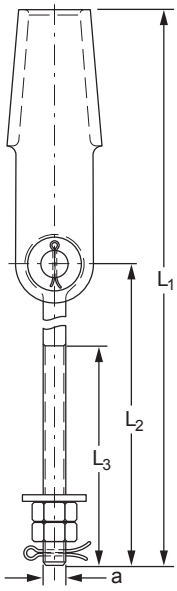
WIRE ROPE LUBRICANTS

- It penetrates the rope surface and prevents rust.
- Liquid, spray and grease.
- It is applied by machine, spray or brush.
- Lubricant to be used for maintenance purposes must be identical to the lubricant used during the manufacting of the rope.

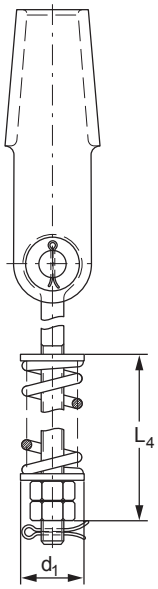
Applications:

Wire rope lubricant is a component that prevents the wires from rubbing against each other. It penetrates between the wires and reduces friction during work. Lubrication of rope with certain periods contributes to rope life. It penetrates the rope surface and prevents rust.

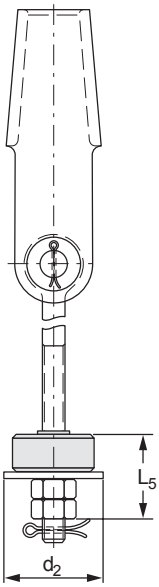
SYMMETRIC WEDGE SOCKET



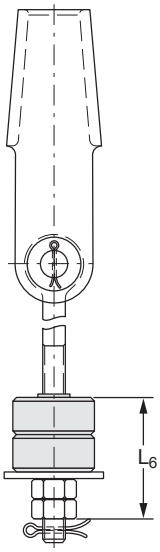
Type UM



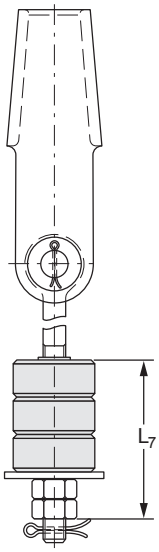
Type D
With Spring



Type FP
With 1 Spring
Buffer



Type FP 2
With 2 Spring
Buffers

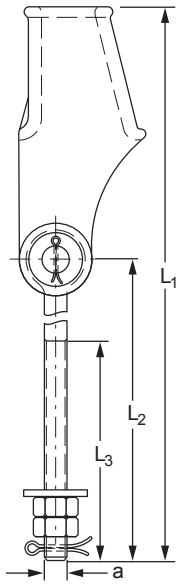


Type FP 3
With 3 Spring
Buffers

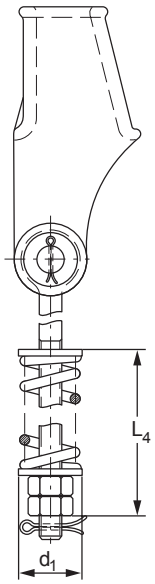
Steel Wire Rope (mm)	Nominal Size Socket	a	Nominal Size Type UM				Type D			Type FP			Type FP 2		Type FP 3	
			L_1 (mm)	L_2^* (mm)	L_3 (mm)	Weight Approx (kg)	d_1 (mm)	L_4 (mm)	Weight Approx (kg)	d_2 (mm)	L_5 (mm)	Weight Approx (kg)	L_6 (mm)	Weight Approx (kg)	L_7 (mm	Weight Approx (kg)
4 – 5	5	M 10	276	180	70	0,420	25	85,5	0,510	40	38	0,361	55	0,373	72	0,384
5 – 6,5	6,5	M 10	264	180	70	0,380	25	85,5	0,470	40	38	0,401	55	0,414	72	0,424
6 – 8	8	M 12	450	320	150	0,780	45	167	1.420	50	51	0,87	79	0,9	107	0,93
9 – 11	11	M 16	484	320	150	1.650	45	173	2.490	58	59	1.785	87	1.815	115	1.850
12 – 14	14	M 20	598	400	150	3.230	54	202	4.500	68	65	3.530	93	3.570	121	3.610
15 – 17	17	M 24	674	450	150	5.300	65	248	8.150	80	74	5.830	102	5.910	130	5.990
18 – 20[1]	20	M 27	760	500	150	8.000	65	254	10.950	-	-	-	-	-	-	-
21 – 25[1]	25**	M 30	740	500	150	11.000	80	251	14.500	-	-	-	-	-	-	-

* Normal Size
** Not acc. to DIN
[1] on request the socket body is galvanized

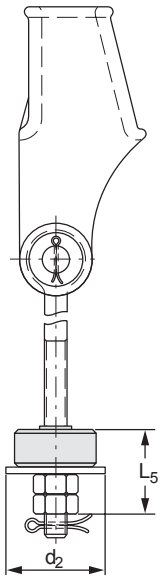
ASYMMETRIC WEDGE SOCKET



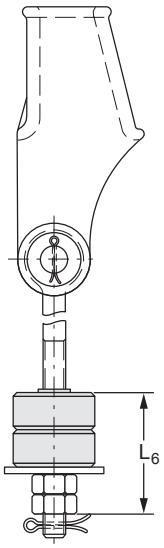
Type KUM



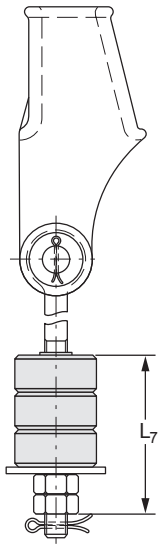
Type KD
With Spring



Type KFP
With 1 Spring
Buffer



Type KFP 2
With 2 Spring
Buffers



Type KFP 3
With 3 Spring
Buffers

Steel Wire Rope (mm)	Nominal Size Socket	a	Normal Size Type KUM				Type KD			Type KFP			Type KFP 2		Type KFP 3	
			L_1 (mm)	L_2^* (mm)	L_3 (mm)	Weight Approx (kg)	d_1 (mm)	L_4 (mm)	Weight Approx (kg)	d_2 (mm)	L_5 (mm)	Weight Approx (kg)	L_6 (mm)	Weight Approx (kg)	L_7 (mm	Weight Approx (kg)
6 – 7	353	M 12[1]	430	300	150	0,948	44	167	1.595	50	51	1.051	79	1.079	107	1.107
8	352	M 12[1]	430	300	150	0,920	44	167	1.567	50	51	1.023	79	1.051	107	1.079
9 – 12	351	M 12[1]	430	300	150	0,892	44	167	1.539	50	51	0,995	79	1.023	107	1.051
10 – 12	402	M 16	440	300	150	1.278	44	173	2.070	57	59	1.454	87	1.482	115	1.510
12 – 14	401	M 16	440	300	150	1.250	44	173	2.042	57	59	1.426	87	1.454	115	1.482
12 – 15	450	M 20[1]	590	400	150	3.330	50	202	4.840	68	65	3.620	93	3.666	121	3.712
16 – 20[2]	500	M 27[1]	715	500	150	7.740	65	254	10.760	-	-	-	-	-	-	-

* Normal Size
[1] Eye of bolt not acc. to DIN
[2] on request the socket body is galvanized

ATTENTION PLEASE:

- The elevator rope constructions shown in this catalogue have very different minimum breaking strengths.
- When specifying rope terminations and springs or spring buffers, their respective maximum applicable force is to be considered.
- Rope terminations are to be secured against rotation.

ROPE TENSION MEASUREMENT MACHINE

Ropes play an important role in the operation of elevators efficiently and comfortably. One of the most important issues here is that the loads on steel wire ropes to be equal.

Otherwise, elongation in ropes, broken wires and early damage can be seen in the pulley. In order to minimize this circumstances, it is important to measure the tension of the rope before taking the elevator into the system.

Through the devices measuring the tension of the ropes, this process now can be done more professionally and significantly. It is possible to adjust the load balance perfectly.

Properties:

- Extremely fast and accurate tension setting in each wire rope.
- Easy-to-fit wire rope WRT sensor
- Easy calibration with no need for known weights
- Suitable for use with any wire rope diameter from 06 - 20 mm
- Up to 12 independent channels for measuring up to 12 ropes at the same time
- Large LCD display with backlight
- USB port
- Easily programmable software
- Operation temperature -10 C° to 50 C°
- Rechargeable batteries
- Total weight 15 kg

WIRE ROPE INSPECTION SYSTEM - LMA-75

Specifications;

- For the Nondestructive Inspection of wire ropes with diameters from 0 to 3/4 inch (19 mm).
- Rope Guide sizes available: 3/8 inch (10 mm), 1/2 inch (13 mm), and 5/8 inch (16 mm).
- Ruggedized construction with pit-worthy hardware and connectors.
- Shown with external latch protector.
- Weight: 2,7 kg
- Battery operation: 6 - 8 hours continuous.
- Signal console weight: 10 kg

Performans

- Rope Sizes : 0 to 3/4 inch diameter.
- Rope Speed : 0,5 to 600 feet per minute (0,003 to 3 m/sec).
- Test Signals : LF and LMA signal, amplitudes independent.
- Flaw Detection : Loss of metallic cross - sectional area (LMA); external and internal corrosion, wear, various changes of wire rope structure.
- Flaw Detectability : Localized flaws (LF); broken wires and corrosion pitting. Flaw cross section: 0,1% of rope cross-sectional area. Quantitative flaw identification of loss of metallic crosssectional area for flaws longer than 2 inch (50 mm), qualitative flaw identification for localized flaws.

CHAIN BLOCK – TYPE HS C

- It requires less force than the lifted load.
- There is a dual bale braking system.
- There is a load limiter model.
- It can be installed wherever desired.

Capacity	Chain Length	Chain Diameter	Number of Tackle	Weight
(ton)	(m)	(mm)		(kg)
0,50	3,00	6,00	1	10,0
0,50	5,00	6,00	1	12,5
1,00	3,00	6,00	1	11,0
1,00	5,00	6,00	1	14,5
2,00	3,00	6,00	2	15,0
2,00	5,00	6,00	2	20,0
3,00	3,00	8,00	2	24,0
3,00	5,00	8,00	2	31,5
5,00	3,00	10,0	2	39,5
5,00	5,00	10,0	2	46,5
10,0	5,00	10,0	4	87,5
20,0	5,00	10,0	8	170

CHAIN BLOCK - TYPE HS

- It requires less force than the lifted load.
- There is a single bale braking system.
- It can be installed wherever desired.

Capacity	Chain Length	Chain Diameter	Number of Tackle	Weight
(ton)	(m)	(mm)		(kg)
0,50	3,00	6,00	1	10,0
0,50	5,00	6,00	1	12,5
1,00	3,00	6,00	1	11,0
1,00	5,00	6,00	1	14,5
2,00	3,00	6,00	2	15,0
2,00	5,00	6,00	2	20,0
3,00	3,00	8,00	2	24,0
3,00	5,00	8,00	2	31,5

TECHNICAL INFORMATION

> Steel Wire Ropes
> Maintenance and Lubrication
> Elevator Ropes Discard Criteria

1- Definition of steel wire ropes

Steel wire rope is a machine that consists of a number of moving parts that are designed and manufactured to be in constant interaction with each other. Steel ropes consist of wires, strands and a core. The main element is steel wire (Figure 1). Wire ropes are produced by careful processing and shaping of wires with predetermined physical properties and nominal strength.

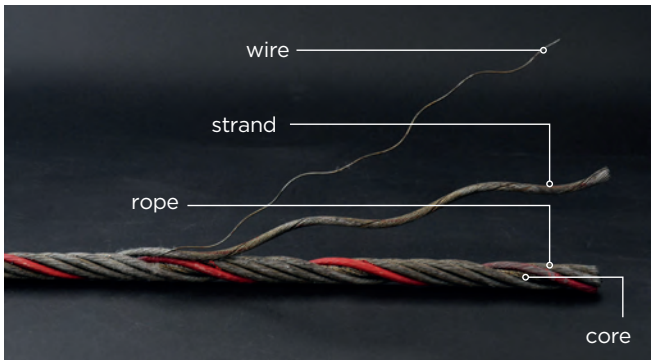


Figure 1: Components of a steel wire rope

2- Steel wire rope structure

Steel ropes are named according to the structures. Special ropes may have their own names (6x19 Seale, 8x19 Seale, 6x36 Warrington Seale.) extensions like Standard, Filler, Seale, Warrington Seale refers to the thinness, thickness and arrangement of the wires in a strand. (Figure 2)

3- Rope Core

There are basically two types of core. There are basically two types of essence. These are called fiber core and steel core. Fiber cores are usually formed from fibers of synthetic products such as sisal and polypropylene. The steel core is again made of steel wires and there are two main types strand core and independent rope core.

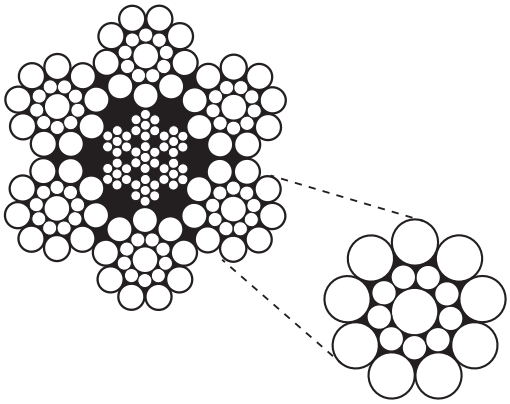


Figure 2: Example of steel wire rope structure

4- Direction of lay

During the production of rope, while the wires and the strands are helically shaped, the selected directions of lay indicates the direction of the rope if lay of the strands and the wires in the strand have the opposite direction, then it is called ordinary lay, if have the same direction, then called lang lay. The lay of the strand determines the lay of the rope. The basic lays are (Figure 3),

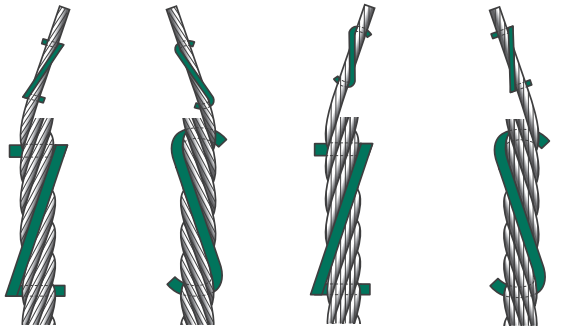


Figure 3: Lay types of steel wire ropes

5- Measuring wire rope diameter

Rope diameters are determined by measuring the circle that just touches the extreme outer limits of the strands. In the measurement of the rope, it is necessary for the caliper's jaws to contact the two outerstrands (Figure 4).

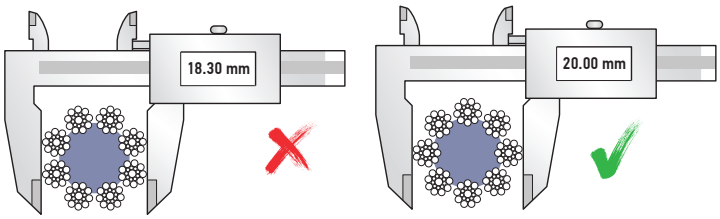


Figure 4: Correct and wrong measuring wire rope diameter

6- Rope diameter tolerances

The measured diameter of the rope will not be not differ from the nominal diameter when measured with no load. If the rope is measured under load equal to 5% or 10% of the minimum breaking load, it will not change more than the tolerances given in the following table.

Diameter tolerances for traction ropes and regulator ropes is following:

Rope Core	Nominal Rope Diameter d (mm)	Percentage Diameter Tolerance in Nominal Rope Diameter		
		Not Load Maximum	%5 F_{min} Loaded	%10 F_{min} Loaded
Fiber Core	≤ 10	%6	%1	%0
Fiber Core	> 10	%5	%1	%0
Steel Core	≤ 10	%3	%0	%-1
Steel Core	> 10	%2	%0	%-1

F_{min} = Minimum breaking force of rope

Diameter tolerances for hydraulic lift ropes and balance ropes is following:

Rope Core	Nominal Rope Diameter d (mm)	Percentage Diameter Tolerance in Nominal Rope Diameter	
		Minimum	Maximum
Fiber Core	≤ 8	%0	%6
Steel Core	> 8	%0	%5

7- Preforming

Preformed means that the wires and strands have been pre-set during manufacture into the permanent helical form they take in the completed rope.

8- Surface coating

Steel ropes are normally made of bright wires that have not been coated. They are galvanized if protection is required due to rust, moisture and steam..

9- Nominal strength

It refers to the amount of load at which the mm^2 of the wires are broken. Some nominal strengths are as follows; there are two kinds of nomimal strength.

a. Mono Tensile
It is the case that inner wires and outer wires have the same tensile strength. For example, the strength of the inner and outer wires of the rope is 1570 N/mm^2.

b. Dual Tensile
It is the case that the outer wires have a smaller tensile strength than the inner wires. For example; the outer wires are 1370 N/mm^2, the inner wires are 1770 N/mm^2 or the outer wires are 1180 N/mm^2, and the inner wires are 1770 N/mm^2.

10- Groove and rope relation

The diameter of the pulley and drum and the diameter and other characteristics of the grooves on them have a great impact on the rope life. The groove gauges can be used for the diameter and width measurements of the grooves. Drum and pulley made of suitable material are useful for rope life. If the grooves are wider and the rope contact angle is higher, then the rope is ovalized. If grooves are narrower or less than necessary, the wire and strands will get stuck both cases there are inconvenient for the service life of the rope. Generally the rope and groove contact angle should be between 135 - 150 degrees (Figure 5).

a. New rope – New groove

b. New rope – Worn groove

c. Worn rope – Worn groove

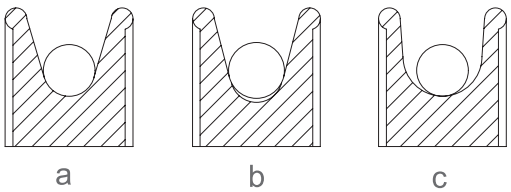


Figure 5: Groove and rope relation

11- Safety coefficient in traction ropes

The safety factor in an elevator is value in Newton, division of the minimum breaking force of a rope to cabin loaded with declared load and at the bottom floor.

Safety coefficient; Sould not less than,

- 12 in systems with three or more ropes,
- 16 in systems with twice ropes,
- 12 in rope hydraulics and drums,
- 10 in chain systems.

12- Rope termination

The rope terminals must at least correspond to 80% of the rope breaking force, rope terminals is made by using symmetrical and asymmetrical rope sockets in system.

Asymmetrical connection

In these connection systems, the rope and the rope socket must move in the same axis as the pin center. The rope must not rub against the corners of the wedge socket. In addition, when the additional safety clamp is discarded, the clamp must not be tied to the live rope.The distance between the clamp and the socket must not exceed 75% of the length of the socket.

Symmetrical connection

It's used as end termination for elevator ropes. Easy to assemble and disassemble. This has the advantage of manually adjusting the rope length. The distance between the socket and the clamp must not exceed 40% of the length of the connector.

When examining an asymmetric and symmetrical wedge socket, you must first ensure that the correct size wedge and socket is used for the rope diameter. If the socket is too large or the wedge is too small, the wedge will be pulled too far from the socket while under load. Therefore, especially if the wedge slots are to be used repeatedly, it is useful to mark the parts with paint before the first use.

It should also be checked that the wedge socket is placed correctly and that the "live" rope is not bending and inclined under load (Figure 6). The rope must be examined for wire breaks in the wedge socket area and if necessary the wedge seat completely removed.

After the rope has been taken out of service, the wedge socket must be carefully checked for physical damage and possible cracks before reuser.

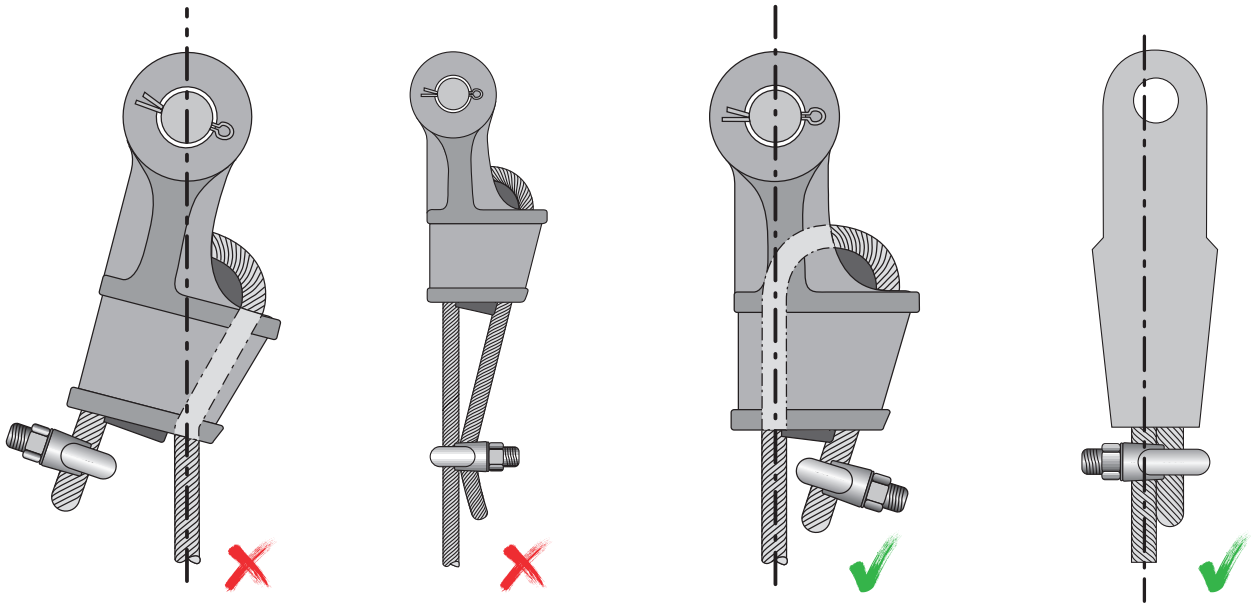


Figure 6: Correct and wrong rope termination

13- Rope lubrication

Elevator ropes are lubricated during manufacture in order to prevent corrosion and abrasion between the wires.owever, the quantity of lubricant applied should only be enough to ensure that elevators operate with sufficient traction and without slippage. Also, the state of the lubrication can be checked easily by running a cloth (or a finger) over the surface of the rope. If there is no oily film on the cloth a relubrication is highly recommended (Figure 7). If only a slight lubricating film is visible, which does not feel oily, a slight re-lubrication is recommended. It is not possible to provide any definitive statement in respect of relubrication intervals, as they depend on:

- The frequency of elevator use,
- The environment (temperature, humidity, incidence of dust),
- The sheave material and sheave wear (hardened traction sheaves require more relubrication, as no graphite is released from the sheave as a result of wear) and
- Slip between the rope and sheave.

Dry ropes can have up to an 80% shorter service life than suffi ciently lubricated ropes!!!

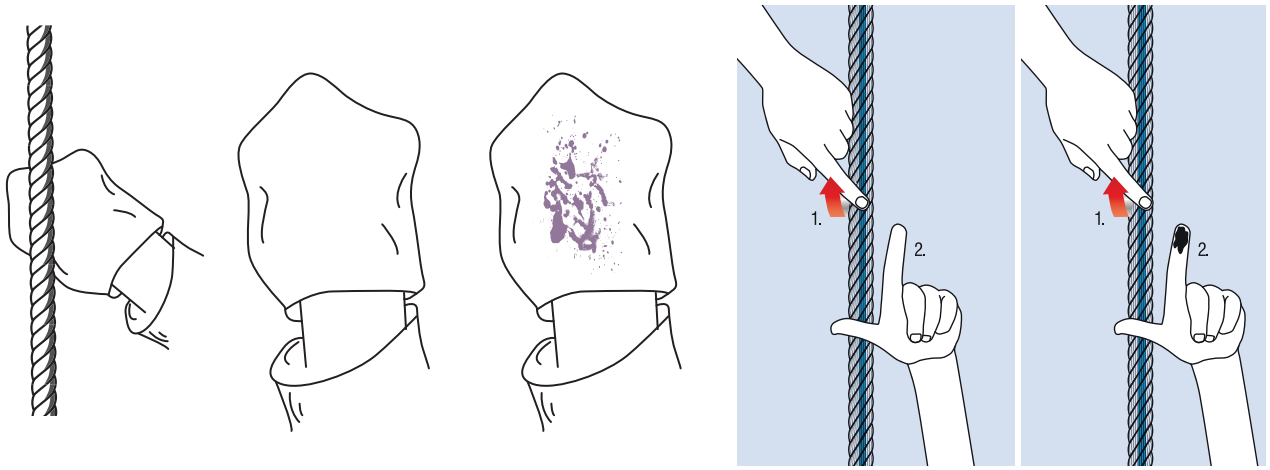


Figure 7: Checking rope lubrication

14- Unwinding of ropes

The ropes must be delivered in coils or on reels, when using the rope for the purpose of use or taking into system, the precautions shown in Figure 9 must be complied. Waves occured during the unwinding, cause permanent and undesired damages like kinks and birdcages that lead the rope to be unusable for further applications (Figure 8). It is not possible to repair the ropes that have the damages of kink or birdcage leading the discard of the ropes.

It cannot be the manufacturer's fault in the rope damage caused by such use errors. In order to avoid similar situations, winding machines should be used in the rope unwinding and cutting operations for certain lengths ropes should be rewind under a preload.

Ropes, are part of a working system, should be very carefully handled and stored before use. In all these activities, rope contact with external influences should be avoided. It should not be forgotten that the ropes are composed of a number of thin wires, as will be seen when they are examined closely, and this situation is very sensitive to external influences.

When the ropes are unwinded from the reels or coils during installation, service and rewinding to the reels, that care should be taken not to cause any damage to the rope and create stress on theropes due to external factors. No matter what the method is unwinding, the sand, gravel and other hard objects should not be adhered to the rope. Otherwise, it can damage the system and rope when the rope passes through the pulleys during the use due to these hard objects.

It has been tested that it is not a practical and efficient method, even if the problem is not seen in the rope unwinding process by rounding the wooden reel on the ground face.

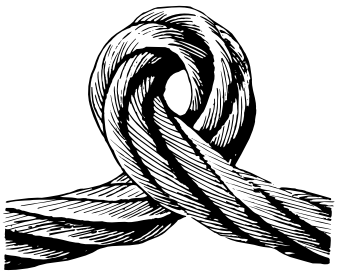


Figure 8: Damages due to wrong unwinding of rope

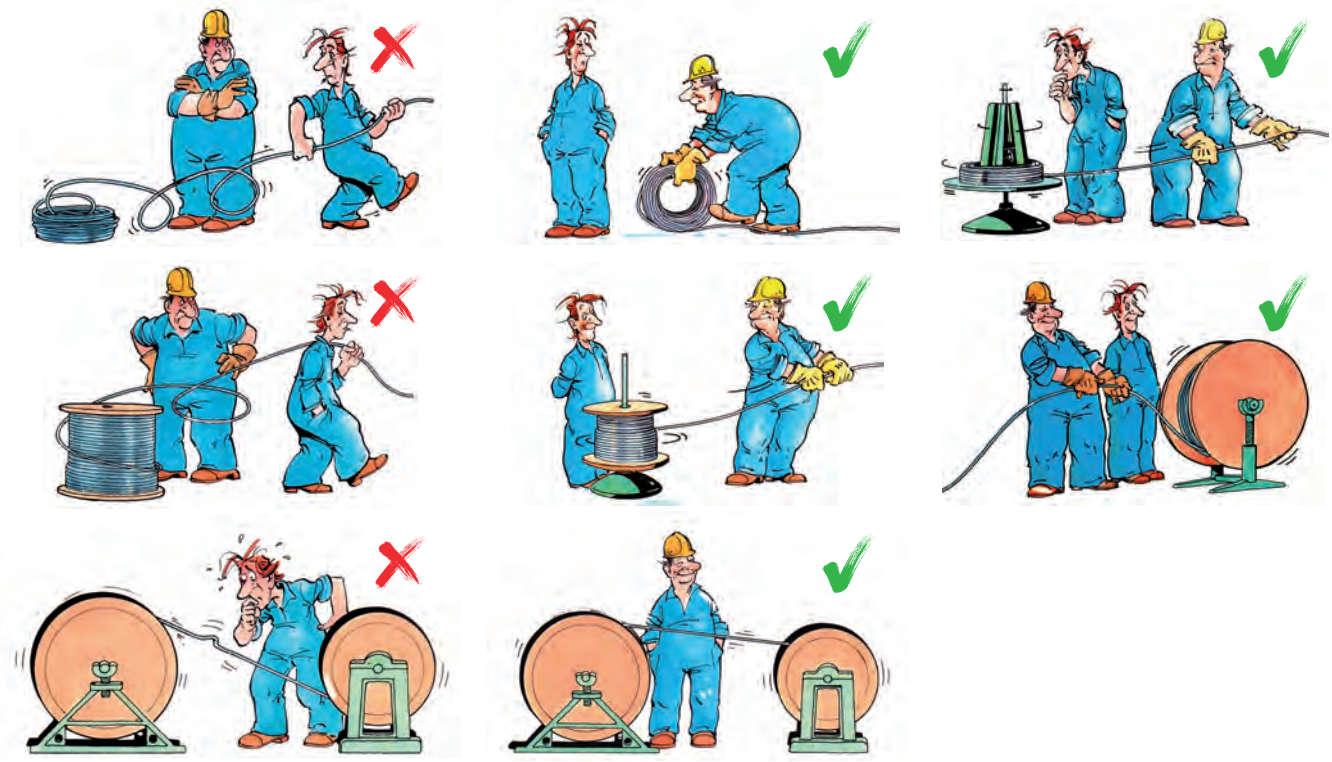


Figure 9: Correct and wrong examples of unwinding of rope

15- Handling, storage, packing

The ropes should be winded on wooden reel or steel reel (on special order) upon the customer demand according to the rope length and weight. Short ropes must be shipped in coils properly.

When transporting steel ropes, it should not touch hard, sharp, angular surfaces. Doing so could cause serious damage (Figure 10).

Steel wire ropes should be stored in closed, dry and cool environment. Direct contact with the ground must be cut. If open storage is to be done, suitable packaging should be made to prevent rusting due to wet, moisture and humidity.

When placing ropes in the stock area, they should be placed according to the first in first out principle. Thus, there will be no long waiting ropes in stocks.

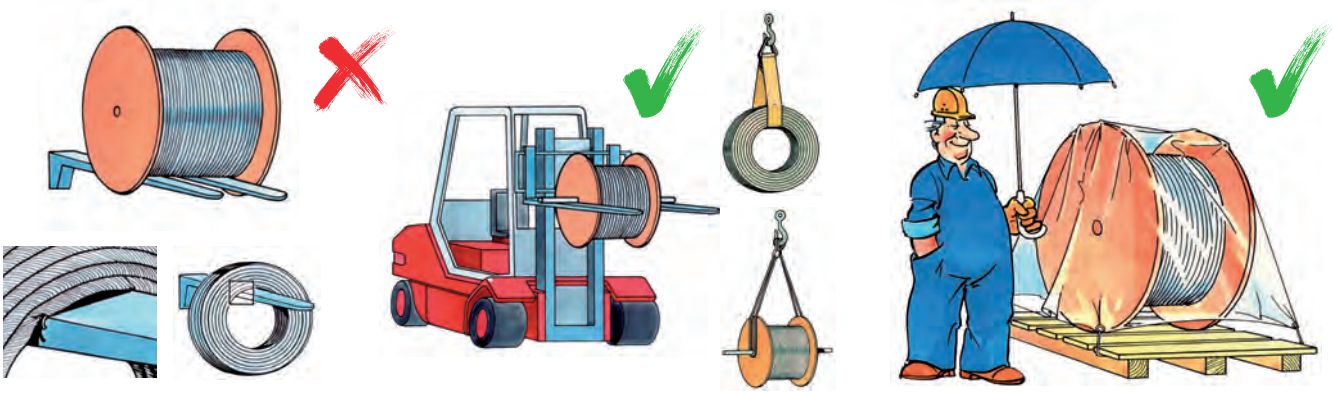


Figure 10: Examples of correct - wrong handling and correct storage

16- Maintenance and Lubrication

Steel wire ropes should be regularly maintained. The type of maintenance may vary depending on the machine, the type of use and the selected rope. The service life of a regularly maintained wire rope will increase significantly.

Removal of broken wires; if the ends of the broken wires are detected during the inspection, they must be removed. Because these broken wires can be crossed crosswise on other wires that are not broken and the rope can destroy other wires while passing through the sheeves in the service. For wires with a diameter that is too thick to be handled by a naked hand, the same procedure must be carried out using a tool.

During the production process, steel ropes are heavily lubricated. Thanks to this application made during the production in the factory, the ropes will be provided with adequate protection against corrosion and abrasion. In other words, the friction between wires forming the ropes will reduce the friction between the rope and the drum, pulley and so on. However, the initial lubrication at the factory remains limited for a limited period of time. Then periodic lubrication should be continued.

Steel wire ropes must be lubricated continuously at regular intervals. Depending on their use, they must be lubricated throughout their bending area. If lubrication is not possible for operational reasons, the service life of the rope must be shorter.

17- Rope damages and examination methods

No matter how high quality the rope is, the rope life depends on;

- The properties of the rope
- Usage area
- Equipment that is in contact or working together
- Type of usage

In addition to the above factors, the factors that cause the ropes to be taken out of service or have an effect on the life of the rope are given below.

These are;

- Unsuitable rope construction, wire breaking strength and diameter,
- Unsuitable wire properties (galvanised-bright),
- Operation on abrasive obstacles and lifting of sharp corner loads by direct contact to the rope,
- Lubrication not suitable for use conditions,
- Working on drums and pulleys of unsuitable sizes,
- Multi-layered and cross winding on drum,
- Operation on misaligned drums and pulleys,
- Operation on unsuitable grooved drums and pulleys,
- Jumping out of pulleys,
- Contact with moisture and acidic environment,
- Use of unsuitable fittings,
- Permission to turn opposite sides,
- Exposure of high temperatures,
- Formation of kink,
- Overloading of ropes in unsuitable conditions,
- Damages due to the entrance of abrasive particles into wires and strands.

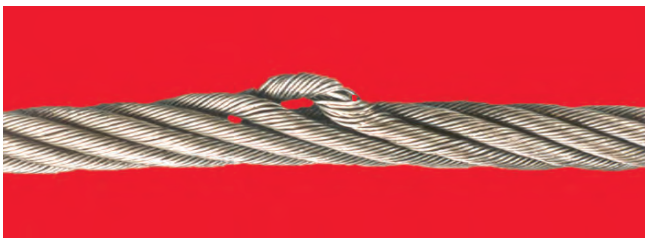
When examining a rope, the following points must be noted;

- Reduction in rope diameter,
- Abrasion in inner and outer wires,
- Rope lay length,
- Impact marks on wires and strands,
- Scratch marks,
- Corrosion,
- Broken wires and the type of breaks.

The above considerations should be observed very well and experience should be given great importance. If possible, the route followed by the rope should be monitored until the end of the rope and the nonconforming issues should be eliminated one by one. A careful and conscious eye will not have trouble finding the cause of any errors.

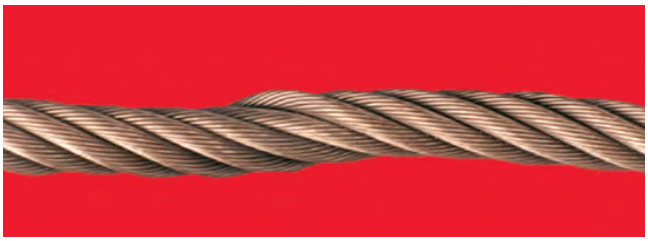
TECHNICAL INFORMATION

Rope damage types are shown in the following pictures.

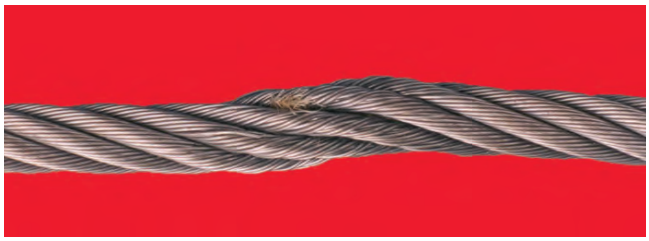


a. Strand protrusion or distortion

b. Flattened portion

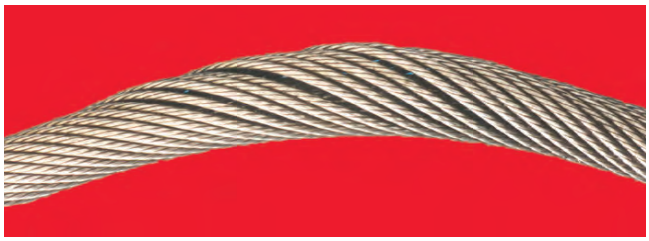


c. Kink (positive)



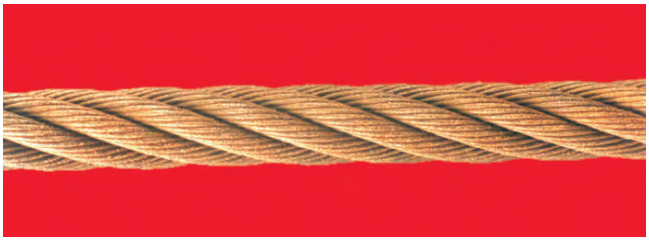
d. Kink (negative)

e. Waviness



f. Basket deformation

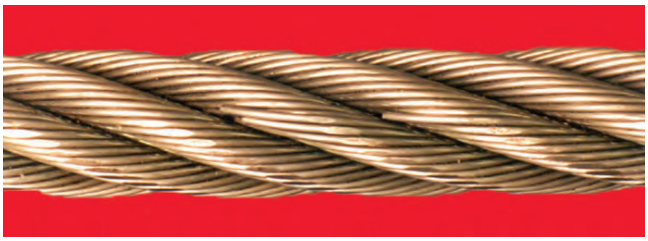
g. External wear



h. External corrosion

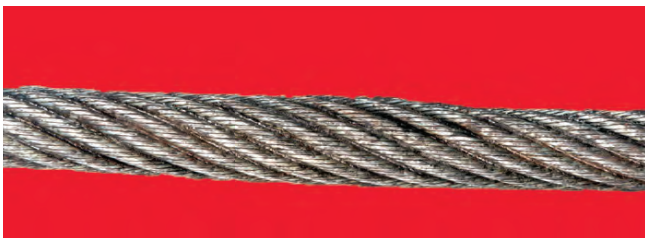
ı. Enlargement of External corrosion

i. Crown wire breaks



j. Valley wire breaks

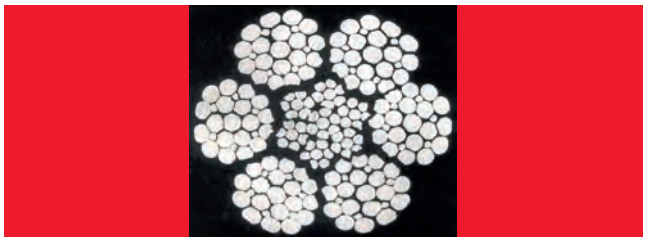
k. Protrusion of inner rope of rotation-resistant rope



l. Local increase in rope diameter due to core distortion

m. Kink

n. Flattened portion



o. Internal corrosion

18- Elevator ropes discard criteria

General

Elevator ropes are usually taken out of service due to broken wires and wear.

However, other factors such as decrease in diameter, corrosion, or excessive tension may cause it to be removed from the system. Expert should carry out a thorough examination and consider all these factors when deciding whether the rope is suitable for the system to remain in the system. Even if only one rope has reached the discard criteria, all ropes must be replaced. However, if the cable is damaged during installation or in the acceptance test before it is commissioning, there is no need to replace all the cables.

In ropes working on pulleys other than cast iron or steel, the expert should be aware of the possibility of further internal deterioration that is visually apparent from the outside.

In the absence of any national regulations or instructions from the original equipment manufacturer, the following information is a general guideline for the extrusion of the rope discard.

Broken wires

The following table provides guidance on whether to replace the rope according to the condition of the broken wires in the rope. Reference rope length is 6d and 30d. Rope are single layer and regular lay (steel core is not considered as a layer in the rope).

Situation	Ropes need to be replaced or checked again within a certain period of time.			Ropes need to be replaced immediately.		
	6x19	8x19	9x19	6x19	8x19	9x19
Randomly distributed wires broken between outer wires.	More than 12 broken wires at a distance.	More than 15 broken wires at a distance.	More than 17 broken wires at a distance.	More than 24 broken wires at a distance.	More than 30 broken wires at a distance.	More than 34 broken wires at a distance.
In one or two strand predominantly broken wires.	More than 6 broken wires at a distance	More than 8 broken wires at a distance	More than 9 broken wires at a distance	More than 8 broken wires at a distance	More than 10 broken wires at a distance	More than 11 broken wires at a distance
Adjacent to the strand broken wires.	4	4	5	More than 4	More than 4	More than 5
Broken wires in bottom.	More than 1 broken wire at a distance	More than 1 broken wire at a distance	More than 1 broken wire at a distance	More than 1 broken wire at a distance	More than 1 broken wire at a distance	More than 1 broken wire at a distance

6xd (d: Nominal rope dieameter)

The above table does not apply if the wire breaks do not occur in a normal order and the breaks are concentrated only in one or two strands. In this case, the following points should be considered.

If there are 5 or more broken wires adjacent to a strand, such ropes should be replaced.

These ropes should be removed from the system as the number of broken wires tends to increase rapidly in ropes with excessive wear tendency.

Under certain conditions and depending on the operating conditions, even if there is no visible broken wire on the outer wires, machine design, load etc. situations may require replacement of the ropes in the system. Ropes (nominal diameter), which have been decrease by more than 6% in diameter, must be removed from the system immediately, even in a short section.

If the elevator system includes plastic pulleys, the ropes in such systems will tend to break in the inside wires rather than break the outside wire. For this reason, the inner parts of the ropes should be checked by MRT (magnetic rope test) method.

The above table is only seen as a guide for rope inspection and removal from the system. When assessing a rope should be considered all changes detected in the rope should be considered. The final decision to remove the rope from the system must be given based on the experience of the assessor.

Diameter decrease
If the nominal rope diameter is decrease by 6%, the rope must be replaced.

Unusual situations
If there are unusual situations that indicate the possibility of deterioration in ropes, it is possible to replace ropes. These; abrasion corrosion (appearance of red powder or gypsum material spreading between wires or strands), a local decreasing in diameter and a change in the physical appearance of the strand.

Life time
The life of the traction rope can not be given for a definite period of time. However, care should be taken to control the ropes where the ropes have been served for more than ten years.

Special situations
If the suspension rope or balance rope is damaged during the installation or acceptance test before the elevator is take to serviced, it is permitted to replace the damaged single rope with a new rope provided that the following points are fulfilled:

a. The wire rope data used for the new rope must correspond to the wire rope data of the original rope group certificate.
b. These ropes must not be shortened since their original installation.
c. After installation, the tension of the newly replaced rope should be checked and adjusted at regular intervals after not less than two months. If the rope tension cannot be properly adjusted after six months, all traction ropes must be replaced.
d. The replaced rope must be introduced into the system with the same type of termination as the other ropes.
e. The diameter of the changed rope must not exceed 0.5% of the nominal diameter of the other ropes under tension.

PACKING AND SHIPMENT

Ropes to wooden sloops in desired features to be wrapped and protected from external factors stretching.

Short quantities ropes are packed in the form of rodas.

Elevator accessories and short quantities ropes can be packaged in parcels and shipped in a tracked manner.

Feature ropes are shipped with large reels.

The balance chains that are our production are of the desired size can be shipped in by palletized.

The balance chains that are our production can be shipped in one piece with wooden spools in a feature length manner.

CERTIFICATES

TRADEMARK REGISTRATION CERTIFICATES

GÇH GÜVEN Steel Wire Rope
Turkish Patent Institute

GÜVEN Steel Wire Rope and Lifting Technologies
Turkish Patent Institute

G-ROPE / G-TEX / G-FLEX
Turkish Patent Institute

Unexamined Patent for Compensation Chain
Turkish Patent Institute

Useful Model for Compensation Chain Roller
Turkish Patent Institute

QUALITY CERTIFICATES

ISO 9001:2015 TÜRKAK
Quality Management System / TUV NORD

ISO 9001:2015 DAKKS
Quality Management System / TUV NORD

DECLARATION OF CONFORMITY

TS EN 13414-1+A2
Steel Wire Rope Slings
Turkish Standards Institution

TS EN 13411-4
Metal and Resin Socketing
Turkish Standards Institution

TSE K 509
Short Link Chain for Lifting Purpose - Safety- Chain Sling Grade 10 / Turkish Standards Institution

EN 13414-1+A2
Hand Spliced Steel Wire Rope Slings
TUV Austria Turk

EN 13414-1+A2
Ferrule-Secured Steel Wire Rope Slings / TUV Austria Turk

EN 13411-4
Steel Wire Rope End Termination / TUV Austria Turk

EN 818-1:1996+A1: 2008, EN 818-2:1996+A1: 2008, EN 818-4:1996+A1:2008, EN 818-6:2000+A1: 2008
Chain Slings Grade 10 / TUV Austria Turk

NOTES

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GÜVEN

STEEL WIRE ROPE & LIFTING TECHNOLOGIES

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