

# PFEIFER DRAKO

ELEVATOR PRODUCTS



10/2011

## Elevator Ropes for

- ⊕ standard and special installations
- ⊕ up to mid- and high-rise
- ⊕ low D/d-ratios
- ⊕ compensation

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# Elevator Ropes

PFEIFER DRAKO, an associate company of the PFEIFER Group, has produced and developed special wire ropes for the elevator construction industry for almost 200 years. Thanks to the extensive sales & distribution network and numerous associate companies in all corners of the globe, DRAKO's special ropes are safely and reliably in use wherever people need to travel vertically. From Moscow to Kuala Lumpur, from New York to Hong Kong and also in Paris, London and Frankfurt, we build on close and long-term relations with our discerning customers. In turn, elevator manufacturers the world over have come to trust us as reliable partners.

At DRAKO, tradition and innovation share equal ranking: one aspect would not be possible without the other. To continue widening our knowledge about ropes and to ensure that our technology remains truly state of the art, we collaborate with universities and institutes. The streamlined precision manufacture of the serial products and the management of customized projects are governed by DIN EN ISO 9001 in accordance with our own quality management system (QMS).

Our company handles resources with as little impact on the environment as possible. We are certified to ISO 14001 and Ökoprofit.

We work to...

- the highest safety standards
- economical levels of efficiency and
- reliable service

... for the benefit of our customers, and that is our goal.

Our mission statement is defined as our adherence to the most up-to-date technical know-how, high-quality materials, safety, user-comfort and economic efficiency which are turned into a set of values transferred to our customers and enable us to embrace every challenge in a multi-cultural world.



Our Production & Logistics site at Rheinstrasse, Mülheim an der Ruhr, Germany

Front cover (left to right):  
Hütter-Aufzüge GmbH and  
Janzhoff-Aufzüge GmbH  
Eiffel Tower, Paris  
Shanghai World Financial Center,  
Shanghai





## Advantages of DRAKO steel wire rope

- Special wire ropes for your application
- Proven strand design and high adaptability
- Long service life
- DRAKO-made fiber core, constant quality
- Low elastic and permanent elongation
- Low maintenance costs
- 100% rope quality, high quality assurance
- Fair cost-benefit ratio
- Highly qualified and experienced personnel
- Competent advice
- Reliable service
- Worldwide sales network



State-of-the-art stranding technology in the production process



PFEIFER DRAKO

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# About Wire Ropes

## Definitions, Designation and Classification

The new European Rope Standards EN 12385-2 (with the above title), EN 12385-5 (Stranded Ropes for Lifts) and EN 12385-1 (General Requirements) show some new requirements, we have to learn to come along with.\*

F. i. in the certificate, which has to accompany the rope delivery, it is required, to comply for the rope designation with the symbols, laid down in EN 12385-2. These symbols – derived from English words – are the same for all European deliveries.

### Symbols for rope cores

- FC = fibre core
- NFC = natural fibre core
- SFC = synthetic fibre core
- IWRC = independant wire rope core
- PWRC = parallel laid fullsteel rope

### Symbols for strand construction

- S = strand construction Seale
- W = strand construction Warrington
- F = strand construction Filler or Filler Wire
- WS = strand construction Warrington-Seale
- M = strand construction Crosslay

You can order as accustomed. Especially our Special Ropes are to be ordered as in the past by their name, f.i. DRAKO 300 T.

### Rope class

So far each rope construction is governed by rope standards. In the new rope standards similar rope constructions in so-called rope class are summarised, e.g. the rope constructions 6 x 19 Seale, 6 x 19 Warrington and 6 x 19 Filler in the rope grade 6 x 19. The rope standards contain tables with the technical data of the common rope grade.

### Rope tensile strength grade

For ropes acc. to EN 12385-5 the rope grade addresses the nominal tensile strength grades of the outer and inner wires of the rope. Additionally, the rope grade defines the minimum breaking strength of this rope. Rope grade 1570 (without the unit N/mm<sup>2</sup>) means, that all wires of this rope are of the nominal tensile strength grade 1570 N/mm<sup>2</sup>. Rope grade 1370/1770 means, that this is a dual tensile rope (term of ISO 4344) and that the outer wires of the outer strands are of 1370 N/mm<sup>2</sup> and the inner wires of the rope are of 1770 N/mm<sup>2</sup> nominal tensile strength grade.

### Symbols for wire finish

- U = bright (from uncoated)
- B = galvanized acc. class B

### Symbols for type of lay

- sZ = right hand ordinary (or regular) lay
- zS = left hand ordinary (or regular) lay
- zZ = right hand lang lay
- sS = left hand lang lay

These symbols have to be used for the standardized rope designation in the rope certificate:



**Example**

**13 8 x 19 S – NFC 1370/1770 U sZ**

nominal rope Ø 13 mm \_\_\_\_\_

8 strands \_\_\_\_\_

19 wires per strand \_\_\_\_\_

strand construction Seale \_\_\_\_\_

naturel fibre core \_\_\_\_\_

rope grade \_\_\_\_\_

here: dual tensile

outer wires: 1370 N/mm<sup>2</sup>

inner wires: 1770 N/mm<sup>2</sup>

wire finish: bright \_\_\_\_\_

lay: ordinarylayright hand \_\_\_\_\_

**\*General references:** The rope standards mentioned in this catalogue are those valid at the time of printing.

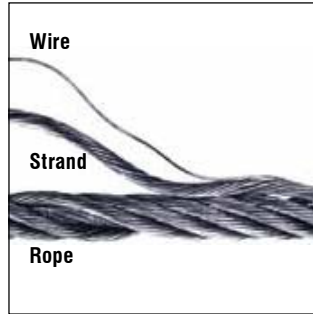
## Elevator Rope Construction

### Elevator Ropes

All DRAKO elevator ropes are DRAKO-made. Ropes with fibre core can easily be identified by the DRAKO-identification label (yellow coloured synthetic wire in the fibre core).

### Strands

Strands consist of one or more layers of wire, which are closed in a helix around the center wire.



### Wires

Wires for elevator ropes are different from those for crane ropes a. s. o. Therefore we order only wires from wire mills nearby, which have qualified as suppliers of stable quality since many years.

### Nominal tensile strength grade of wires

The nominal tensile strength grade in Germany is usually 1570 N/mm<sup>2</sup>. Reasonably, the international standard for lift ropes, ISO 4344 as well as the USA, Japan and many European countries know and use elevator ropes of dual tensile rope grade. To come along with sheaves of often minor quality, the outer wires are then of lower tensile strength grade.

DRAKO produces for the very different requirements of German and foreign customers ropes in dual tensile rope grade with a variety of tensile strength combinations. Ropes for roped hydraulic elevators are preferably supplied with rope grade 1770.

### Cores

Two types of cores are used in the elevator industry depending on the application: the fibre core, made of natural or synthetic fibre, and the steel wire core, i. e. an independent wire rope core (IWRC).

Because of their elasticity, ropes with fibre core adapt themselves within certain limits to the shape of the corresponding groove. Natural fibre cores (made of sisal-yarn) have a better storage capacity for the lubricant than synthetic fibre cores. But in any case, the lubricant in the fibre core is only sufficient for the lubrication and impregnation of the fibre core itself.

We produce the fibre cores for our elevator ropes in our own factory, the only way, to fulfil the high requirements of our works standard in regard of uniformity and stable lubricant content.

Synthetic fibre cores offer the advantage of an exactness in diameter and form-stability and are also rot resistant in humid environs.

The IWRCs increase the metallic cross-section and thereby reduce the tensile stress in the cross section. Consequently ropes with a steel wire core show a reduced stretch under the same load compared to ropes with fibre core.

## Direction of Lay

Only in very special cases – f. i. unguided or only wire guided counterweight – it should be considered to take right and left hand lay ropes. The influence of the rope torque on the guiding forces of normal elevators with guide rails is extremely small. It should be much more important to have a set of ropes out of one production length (left hand and right hand can't be out of one production run).



Burj Khalifa,  
Otis L.L.C. - U.A.E.

## Quality

As we are specialized on the production of elevator ropes, we are accustomed to produce these ropes in big production lengths on one purpose

production lines with a very experienced staff of workers. This is one of the reasons for the high and equal level of DRAKO elevator rope quality.

## Testing

All elevator ropes run through a testing procedure, which was developed especially for DRAKO elevator ropes. Here they are checked in whole length continuously in respect of diameter, of irregularities in material and closing.

By this it is ensured that every production length corresponds to the special requirements of the DRAKO quality standard.

## Tolerances of Rope Diameter

The tolerances of elevator-rope diameters have to be much smaller than for other ropes. The reason for this smaller tolerances is to ensure the exact

interfit between the rope and the sheave groove to obtain enough traction but also to achieve best durability of rope and sheave.

According to EN 12385-5 and ISO 4344 the following new standard diameter tolerances are valid for elevator ropes

Rope construction				Rope diameter tolerance in % of nominal rope diameter		
Application	Core type	Rope grade	Nominal rope diameter mm	Max. unloaded	Minimum	
					Loaded with 5% $F_{min}^*$	Loaded with 10% $F_{min}^*$
Traction drive ropes Governor ropes	Fibre core	6 x 19 – FC 8 x 19 – FC	≤ 10	6	1	0
			> 10	5	1	0
	Steel core	6 x 19 – IWRC 8 x 19 – IWRC 9 x 19 – IWRC	≤ 10	3	0	-1
			> 10	2	0	-1

\*  $F_{min}$  = minimum breaking strength of the rope

Rope construction				Rope diameter tolerance in % of nominal rope diameter	
Application	Core type	Rope grade	Nominal rope diameter mm	Minimum	Maximum
Ropes for roped hydraulic elevators and compensating ropes	Fibre core	6 x 19 – FC 6 x 36 – FC 8 x 19 – FC	≤ 8	0	6
	Steel core	6 x 19 – IWRC 8 x 19 – IWRC 9 x 19 – IWRC	> 8	0	5

This shows, that the diameter tolerances of DRAKO elevator ropes are equal to or smaller than those of the new European Standard EN-12385-5, especially, the international norm ISO 4344.

The observation of an exact rope diameter has a considerable influence on the service life of an elevator rope.

For traction elevators the following facts are valid:

The service life of the rope becomes the greater,

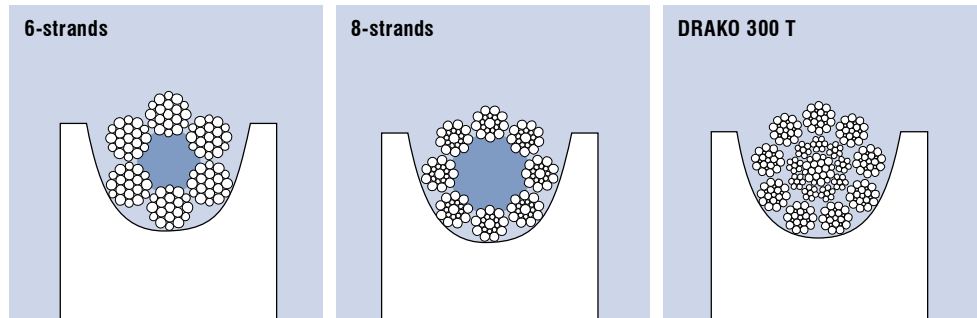
1. the better rope diameter and sheave radius conform with each other,
2. the fewer the rope diameter decreases during operation,
3. the more uniform the rope diameter remains over the whole rope length of an elevator.

The points 1–3 are valid for U-grooves, point 2 and 3 also for V-grooves. A set of ropes is to be taken from the same production length.

## Contact between Rope and Groove

Ropes are not a plain rod with a circular cross section; in fact they appear to be of polygonal cross section. Therefore the ropes touch the groove only at individual points. It can be only an advantage for the contact rope to groove, when the rope has more than 6 strands.

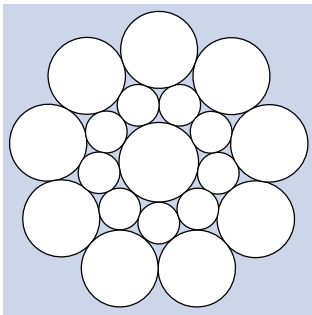
The success of our 9-strand DRAKO 300 T rope seems to give evidence, that this assumption is valid.



## Strand Constructions

Here are information why certain strand and rope constructions are better qualified for specific applications in elevators.

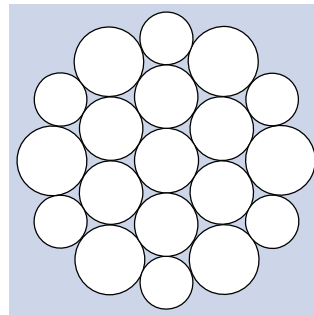
For rope users, who don't want to be involved so deeply in rope technology, and only want to find simply the best rope for their purpose, there is a special printed matter as selection-guidance available. Please ask for it or look at [www.drako.de](http://www.drako.de).



### Seale

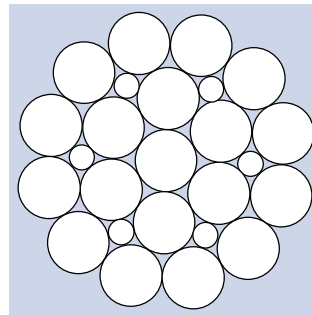
The most common strand construction for elevator ropes worldwide is Seale (1-9-9). This has at least the following reason:

Elevator ropes are known to get abrasion in usage and the big outer wires of Seale have a big metallic cross-section to be abraded before the wires will break.



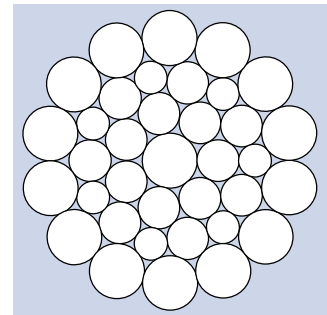
### Warrington

Whenever a comparison of fatigue bending life of ropes on sheaves with round groove is made, ropes of Warrington strands are beating Seale ropes with 20 to 40% more lifetime. This is due to more and smaller wires per strand. It must be taken into account that in elevators here is not only abrasion but also a lot of fatigue bending. Especially in elevators with double wrap drives or in roped hydraulic elevators the latter is more important. So in UK and Germany we find both: Seale and Warrington as constructions for strand elevator hoist ropes.



### Filler (Filler wire construction)

Filler wire strand construction is an especially fatigue bending withstanding wire configuration. This is covered by the fact that f. i. the rope 8 x 21 Filler wire + fibre core (strand) is part of the Canadian elevator rope standard. Suspension ropes, bigger in diameter than 16 mm (5/8") with 6 to 9 outer strands should have at least Filler wire strands because of better flexibility. This especially refers to 6-strand ropes. The disadvantages of this strand construction are: very vulnerable to geometry distortion, especially, when the Filler wire itself has not the nominal diameter. So the recommendation is given not to take Filler wire strands for ropes below 10 mm diameter.



### Warrington-Seale

Ropes of Warrington-Seale construction are normally not suitable for suspension and governor ropes. But compensating ropes up from 24 mm and suspension ropes up from 22 mm are not flexible enough with the accustomed strand constructions. This is reason enough for DRAKO to recommend beyond these limits Warrington-Seale constructions with more than just 25 wires.

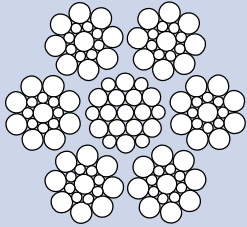


# Rope selection

TÜV Süd approved!

## Ropes for Traction Sheave Elevators Special Traction Sheaves for Smaller Sheave Diameters

Rope Selection



### DRAKO STX

→ see page 16

$D/d \geq 30$ \*

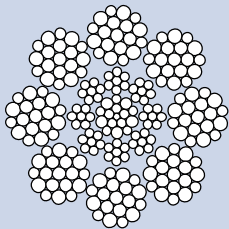
Steel rope with 6 outer strands in the proven Seale design for rope diameters of 4 mm\* and 5 mm. By using high quality wire with a nominal tensile strength of 1960 N/mm<sup>2</sup>, the diameter of the rope and traction sheaves is reduced, which thus lowers the output torque while maintaining the diameter ratio between traction sheave and rope. It also decreases the initial costs of the drive. Good elongation properties of the DRAKO STX construction increase the alignment of the car during loading and unloading procedures.

#### Advantages

- high breaking strength
- low permanent and elastic elongation
- low rope diameter change under load
- durable round-rope form suitable for the use in V-grooves
- cost saving drives

#### Field of Application

Ideal for elevators with small and medium-sized shaft height, highly requiring stop accuracy and the smallest traction sheave diameter.



### DRAKO 250 T the 8-strand steel rope in diameters of 6 mm, 6.5 mm\*\* and 8 mm

→ see page 16

$D/d \geq 24.6$ \*\*

In million ways established steel core rope with 8 outer strands in Warrington design also with smaller rope diameters. By intense testing and verification of safety now approved for very low D/d ratio! Also for indirect hydraulic elevators according to EN 81-2.

#### NEW TÜV Süd Certificate KP067

- very low D/d ratio of up to 8 mm in diameter is facilitated
- required drive torque is greatly reduced
- cost saving drives
- space saving in indirect hydraulic elevators thanks to very small pulleys

So customized elevator systems with an optimized cost benefit ratio are possible.

#### Advantages

- rounder than 6-strand rope
- flexible with good bending endurance
- low permanent and elastic elongation
- low rope diameter change under load, also over time
- high breaking strength in relation to diameter and
- durable round-rope form

#### Field of Application

The perfect solution for a customized elevator.

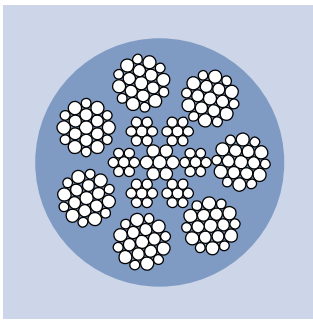


#### Please Note

The rope terminations must be secured against rotation.



## Ropes for Traction Sheave Elevators Special Traction Sheaves for Smaller Sheave Diameters



### **DRAKO PTX** the 7-strand steel rope with polyurethane coating

→ see page 16

$$D/d \geq 25^*$$

$$\mu = 0.2 \dots 0.5^{**}$$

A plastic-coated steel rope with 7 outer strands in the optimized Warrington design and nominal rope diameter of 6 mm\*. The use of high-strength steel wires facilitates the application of smaller traction and deflection sheaves with a low number of ropes. Due to the high friction coefficient of the plastic coating, the traction sheaves can be made in the round groove design, thus enhancing service life.

#### **Advantages**

- very high breaking strength
- small number of ropes possible
- low permanent and elastic elongation (E-module = 160,000 N/mm<sup>2</sup>)
- reduction of sheave diameter up to 150 mm
- cost saving drives
- long service life
- good travelling comfort
- no relubrication
- eased detection of discard criteria
- high traction even with reduced wrap angles
- high-precision stopping and alignment during loading and unloading procedures

#### **Field of Application**

Elevators with small and medium-sized shaft heights, highly frequented systems in constricted shafts, and systems with high demands on energy efficiency.



#### **Please Note**

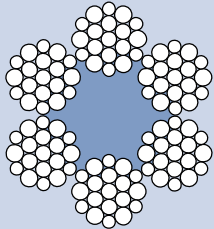
Do not lubricate the rope.

The rope terminations must be secured against rotation.

\*\* depending on rope speed  
PFEIFER DRAKO

# Ropes for Traction Sheave Elevators

## Ropes with Fibre Core (FC)



### DRAKO 6 x 19 NFC (natural fibre core)

→ see page 17

Example:  
DRAKO 6 x 19  
Warrington – NFC

#### Advantages

- big metallic cross-section, i.e. high breaking strength compared to diameter,
- relatively small permanent and elastic elongation,
- low price per meter.

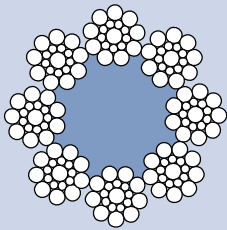
#### Field of Application

- for low duty elevators



#### Please note

These ropes are generally not suitable for grooves with big undercuts.



### DRAKO 8 x 19 NFC (natural fibre core)

→ see page 18

Example:  
DRAKO 8 x 19 Seale – NFC

#### Advantages

- rounder than 6-strand ropes, i.e. more contact points rope to groove,
- deformable in cross-section: i.e. the new rope adapts a little bit to-slightly worn out grooves,
- wires smaller in diameter: i.e. flexible, good fatigue bending characteristics,
- medium price per meter.

#### Field of Application

The rope construction 8 x 19 Seale – NFC, see drawing, is without doubt the worldwide most common traction drive suspension rope. But also the rope construction 8 x 19 Warrington – NFC has its market share in Germany and UK due to better fatigue bending properties.

Anyway, 8-strand ropes with natural fibre core are the best solution for the normal traction drive elevator.

To make correct rope installation easier, especially on high rise installations, DRAKO 8 x 19 S-NFC are produced with a yellow marking line. Traction ropes DRAKO 8 x 19 W-NFC therefore are produced with a yellow marking line.



#### Please note

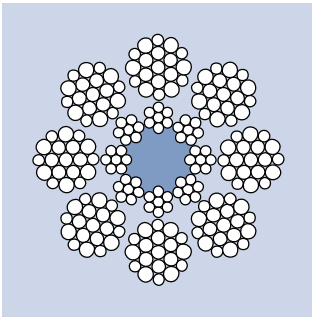
The rope quality of this rope construction depends on the quality of the fibres and the resulting fibre core. This is the reason, why DRAKO is only using DRAKO-made fibre cores.

As the elevator industry is using ropes for very different purposes, these ropes consequently differ in their construction, their lubrication and their rope grades.

Rope terminations must be secured against rotation.



## Ropes for Traction Sheave Elevators Rope with Steel and Fibre Core



### DRAKO 210 TF

→ see page 19

Steel rope with 8 outer strands and combined steel and fiber core. Thanks to that combined core, this special traction rope offers enhanced cross-elasticity to adapt to unique groove requirements and slightly worn grooves. The fiber core also provides additional storage space for lubricant.

#### Advantages

- large metallic cross-section – i.e. high breaking strength in relation to diameter
- slightly more deformable cross-section
- good flexural performance with small deflections
- low permanent and elastic elongation

#### Field of Application

A special traction rope for highly frequented systems.



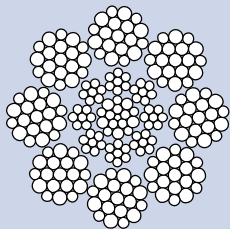
#### Please note

Ropes in operation are to be relubricated at regular intervals. The combined steel and fiber core does not dispense with the need to relubricate. When changing rope, the somewhat higher rope cross-elasticity does not dispense with the need to rework and/or replace the traction sheave.



## Ropes for Traction Sheave Elevators

### Ropes with Steel Core (IWRC)



#### DRAKO 250 T the 8-strand steel core rope

→ see page 19

Example:  
DRAKO 250 T

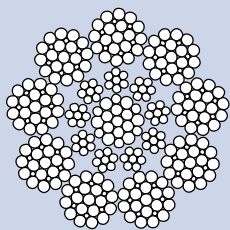
Full steel rope with 8 outer strands in the Warrington design for high breaking strengths and high flexural performance. Now available for installations with extremely tough requirements on the elevator rope in various diameters also at wire nominal strength of 1770 N/mm<sup>2</sup>.

##### Advantages

- rounder than 6-strand ropes,
- flexible, i.e. good fatigue bending characteristic,
- low permanent and elastic elongation,
- low reduction in diameter,
- high breaking strength compared to diameter,
- remains round: good for wide undercuts.

##### Field of Application

Ideal for the medium duty elevator, requiring only minimum maintenance.



#### DRAKO 300 T und 300 TX the 9-strand heavy duty rope

→ see page 20

Example:  
DRAKO 300 T

This rope has been probably the first elevator rope in the world with a steel core (IWRC). It has been designed in 1955 by DRAKO. After this rope being nationally and internationally successful in demanding building projects, ropes with steel core are now also implemented in the relevant European and ISO-standards.

Standard wire strength will soon reach the height limit in the challenge of the highest elevator shafts. Increasing the tensile strength of the rope wires can be a feasible way to shift this limit further. For example as 300TX with nominal wire strength of 1960 N/mm<sup>2</sup> the rope offers new advantages to high and super high rise applications. The number of ropes, and thereby the rope mass, could be reduced in many hoist ways. Invest and installation costs can be reduced. Weight savings in rope mass enable a sustainable reduction of the power consumption. Unfortunately the tensile grade 1960 lies beyond current standards for suspension ropes. But it is already state of the art and approved for small diameter ropes like DRAKO STX. So trend-setting in this direction has already begun!

##### Advantages

- very round cross-section, i.e. small pressure in the groove,
- many wires, i.e. flexible, very good fatigue bending life. One of the reasons is, that due to the special configuration of the wires in the strands and of the strands in the rope, wire crossings are avoided. Therefore the possibility of inner nonvisible wire breaks is reduced.
- small permanent and elastic elongation. Result: the car is better connected to the machine (important in high shafts) and it is easier to approach the floors correctly.

##### Field of Application

DRAKO 300 T is the most efficient solution as suspension rope for high and very high elevators and for all traction drive elevators with many deflection sheaves.

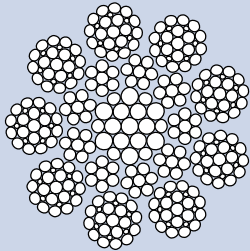


##### Please note

Rope terminations must be secured against rotation. For big shaft heights: ropes should be prevented from untwisting whilst installation. The single blue marking line along the rope enables to control and to rectify this. At rope replacement, the grooves of the drive sheave should be controlled. To make correct rope installation easier, especially on high rise installations, DRAKO steel core ropes are produced with a blue marking line.

## Ropes for Traction Sheave Elevators Double parallel ropes with steel core

**NEW!**



### DRAKO 300 TP the 9-strand double-parallel steel core rope

→ see page 21

Example:  
Ø 16.0 mm

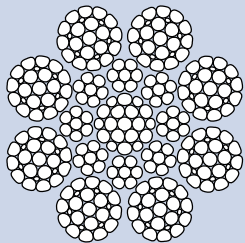
This is the strand design of the time-proven DRAKO 300 T, here with a double parallel rope. The wide metallic cross-section leads to higher breaking strengths and reduced elastic and permanent elongation. Plus, the simplified stranding process with double parallel ropes leads to a different rope behaviour during installation compared to our independently stranded IWRC ropes.

#### Advantages

- well-rounded rope cross-section
- large metallic filling factor
- high cross-stability
- high breaking strengths
- very low elastic elongation
- high flexural performance

#### Field of Application

Suitable for systems with high demands on precision stopping for loading and unloading procedures, especially in the case of systems with simple rope run.



### DRAKO 250 TPC the 8-strand compacted double-parallel steel core rope

→ see page 21

Example:  
Ø 16.0 mm

Thanks to the compaction of the strands, the metallic cross-section is additionally enlarged. This, in turn, leads to a further increase in breaking strength as compared to non-compacted double-parallel ropes. Moreover, the compacted outer strands are well-rounded and go easy on traction and deflection sheaves. The run is particularly quiet, which thus enhances ride comfort. Due to compaction, rotation is reduced during the installation process.

#### Advantages

- very rounded rope cross-section
- unrivalled large metallic filling factor
- high cross-stability
- very high breaking strengths with rope grade 1570 already
- very low elastic elongation
- high flexural performance
- super quiet smooth run

#### Field of Application

Suitable for systems with large loads and high demands not just on precision stopping for loading and unloading procedures but also in terms of ride comfort – above all in the case of systems with simple rope run.



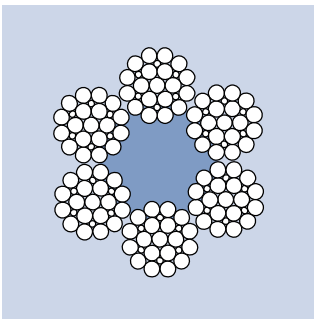
#### Please note

At the installation stage, double parallel ropes tend to untwist more than full-steel ropes with a separately stranded IWRC. For this reason, special attention is necessary during installation.

Twisted ropes are damaged in their fabric and reveal substantial change in their original properties in terms of load capacity, elongation and service life.

To make correct rope installation easier, especially on high rise installations, DRAKO steel core ropes are produced with a blue marking line.

## Ropes for Traction Sheave Elevators Weight Compensating Ropes



### DRAKO 180 B / 200 B

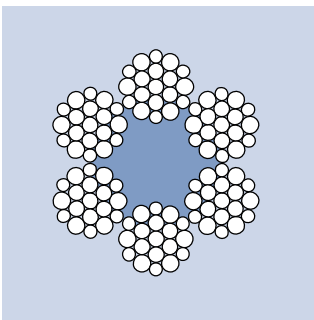
→ see page 22

The purpose and the operating conditions of weight compensating ropes are different to those of traction sheaves and suspension ropes used in the same elevator systems. Which is why DRAKO recommends the use of special compensating ropes. **Abundant lubrication and a special fibre core**, a selection of even wider rope diameters (for fewer ropes) and a flexible rope design adapted to the rope diameter will all go towards a longer service life, quietness of running and stability of length.

However, as always, DRAKO can deliver compensating rope in the same design as that of the suspension rope.

*For more information about our weight compensating ropes, please see our separate "Weight Compensation" catalog.*

## Overspeed Governor Governor Ropes



### DRAKO 6 x 19 / 8 x 19 – FC – IWRC – WSC

→ see page 23 and 24

These ropes are an essential functional element of the speed limitation process and the safety gear. Since the transmission of energy usually proceeds via friction, the lubrication of the governor rope needs to be dosed exactly. Following the introduction of safety gear also effective in ascent rides, governor ropes with greater breaking strength became more necessary and this was achieved by a wider rope diameter, by a higher rope grade and a full-steel rope design.

The fiber core of the DRAKO governor ropes is made of synthetic fibers. This leads to optimal diameter stability with smaller rope diameters too. In addition, the synthetic-material fibers are dampproof – and there is no swelling and no decomposing. Many DRAKO governor ropes are also available in the galvanized design.

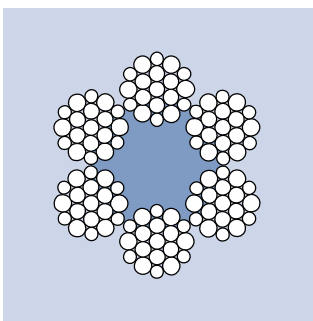
#### Advantages

- greater reliability and system availability
- lower susceptibility to breakdown
- reduced elongation with higher vertical rises
- higher breaking strengths
- reduced speed governor dimensions
- length and form stability in all environments.



## Ropes for Roped Hydraulic Elevators

### Ropes with Fibre Core (FC)



#### DRAKO 6 x 19 FC

→ see page 25

Example:  
DRAKO 6 x 19 Warrington – FC

##### Advantages

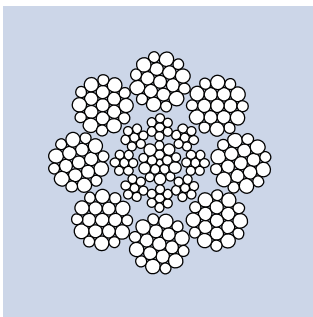
- big metallic cross-section, i.e. high breaking strength in relation to the rope diameter,
- relatively low permanent and elastic elongation,
- low price per meter.

As only sheaves with round grooves are common in such elevators, ropes of rope grade 1770 with the resulting breaking strength advantage can also be used.

##### Field of Application

Highly suitable for elevators of average usage, whereby rope grade 1770 is recommended.

## Ropes with Steel Core (IWRC)



#### DRAKO 250 H the 8-strand full steel rope

→ see page 26

Example:  
DRAKO 250 H

##### Advantages

- rounder than a 6-strand rope,
- flexible, with good fatigue bending properties,
- low permanent and elastic elongation,
- low rope diameter reduction in loaded condition, also after long periods,
- high breaking strength in relation to diameter (full steel rope),
- rope grade 1770 leads to very high breaking strength.

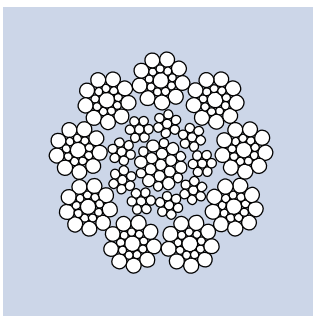
##### Field of Application

Ideal for the heavy duty roped hydraulic elevator, requiring only minimum maintenance.



##### Please note

Rope terminations must be secured against rotation.  
This rope is suitable to only a limited extent for traction drive elevators.



#### DRAKO 300 H the 9-strand full steel rope

→ see page 26

Example:  
DRAKO 300 H

Due to the 9 strands, consisting of many thin wires, this rope type is very flexible and has extraordinary high fatigue bending life. The big metallic cross-section and rope grade 1770 lead to a high minimum breaking strength with carefully dosed ample lubrication and low elongation this rope requires only small maintenance.

##### Field of Application

Ideal for fast running drives with high usage and heavy loads.



##### Please note

Rope terminations must be secured against rotation.  
This rope is not suitable for traction drive elevators.

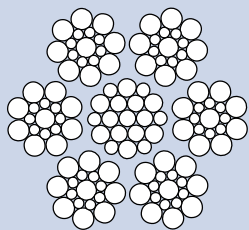
# Technical Data

## Ropes for Traction Drive Elevators Special Traction Ropes for Small Diameter Sheaves

Characteristics      preformed, prestretched (medium), bright,  
right hand, ordinary lay  
Please note            special traction ropes outside of EN 12385-5,  
EN 81-1, for  $D/d \leq 40$  or  
rope diameter  $< 8.0$  mm

**TÜV Süd approved!**

Technical Data



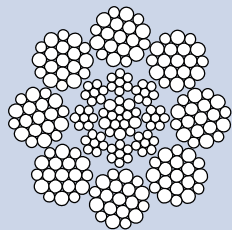
6 x 17S + WSC

### DRAKO STX

**$D/d \geq 30$** \*

Elastic Elongation<sup>1)</sup>     $\leq 0.10\%$   
Permanent Elongation<sup>2)</sup>  $\leq 0.12\%$

Nominal Rope diameter mm	Rope grades	Minimum breaking strength $F_{min}$ kN	Length mass approx. kg/100 m	Metallic cross-section approx. mm <sup>2</sup>
4*	1960	12.6	6.9	7.9
5	1960	20.0	10.9	12.5



8 x 19W + IWRC

### DRAKO 250 T

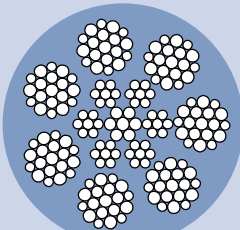
**$D/d \geq 24.6$** \*\*

Elastic Elongation<sup>1)</sup>     $\leq 0.12\%$   
Permanent Elongation<sup>2)</sup>  $\leq 0.15\%$

6**	1770	26.8	16.4	18.5
6.5	1770	31.5	17.9	21.4
8	1570	43.0	27.3	31.6

extention to 1770 N/mm<sup>2</sup> for 8 mm in preparation

Example:  
 $\varnothing 8.0$  mm



7 x 7 + 7 x 19W

### DRAKO PTX 300

**$D/d \geq 25$**

Elastic Elongation<sup>1)</sup>     $\leq 0.08\%$   
Permanent Elongation<sup>2)</sup>  $\leq 0.08\%$

6	2700	25.2	11.0	12.1
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**$\mu = 0.2 \dots 0.5$** <sup>3)</sup>

*For further information  
please contact us.*

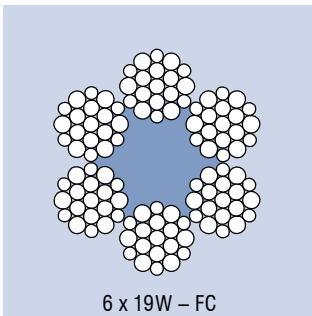
## Ropes for Traction Drive Elevators

### DRAKO 6 x 19 – FC 6-Strand Suspension Ropes

Rope diameter < 8 mm for small service lifts please see  
"Overspeed Governor Ropes"  
natural fibre core, Sisal (NFC)

Characteristics      preformed, prestretched (medium), bright,  
right hand, ordinary lay. Lang lay on request

Rope grades available      1370/1770 and 1770  
Elastic Elongation<sup>1)</sup>      ≤ 0.20%  
Permanent Elongation<sup>2)</sup>      ≤ 0.30%  
Rope diameter tolerance      see page 6



#### DRAKO 6 x 19 W – FC

Nominal Rope diameter mm	Minimum breaking strength $F_{min}$		Length mass approx. kg/100 m	Metallic cross-section approx. mm <sup>2</sup>
	1370/1770 kN	1770 kN		
8	35.1*	39.6	23.6	25.4
9.5	49.5*	–	33.2	35.9
10	54.9*	61.9	36.8	39.7
11	66.4*	74.9	44.5	48.1
13	92.8*	104.6	62.2	67.2
14	108*	–	72.1	77.9
16	141*	158.5*	94.2	102

\* no stock material

<sup>1)</sup> at 10% of the minimum breaking load  
<sup>2)</sup> acc. to DIN 51201



# Ropes for Traction Drive Elevators

## DRAKO 8 x 19 – FC 8-Strand Suspension Ropes

With natural fibre core, Sisal

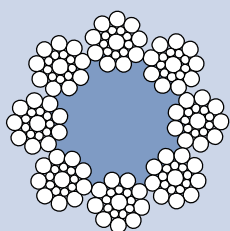
Characteristics preformed, prestretched (medium), bright, right hand, ordinary lay. Lang lay on request

Rope grades available 1570 and 1370/1770

Elastic Elongation<sup>1)</sup> ≤ 0.20%

Permanent Elongation<sup>2)</sup> ≤ 0.40%

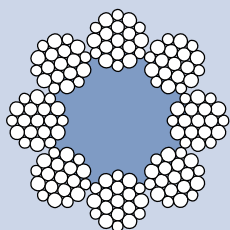
Rope diameter tolerance see page 6



8 x 19S – FC

### DRAKO 8 x 19 S – FC

Nominal Rope diameter mm	Minimum breaking strength $F_{min}$ 1570 and 1370/1770 kN	Length mass approx. kg/100 m	Metallic cross-section approx. mm <sup>2</sup>
8	30.4	21.5	22.5
9	38.4	27.3	28.4
9.5	42.8	30.4	31.7
10	47.4	33.7	35.1
11	57.4	40.7	42.5
12	68.3	48.5	50.6
13	80.2	56.9	59.3
14	93.0	66.0	68.8
15	107	75.7	79.0
15.5	114	80.8	84.4
16	121	86.1	89.9
18	154	109	114
19	171	121	127

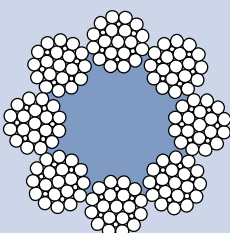


8 x 19W – FC

### DRAKO 8 x 19 W – FC

8	31.6	22.2	23.4
9*	40.0	28.1	29.6
10	49.4	34.7	36.5
11	59.7	42.0	44.2
12	71.1	50.0	52.6
13	83.4	58.6	61.7
16	126	88.8	93.5

\* no stock material



8 x 25F – FC

### DRAKO 8 x 25 F – FC

13*	84.4	58.9	62.5
15*	112	78.4	83.3
16*	128	89.2	94.7
18*	162	113	120
19*	180	126	134

\* no stock material

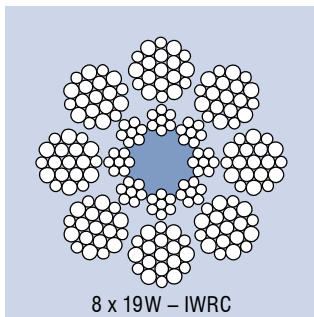


To make correct rope installation easier, especially on high rise installations, DRAKO 8 x 19 are produced with a yellow marking line.

Elevator ropes will be supplied with servings on both ends, if not specified otherwise.

## Ropes for Traction Drive Elevators DRAKO 210 TF – 8-Strand Steel and Fibre Core

Characteristics	preformed, prestretched (medium), bright, right hand, ordinary lay	Rope grades available	1570
		Elastic Elongation <sup>1)</sup>	≤ 0.15 %
		Permanent Elongation <sup>2)</sup>	≤ 0.15 %
		Rope diameter tolerance	see page 6



Nominal Rope diameter mm	Minimum breaking strength F <sub>min</sub> 1570 kN	Length mass approx. kg/100 m	Metallic cross-section approx. mm <sup>2</sup>
8	40.0	25.0	28.5
10	61.3	39.0	44.5
11	76.1	47.0	53.8
12*	88.3	56.0	64.1
13	106	66.0	75.2
15*	137	86.0	99.0
16	156	100.0	113.9

\* no stock material

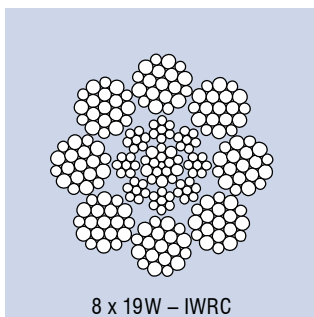


Elevator ropes will be supplied with servings on both ends, if not specified otherwise.

Accessories, such as fitting with thread and symmetric wedge socket, are available and can be inquired.

## DRAKO 250 T – 8-Strand Steel Core Rope

Characteristics	preformed, prestretched (medium), bright, right hand, ordinary lay	Rope grades available	1570 and 1770
		Elastic Elongation <sup>1)</sup>	≤ 0.12 %
		Permanent Elongation <sup>2)</sup>	≤ 0.15 %
		Rope diameter tolerance	see page 6



Nominal Rope diameter mm	Minimum breaking strength F <sub>min</sub> 1570 kN	Minimum breaking strength F <sub>min</sub> 1770 kN	Length mass approx. kg/100 m	Metallic cross-section approx. mm <sup>2</sup>
8	43.3	46.6	27.3	31.6
9	54.8	–	34.3	40.0
10	67.7	72.7	42.3	49.4
11	81.9	–	51.2	59.7
12	97.4	–	61.0	71.1
13	114	–	71.5	83.4
14	133	–	82.9	96.7
16	173	–	108.3	126



To make correct rope installation easier, especially on highrise installations, DRAKO steel core ropes are produced with a blue marking line.

Elevator ropes will be supplied with servings on both ends, if not specified otherwise.

<sup>1)</sup> at 10% of the minimum breaking load  
<sup>2)</sup> acc. to DIN 51201

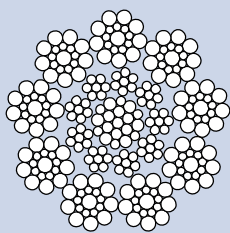
# Ropes for Traction Drive Elevators

## DRAKO 300 T and 300 TX – 9-Strand Steel Core Rope

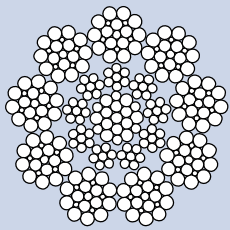
The strand construction of DRAKO 300 T and 300 TX is dependent on the rope diameter to optimize fatigue bending performance and wear resistance

Characteristics preformed, prestretched (medium), bright (galvanized on request, in some diameters ex stock), right hand (left hand on request), ordinary lay

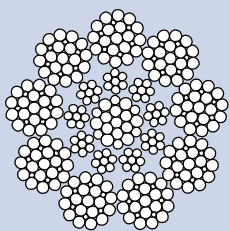
Rope grades 1570, 1770 and 1960 as DRAKO 300 TX  
 Elastic Elongation<sup>1)</sup> ≤ 0.11 %  
 Permanent Elongation<sup>2)</sup> ≤ 0.15 %  
 Rope diameter tolerance see page 6



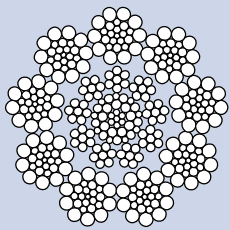
9 x 19S – IWRC



9 x 21F – IWRC



9 x 25F – IWRC



9 x 26WS – IWRC

Nom. Rope diameter mm	Minimum breaking strength $F_{min}$			Length mass approx. kg/100 m	Metallic cross-section approx. mm <sup>2</sup>
	1570 kN	1770 kN	1960** kN		
8	42.1	45.0	–	26.1	30.8
9	53.3	–	–	33.1	39.0
9.5	59.4	–	–	36.8	43.5

10	66.0	71.0	–	42.8	49.7
11	79.9	–	–	51.8	60.1
12	95.1	–	–	61.6	71.6
13	111.6	118.3*	136*	72.3	84.0

14	133	141.0*	–	84	96.6
15	153	–	–	96	110.9
15.5	163*	–	–	103	118.4
16	174	184.2*	208*	110	126.2
17.5	208*	–	–	131	151.0
18	220	233.1*	–	139	159.7
19	245	–	298*	154	178.0
20	272*	–	–	171	197.2

22	333*	–	390*	215	243.5
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\* no stock material  
 \*\* DRAKO 300 TX not covered by recent standards for suspension ropes

➔ To make correct rope installation easier, especially on highrise installations, DRAKO steel core ropes are produced with a blue line along the rope. If the ropes have untwisted whilst being installed, the blue line enables, to correct it. Elevator ropes will be supplied with servings on both ends, if not specified otherwise.

<sup>1)</sup> at 10% of the minimum breaking load  
<sup>2)</sup> acc. to DIN 51201

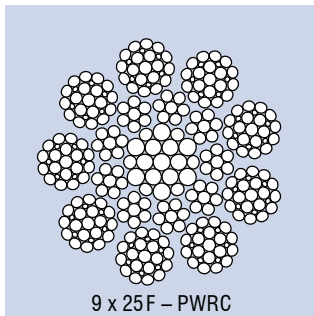
## Ropes for Traction Drive Elevators Double-Parallel Steel Core Ropes

**NEW!**

### DRAKO 300 TP – 9-Strand Double-Parallel Steel Core Rope

This is the strand design of the time-proven DRAKO 300 T, here with a double parallel rope. The wide metallic cross-section leads to higher breaking strengths and reduced elastic and permanent elongation.

Characteristics	preformed, prestretched (medium), bright
Rope grades	1570
Elastic Elongation <sup>1)</sup>	≤ 0.10 %
Permanent Elongation <sup>2)</sup>	≤ 0.13 %
Rope diameter tolerance	see page 6



9 x 25F – PWRC

Nominal Rope diameter mm	Minimum breaking strength $F_{min}$ 1570 kN	Length mass approx. kg/100 m	Metallic cross-section approx. mm <sup>2</sup>
12*	101	62.7	73.9
13	119	74.8	86.6
16	180	113.0	131.0
19	254	161.0	187.0
22*	340	213.0	246.0

\* no stock material

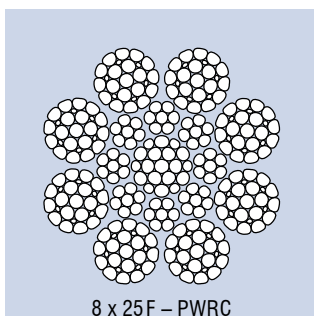
Example:  
Ø 16.0 mm

Technical Data

### DRAKO 250 TPC – 8-Strand Compacted Double-Parallel Steel Core Rope

Thanks to the compaction of the strands, the metallic cross-section is additionally enlarged. This, in turn, leads to a further increase in breaking strength as compared to non-compacted double-parallel ropes. Moreover, the compacted outer strands are well-rounded and go easy on traction and deflection sheaves. The run is particularly quiet, which thus enhances ride comfort. Due to compaction, rotation is reduced during the installation process.

Characteristics	preformed, prestretched (medium), bright, compacted
Rope grades	1570 und 1770 auf Anfrage
Elastic Elongation <sup>1)</sup>	≤ 0.10 %
Permanent Elongation <sup>2)</sup>	≤ 0.10 %
Rope diameter tolerance	see page 6



8 x 25F – PWRC

Nominal Rope diameter mm	Minimum breaking strength $F_{min}$ 1570 kN	Length mass approx. kg/100 m	Metallic cross-section approx. mm <sup>2</sup>
13	130	81.6	93.9
16	198	123.6	142.8
19	279	174.5	202.2

Example:  
Ø 16.0 mm

#### ➔ Please note

At the installation stage, double parallel ropes tend to untwist more than full-steel ropes with a separately stranded IWRC. For this reason, special attention is necessary during installation.

Twisted ropes are damaged in their fabric and reveal substantial change in their original properties in terms of load capacity, elongation and service life.

To make correct rope installation easier, especially on high rise installations, DRAKO steel core ropes are produced with a blue marking line.

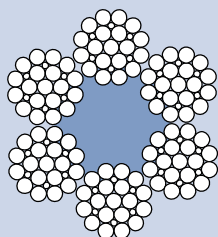
<sup>1)</sup> at 10% of the minimum breaking load  
<sup>2)</sup> acc. to DIN 51201

# Ropes for Compensation

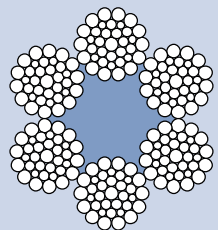
## Special Compensating Ropes

Special compensating ropes (balance ropes), to be used in tensioned application only. The rope construction varies with the nominal diameter to optimize the performance.

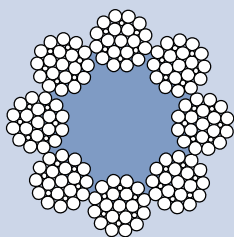
Characteristics	preformed, bright, right hand ordinary lay
Core	DRAKO 180 B and DRAKO 200 B are made with a synthetic fibre core (SFC)
Rope grades available	1370/1770 or 1570
Rope diameter tolerance	see page 6



6 x 25F – FC



6 x 25WS – FC



8 x 25F – FC

### DRAKO 180 B

Nominal Rope diameter mm	Minimum breaking strength $F_{min}$ 1370/1770 or 1570 kN	Length mass approx. kg/100 m
13	83.7	60.7
16	127	92
18*	160	116
19*	179	130
20*	198	144
22*	240	174
24*	292	211
26*	342	248
32*	518	376
36*	656	476
38*	731	530

### DRAKO 200 B

13*	74.3	57.5
16*	113	87.0
18*	142	110
19*	159	123
22*	213	165

\* no stock material

*For more detailed information, see PFEIFER DRAKO Catalogue "Compensation".*



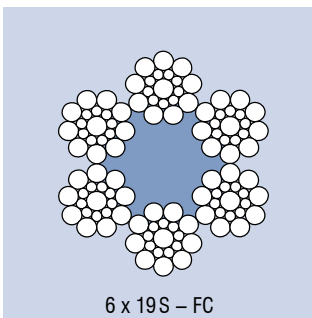
Elevator ropes will be supplied with servings on both ends, if not specified otherwise.



## Overspeed Governor Ropes Special Ropes for Governors

The fiber core of the DRAKO governor ropes is made of synthetic fibers. This means optimal diameter stability with smaller rope diameters too. In addition, the synthetic material fibers are dampproof – and there is no swelling and no decomposing. Many DRAKO governor ropes are also available in the galvanized design.

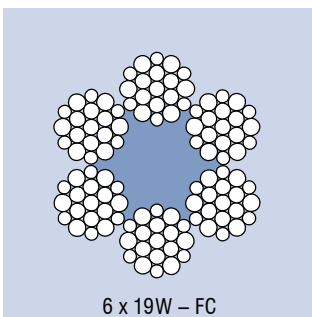
Characteristics preformed, prestretched, (medium), bright or galvanized, right hand, ordinary lay  
Rope grades available 1370/1770, 1570, 1770, 1960  
Rope diameter tolerance see page 6



### DRAKO 6 x 19 S – FC

Permanent Elongation<sup>1)</sup> ≤ 0.30%

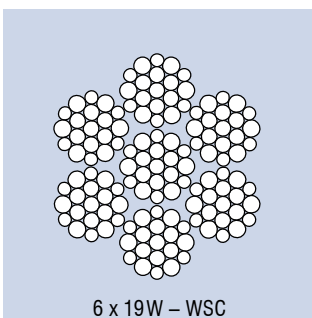
Nominal Rope diameter mm	Minimum breaking strength F <sub>min</sub>				Length mass approx. kg/100 m	Metallic cross-section approx. mm <sup>2</sup>
	1370/1770 kN	1570 kN	1770 kN	1960 kN		
6	–	19.0	21.4	23.3*	13	13.8



### DRAKO 6 x 19 W – FC

Permanent Elongation<sup>1)</sup> ≤ 0.30%

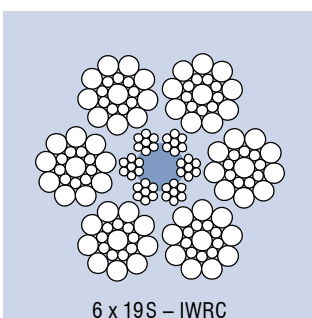
5	–	–	14.6	–	9.5	9.9
6	–	19.8	–	24.7*	13.2	14.3
6.3	–	–	–	27.2	14.6	15.8
6.5	23.2*	23.2	26.2	–	15.5	16.8
7	–	–	28.6*	–	18	19.5
8	–	–	39.6	–	23.6	25.4



### DRAKO 6 x 19 W – WSC

Permanent Elongation<sup>1)</sup> ≤ 0.14%

6.0	–	–	–	29.0	14.5	17.6
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### DRAKO 6 x 19 S – IWRC

Permanent Elongation<sup>1)</sup> ≤ 0.15%

8	–	35.9	–	–	26.2	31.3
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\* no stock material

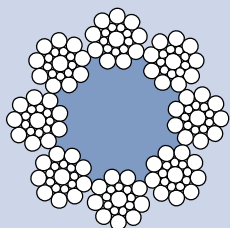
<sup>1)</sup> acc. to DIN 51201  
PFEIFER DRAKO

# Overspeed Governor Ropes

## Special Ropes for Governors

Characteristics preformed, prestretched, (medium), bright or galvanized, right hand, ordinary lay

Rope grades available 1370/1770, 1570, 1770, 1960  
Rope diameter tolerance see page 6

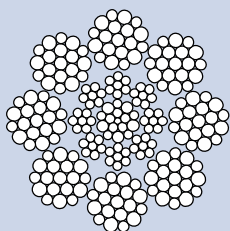


8 x 19 S – FC

### DRAKO 8 x 19 S – FC

Permanent Elongation<sup>1)</sup> ≤ 0.40%

Nominal Rope diameter mm	Minimum breaking strength F <sub>min</sub>				Length mass approx. kg/100 m	Metallic cross-section approx. mm <sup>2</sup>
	1370/1770 kN	1570 kN	1770 kN	1960 kN		
6.5	–	19.0*	–	–	14.6	13.4
8	–	–	34.2	–	21.5	22.5
9.5	–	–	48.3	–	30.4	31.7
10	47.4	47.4*	–	–	33.7	35.1
12.7	76.5*	–	–	–	54.3	56.6

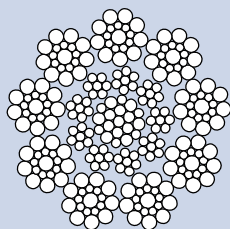


DraKO 250 T

### DRAKO 250 T

Permanent Elongation<sup>1)</sup> ≤ 0.15%

Nominal Rope diameter mm	1370/1770 kN	1570 kN	1770 kN	1960 kN	Length mass approx. kg/100 m	Metallic cross-section approx. mm <sup>2</sup>
6.5	–	–	31.5	–	17.9	20.9
8	–	43.3	46.6	–	27.1	31.6
9	–	54.8	–	–	34.3	40.0
10	–	67.7	72.7	–	42.3	49.4



DraKO 300 T and TX

### DRAKO 300 T und TX

Permanent Elongation<sup>1)</sup> ≤ 0.15%

Nominal Rope diameter mm	1370/1770 kN	1570 kN	1770 kN	1960 kN	Length mass approx. kg/100 m	Metallic cross-section approx. mm <sup>2</sup>
8	–	42.1	45.0	–	26.1	30.8
9	–	53.3	–	63.5*	32.2	38.0
10	–	66.0	71.0	–	42.8	49.2
13	–	111.6	118.3*	136.0*	72.3	84.0

\* no stock material

Example:  
Ø 8.0 mm

## Ropes for Roped Hydraulic Elevators Ropes with Fibre Core

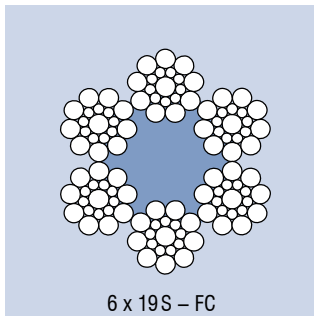
Rope diameter

7 mm and smaller: synthetic fibre core (SFC) on request  
8 mm and bigger: natural fibre core Sisal (NFC). SFC on request

Characteristics preformed, prestretched (heavy), bright,  
ordinary lay, right hand

Rope grades available 1770

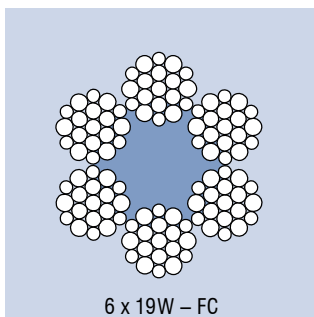
Rope diameter tolerance see page 6



6 x 19S – FC

### DRAKO 6 x 19 S – FC

Nominal Rope diameter mm	Minimum breaking strength $F_{min}$ 1770 kN	Length mass approx. kg/100 m	Metallic cross-section approx. mm <sup>2</sup>
9	50.6	29.2	31.1
10	61.6	36.0	38.4



6 x 19W – FC

### DRAKO 6 x 19 W – FC

8	39.6	23.6	25.4
10	61.9	36.8	39.7
11	74.9	44.5	48.1
12	89.1	53.0	57.2
13	104.6	62.2	67.2
16*	158.5	94.2	102.0

\* no stock material

➔ Elevator ropes will be supplied with servings on both ends,  
if not specified otherwise.

# Ropes for Roped Hydraulic Elevators

## DRAKO 250 H – 8-strand rope with steel core for roped hydraulic elevators

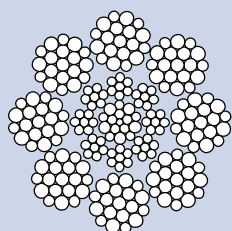
**This rope is suitable to only a limited extend for traction drive elevators!**

Characteristics      preformed, prestretched (medium), bright,  
right hand, ordinary lay

Rope grades available      1770

Rope diameter tolerance      see page 6

Technical Data



8 x 19W – IWRC

Nominal Rope diameter mm	Minimum breaking strength $F_{min}$ 1770 kN	Length mass approx. kg/100 m	Metallic cross-section approx. mm <sup>2</sup>
8*	46.7	27.3	31.4
9	58.9	34.9	39.4
10	72.7	43.1	48.8
11	86.0	52.1	57.8
12	104.8	62.1	69.6
13	126.0	72.8	83.7

\* 8 x 19 S – IWRC

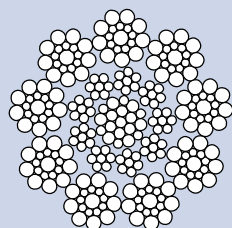
## DRAKO 300 H – 9-strand steel core rope for roped hydraulic elevators

**This rope is not suitable for traction drive elevators!**

Characteristics      preformed, prestretched (medium), bright,  
right hand, ordinary lay

Rope grades available      1770

Rope diameter tolerance      see page 6



9 x 19S – IWRC

Nominal Rope diameter mm	Minimum breaking strength $F_{min}$ 1770 kN	Length mass approx. kg/100m	Metallic cross-section approx. mm <sup>2</sup>
8	45.0	27.0	32.4
9	57.5	35.0	40.5
10	71.0	45.0	50.1
11	82.0	52.0	58.5
13	114.0	73.0	80.6



## Elevator Rope Maintenance

DRAKO elevator ropes are lubricated during the manufacture process with the aim of reducing corrosion and abrasion. But the quantity of lubricant so applied may only be enough to prevent elevators with sharply calculated traction capability from slipping.

Since, however, dust and abrasion tend to thicken the lubricant, it is only in rare cases that this first lubrication remains effective over the entire service life. And so DRAKO recommends that the elevator ropes be periodically relubricated during service.

Relubrication is not necessary as long as your fingers pick up a smear of oil if you touch the rope. As such, relubrication is carried out a number of ways – with a spray can or oil can or paint brush or similar. For traction drives, only small quantities need to be applied, following which the elevator should be run up and down the whole distance several times. In doing so, observe any slipping characteristics and, if necessary, apply more lubricant. The lubricant used should initially have low viscosity and good creep properties so that the inner parts of the rope are also lubricated.

For this purpose, we recommend two DRAKO special rope lubricants: either **DRAKO-LUBE** or **DRAKO-SOL**, which are both compatible with the lubrication applied at manufacture. As a further alternative, **DRAKO-Outdoor** has stood the test of time in use outdoors. It comes as a paste but takes on fluid form in the course of operation.

Transparent and of low viscosity, **DRAKO-LUBE** and **DRAKO-SOL** are able to penetrate the rope even under load. During non-operational phases, they flow back to the rope contact points from which they were displaced during rope/elevator operation.

**DRAKO-FLUID SF**, our fourth recommended elevator rope lubricant, is **solvent-free** and therefore suitable for use in **automatic lubrication equipment**.

**Attention:** The automatic lubricators available nowadays may only be used at a specific elevator for a very limited period of time. Otherwise, excess lubrication soon occurs with the attendant risk of rope slip.

Over-lubricated ropes can be degreased by means of our special chemically neutral **DRAKO-FLORIDEAL** rope degreasing powder.



Maintenance of Ropes

**Our lubricants contain solvents except for DRAKO FLUID SF. Make sure that the workplace is kept well ventilated!**

Article	Condition as delivered	Operating conditions	Container size	Solvent	Application by means of
DRAKO-LUBE	fluid	indoor and outdoor	2.5-l-can 5.0-l-can	Yes Yes	brush/roller
DRAKO-SOL <sup>1)</sup>	fluid	indoor	spray can 500 ml (12 cans = 1 box)	Yes Yes	spray
DRAKO-FLUID SF	fluid	indoor and outdoor	2.5-l-can 5.0-l-can	No No	automatic lubricator, brush/roller, squirt gun
DRAKO-Outdoor	fluid/paste	outdoor	10-kg-can	Yes	brush/roller
DRAKO-Florideal	Rope degreasing powder	indoor and outdoor	25-kg-bag 5-kg-pot with lid	– –	gloves

<sup>1)</sup>hazardous substance, observe all transport regulations!

**Please Note:** DRAKO rope maintenance products are designed to conform to the basic lubrication that DRAKO ropes receive at manufacture. If other products are used, no warranty for conformance can be offered. This also applies to the rope maintenance products of other manufacturers. It is imperative that you consult the information given for the use and maintenance of elevator ropes made of steel wire as per EN 12385-3.



## Weight Watcher – the mobile rope load measurement

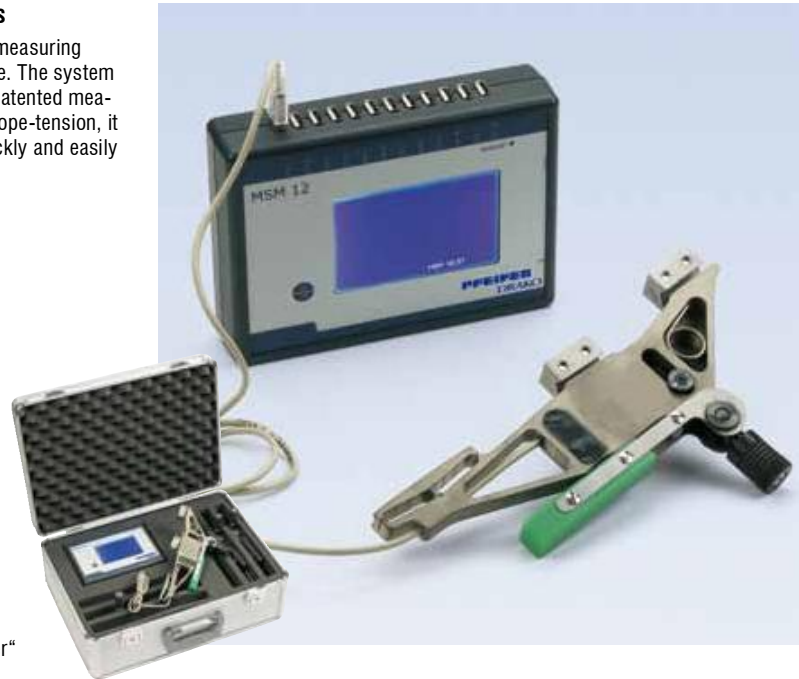
### Mobile rope load measurement for up to 12 ropes

The rope-tension measuring system embodies a patented measuring principle. An individual load sensor is mounted at each rope. The system can be used with different rope types and diameters. The patented measuring principle allows not only the measurement of each rope-tension, it also enables you to set the optimum rope-tension very quickly and easily (integrated software-wizard).

#### Highlights:

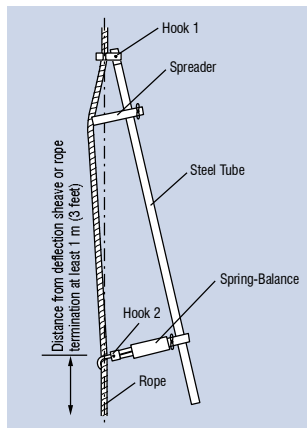
- time saving rope tension setting
- simple weight determination of cab and counterweight
- rope load sensor LSM with quick clamp device
- built-in wizard for optimum rope tension setting
- suitable for use with different rope diameters and types Ø 4–22 mm (3 different sensors sizes)
- no calibration with weight necessary
- 12 measuring channels for up to 12 ropes
- stores up to 100 measurements
- USB-port, Bluetooth (optional)
- big touch screen display with backlight
- a component of LiftPC® mobile diagnosis

for more information please see our leaflet "Weight Watcher"



## Wire Rope Tensioning Device

- Equal rope tension adds to the life of the elevator ropes and the sheaves,
- light-weight design, easy to handle,
- comparable measured values for a set of ropes
- preferable for elevators of more than 50 m shaft height.
- The attached manual contains all relevant instructions on the use of the device and the assessment of measured values.



## Running-off crown VARIO CLOU

Improper pulling from the rope ring causes twisting depending on direction of lay of the rope. This twisting causes a change in the rope structure, which cannot be corrected. Unequal strand lengths in steel-cored ropes occur through these forced twistings. The consequence is an unequal load distribution in the rope coil which can lead to "bird caging" of strands which have experienced an excess length.

In order to avoid such an irreversible damage to the rope there are auxiliary means, such as the **VARIO CLOU** running-off crown. It enables an unreeling of the rope without any twisting.



## Technical References

### Discard Criteria

The following table shows the discard criteria according to the elevator rope standards EN 12385 - 5 and ISO 4344 and extended on the bases of DIN 15020

Criteria	Discard or examination within the time span prescribed by an expert			immediate discard		
	Rope grade 6 x 19	Rope grade 8 x 19	Rope grade 9 x 19	Rope grade 6 x 19	Rope grade 8 x 19	Rope grade 9 x 19
Average number of wire break among outer strands	More than 12 per length of lay	More than 15 per length of lay	More than 17 per length of lay	More than 24 per length of lay	More than 30 per length of lay	More than 34 per length of lay
Number of wire break predominantly in one or two strands	More than 6 per length of lay	More than 8 per length of lay	More than 9 per length of lay	More than 8 per length of lay	More than 10 per length of lay	More than 11 per length of lay
Number of wire break adjacent to another in one outer strand	5	5	6	More than 5	More than 5	More than 6
Intermediate wire break	1 per length of lay	1 per length of lay	1 per length of lay	More than 1 per length of lay	More than 1 per length of lay	More than 1 per length of lay

#### Reduction in rope diameter

The ropes should be replaced if the rope diameter is reduced by more than 6 per cent based on a rope nominal diameter.

#### For comparison the discard criteria of the current standards

The following table indicates whether a rope is to be replaced, based on the number of broken wires in the rope section with the highest number of such fractions. The reference length is 6 x or 30 x the rope diameter. The table complies with the specification of TRA 102 and DIN 15020, Bl. 2.

The values apply only under the following conditions:

- the ropes are single layer regular lay ropes (the steel core is not considered a strand layer)
- the friction sheave is of cast iron or steel (for traction drive elevators)
- the broken wires are distributed evenly across the majority of the strands

Rope construction	Number of wires in outer strands	Number of broken wires within a length of 6 x Ø	Number of broken wires within a length of 30 x Ø
DRAKO 6 x 19 S – FC	= 114 wires	6	12
DRAKO 6 x 19 W – FC	= 114 wires	10	19
DRAKO 6 x 25 F – FC			
DRAKO 180 B (in 6 x 25 F – FC)			
DRAKO 8 x 19 S – FC	= 152 wires	10	19
DRAKO 250 H, 8 mm			
DRAKO 8 x 19 W – FC	= 152 wires	13	26
DRAKO 8 x 25 F – FC			
DRAKO 250 T			
DRAKO 250 H (except 8 mm)			
DRAKO 200 B			
DRAKO 300 T	> 180 wires	16	32
DRAKO 180 B (in 6 x 36 WS – FC)	= 216 wires	18	35

#### Please note

- If wire fractures don't occur in a regular pattern across the majority of the strands but are concentrated in one or two strands, the above table is not applicable.
- Such ropes must be replaced, if there are 5 or more broken wires adjacent to each other within one strand.
- Ropes with excessive crown wear tend to show rapidly increasing numbers of broken wires.

Under certain circumstances and depending on the operating conditions, the machine design and the loads, etc., ropes might have to be replaced, even if there are no visible broken wires at the outer strands: ropes with a diameter reduction of more than 6% (from nominal diameter) even in only a short section must be immediately removed.

If the elevator system contains plastic sheaves, refer to German safety instructions for elevators "SR Kunststoffrollen", as ropes in such systems tend to show internal rather than external wire fractures. The above table is to be seen only as a guideline for rope inspection and the decision for rope discard. Please note that the above figures are never to be considered the only criteria for rope discard. Any detected changes in the rope must be taken into account when assessing a rope. The final decision to remove a rope must be made on the basis of the experience of the assessing person.

For DRAKO ropes installed in systems outside Germany, the relevant statutory regulations for rope replacement apply, please look also to pr EN 12385-3 Annex C.

# Rope Terminations

## Ferrule secured Thimble with Eye Bolt

**How to order:** (additional to the designation of the required rope) f.i.:  
a 13 mm rope, thimble DIN 6899 (if DIN 3090, please specify) selected  
eye bolt M 20, 450 mm long and spring:

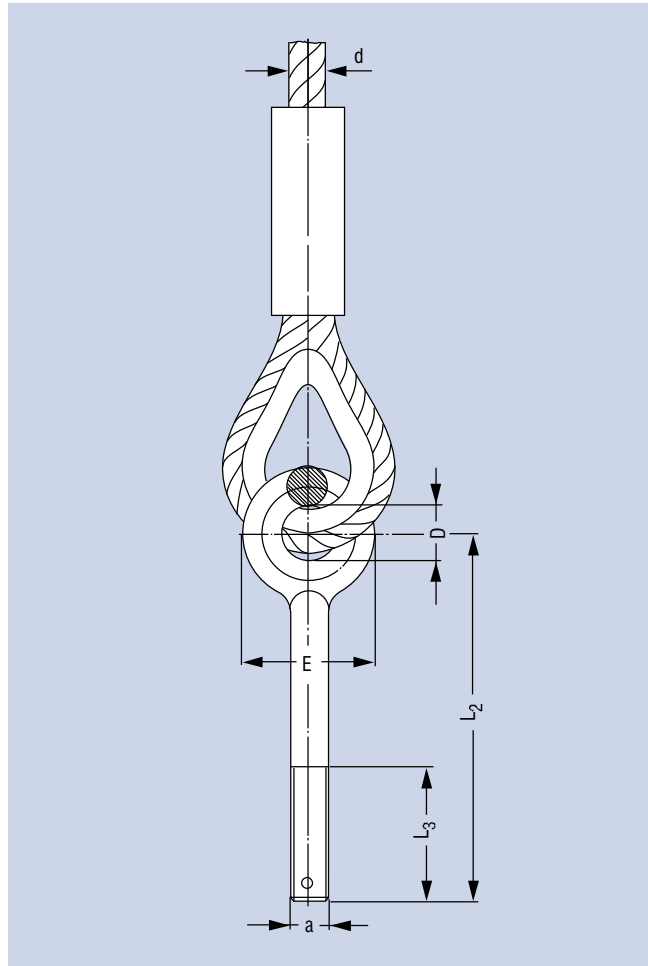
One rope end with thimble and eye bolt M 20 x 450 D

**Please note:**

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.

**Anti-Twist Rope Sets (4 mm rope with 2 wire rope grips) are available ex stock.**



➔ On request we supply for this kind of rope suspension a complete accessory kit (unmounted), comprising

Designations	Contents
D	1 pressure spring, 2 spring collars, 2 nuts, 1 split pin
FP	1 elastomer spring, 1 washer, 2 nuts, 1 split pin
FP 2	2 elastomer springs, 1 washer, 2 nuts, 1 split pin
FP 3	3 elastomer springs, 1 washer, 2 nuts, 1 split pin

**Eye Bolts**

Rope-Ø d mm	Nominal Size (a x L <sub>2</sub> )	L <sub>3</sub> (approx.) mm	D mm	E (approx.) mm	F <sub>min</sub> kN
6-8	M 12 x 260	60	26	50	33.7
	M 12 x 350	150	26	50	33.7
	M 12 x 500	150	26	50	33.7
9-11	M 16 x 260	120	22	51.4	62.8
	M 16 x 300	150	22	51.4	62.8
	M 16 x 350	200	22	51.4	62.8
	M 16 x 400	200	22	51.4	62.8
	M 16 x 450	200	22	51.4	62.8
	M 16 x 500	200	22	51.4	62.8
12-14	M 20 x 290	120	27.7	67.6	98
	M 20 x 450	200	27.7	67.6	98
	M 20 x 600	200	27.7	67.6	98
15-17	M 24 x 400	220	27	65	141.8
	M 24 x 600	200	27	65	141

Eye bolts will come with washer (DIN 125), 2 nuts and 1 split-pin.

## Swaged Fitting with Thread

This slim construction of rope termination is particularly suitable for modern concepts of machineroomless elevators.

These terminations must be secured against rotation by means of the big securing hole at the upper end of the rod and a small steel wire rope. The small inspection hole in the swaged part of the terminal allows to control the presence of sufficient inserted rope length.

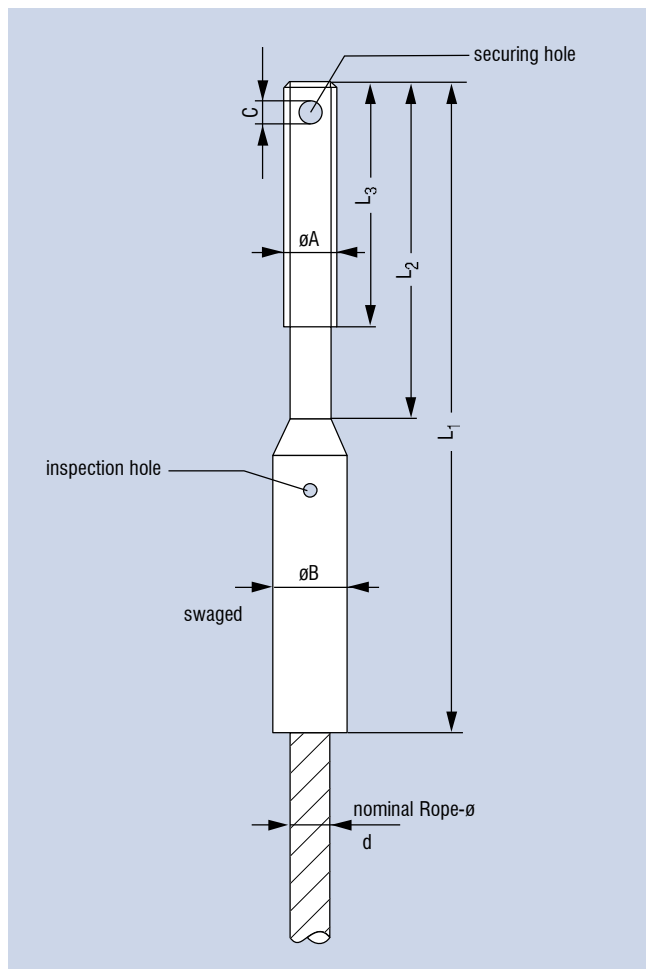
According to EN 81 it is necessary for such a non standardized termination system, to demonstrate to an authorized body that it is a system of equivalent safety like the usual standardized ones. "TÜV Süd" have certified, on the base of researches at the "Institut für Fördertechnik" at the University of Stuttgart, that our system of swaged fittings fulfils the requirements of EN 81 for DRAKO-Ropes with fibre cores as well as for DRAKO-Ropes with steel core ropes.

**DRAKO swaged fittings with thread are compliance tested by TÜV Süd!**

**TÜV Süd approved!**

### Please note

The elevator rope constructions, shown in this catalogue have very different minimum breaking strengths. When specifying springs or spring buffers, their respective maximum applicable force is to be considered.

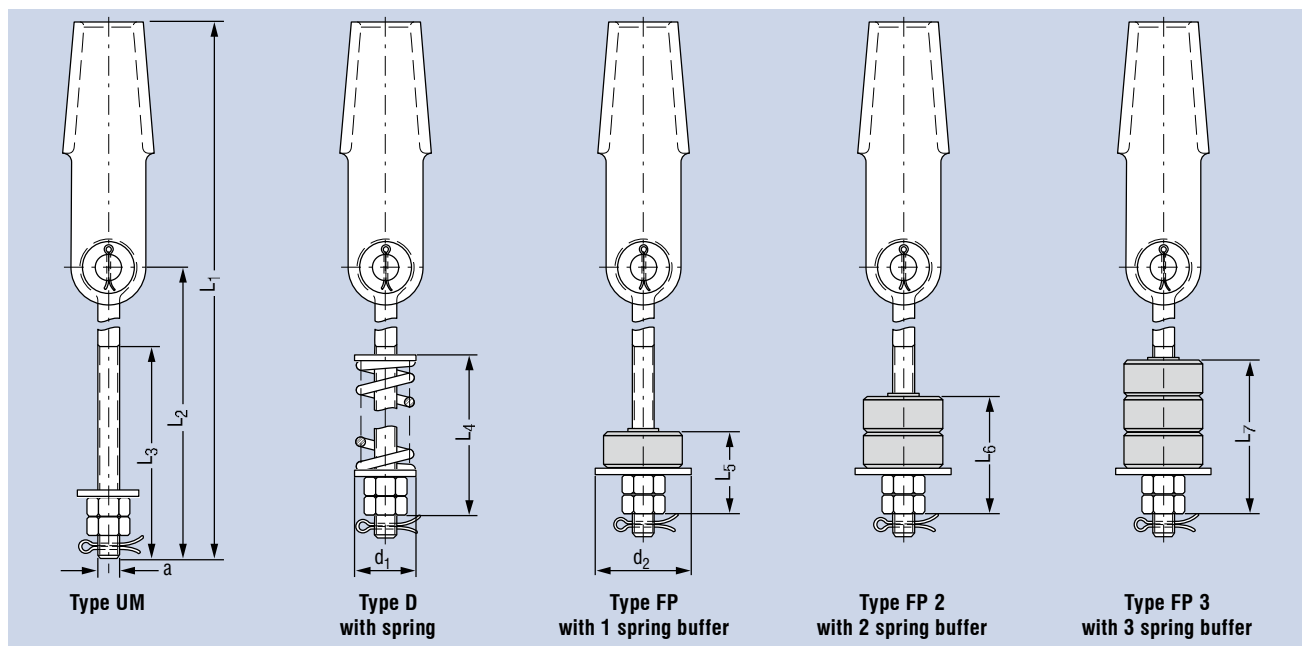


Nominal rope diameter d mm	Nominal size	thread diameter A	thread length L <sub>3</sub> approx. mm	shaft length L <sub>2</sub> approx. mm	swaged diameter B approx. <sup>1)</sup> mm	total length L <sub>1</sub> approx. <sup>1)</sup> mm	securing hole diameter C mm
4	M 8 x 140	M 8	140	140	10.5	185	3
5	M 10 x 140	M 10	140	140	14.5	194	3
6	M 12 x 180	M 12	180	180	14.5	243	6
6	M 10 x 235	M 10	60	236	14.5	308	3
6	M10 x 145	M 10	45	145	14.5	145	3
6.5	M 10 x 235	M 10	60	236	14.5	310	3
8*	M 14 x 160	M 14	160	163	16.0	240	6
8**	M 14 x 300	M 14	200	300	16.0	380	6
10*	M 16 x 160	M 16	160	163	18.0	260	8
10**	M 16 x 300	M 16	200	300	18.0	400	8
11*	M 16 x 160	M 16	160	163	20.5	270	8
11**	M 16 x 300	M 16	200	300	20.5	410	8
12*	M 16 x 160	M 16	160	163	22.5	280	8
12**	M 16 x 300	M 16	200	300	22.5	420	8
13*	M 20 x 160	M 20	160	163	24.5	280	8
13**	M 20 x 300	M 20	200	300	24.5	420	8
16*	M 24 x 160	M 24	160	163	29.0	310	8
16**	M 24 x 350	M 24	250	350	29.0	500	8

\* special size: when used with springs, then only with Elastomer spring buffers \*\* normal size  
<sup>1)</sup> provided only as information for determining installation dimensions

# Symmetric Wedge Socket EN 13411-7 with Eye Bolt DIN 444

Termination acc. to EN 13411-7 in combination with our eye bolts fulfil the requirement of EN 81-1, clause 9.2.3, to withstand at least 80% of the minimum breaking strength even when used together with the fullsteel ropes DRAKO 250 H and 300 H.



Rope-Ø d	Nominal Size	a	Normal size Type UM				Type D			Type FP			Type FP 2		Type FP 3	
			L <sub>1</sub> ** mm	L <sub>2</sub> * mm	L <sub>3</sub> mm	appr. kg	d <sub>1</sub> mm	L <sub>4</sub> mm	appr. kg	d <sub>2</sub> mm	L <sub>5</sub> mm	appr. kg	L <sub>6</sub> mm	appr. kg	L <sub>7</sub> mm	appr. kg
4 - 5	5	M10	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	M10	264	180	70	0.380	25	85.5	0.470	40	38	0.401	55	0.414	72	0.424
6 - 8	8	M12	450	320	150	0.780	45	167	1.420	50	51	0.870	79	0.900	107	0.930
9 - 11	11	M16	484	320	150	1.650	45	173	2.490	58	59	1.785	87	1.815	115	1.850
12 - 14	14	M20	598	400	150	3.230	54	202	4.500	68	65	3.530	93	3.570	121	3.610
15 - 17	17	M24	674	450	150	5.300	65	248	8.150	80	74	5.830	102	5.910	130	5.990
18 - 20	20	M27	760	500	150	8.000	65	254	10.950							
21 - 25	25***	M30	740	500	150	11.000	80	251	14.500							

\* normal size

\*\* total length of the normal size combination

\*\*\* not acc. to DIN

The socket body is galvanized.

### Please note

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.

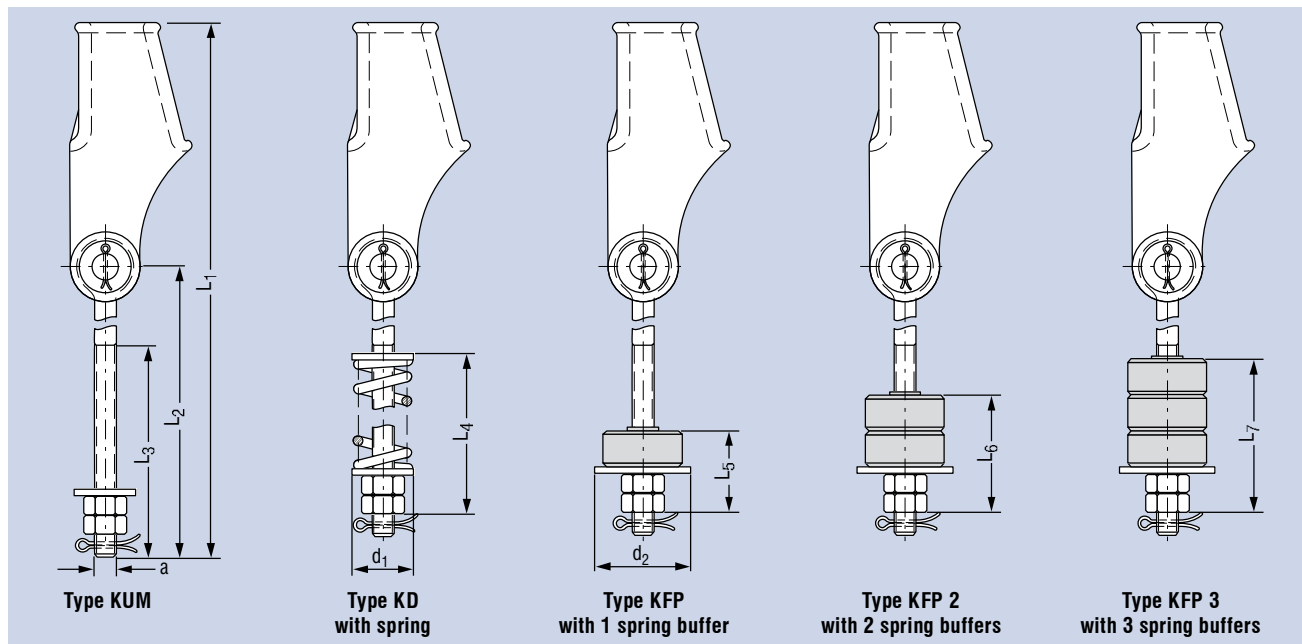
### How to order (example)

Symm. wedge socket \_\_\_\_\_ Type 14 D x length L  
nominal size 14 for  
rope – ø 12 to 14 mm  
with spring \_\_\_\_\_  
length L<sub>2</sub> of eye bolt \_\_\_\_\_  
acc. table above or acc.  
to the respective table page 30



## Asymmetric Wedge Socket DIN 43 148 (EN 13411-6) with Eye Bolt similar to DIN 444

Terminations acc. to DIN 43148 only in some combinations of rope constructions, rope diameters and eye bolts are according to the requirement of EN 81-1, clause 9.2.3. (Requirement: withstanding at least 80 % of the rope's minimum breaking strength). Please contact us in case of any questions.



Rope Terminations

Rope-Ø d	Nominal Size	a	Normal size Type KUM				Type KD			Type KFP			Type KFP 2		Type KFP 3	
			L <sub>1</sub> ** mm	L <sub>2</sub> * mm	L <sub>3</sub> mm	appr. kg	d <sub>1</sub> mm	L <sub>4</sub> mm	appr. kg	d <sub>2</sub> mm	L <sub>5</sub> mm	appr. kg	L <sub>6</sub> mm	appr. kg	L <sub>7</sub> mm	appr. kg
6 - 7	353	M12 <sup>1)</sup>	430	300	150	0.948	44	167	1.595	50	51	1.051	79	1.079	107	1.107
8	352	M12 <sup>1)</sup>	430	300	150	0.920	44	167	1.567	50	51	1.023	79	1.051	107	1.079
9 - 12	351	M12 <sup>1)</sup>	430	300	150	0.892	44	167	1.539	50	51	0.995	79	1.023	107	1.051
10 - 12	402	M16	440	300	150	1.278	44	173	2.070	57	59	1.454	87	1.482	115	1.510
12 - 14	401	M16	440	300	150	1.250	44	173	2.042	57	59	1.426	87	1.454	115	1.482
12 - 15	450	M20 <sup>1)</sup>	590	400	150	3.330	50	202	4.840	68	65	3.620	93	3.666	121	3.712
16 - 20	500	M27 <sup>1)</sup>	715	500	150	7.740	65	254	10.760							

\* normal size. Eye bolts with other dimensions L<sub>2</sub> on request.

\*\* total length for the normal size combination

<sup>1)</sup> Eye of bolt not acc. to DIN 444.

The socket body is galvanized.

### Please note

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.

### How to order (example)

Type 402 KD x length L  
 Asymm. wedge socket  
 nominal size 402 for  
 rope – ø 10 to 12 mm  
 with spring  
 length L<sub>2</sub> of eye bolt  
 acc. table above

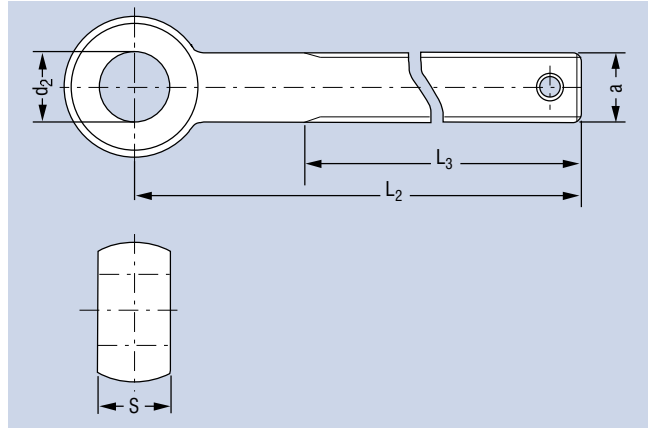
# Eye Bolts

## DIN 444

(in combination with symm. wedge sockets DIN 15 315)

thread	M 10	M 12	M 16	M 20	M 24	M 27	M 30**
<b>"a"</b>							
F <sub>min</sub> in kN	29.0	42.2	78.5	122.0	176.0	230.0	230.0
d <sub>2</sub>	10.5	12.2	16	18	22	25	42
s	9	14	17	22	25	27	30
L <sub>2</sub> / L <sub>3</sub>	<b>180/70</b>		200/100				
	130/35						
	230/70		<b>300/150</b>	<b>300/150</b>			
		<b>320*/150</b>	<b>320*/150</b>				
		350/150					
	<b>400/150</b>	<b>400/150</b>	<b>400*/150</b>				
		<b>450/150</b>	<b>450/150</b>	<b>450*/150</b>			
		<b>500/150</b>				500*/150	500*/150
			560/150	600/150			
						800/400	

All dimensions in mm



\* normal sizes  
 Sizes in bold type are usually available  
 ex stock.  
 \*\* not acc. to DIN

Rope Terminations

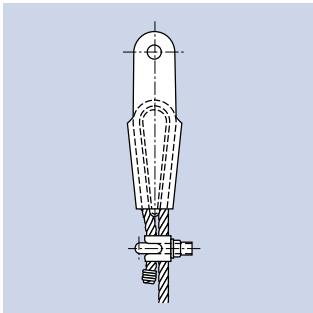
## Wire Rope Grips EN 13411-5

(to be used with wedge sockets DIN 15315 / EN 13411-7 and DIN 43148 / EN 13411-6)

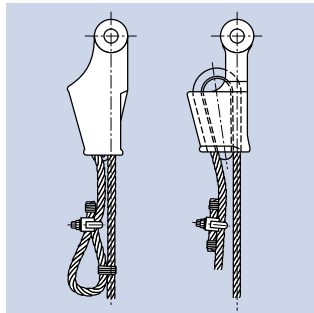
nominal size = biggest nominal rope-Ø	5	6.5	8	10	12	14	16	19	22
---------------------------------------	---	-----	---	----	----	----	----	----	----

For intermediate nominal rope diameters, the next bigger grip size shall be applied. Nominal size 5 is only applicable for 5 mm nominal rope diameter.  
 Usage only acc. to the requirements for application and installation of EN 13-411-5.

## Standardised Fixing of Rope End with Wire Rope Grip



Symmetric wedge socket:  
 see EN 13 411-7



Asymmetric wedge socket:  
 see EN 13 411-6

## Springs for Rope Terminations

	Spring I	Spring II	Spring III	Spring IV	Spring V	Spring VI
symm. wedge socket EN 13411-7/DIN 15 315	5 D 6.5 D	8 D	11 D	14 D	17D 20 D	25 D
asymm. wedge socket EN 13411-6/DIN 43 148	–	351 352	401 402	450	500	–
swaged fitting	M 8 M 10	M 12	M 16	M 20	M 24	–
wire-Ø [mm]	4.5	7.5	9.0	11.0	15.0	18.0
outer-Ø [mm]	23.5	43.0	46.0	53.0	65.0	80.0
average spring Ø [mm]	19.0	35.5	37.0	42.0	50.0	62.0
length unloaded [mm]	61.5	135.0	135.0	157.5	190.0	155.0
maximum spring load $F_{max}$ [kN]	1.703	3.382	5.930	9.383	14.880	24.525
compressions $s$ [mm] at spring load $F_{max}$	21.0	47.0	40.5	42.0	32.5	27.0
spring factor $c$ [kN/mm]	0.081	0.072	0.146	0.223	0.458	0.908

Calculation of compression  $s$ :

$$s = \frac{F}{c} \text{ [mm]}$$

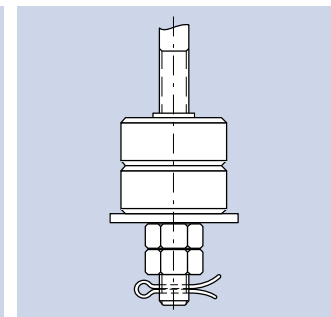
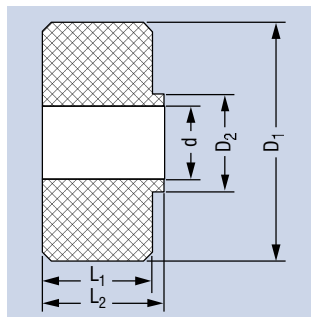
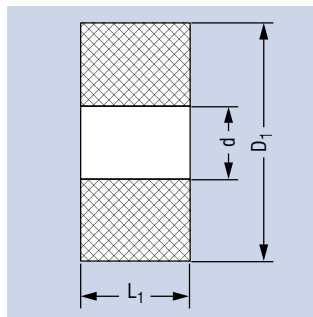
$c$  = spring factor [kN/mm]

$F$  = spring load [kN]  
(same as rope load)

## Elastomer Spring Buffers for Rope Terminations

### Characteristics

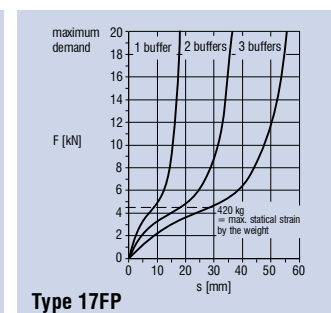
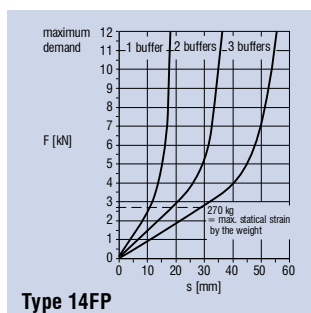
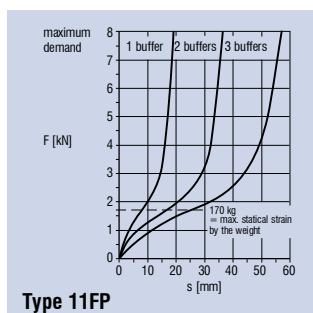
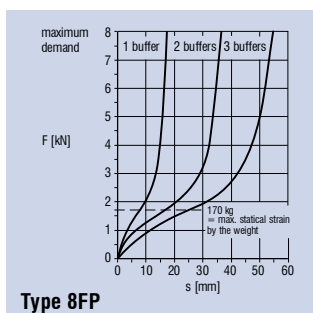
- grease and oil resistant
- excellent damping properties
- material: cellular polyurethane-elastomer



Type	d mm	D <sub>1</sub> * mm	D <sub>2</sub> * mm	L <sub>1</sub> * mm	L <sub>2</sub> * mm
5	10	40	20	17	20
6.5	10	40	20	17	20
8	13	50	22	28	33
11	17	50	22	28	33
14	21	65	27	28	33
17	25	80	27	28	33

\* unloaded

Dimension d must fit to the thread diameter a of the eye bolt



## Delivery Programme

### Elevator Industry

- special ropes of 6-strand and 8-strand construction
- special ropes with 9 outer strands for high rise/high speed installations
- special compensating ropes
- compensating chains and their suspension means
- Ropes for small goods elevators, overspeed controllers and door mechanisms
- ropes for gondola systems with inner electric conductors

### Mechanical and Construction Industry

- special crane and excavator ropes with 8 and 9 outer strands
- rotation-resistant and non-rotating ropes for electric hoists
- non-rotating ropes for tower cranes and mobile cranes
- winch ropes, clamshell ropes and pendant ropes
- slings according to DIN 3088 and ISO 8792

### Mining

- Koepe hoist ropes
- drum hoist ropes
- flat hoist ropes
- flat balance ropes
- round balance ropes (multi-layer flat strand ropes)
- haulage ropes for monorail conveyors
- signal ropes

### Shaft Sinking

- rotation resistant and non-rotating stage ropes
- flat hoist ropes
- clamshell ropes
- guide ropes
- direction survey ropes

### Oilfield Industry

- rotary drilling lines according to API Spec. 9A
- swab and bailing lines
- winch lines
- percussion drilling lines
- air winch lines
- logging lines and wires

### Additional

- rope terminations
- wire rope socks for cables and ropes
- wire rope with polymer cover
- spiral ropes and strands (automotive industry)
- deep sea research ropes.

### Approvals and certifications:

- TÜV Süd
- Approved by Germ. Lloyd, Lloyd's Register of Shipping
- Quality Managementsystem acc. EN ISO 9001
- LOM (Spain)
- GOST (Russia)



## General Service

### Technical support

Using the large number of technical configurations available to us, we are pleased to assist you in finding the right solution and combination for your ropes and rope accessories.

As early as the planning and design phases, we will support and advise you as extensively as possible. In addition to years of experience, we have all kinds of calculation aids for elevator rope requirements. We can help you select the best rope for your purposes, understand the rope drive & elevator system and advise you accordingly. These are the services we offer ...

### DRAKO Rope Sector (DRS)

The DRS is a program that helps to calculate the rope drive of your traction sheave elevator as per EN81-1 and, additionally, any significant values based on standards in place. In this way, we can assess and/or modify the actual choice of rope as well as the effect of the influential components. The result: we can recommend you the best-possible coordinated rope drive system.

### Rope service life assessment

Our Technical Competence Center (TCC) has gathered far-reaching experience in the field of rope service life assessment and this has led to the creation of professional software. Even so, the software program requires that its technicians have a deep understanding of all the complex processes that also run in the background. After all, a service life assessment worth the name means more than knowledge of loads, sheaves and groove forms alone.

An end-user version of this sophisticated program is now available which will help you greatly when it comes to the design of your system with our DRAKO 250T in the operating area of our KP067. It is now available at the [www.drako.de](http://www.drako.de) website. To access it, all you need do is register and log in.

### Rope and system diagnosis

Unexpected damage to rope can never be ruled out in elevator systems, and sometimes the cause cannot be established – at least at first. Our highly experienced experts will help you pinpoint the cause of damage and ensure that the same malfunction does not re-occur after the rope has been changed.

We are happy to advise, and free of charge! In the case of more extensive calculations and services having to be provided, we would be pleased to make you an offer.

### Simplified order form / online ordering

We aim to make the selecting and ordering procedures as easy as possible. To do so, please use our special fax order form which you can copy at will. Alternatively, feel free to order online or to place a query at [www.drako.de](http://www.drako.de) or [info@drako.de](mailto:info@drako.de)

### Stock keeping

For your convenience, we permanently keep in stock all sizes of weight compensating chains and over 80 different rope types and diameters for elevator operations. In fact, there are approx. 1,600 kilometers of rope in our warehouse at any one time, meaning that (subject to prior sale) we can respond swiftly to your delivery requirements.

### Systemized deliveries / ropes and accessories from a single source

Do you need our ropes and/or compensating chains complete with accessories at the building site?

→ We offer tailor-made solutions for ready-packed systemized deliveries.

### Response within 24 hours

If it is foreseeable that we cannot reply to your query in the desired time, we will get back to you within one workday after receipt of your message and let you know ...

- who your contact person is, and
- by when exactly you can expect the reply you need.

### Professional seminars for your installation and service staff

Ropes have to be handled expertly at all times. Even the smallest mistake can lead to high follow-up costs. We offer special Rope Seminars for your staff on your premises if requested. Please ask for a copy of our seminar schedule.

### Homepage

You can find all the technical data on our website at [www.drako.de](http://www.drako.de).



**“Our goal is your satisfaction. Not just via our products but also via our service”**



## Ways of Dispatch



Up to a length of 50 m, elevator rope will be commissioned in **coils**, if requested, also with ferrule secured terminations.

The dispatch of each commission will be effected on **pallets**, accessories loose in a bag.

Larger quantities will be packed in **skeleton containers** if requested.



Production lengths will be commissioned on **wooden reels** which can be returned.

These reels can also be packed (flat) on **EURO-pallets**.



Cut-to-lengths, usually commissions of more than 100 meters single length, will be dispatched on **non-returnable** reels on pallets, also with ferrule secured terminations, if requested.



Furthermore we offer the opportunity to let you have your commissions systemized. In this case, elevator ropes and loose rope termination material as well as other accessories and governor ropes, for example, can be packed in **stable cardboard boxes with handles**. Then the boxes will be dispatched stacked and ringed on **EURO-pallets**. This packing is a solution for a weight up to approx. 80 kg gross per box.

For heavy commissions we provide a **systemized delivery on pallets**.

Based on a delivery of one packing unit per commission, each rope component package can easily be identified to the corresponding elevator. Sorting risks as well as loss of parts (for example accessories, during forwarding, in your warehouse, or on site) can be minimized by this **logistic service**. As an option bar code labels or labels according to your request can be added.



We are ready to assist in finding your best dispatch solution.

## Warnings

Ropes must only be used in accordance with the **applicable safety regulations** and the relevant standards (DIN 15020, EN 12 385 and EN 81 and the German TRA). If the installation is outside Germany the relevant statutory regulations and the national standards apply. Before usage inspect the rope and the rope terminations and comply with the recommendations of the manufacturer and the applicable standards.

### Note:

The breaking strengths in the catalogue apply exclusively to new ropes. Whether the rope is performing as expected in the long run depends on

- the design of your elevator system,
- the selected rope diameter,
- the chosen rope construction,
- the chosen rope grade and the
- correct installation and maintenance of the elevator in which the rope is used, and
- the correct storage, handling, maintenance and inspection of the rope.

### General instructions:

The standards referred to in this catalogue are the standards as amended and valid.

No part of this catalogue (with the exception of the included fax form) may be reproduced and distributed by electronic or any other means without the prior written consent of DRAKO.

This catalogue replaces all previous catalogues. Any technical data printed in previous catalogues cease to be valid.

All data in our catalogues is subject to be changed by PFEIFER DRAKO in respect of technical development.

**Fax +49 (0)208-4 29 01-43**

**Inquiry**    **inquiry@drako.de**  
 **Order**      **order@drako.de**

to
----

**PFEIFER DRAKO  
DRAHTSEILWERK GMBH & CO. KG**

RHEINSTRASSE 19-23  
D-45478 MUELHEIM AN DER RUHR  
TELEFON +49 (0)208-42901-0

Customer-No.	Date
Company	
Ordererd by	
Phone	Fax
E-Mail	

<b>Order/Inquiry-No.:</b>
Required delivery time:

Item 1	<input type="checkbox"/> Traction drive ropes	<input type="checkbox"/> Hydraulic ropes			Price Euro
	pieces	length in m	Ø mm	construction	
<b>Item 2</b>	<b>1. rope end</b>				
	<input type="checkbox"/> plain end <input type="checkbox"/> one end with ferrule secured thimble <input type="checkbox"/> and attached eye bolt M _____ <input type="checkbox"/> with spring and accessories <input type="checkbox"/> with 1 PU-buffer and accessories <input type="checkbox"/> with 2 PU-buffer and accessories <input type="checkbox"/> with 3 PU-buffer and accessories <input type="checkbox"/> without any <input type="checkbox"/> rope termination type _____ (loose) <input type="checkbox"/> swaged fitting with thread M _____ <input type="checkbox"/> eye bolt M _____ (quantity according to the number of the ropes)				
<b>Item 3</b>	<b>2. rope end</b>				
	<input type="checkbox"/> plain end <input type="checkbox"/> rope termination type UM _____ (loose) (quantity according to the number of the ropes)				
<b>Item 4</b>	_____ pieces of <b>rope grips</b> EN 13411-5 size _____				
<b>Item 5</b>	_____ pieces of <b>Anti-Twist Rope Sets</b>				
<b>Item 6</b>	<b>Governor rope</b>				
	pieces	length in m	Ø mm	construction	
<b>Pos. 7</b>	<b>Packing</b>	Suspension Rope	<input type="checkbox"/> delivery in coils	<input type="checkbox"/> delivery on wooden reel	
		Governor Rope	<input type="checkbox"/> delivery in coils	<input type="checkbox"/> delivery on wooden reel	
<b>Item 8</b>	_____ pieces <b>wedge sockets</b> EN 13411-7 NG _____				
<b>Item 9</b>	_____ pieces of <b>rope grips</b> EN 13411-5 size _____				
For ordering compensating ropes please use the order form from the special catalogue "Compensation".					
Delivery address (if different from order address):			Signature		
Notes:					

Service

# PFEIFER DRAKO

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