Giving you a peace of mind!

Proficiency and expert knowledge
PFEIFER is your specialist for the application-oriented rope selection and the delivery of customized wire ropes. Cutting to length, prestressing, splicing, endless laying, swaging and hot metal socketing – this is our business.
PFEIFER has been dealing with ropes for generations. Leading crane and elevator manufacturers, the port, construction and automobile industry as well as rope users from many different industries are our customers. They all trust in PFEIFER’s worldwide renown efficient service.

A good feeling
Throughout manufacturing, with us, you are on the safe side. We hold all necessary licences and qualifications. Additional proof of our high quality standard is the certification for the quality assurance system according to DIN EN ISO 9001.

Highest quality level
Wire ropes have a central function wherever they are applied: lifting, transporting, pulling, staying or handling. All this involves a high degree of responsibility; we are well aware of this fact. The highly qualified competent staff, the latest production equipment and strict quality control measures are a guarantee for the quality standard of PFEIFER products.

Efficient production, Exact testing
Our manufacturing and test equipment conforms to the latest requirements. In the “coiling alley” with a 4000t wire rope storage capacity ropes are cut to length to close tolerances in all required lengths and diameters.
We provide large swaging presses with a pressing force of 3000t. Ropes with a diameter up to 80 mm can be fitted with various types of end terminations.
Two socketing towers with a capacity of 10 socketing boxes allow for connection of sockets and rope.
In the 240m pre-stressing tunnel wire ropes up to 160 mm dia. can be dynamically prestressed to exact length. Our hydraulic prestressing machine has a capacity rating of 6000 kN, therefore elongation-, tensile and pull tests of ropes in high precision class 1 are possible.
The PFEIFER group

PFEIFER is one of the leading European companies for rope, anchoring and lifting systems. The group consists of many companies both in Germany and abroad. PFEIFER headquarters are located in Memmingen, Germany.

Business fields

The business fields of the PFEIFER group are:

- **Cable structures**
  Architects can use cable structures to transform space into vast areas of lightness and transparency. Impressive examples of the aesthetics and elegance of PFEIFER cable structures can be found all over the world.

- **Mining and industry ropes**
  PFEIFER DRAKO in Mülheim, Germany located in the heart of the german coal mining area has been producing ropes of high quality for the past 150 years. Other parts of the product range include special steel wire ropes for steel mills, different industrial applications and deep sea research.

- **Lifting technology**
  Safely lifting heavy loads – our development engineers have acquired a great deal of expertise in this field. We are your global partner when it comes to the technological and safety challenges involved in the integrated lifting and moving of heavy loads.

- **Attachment and lashing equipment**
  With our experienced staff and our extensive product program we meet our customers’ permanently changing needs.

- **Elevator products**
  PFEIFER DRAKO elevator ropes are used in skyscrapers worldwide. With the surge of highrise buildings and highspeed elevators demands for increased performance are met through continuous development.

- **Protection systems against natural hazards**
  PFEIFER ISOFER, Switzerland is a pioneer in the development, manufacturing and installation of protection systems against natural hazards or rock and slope stabilization.

- **Connecting and lifting systems**
  We are the market leaders in the fields of lifting anchors, fixing systems and infrastructure technology. We have developed products of the highest standards and believe we can offer the most comprehensive and competitive systems for the construction industry today.

- **Inspection service, technical seminars**
  We completely service all your lifting devices in your factory. We teach – we inspect – we maintain – we repair.

- **Rope application technology**
  Only a rope manufactured to appropriate specifications will be able to fulfil a given task. As a specialist in the use of steel wire ropes, we can supply the right rope for your job. Wire rope manufacturing takes place at our group company PFEIFER DRAKO Drahtseilerei Gustav Kocks GmbH & Co. in Mülheim, Germany.
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**Technical Aspects about Wire Rope**

**History**

When Wilhelm Albert, an official of the German Board of Mines, manufactured a wire rope in 1834, it was admittedly, not the first wire rope in the world, but the tools he used and the level of steel wire production enabled him to produce ropes of acceptable length and quality.

The ensuring rapid development of wire rope production and its machinery and an ever increasing number of new rope constructions revealed, how urgently wire ropes were needed by the emerging industrial revolution. Since then the very simple Albert rope construction has developed – according to the various demands – into a vast and for the uninformed somewhat daunting variety of rope constructions.

**Common types of ropes**

- Standard ropes
- Rotation resistant ropes
- Compacted ropes
- Ropes with coated core

**Wire rope consists of three basic components**

- The core
- Wires that form a strand
- Strands laid helically around the core

**Rope cores (C)**

The inner part of a single layer rope surrounded by the outer strands is normally filled by a rope core. Rope cores are separated according to the material and design. Its main function is to support the outer strands and, by using a steel core, also to increase the load bearing metallic cross section.

- **Fibre core (FC)** (fig. 1 and 2) The core of the rope consists of natural (NFC) or synthetic fibre (SFC). Fibre cores store lubricants, support the strands and diminish vibrations.
- **Steel core (WC)** (fig. 3) There are two typical types of steel core
  1. **Wire strand core (WSC)** (fig. 4) The core of a round strand rope consists of a strand.
  2. **Independent wire rope core (IWRC)** (fig. 5) The core of the round strand rope consists of a stranded rope.
- **Independent wire rope core, plastic coated** (fig. 6, 17) The core consists of a plastic coated steel core.
Strand constructions

It was obvious from a very early stage that the structure of the strand in particular has a great influence on the characteristics of the rope. Over 100 years ago the Seale, Warrington, Filler wire and the cross lay (formerly called standard) wire configuration were already well known. Other common strand formations, e.g. Warrington-Seale and Warrington – Compound are merely combinations of these basic constructions.

Wire and strand diameter of our wire ropes have been optimized constantly by using computer technology. Thus bending properties and service life of the running ropes could be improved considerably. By an absolutely equal load distribution to all wires an early failure of any individual wire due to overloading will be eliminated.

Standard stranding (fig. 7 a) methods cause wire crossings between the wire layers within the strand resulting in high stress concentrations, where crossings occur. Premature damage may be the consequence. In a parallel stranded strand (fig. 7 b) all wires are arranged parallel in the strand structure thus a continuous linear contact is provided. The result is a reduction of compressive stress of the wires. Therefore many of our special ropes for running service are made of parallel stranded strands. Thus an optimum in rope work and considerably improved service life will be achieved.

Wire and strand – direction of lay

The direction of lay of the strand is the direction of the helix of the outer wires. There are two types, the right hand lay (abbreviated to z, fig. 8 a) and the left hand lay (abbreviated to s, fig. 8 b).

The stranded rope – direction and type of lay

The direction of lay of the rope is the direction of the helix of the outer strands. There are two types, the right hand lay (abbreviated to Z, fig. 9 a) and the left hand lay (abbreviated to S, fig. 9 b).

When spinning stranded ropes, different methods to combine the strands are possible. The spinning process affects rope properties and determines later use of the rope. There are basically two different types of lay.

Regular or Cross lay (fig. 10)

The direction of lay of the wires in the outer strands will be in opposite direction to the direction of lay of the outer strands in the rope itself.

Regular laid ropes are more pressure and deformation resistant.

Two types of lay direction are possible. The lay direction is determined by the outer strands:

- zZ: right hand regular lay (fig. 10 a)
- sS: left hand regular lay (fig. 10 b)

Lang lay (fig. 11)

The direction of lay to the wires in the outer strands equals the direction of lay of the outer strands in the rope. Lang lay ropes provide improved abrasion resistant properties when used on multiple rope reeving.

Two types of lay direction are possible. The lay direction is determined by the outer strands:

- zZ: right hand lang lay (fig. 11 a)
- sS: left hand lang lay (fig. 11 b)

Rope types

In the following parts the most common rope types will be explained. Please also read “Wire rope selection” to get additional information.
Single layer stranded ropes (fig. 12)

Single layer round strand ropes consists of several strands laid in one layer around a fibre or steel core. They are used e.g. for cranes, excavators, winches, construction machinery, elevators and as sling rope.

Rotation resistant ropes

Rotation resistant ropes designed to generate reduced levels of torque and rotation when loaded (fig. 13). Rotation resistant ropes generally comprise an assembly of at least two layers of strands laid helically around a core, the direction of lay of the outer strands being opposite of that of the underlying layer. To achieve an additional reduction of torque and rotation when loaded special rotation resistant ropes were designed and manufactured. Typical application for these special ropes are hoisting ropes for cranes working with only one fall and/or high lifting heights (fig. 14). Further information in “Wire rope selection”.

Parallel-closed stranded ropes (fig. 15)

Parallel-closed stranded ropes consist of at least two layers of strands laid helically in one closing operation around a core. The diminished gaps between the strands result in an enlarged metallic cross section and thus in higher breaking load values. They are used e.g. for cranes, excavators, construction machinery.

Low-stress ropes

If all internal stresses in the wires resulting from the manufacturing process have been completely or nearly eliminated the rope will be low-stressed. If seizing is removed strands remain in position. Wire breakages occuring during rope work do not protrude from the rope structure.

High performance compacted ropes

Generally the compacted ropes may be divided into:

- **Compacted strand stranded rope** (fig. 16 e)
  Rope in which the strands, prior to closing of the rope, are subject to a compacting process such as drawing, rolling or swaging. Fig. 16a, c shows the standard, fig. 16b, d the compacted strand.

- **Compacted (swaged) stranded rope** (fig. 16f)
  Rope which is subjected to a compacting (usually swaging) process after closing the rope, thus reducing its diameter.

The advantages of compacted ropes are: higher breaking load, better flexibility, smooth surface and a higher resistance to abrasion.
Ropes with plastic coated steel core (cushioned core rope) (fig. 17)
The interior structure of some of our special ropes is plastic coated. This structure is characterised by a number of improvements:
- reduced friction between rope core and outer strands
- high bending cycle strength
- high structural strength
- excellent vibration-resistant properties
- improved corrosion protection of the wire core

Surface treatment of wires/rope lubrication
The most common surface treatment for the wires of a rope are, either ungalvanized or bright (U), galvanized (B) and heavy galvanized (A). Ropes are lubricated during manufacturing process. The lubricant has two important functions. It reduces friction between the wires in the strand and the strands within the rope and thus supports the movements of the rope during running over sheaves or spooling on drums. In addition it protects from corrosion.

To maintain the positive characteristics of the base lubrication ropes have to be relubricated regularly.

Explanation of important terms
- **Nominal rope diameter**
The nominal rope diameter is a size which defines a rope in combination with other characteristics. Together with the tolerances the manufacturer or an existing standard provides, the range for the actual rope diameter can be determined.

- **Actual diameter** (fig. 18)
To measure the actual diameter it is important to do it the correct way. Only the measurement according fig. 18b will lead to the required result. The measurement according to fig. 18a is wrong.

- **Fill factor**
The fill factor is the relation of the metallic cross section of the rope to the area of its circumscribed circle.

- **Wire tensile strength grade (R)**
A level of requirement of tensile strength of a wire and its corresponding range. It is designated by the value according to the lower limit of tensile strength and is used when specifying wire and when determining the calculated minimum aggregate breaking force a rope, expressed in N/mm². Common tensile strength grades are 1770 N/mm², 1960 N/mm² and 2160 N/mm².

- **Spinning loss factor**
The spinning loss factor is a pragmatical value based on the breaking load loss of the wires during the spinning process.

- **Minimum breaking load (F_{min})**
The minimum breaking load of the rope is the product between nominal aggregate breaking load and the spinning loss factor. Most of the end terminations decrease minimum breaking load of the rope. Detail in “Rope end terminations”.
Wire ropes are divided into four main groups:

- **Slings**
  - are load handling ropes.
- **Track rope**
  - are used in cable ways.
- **Structural cables**
  - are ropes being anchored at two fixed points and do not run over sheaves or spool on a winch, e.g. guy and pendant ropes, suspension ropes.
- **Running ropes**
  - are ropes running above sheaves, drums or traction sheaves, e.g. hoist ropes, luffing ropes, elevator ropes, haulage ropes etc.

The most suitable rope for a given application is the one best able to withstand the conditions the rope will encounter in service. The correct choice for rope will not only decrease the danger and hazards for personnel and machine but will also help to prevent very expensive down time due to premature failure of ropes etc.

Avoid any risk, trust in our experience and assign this task to us. We are always ready to assist you in finding a solution or any special rope problem you may have, just contact us.

At the beginning of the wire rope selection the most important decision is: “Do I need a rotation resistant or a non-rotation resistant rope?”

**What is the difference between both rope types?**

**Rotation resistant ropes**

As explained in the part “Rope types” rotation resistant ropes designed to generate reduced levels of torque and rotation when loaded.

**Please note!** Ropes called “rotation resistant ropes” may have different levels of rotation resistance e.g. torque and rotation when loaded. To give you advise to the different rope properties we have separated the rotation resistant ropes into two classes:

1. **Rotation resistant ropes**
   - These are rope constructions, e.g. 18 x 7, 17 x 7 (fig. 13), with two layers of strands laid helically around a core, the direction of lay of the outer strands being opposite to that of the underlying layer.
   - **WARNING!** Don’t use these ropes attached to a swivel or have one or both ends rotate freely under load! If this is not observed serious injury, considerable damage or death will occur!

2. **High performance rotation resistant ropes** (fig. 14)
   - We indicate the higher quality of these ropes through adding the term “high performance”. The high performance resistant ropes have a steel core which is an independent rope, closed in the opposite direction to the outer strands. Today these ropes consist of 15 and more outer strands (fig. 19). Due to that, under load the core tries to twist the rope in the one direction (fig. 19a), the outer strands try at the same time to twist the rope in the opposite direction (fig. 19b). The result is, that high performance rotation resistant ropes almost compensate the torque over a particular load spectrum. Because of these excellent rope properties the high performance rotation resistant ropes are used with lifting heights and lifting unguided loads on a single fall. Up to now these ropes were also called “non-rotation ropes”.
   - The high performance rotation ropes can be used with or without a swivel; if possible, the use of a swivel is preferred.
Non-rotation resistant ropes

According to the rope properties “torque and rotation” non-resistant ropes generate high levels of torque when loaded. That is why both rope ends must be fixed when loaded to avoid rotation. Typical wire rope constructions are ropes ropes with e.g. 6-, 8-, 9- or 10-outer strands. Non rotation resistant ropes can be used, when the load is guided, in lifting systems where pairs of the right and left hand ropes are working or when having a low lifting height with more than one fall. Under these conditions the advantage of non-rotation resistant ropes – compared with rotation-resistant ropes in the same application – is, that these ropes achieve a higher service life.

WARNING! Don’t use these ropes attached to a swivel or have one or both ends rotate freely under load! If this is not observed serious injury, considerable damage or death will occur!

Right-hand or left-hand lay rope?

For the installation of ropes on winches there is the basic rule:
• Right-hand lay rope for a left drum
• Left-hand lay rope for a right drum

For the correct running of the rope it is necessary that drum and reeving will be of the same direction. If a rope runs from a right drum into a left reeving or from a left drum into a right reeving only a test can prove whether a left-hand or a right-hand lay rope must be installed.

By using multiple layer spooling systems we recommend to follow the above mentioned basic rule.

How to determine the correct rope lay direction?

• First step: Check how the rope runs from the drum into the reeving. There are two possibilities:
  – overwound drum (fig. 20 right)
  – underwound drum (fig. 20 left)

• Second step: Put your hand on the rope on the drum
  – Index finger shows in the direction of the rope running into the reeving
  – Thumb shows to the rope fix point on the drum

• Third step: Decision
  – If you need your left hand to fulfill the requirements of the second step, then you need a left-hand rope (fig. 20 top figures).
  – If you need your right hand to fulfill the requirements of the second step, then you need a right-hand rope (fig. 20 lower figures).

Product safety

Our basic information in this brochure provides guidance on product safety. It is produced for those already having knowledge of wire ropes, as well as for new users. Please pass the basic information on to others.

Read it carefully, understand and practice these instructions, also read and understand the machinery manufacturer’s manual. If these are not observed serious injury, death or considerable damage can occur! Protect yourself and others!

WARNING! Wire rope will fail if worn-out, shock loaded, over-loaded, misused, damaged, improperly maintained or abused.

Always inspect wire rope before use for:
• wear
• damages
• deformations
• corrosion

Never use wire rope which is
• damaged
• worn-out
• deformed
• improperly maintained
• not suitable

If in doubt about the wire rope, the wire rope application, the wire rope end termination or anything else, regarding the wire rope, please contact us or the machine manufacturer.
Rope designations

1. Hoisting rope
2. Pendant rope
3. Luffing rope
4. Trolley rope
5. Closing rope
6. Winch rope
Steel wire rope end finishing

In most cases a steel wire rope manufactured on a master reel is not ready to be put to work. A rope must be cut to size and the rope ends finished to enable the rope to fulfill its task.

Not only the correct rope selection, but also a properly fitted rope end terminations is necessary to achieve safe and satisfactory service life.

PFEIFER has a very skilled work force and our employees are educated and trained in the specialised field of rope end finishing.

Commonly there are three ways of rope end finishing

- Cutting to size and seizing or fusing of rope ends
- Forming a loop in the rope
- Attaching a fitting to the rope

PFEIFER’s facilities are fitted with precision working equipment to ensure high quality ready for use ropes.

Coiling and cutting to size: a stock arrangement for effective rope finishing ensures short processing time (fig. 21).

Rope end seizing: seizing of rope ends avoids loosening of the rope structure. Firm seizing is absolutely necessary for rotation resistant ropes as they are not preformed (fig. 22).

Cutting of ropes (fig. 23)

Fusing: we can taper and fuse rope ends up to a rope diameter of 34 mm. Larger diameters, the rope ends will be welded. Such end treatment simplifies the mounting of ropes on winches or in open wedge sockets. (fig. 24)

Swaging: aluminium ferrules or steel fittings are cold bonded to the wire rope under extremely high pressure. Two presses, with a pressing force of 3000t each, enable us to swage steel wire ropes up to 80mm diameter. Swaging reduces the minimum breaking load of ropes.

Casting: is the end finishing of a rope where there is no reduction of the minimum breaking load. For casting the most common used materials are zinc or resin. Two socketing towers with 5 socketing boxes each, allow short processing time with a large number of ropes. In our plant ropes up to 120mm diameter have already been tilted with sockets. PFEIFER is very experienced in casting rope fittings either in our facilities or on site (fig. 26).

Pre-stressing: to achieve exact rope lengths under specified working conditions, it is necessary to pre-stress ropes with a determined load. A pre-stressing machine with a capacity rating of 6000 kN (in high precision class 1) and a pre-stressing tunnel with a length of 240 meters, enable us to do various elongation-, tensile – and breaking tests (fig. 27).

Testing: only a test of the rope fitted with the required end terminations will qualify the produced quality. Regular testing is necessary to guarantee a continuos high quality (fig. 28).
Most rope end terminations reduce the breaking force of the rope system significantly. As an approximate value, we give you the remaining value of the minimum breaking force as a percentage of the minimum breaking force of the rope according to the following table.

<table>
<thead>
<tr>
<th>Rope Termination</th>
<th>Remaining Value</th>
<th>Minimum Breaking Force</th>
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</thead>
<tbody>
<tr>
<td>Cast open spelter socket</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td>Flemish eye</td>
<td>90%</td>
<td>90%</td>
</tr>
<tr>
<td>Swaged eye</td>
<td>90%</td>
<td>90%</td>
</tr>
<tr>
<td>Swaged thimble</td>
<td>90%</td>
<td>90%</td>
</tr>
<tr>
<td>Swaged solid thimble</td>
<td>90%</td>
<td>90%</td>
</tr>
<tr>
<td>Swaged fork end thimble</td>
<td>90%</td>
<td></td>
</tr>
<tr>
<td>Rope clamp acc. EN 13411-5***</td>
<td>80%</td>
<td></td>
</tr>
<tr>
<td>Spliced eye</td>
<td>80%</td>
<td>80%</td>
</tr>
<tr>
<td>Spliced thimble</td>
<td>80%*</td>
<td>80%</td>
</tr>
</tbody>
</table>

* with spliced terminations in some cases, a reduction of the tensile strength of up to 40% may occur. This depends on the rope construction and the rope diameter.

** These terminations are only for use with full steel wire ropes (with steel core).

*** the use of wire clamps with compacted wire ropes is not described by the standard and should therefore be avoided!

**WARNING:**
These data define the ideal case. That means that the in rope system used rope end terminations (especially casting sockets, fittings and open wedge sockets) must fit in design and material quality regarding the used rope type (construction, nominal strength, compacted / uncompacted). If in doubt, the system breaking force needs to be determined by type testing through tensile testing.

**WARNING:**
Make long splices according DIN 3089 section 2. Please note that by splicing wire ropes with a steel core, the metallic cross section is to be reduced by the core!
Correct handling of wire ropes

Spooling of wire ropes

Correct:
Lay wire rope rings on clean ground. Please consider the preferred bending direction when rewinding the rope.

Correct:
Place reel on a suitable frame or spike, draw-off straight. Make absolutely sure that the rope is not fouled.

Wrong:
Drawing-off the rope of a ring or over the flange of the reel as well as counterwise spooling cause “twist” for each winding in the rope. Loops may occur, which may result in bends under tension.

STOP!
Storage and transport of wire ropes

Correct:
Store wire ropes dry and cool. Avoid ground contact, so that humidity cannot taper the rope. Take off air and water tight transport packing. Humidity causes oxidation.

Correct:
Protect the rope of crushes and kinks.

Wrong:
Improper transportation of wire rope reels and rings will cause irreparable damage to wires, strands or the rope structure.

Wrong:
The squeezing of ropes with wooden beams or similar items cause irreparable damage to the rope structure.

Applying of pretension in the multiplayer spooling

Correct:
The reel is braked mechanical at the flange of the reel.
Discard

Warning: Considering security crane ropes should be taken off operation in time, if one of the following criterias apply:

- Broken strand
- Local concentration of wire breaks
- Achievement of type and number of wire breaks according to the tablets
- At least two wire breaks in strand valley or adjacent strands within one lay length (approx. 6 × d)
- Corkscrew deformation of more than 1/10 of the rope diameter (g/d ≥ 0,1); d: nominal rope diameter, g: height of waviness
- Corkscrew (fig. 30)
- Hairpin like escape of wires (fig. 31)
- Decrease of diameter – regarding the nominal rope diameter – at uniform decrease of:
  - 7.5% at non-rotation resistant ropes with steel core
  - 5.0% at rotation resistant ropes
- Local increase of diameter of more than 5% compared with the diameter of the rest of the rope
- Heavy corrosion: The surface of the wires is strongly affected or rosty dust comes out of the rope
- Loose rope structure (fig. 32)
- Constriction (fig. 33)
- Kinks or flattened areas (fig. 34 + 36)
- Bends or other deformations (fig 35)
- Bluish discoloration, broken or fused wires due to heat effects or electric arc

If several of the above mentioned criterias apply, they need to be considered in their entirety. Therefore ropes need to discarded, if none of the criteria are completely but some partially fulfilled. For example: Light Corkscrew with some broken wires.

The above criteria are an excerpt from the ISO 4309-2010 maintenance and care, inspection and storage. Consequently, these criteria do not replace the instructions and requirements for inspection and maintenance of wire ropes as written in the standard.

If in doubt on the estimation of the cable damage, the rope must be discarded or your rope specialist needs to be contacted: wireropes@pfeifer.de or via phone +49 (0) 83 31-937-267.
Approved rope quality

- Be aware that not only the usual catalog values such as weigh/length and minimum tensile strength determine the wire rope property PFEIFER is analyzing all properties of the wire rope with extensive tests.
- Equipped with this knowledge we can choose the optimum wire rope for your application.

Testing machines to determine the bending strength.

Testing facility for measuring the resistance against lateral pressure.

37 m high test tower to analyze the suitability in the multilayer spooling.

Different applications require different qualities of corrosion protection.

Many available galvanization qualities do not meet the requirements of individual applications.

We are one of few providers which can test the galvanizing quality in in-house laboratories and fulfill exceptional customer needs.

We are authorized to issue certificates for all kind of ropes. These certificates document that regulatory requirements are in place to the standards.

Upon request we provide for example test reports, inspection certificates, certificates of Germanischer Lloyd and manufacturer declarations.
Measurement devices

Based on our long-term practical experience of rope drive inspection, we created the following measurement devices kit. These measurement devices are used by our rope experts for each inspection and thereby approved for general use.

**Measurement equipment case 75**

**Content:**
- Rope caliper 75
  - Made of galvanized steel with attached wide jaws
  - Recommended for the frequent measuring of ropes in the most common diameters
- Rope diameter
  - 5–28 mm, 12–45 mm, 21–60 mm, 5–60 mm
- Further combinations of the 5 different groove gauges kits on request

**Product advantages**
- Stellen Sie sich Ihren Messmittelkoffer nach Ihren Bedürfnissen zusammen!

**Rope caliper 150**

**Content:**
- Rope caliper 150
  - With attached extra wide jaws and adapter plates for big rope diameters
- Groove gauges “Bolt” with 5 kits (see picture measurement equipment case 75)

**Product advantages**
- The complete measurement equipment case for the frequent professional groove inspection!

**Ring**

**Stainless steel**

**Rope diameter**
- 5–20 mm, 20–40 mm, 40–60 mm, 60–75 mm

**Product advantages**
- Recommended for the frequent check of rope drives with the most common rope diameters

**Propeller**

**Stainless steel**

**Rope diameter**
- 15 mm, 20 mm, 24 mm
- Further sizes on request

**Product advantages**
- Recommended for the frequent check of rope drives with a specific diameter

**Measurement equipment case 150**

**Content:**
- Rope caliper 150
- Groove gauges „Bolt“ with 5 kits (see picture measurement equipment case 75)
- Rope diameter
  - 5–60 mm

**Product advantages**
- The complete measurement equipment case for the frequent professional groove inspection!

**Rope caliper 40**

**Product advantages**
- With attached wide jaws

**Product advantages**
- Recommended for frequent measurement of ropes with the most common diameters up to 40 mm
- Enables quick and easy check – wide jaws reduce measuring faults

**Rope service – starter kit**

**Content:**
- 2x PFEIFER RL-S Wire rope lubrication Spray can
- 1x Groove-gauge-Kit Worker
- 1x Pair gloves
- 1x Rope caliper 40
- 1x Yard stick
- 1x Steel wire brush

**Product advantages**
- Allows quick and easy control as well as professional care of your wire ropes
### Wire rope accessories

<table>
<thead>
<tr>
<th><strong>Fittings</strong></th>
<th><strong>Open and closed spelter socket</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Fittings are manufactured using special steel and are swaged directly onto the rope end. Therefore you get a thin rope end termination, which is fitted by means of drilling. Threaded fittings are to be fixed securely and non-rotatable.</td>
<td>Rope ends are cast in open spelter sockets and closed spelter sockets.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Closed swaged fitting</strong></th>
<th><strong>Open swaged fitting</strong></th>
<th><strong>Swaged thread fitting</strong></th>
</tr>
</thead>
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<tr>
<th><strong>Open wedge socket</strong></th>
<th><strong>Solid and fork thimbles</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>The wedge socket is a close-end-fitting which is commonly used on cranes.</td>
<td>PFEIFER can supply solid thimbles and forked end thimbles which are used to join. DIN 3091 solid thimbles are drilled to a specific diameter.</td>
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<tr>
<th><strong>Thimble</strong></th>
<th><strong>Lubrication</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Thimbles protect the rope eyes and increase the life-time expectancy of the rope considerably.</td>
<td>Steel wire ropes need to be regularly lubricated to maximize service life.</td>
</tr>
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<th><strong>Shackle</strong></th>
<th><strong>Open wedge socket</strong></th>
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<tbody>
<tr>
<td>Shackles are universal accessories and have a wide range of applications. The two types of shackles which can be supplied are ‘D’ shackles and bow shackles fitted with screw bolts or bolt, nut and split pin.</td>
<td>The wedge socket is a close-end-fitting which is commonly used on cranes.</td>
</tr>
</tbody>
</table>

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<tr>
<th><strong>Warning:</strong> Don’t use non-rotation resistant or rotation resistant ropes with a swivel! If this is not observed serious injury, considerable damage or death will occur!</th>
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<tr>
<th><strong>Pouch socket system</strong></th>
<th><strong>Swivel</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Fast and safe re-reeving of wire ropes with the PFEIFER pouch socket system.</td>
<td>Swivels are to be used with high performance rotation resistant ropes only. Swivels rotate under load and can compensate torsion in hoisting ropes. The ends can be supplied with forks and with eyes.</td>
</tr>
</tbody>
</table>

| **Warning:** Don’t use non-rotation resistant or rotation resistant ropes with a swivel! If this is not observed serious injury, considerable damage or death will occur! |
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  and additional test service centres in Mannheim and Munich

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