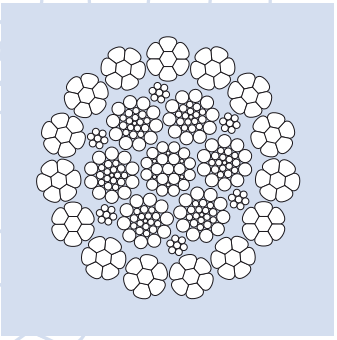
PFEIFER



03/2018

PFEIFER –
Your specialist for ropes for mobile and crawler cranes

PFEIFER
SEIL- UND HEBETECHNIK
GMBH

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E-MAIL wirerope@pfeifer.de
INTERNET www.wirerope.info

Innovative wire rope systems for mobile and crawler cranes

Moving means to set things in motion, to unfold dynamics, to create things. For us in the PFEIFER group, to move is very specific: it means that with our products from Wire Rope Technology, Rope and Lifting and Building Systems elevators, heavy loads on cranes, sheet metal coils, workpieces and precast concrete elements move. Our cable structure buildings are known all over the world, and so is our extensive knowledge on the dynamics of wire rope in all applications.

Moving also means for us that we don't sit still, we study, we learn, we apply and we invest. There is a reason why the PFEIFER group is one of Europe´s leading companies in Structures, Wire Rope Technology, Rope and Lifting and Building Systems.

We get things going – special requests by customers, efficient and practical solutions, technical expertise, quality and dependable service – these are the benefits for you as a partner.

Gerhard Pfeifer,
President of the PFEIFER group

The PFEIFER group is one of Europe´s leading companies in Structures, Wire Rope Technology, Rope and Lifting and Building Systems. The head-quarters are located in Memmingen, Germany. Numerous service centres and subsidiaries worldwide are responsible for sales and distribution.

Ropes ready to use for cranes and construction machinery are our strength for years. We are the original equipment manufacturer of well-known construction machinery manufacturers, e.g. Liebherr, and have the comprehensive know-how in production and application of crane and construction machinery ropes.

The choice of a specific rope construction of our very extensive portfolio of ropes for your machine requires the special application- and rope-know-how of our consultants, because of the dependence on crane system, operation conditions and abrasion behaviour of the ropes.

Our complete documentation guarantees you traceability for all operations.

We guarantee rapid availability with our fully automatic high rack storage in Memmingen with a capacity of more than 4000 tons and further storages worldwide. Professional logistic partners ensure quick delivery.

Reduce every risk and trust in our longtime experience of correct rope selection!

➜ Further infomation can be found under Products & Services at the PFEIFER web portal:
www.pfeifer.info/building-construction

Content

General information

Requirements in wire ropes of mobile and crawler cranes

Hoisting ropes

High rope speeds, small winch dimensions, as well as large hoisting heights are complex challenges, which require wire ropes with special properties. The resistance in multi-layer spooling plays a decisive role. The choise of the right end-termination is of high importance. We will be pleased to advise you!

Luffing ropes

Large rope tension and multiple reeving require special ropes. Therefore characteristic of our luffing ropes is for example the excellent performance during the boom set up.

Pendant ropes

Only by production with high dimensional accuracy and by the use of special wire ropes with high breaking forces the specific demands on pendant ropes in mobile and crawler cranes can be reached. We set ourselves this challenge everyday.

PFEIFER added value advantage

- Complete documentation and traceability
- High availability
- Attractive price
- Own material test centre
- Comprehensive stock

PFEIFER analyses all properties of wire ropes and applied materials with extensive tests to choose the right wire rope for your application and to optimize the lifetime in your equipment.

Reduce every risk and trust in our longtime experience in choosing the right ropes!

Ropes for mobile cranes

PFEIFER

Hoisting ropes

Extract from our in stock rope range

Liebherr

Type of crane	Rope diameter in mm	Rope length in m	ID-No. manufacturer
LTM1030-2	13	150	10491443
LTM1040-2	13	165	10491445
LTC1055-3	15	185	10333180
LTM1055/1	15	220	10021476
LTM1040/1	16	150	773432908
LTM1050	17	180	773433008
LTM1060/2	17	200	10097306
LTM1080/1	17	245	773462408
LTM1090-4.	17	260	10290691
LTM1100/2	21	205	10354025
LTM1160-5.	21	250	11101843
LTM1160/2	23	300	773432608
LTM1200/1	23	280	10041944
LTM1220	23	350	10285056
LTM1250/1	23	360	10044178
LTM1350-6.	23	350	11160451
LTM1400	25	775	10358945
LTM1500	25	620	10045079
LTM 1750-9.1	25	700	11834083
LR 1100/1130/1160/1200	26	420	790517414
LR 1280/1300	28	665	790517214
LR 1350	25	600	10651633
LR 1400	25	750	10097605
LR 1600/2	28	1100	11820301
LR 1750	28	1250	10218816
LR 1750	28	1300	10114967

Terex

Type of crane	Rope diameter in mm	Rope length in m
AC 100	18	265
AC200-1	21	345
AC 250	23	380
AC 350-6	23	380
AC 500-2	24	600
AC700	26	550
CC1800	26	650
CC2000-1	26	1020
CC2500	26	830
CC2600	28	850
CC2800-1	28	900

Hoisting ropes

Extract from our in stock rope range

Faun

Type of crane	Rope diameter in mm	Rope length in m
RTF 40-3	16	160
RTF 50-4	16	200
ATF 60-4	16	170
ATF 70-4	18	200
RTF 80-4	18	200
ATF 90-4	18	200
ATF 100-5	21	250
ATF 120-5	21	250

Manitowoc

Type of crane	Rope diameter in mm	Rope length in m
GMK2035	13	135
GMK3050	16	150
GMK4100	16	220
GMK5095	17	255
GMK5115	17	255
GMK5120	19	255
GMK5165	19	255
GMK5175	19	300
GMK5170	22	290
GMK5225	22	290
GMK5275	22	290
GMK5240	22	300
GMK6300	24	300
GMK6350	24	300
GMK6400	24	380
GMK7550	24	460

Further manufacturers

- Kobelco
- Link Belt
- Manitex
- Palfinger
- XCMG
- Sany
- Zoomlion
- and further manufacturers

Detailed handling constructions you will find in our operating manual for stranded ropes in the PFEIFER download centre at:

➜ **www.pfeifer.info/manual-strand-ropes**

Luffing ropes

Extract from our in stock rope range

Liebherr

Type of crane	Rope diameter in mm	Rope length in m
LR 1130/60	24	240
LR 1200	24	268
LR 1280/1300	24	435
LR 1350	25	850
LR 1400	25	750
LR 1750	28	750
LR 1600/2	28	1200

Terex

Type of crane	Rope diameter in mm	Rope length in m
CC1800	26	
CC2000-1	26	700
CC2500	26	700
CC2600	28	870
CC2800-1	28	865

Further manufacturers

- Kobelco
- Link Belt
- Manitex
- Palfinger
- XCMG
- Sany
- Zoomlion
- and further manufacturers

Detailed handling constructions you will find in our operating manual for stranded ropes in the PFEIFER download centre at:

→ **www.pfeifer.info/manual-strand-ropes**

Extract from our in stock rope range

PFEIFER

Different manufacturers

Trust in our experience and let us advice you!

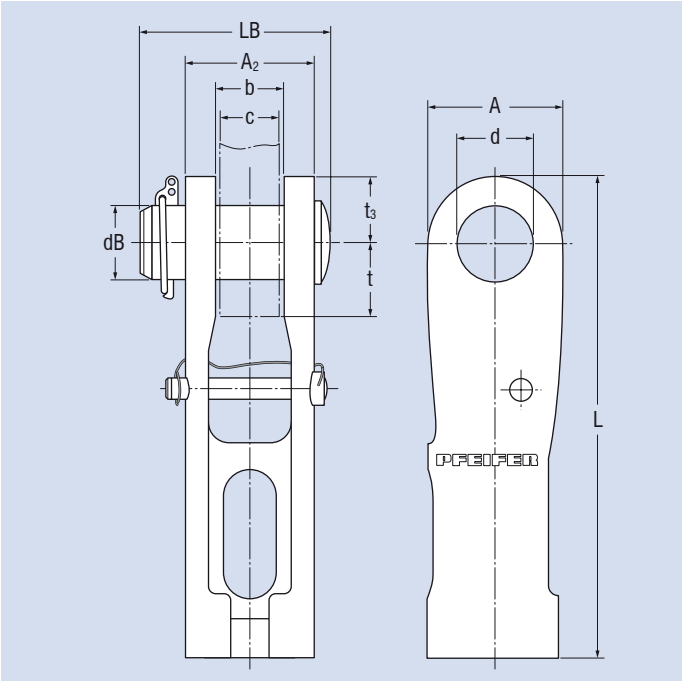
Detailed handling constructions you will find in our operating manual for stranded ropes in the PFEIFER download centre at:

→ **www.pfeifer.info/manual-strand-ropes**

Special end terminations on request

Pouch Socket PSH

22A



Technical data

Material bolt	Quenched and tempered steel
Surface bolt	Plasma nitrided
Material housing	Cast steel (cold resistant to -40 °C)
Surface housing	Hot-dip galvanised or painted
Surface hinged safety pin	zinc-plated

Application area

Round strand ropes

Combination products

Swivel PSH 42A
Swivel 96A
Swaged sleeve rotary locked PSH 12A
Resin Socket PSH 13A
Resin Socket rotary locked PSH 14A
Swaged Sleeve PSH 11A

Don't use non-rotation resistant and rotation resistant ropes with a turnable fixed point (e. g. swivel). The end termination has to be fixed against rotation as well. If this is not observed considerable damage, serious injury or death will occur.

Reference no.	NG	ds	A	A_2	b	d	dB	LB	L	t_{max}	t_3	c max	WLL	Weight
		mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	kN	kg
237744	16	14 – 16	58	60	32	31,5	30	97,75	246,5	57,5	29	31	85	2,81
237745	19	17 – 19	70	72	38	36,5	35	114,75	285,5	62,5	35	37	120	4,68
237746	22	20 – 22	80	83	45	42,5	41	128,75	310,5	67,5	40	44	160	4,68
237747	26	23 – 26	95	95	51	51,5	50	148,75	357	72,5	47,5	50	220	10,84
237748	29	27 – 29	107	107	57	58,5	57	163,75	398	77,5	53,5	56	275	15,55
237749	32	30 – 32	120	120	63	65	63,5	179,75	436,5	82,5	58,82	62	335	21,81
237750	36	33 – 36	134	134	70	75	73,5	202,25	487	90	67	69	425	29,74
237751	40	37 – 40	150	150	77	82,5	81	221,75	543	100	75	75	520	42,29
237752	44	41 – 44	165	165	85	86,5	85	241,75	545,5	110	82,5	83	630	55,93
237753	48	45 – 48	180	180	94	91,5	90	262,25	659	120	90	92	755	71,39
237754	52	49 – 52	196	196	104	96,5	95	281,75	710	130	98	102	885	90,09
273711	56	53 – 56	213	213	115	101,5	100	304	771,5	140	106,5	112	1025	116,6
272359	60	57 – 60	233	233	127	106,5	105	314	828,5	150	116,5	124	1180	150

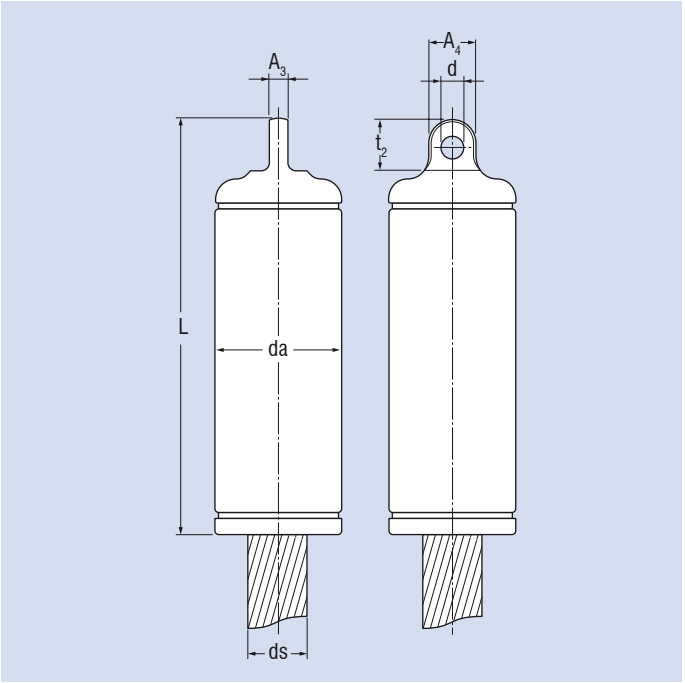
Please note that these are castings with tolerances. Detailed measurements on request!

Dimensions correspond to nominal sizes without tolerance and without coating. Please contact us for exact measurements!

Swaged Sleeve PSH

11A

Pouch socket systems



Technical data

Material	Stainless steel (rustproof, cold resistant to -45 °C)
Surface	Plain
Nominal tensile strength	≤ 2160 N/mm²
Loss factor	0,9

Fill factor range

Fill factor f	0,64...0,78

Application area

High performance rotation-resistant ropes

Combination products

Pouch Socket PSH 22A

Don't use non-rotation resistant and rotation resistant ropes with a turnable fixed point (e. g. swivel). The end termination has to be fixed against rotation as well. If this is not observed considerable damage, serious injury or death will occur.

Reference no.	NG	ds	A_3	A_4	da	da Tol	d	L	L Tol	t_2	Weight
		mm	mm	mm	mm	mm	mm	mm	mm	mm	kg
214369	16	14	10	24	36	+0,4	12	116	+2	24	0,66
214372	16	15	10	24	36	+0,4	12	116	+2	24	0,6
214286	16	16	10	24	36	+0,4	12	116	+2	24	0,5
214374	19	17	10	24	44	+0,4	12	135	+2	24	1,2
214377	19	18	10	24	44	+0,4	12	135	+2	24	1,1
214386	19	19	10	24	44	+0,4	12	135	+2	24	1
214388	22	20	10	24	48	+0,4	12	154	+3	26	1,6
214398	22	21	10	24	48	+0,4	12	154	+3	26	1,5
214400	22	22	10	24	48	+0,4	12	154	+3	26	1,4
214409	26	23	10	24	56	+0,6	12	181	+4	26	2,6
214408	26	24	10	24	56	+0,6	12	181	+4	26	2,6
214405	26	25	10	24	56	+0,6	12	181	+4	26	2,5
214148	26	26	10	24	56	+0,6	12	181	+4	26	2,5
214410	29	27	10	24	62	+0,6	12	202	+4	28	3,6
214128	29	28	10	24	62	+0,6	12	202	+4	28	3,4
213983	29	29	10	24	62	+0,6	12	202	+4	28	3,2
214417	32	30	10	24	68	+0,6	12	220	+4	28	4,9
214413	32	31	10	24	68	+0,6	12	220	+4	28	4,7
212709	32	32	10	24	68	+0,6	12	220	+4	28	4,5
214421	36	33	10	24	78	+0,8	12	252	+4	28	7,7
214420	36	34	10	24	78	+0,8	12	252	+4	28	7,4
214419	36	35	10	24	78	+0,8	12	252	+4	28	7,1
213984	36	36	10	24	78	+0,8	12	252	+4	28	6,8
229694	40	37	16	40	86	+0,8	20	280	+5	40	9,3
229695	40	38	16	40	86	+0,8	20	280	+5	40	9
229696	40	39	16	40	86	+0,8	20	280	+5	40	8,7
229697	40	40	16	40	86	+0,8	20	280	+5	40	8,4

Dimensions correspond to nominal sizes without tolerance and without coating. Please contact us for exact measurements!

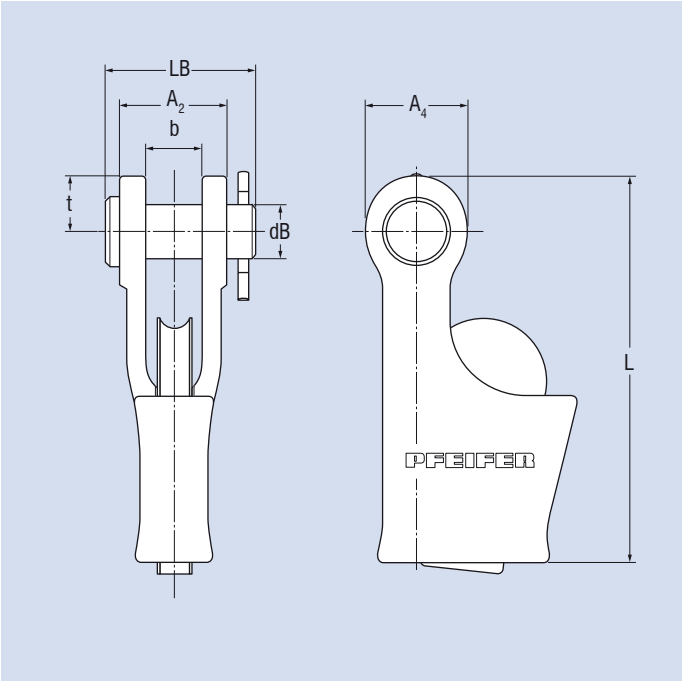
Rope end terminations

Special end terminations on request

Open wedge socket PSH

95A

Clamps



Technical data

Material bolt	Quenched and tempered steel
Material housing	Cast steel (cold resistant to -40 °C)
Surface housing	Hot-dip galvanised
Material wedge	Cast steel (cold resistant to -40 °C)
Surface wedge	Hot-dip galvanised
Loss factor	0,8

Application area

Round strand ropes

Combination products

Pouch Socket LH 570/85A
Swivel Pouch Socket LH 571/86A

Don't use non-rotation resistant and rotation resistant ropes with a turnable fixed point (e. g. swivel). The end termination has to be fixed against rotation as well. If this is not observed considerable damage, serious injury or death will occur.

Reference no.	NG	ds	A_2	A_4	b	dB	LB	L	t	WLL	MBL	Weight
		mm	mm	mm	mm	mm	mm	mm	mm	kN	kN	kg
289721	8 / 7	7	36	36	18	16	52	130	18	20	70	0,8
289720	8 / 8	8	36	36	18	16	52	130	18	20	70	0,8
270717	10 / 9	9	42,5	40	20,5	21	59,5	145	22	35	110	1,2
270733	10 / 10	10	42,5	40	20,5	21	59,5	145	22	35	110	1,2
270718	13 / 11	11	50	50	25	26	71	180	27	55	185	2,6
270734	13 / 12	12	50	50	25	26	71	180	27	55	185	2,6
270735	13 / 13	13	50	50	25	26	71	180	27	55	185	2,6
270719	17 / 13	13 – 14	60	58	32	30	85	225	31	95	316	4,7
270736	17 / 15	15 – 16	60	58	32	30	85	225	31	95	316	4,7
270737	17 / 17	17	60	58	32	30	85	225	31	95	316	4,7
270720	19 / 16	16 – 17	72	67	38	35	99	255	36,5	120	395	6,5
270738	19 / 18	18 – 19	72	67	38	35	99	255	36,5	120	395	6,5
270721	23 / 19	19 – 20	83	80	45	41	115	300	44	170	580	9,8
270739	23 / 21	21 – 23	83	80	45	41	115	300	44	170	580	9,8
270722	26 / 23	23 – 24	96	96	51	50	129	330	53	220	740	14,5
270741	26 / 25	25 – 26	96	96	51	50	129	330	53	220	740	14,5
270724	29 / 27	27 – 29	107	108	57	57	145	375	59	275	920	20
270726	33 / 30	30 – 31	120	115	63	63,5	159	425	63,5	355	1190	31
270728	33 / 32	32 – 33	120	115	63	63,5	159	425	63,5	355	1190	31

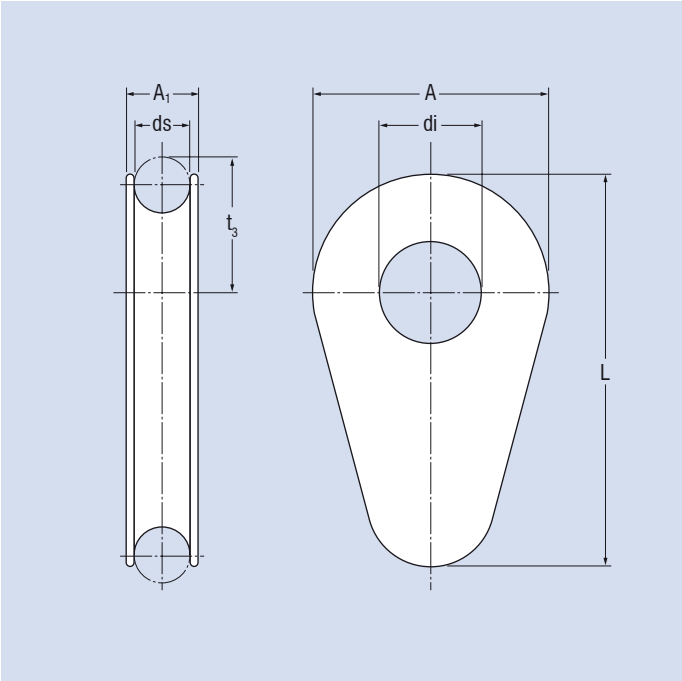
Additional sizes on enquiry.

Dimensions correspond to nominal sizes without tolerance and without coating. Please contact us for exact measurements!

Special end terminations on request

PFEIFER

Solid thimble PSH
519



Technical data

Material	Cast steel (cold resistant to -40 °C)
Surface	painted

Application area

Round strand rope pressed acc. to EN 13411-3

Combination products

Pin 518 P
Swaged fork thimble PSH 518
Ferrule acc. to EN 13411-3 510
Safety spring 518 S

Don't use non-rotation resistant and rotation resistant ropes with a turnable fixed point (e. g. swivel). The end termination has to be fixed against rotation as well. If this is not observed considerable damage, serious injury or death will occur.

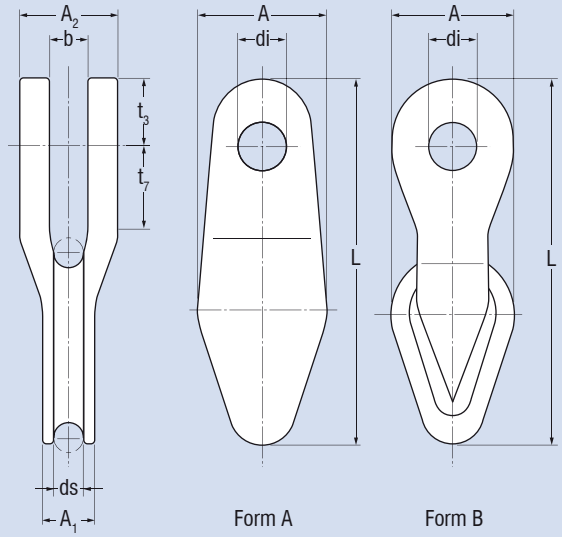
Reference no.	NG	ds	A	A_1	A_1 Tol	di	di Tol	L	t_3	WLL	Weight
		mm	mm	mm	mm	mm	mm	mm	mm	kN	kg
149743	16	14 – 16	65	23	–2	29	+1,5	105	41	95	0,53
221033	19	17 – 19	77	30	–2	36	+1,5	129	49	135	1,21
111286	22	20 – 22	88	29	–2	41	+1,5	151	56	180	1,32
111289	27	23 – 27	104	36	–2 / +1	51	+1,5	186	70	270	2,17
111293	31	28 – 31	118	40	–2 / +1	57	+1,5	205	79	350	2,88
111298	36	32 – 36	132	44	–2 / +1	62	+1,5	227	88	475	3,86
111303	42	37 – 42	168	52	±2	67	+1,5	260	112	620	7,28
159823	49	43 – 49	186	60	±2	72	+1,5	296	118	795	11,14
111306	60	50 – 60	222	70	±2	72	+1,5	352	132	1200	16,66
221046	68	61 – 68	252	80	±2	82	+1,5	407	152	1650	24,3

WLL = maximum payload
Safety factor = 3,0

Dimensions correspond to nominal sizes without tolerance and without coating. Please contact us for exact measurements!

Special end terminations on request

Swaged fork thimble PSH
518



Technical data

Material	Cast steel (cold resistant to -40 °C)
Surface	painted or galvanised

Application area

Round strand rope pressed acc. to EN 13411-3

Combination products

Solid thimble PSH 519
Pin 518 P
Ferrule acc. to EN 13411-3 510
Safety spring 518 S

Don't use non-rotation resistant and rotation resistant ropes with a turnable fixed point (e. g. swivel). The end termination has to be fixed against rotation as well. If this is not observed considerable damage, serious injury or death will occur.

Reference no.	NG	ds	A	A_1	A_1 Tol	A_2	b	b Tol	di	di Tol	L	t_3	t_7	WLL	Weight
		mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	kN	kg
111243	16	14 – 16	74	28	+5	58	24	+1	29	+1,5	210	39	50	95	2,5
111248	19	17 – 19	84	32	+5	64	31	+1	36	+1,5	251	44	55	135	3,52
111253	22	20 – 22	92	36	+5	82	32	+1	41	+1,5	282	56	60	180	6,08
199269	27	23 – 27	108	42	+6	91	38	+2	51	+1,5	330	60	80	270	9,64
201710	31	28 – 31	124	48	+7	104	42	+3	57	+1,5	386	73	100	350	13,7
111263	36	32 – 36	138	52	+7	117	46	+3	62	+1,5	432	79	110	475	19,71
111266	42	37 – 42	151	54	+7	105	55	+3	67	+1,5	524	105	130	620	22,42
230205	49	43 – 49	190	60	+7	115	65	+3	72	+1,5	582	111	145	795	27,1
111270	60	50 – 60	222	73	+7	135	75	+3	72	+1,5	681	140	160	1200	40
111274	68	61 – 68	262	80	+7	145	85	+3	82	+1,5	833	170	220	1650	67

WLL = maximum payload
Safety factor = 3,0
NG 14 to 36: Form A, NG 37-68: Form B
Dimensions correspond to nominal sizes without tolerance and without coating. Please contact us for exact measurements!

Innovative packaging solutions

PFEIFER-reels and PFEIFER-stands for reels – the perfect combination for your ropes:

- Optimized packaging sizes
- Simplified transport – to be taken by forklift
- Stands for reels are gently for reels and ropes
- Prevention of transport mistakes and resulting damages
- Heat treatment according to ISPM 15

Further possibilities of packaging of ropes on reels:

- Planked reels
- Seaworthy packing

- Depending on your needs we can pack your ropes in wooden boxes according to ISPM 15.
- Of course we follow your special requirements as well.
- All our shipments are insured to provide maximum customer service.

Further products and services

Rope accessories

Connecting links

For fast and simple connection and fastening options of steel wire ropes

Available in various versions

Swivels

To avoid the rope torque being transmitted to the load and thus causing great damage

Bolts

For fast and stable securing in the most diverse areas of application

Manual strand ropes

Detailed manual for the proper use of your strand ropes with useful tips to extend the rope lifetime

Further languages on request

Included in each Rope Service Starter Kit and the measurement equipment cases 75/150 or available as PDF in the PFEIFER download centre at:

→ **www.pfeifer.info/manual-strand-ropes**

Rope service and rope handling

Rope lubrication RL-S & RL-B

Product		Part.-No.
12 x Spray	600 ml	245066
Bucket	10 l	212406
Bucket	30 l	212405

Maintain your wire ropes with the proper re-lubricant and extend the lifetime.

Save costs for new ropes and rope changes by extended lifetime.

We can offer re-lubricating large rope lengths using a special re-lubrication device. Our service team comes to you worldwide and saves you cost intensive trips with your crane.

Rope measurement

- Groove gauges
- Caliper gauges
- Sets

Use our special measurement devices from the rope specialist to reduce costs by extending the lifetime.

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

Tools for working on ropes

- Crimping pliers
- Wire rope cutter

So that you can also easily carry out minor work on ropes, PFEIFER offers you a selection of different tools for working on ropes.

Rope assembly aids

- Winding blocks
- Rope tensioning clamps
- Cable grips

PFEIFER rope assembly aids assist you reliably in the attachment and replacement of your steel ropes.

Innovative packaging solutions

- Reels
- Stand for reels

PFEIFER-reels and PFEIFER-stands for reels – the perfect combination for your ropes:

- Optimized packaging sizes
- Simplified transport – to be taken by forklift
- Stands for reels are gently for reels and ropes
- Prevention of transport mistakes and resulting damages
- Heat treatment according to ISPM 15

Rope services

Rope assembly

PFEIFER is expert in all kinds of rope assembly – from the high-precision manufacturing of the finest ropes for medical technology to the precise cutting to length of crane hoisting ropes and the casting of ropes with the largest of diameters.

Rope application consultancy

Through the correct selection of ropes and end connections to suit the conditions of use you can achieve the most economical lifetime, reduce possible dangers and avoid high failure costs.

End connection design

Standard or tailor-made – through our own development and production every rope receives the optimal connection.

Repair service

Steel wire ropes are subject to wear in tough continuous use and can be damaged by external influences. PFEIFER offers you a rope repair in original rope quality at your premises.

Rope stocking

PFEIFER guarantees fast availability in one of the industry's largest stock assortments and a capacity of well over 4000 tonnes in a fully automatic rope warehouse in Memmingen and in further warehouses all over the world. High-performance logistics partners guarantee fast delivery. Thanks to optimised packaging, every reel reaches its destination worldwide well protected.

Rope inspection

After the delivery of the optimum rope we support our customers and are happy to assist with all questions regarding the rope application.

We analyse optimization potentials at rope winches and drives, check ropes for damages and abrasion to extend the lifetime and reduce rope change and down time costs.

We do this job on a daily basis – worldwide.

Technical rope seminar

Interested in a seminar at your premisis?

We would be pleased to provide you with an individual offer.

Using discarded products or disregarding basics of proper application by the use of wire ropes can cause enormous danger for humans and material.

Trained employees increase safety in your company, avoid accidents and reduce costs.

In our established technical seminars, our competent and experienced instructors train your staff in latest standards and in all theoretical and practical issues.

Rope services

Rope analysis

- PFEIFER analyses with extensive tests in the central Rope and Material Test Centre all properties of wire ropes and applied materials at the headquarter in Memmingen as well as at further machines at PFEIFER DRAKO in Mülheim/Ruhr. Also necessary tests can be done locally in our global subsidiaries.
- Aware that not only the usual catalog values such as weight per meter and minimum breaking force decide on the performance of wire ropes, all properties of the ropes are determined at PFEIFER in extensive tests.
- Equipped with this knowledge, we will choose the right wire rope for your application and so we optimize the lifetime of your equipment.

Test Facility for Determining Bending Fatigue

Spectral Analysis

Multi Layer Spooling Test Tower

Magnaflux Test

Rope Efficiency Test Facility

Tension Fatigue Test Facility

Further Offers:

Test Facility for Lateral Pressure Resistance

Coat Thickness Measuring Ultrasonic

Torsion Test Facility

Microscopic Analysis

Elongation and Pull Test Facility

Hardness Test

Notch Impact Test

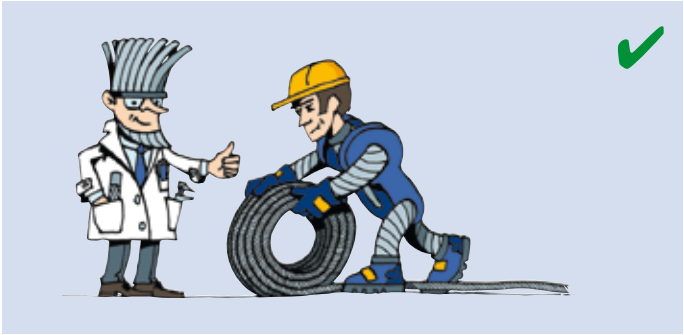
Dye Penetrate Test

Pull Test Facility 800 kN

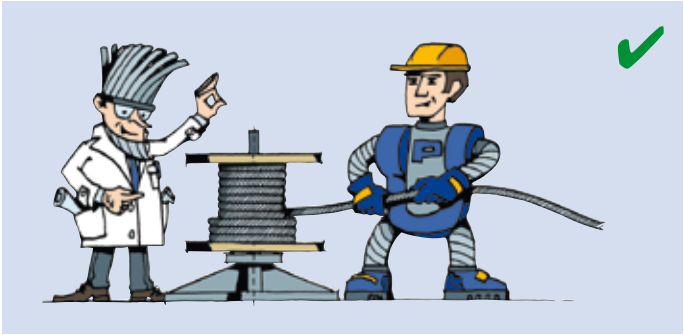
Pull Test Facility 6,000 kN

Correct handling of wire ropes

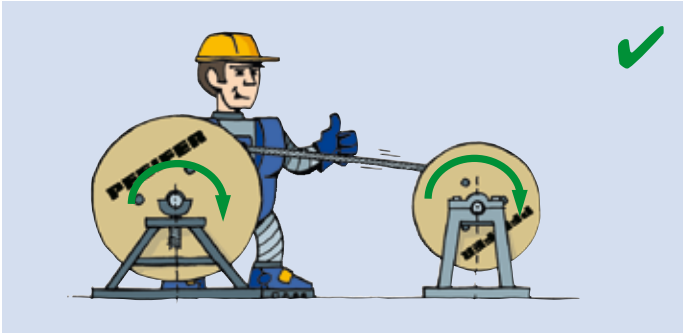
Spooling of wire ropes



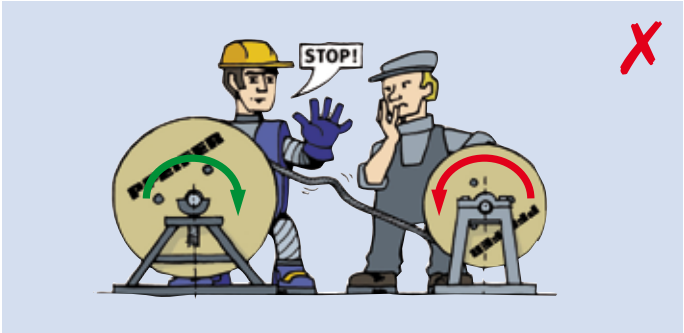
Correct
Lay wire rope rings on clean ground. Please consider the preferred bending direction when rewinding the rope.



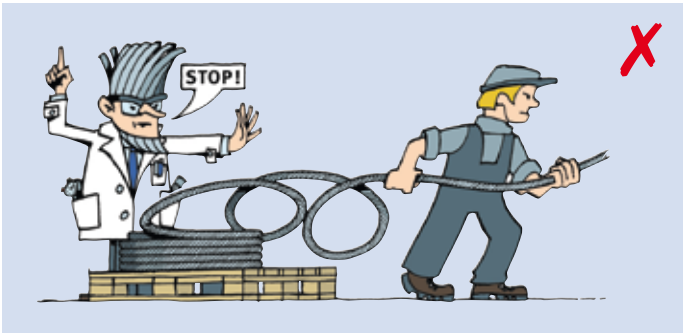
Correct
Place reel on a suitable frame or spike, draw-off straight. Make absolutely sure that the rope is not fouled.



Correct
When winding on a rope drum, pay attention to the direction of rotation and the right distance between reel and drum. A too small distance can cause torsional damage in the rope during later operation.



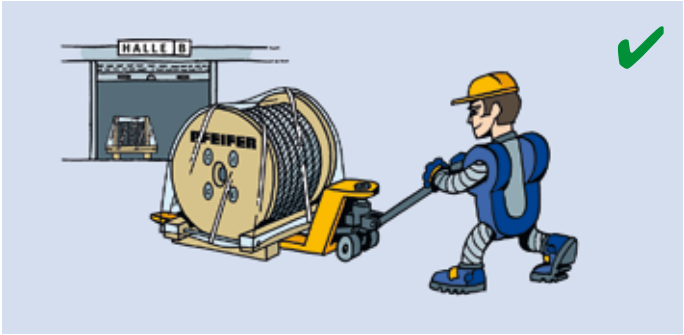
Wrong
Drawing-off the rope of a ring or over the flange of the reel as well as counterwise spooling cause “twist” for each winding in the rope. Loops may occur, which may result in bends under tension.



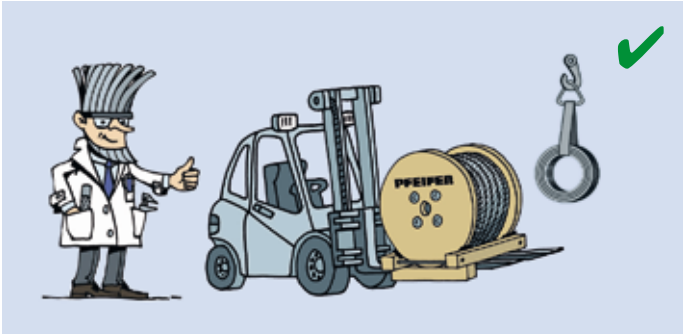
Detailed handling constructions you will find in our operating manual for stranded ropes in the PFEIFER download centre at:

➜ **www.pfeifer.info/ manual-strand-ropes**

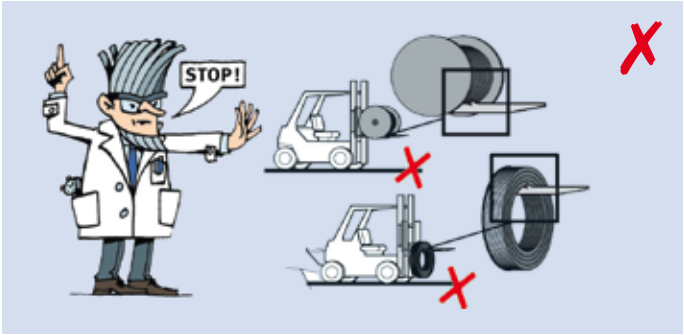
Storage and transport of wire ropes



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

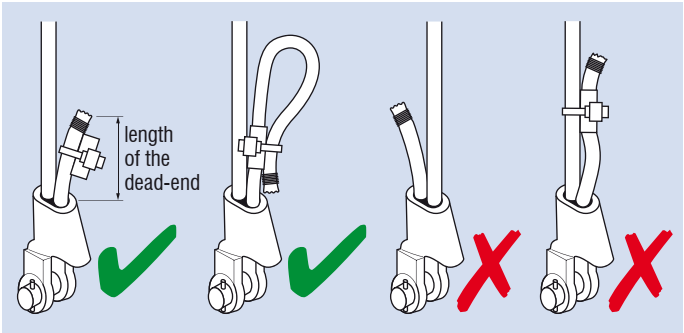


Correct
Protect the rope of crushes and kinks.



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

Instructions for use



Instruction
When a rope is to be re-terminated with a wedge socket assembly this can only be achieved by shortening the rope. No part of any previous flattening and/or damaged rope should be on the standing part of the rope or within the clamping area between either side of the socket body and the wedge.

With the use of wedge sockets the rope is introduced on the balanced side so that under load the center line of the rope is in-line with the bolt hole. The dead end is passed through the asymmetric side and is secured with a rope clip.

The length of the dead-end should be 10 x the nominal rope diameter, at least 150 mm. The rope clip must be applied only to the loose, unloaded rope end, never on both strands. The maximum operating temperature for wedge sockets is 200 °C / 400 F.

Detailed handling constructions you will find in our operating manual for wedge sockets in the PFEIFER download centre at:

→ **www.pfeifer.info/manual-wedge-socket**

Installation of wire ropes

Wire ropes can easily be damaged and must therefore be handled with utmost care during transport and unloading.

Only the installation of an untwisted an undamaged rope will guarantee a trouble-free operation. Ropes must always be uncoiled from the reel or the ring in the direction of winding. Lateral uncoiling of the rope causes twisting and can lead to destruction by kink formation. It is recommended to use a frame-mounted reel for coiling the rope onto the drum. Coiling in the direction of bend gives an excellent fit on the drum and avoids that any additional tension is built-up in the rope. Never drag ropes over soil or dirt.

For installing the new rope it has to be fixed to the still mounted old one or an auxiliary rope. Connection between the two ropes can be achieved either by a cable grip or two welded pad eyes connected with a swivel.
Any transmission of torsion to the new rope from either the old one or the auxiliary rope must be definitively avoided. Nonrotating ropes must be protected from torsion by insertion of a swivel.

Multi-layer operation requires that even the lower layers must be tightly coiled with a pretension of 1–2 % of the minimum breaking load of the rope. It is attained by braking the reel.

The end termination of non-rotation resistant and rotation resistant ropes has to be fixed on both end terminations against rotation.

It is NOT allowed to use non-rotation resistant or rotation resistant ropes with a turnable fixed point (e. g. swivel).

If the lower layers on the drum are hardly or seldom used the pretension of the entire rope has to be renewed from time to time. To renew the pretension in the hoist ropes the complete rope has to be spooled off and wound up again with tension of approximately 2 % of the minimum breaking force or 10 % of the maximum line pull force in operation. Ropes work most efficient if is always used the entire rope length.

If the rope areas are used unequal the rope can be turned after a certain time. In multi-layer spooling the lifetime of the rope can be significantly extended by cutting away the length of half the drum diameter from the rope at the fastening point of the drum. Through this procedure the predamaged rope areas are relocated from the climbing zones on the drum into the parallel zones. The shortening procedure can be carried out, at most, two times.

Discarding time for wire ropes according to ISO 4309

Exemplary for single layer and parallel-closed ropes

Number of visible wire breaks, reached or exceeded, occurring in single-layer and parallel-closed ropes, signalling discard of rope

RCN	Total number of load-bearing wires in the outer layer of strands in the rope[a] *n*	Number of visible outer wire breaks[b]					
		Sections of rope, running over steel sheaves and/or spooled on a single layer drum (random distribution of wire breaks)				Sections of wire rope spooled onto a multilayer drum[c]	
		Classes M1 to M4 or calss unknown[d]				All Classes	
		Ordinary lay		Langs lay		Ordinary and langs lay	
		over a length of					
		$6d$[e]	$30d$[e]	$6d$[e]	$30d$[e]	$6d$[e]	$30d$[e]
01	$n \leq 50$	2	4	1	2	4	8
02	$51 \leq n \leq 75$	3	6	2	3	6	12
03	$76 \leq n \leq 100$	4	8	2	4	8	16
04	$101 \leq n \leq 120$	5	10	2	5	10	20
05	$121 \leq n \leq 140$	6	11	3	6	12	22
06	$141 \leq n \leq 160$	6	13	3	6	12	26
07	$161 \leq n \leq 180$	7	14	4	7	14	28
08	$181 \leq n \leq 200$	8	16	4	8	16	32
09	$201 \leq n \leq 220$	9	18	4	9	18	36
10	$221 \leq n \leq 240$	10	19	5	10	20	38
11	$241 \leq n \leq 260$	10	21	5	10	20	42
12	$261 \leq n \leq 280$	11	22	6	11	22	44
13	$281 \leq n \leq 300$	12	24	6	12	24	48
	$n > 300$	$0{,}04 \times n$	$0{,}08 \times n$	$0{,}02 \times n$	$0{,}04 \times n$	$0{,}08 \times n$	$0{,}16 \times n$

NOTE Ropes having outer strands of Seale construction where the number of wires in each strand is 19 or less (e. g. 6 × 19 Seale) are placed in this table two rows above that row in which the construction would normally be placed based on the number of load bearing wires in the outer layer of strands.

RCN = Rope category number

[a] For the purpose of this International Standard, filler wires are not regarded as load-bearing wires and are not included in the values of *n*.

[b] A broken wire has two ends (counted as one wire).

[c] The values apply to deterioration that occurs at the cross-over zones and interference between wraps due to fleet angle effects (and not to those sections of rope which only work in sheaves and do not spool on the drum).

[d] Twice the number of broken wires listed may be applied to ropes on mechanisms whose classification is known to be M5 to M8.

[e] d = nominal rope diameter

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Discard

⚠ **Warning: Considering security 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
- Corkscrew deformation (fig. 1)
- Corkscrew (fig. 2)
- Hairpin like escape of wires (fig. 3)
- Decrease of diameter – regarding the nominal rope diameter
- Local increase of diameter
- Heavy corrosion: The surface of the wires is strongly affected or rosty dust comes out of the rope
- Loose rope structure (fig. 4)
- Constriction (fig. 5)
- Kinks or flattened areas(fig. 6 + 8)
- Bends or other deformations (fig 7)
- 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 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. For evaluation of the discard criteria please refer to our original operating manual for strand ropes!

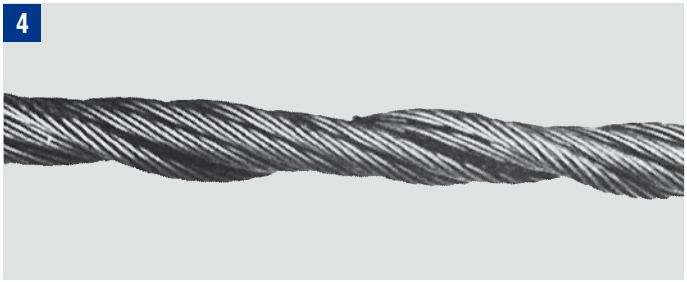
If in doubt on the estimation of the cable damage, the rope must be discarded or your rope specialist needs to be contacted: wirerope@pfeifer.de or via phone +49 (0) 83 31-937-301.

Looping on a wire rope

3

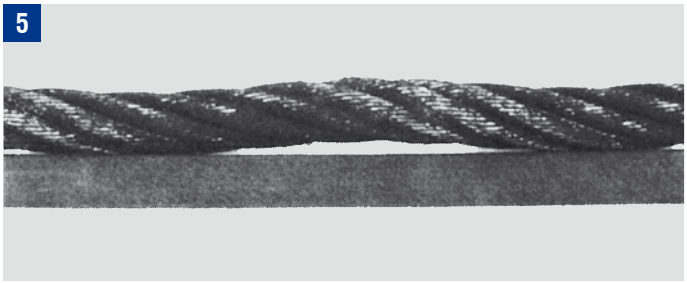
Through corrosion and wear heavy loose strand

4



Constriction due to a broken rope core

5



Flattened wire rope caused by over-ride

6

Corkscrew deformation

1

Basket deformation

2

Bend caused by a pinched rope sling

7

Kind caused by mechanical impact

8

PFEIFER

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