

# PFEIFER



03/2018

**PFEIFER – Your specialist  
for ropes in process plants**

**PFEIFER  
SEIL- UND HEBETECHNIK  
GMBH**

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## Innovative rope systems for ropes in process plants

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 headquarters are located in Memmingen, Germany. Numerous service centres and subsidiaries worldwide are responsible for sales and distribution.

The usual performances of rope drives at process cranes require right-handed (sZ) and left-handed (zS) non-rotation-resistant hoist ropes of the same construction and production. Although, our claim is constant quality, optimal bending fatigue performance and reliability - extraordinary strains, too.

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. The choice is dependent on the kind of crane construction, the application conditions and wear 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 in choosing the right ropes!**



→ Further information can be found under Products & Services at the PFEIFER web portal: [www.pfeifer.info/steel-mills](http://www.pfeifer.info/steel-mills)



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# General information

## Rope requirements in process plants

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### Technical requirements

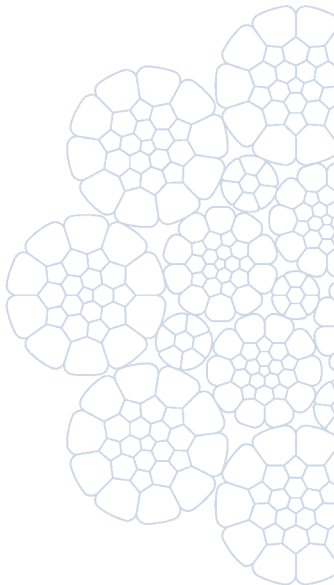
- Sufficient breaking force  
Minimum breaking force  $\geq$  data of crane test book / original rope
- Stable rope structure (not susceptible to structural damages like birdcage, corkscrew, formation of loops ...)
- High bending cycles performance
- Suitable end terminations
- High, reproducible quality
- Reliability at high operation temperatures, like pouring- and charging cranes

### Maintenance

- Safe signalling of the discarding time (extraneous wearing)
- Easy assembly – packaging to special customer demands (cable ring, disposable reel)

## PFEIFER rope classification

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### Premium-Line

- Highest bending cycles performance
- Very good characteristics values of performance also on the limits
- High structure stability
- High breaking force

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### High-Performance-Line

- High bending cycles performance
- High structure stability

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### Performance-Line

- High bending cycles performance

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### Standard-Line

- Standard bending cycles performance

## PFEIFER added value advantage

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- 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.

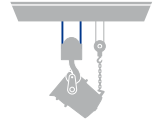
**Reduce every risk and trust in our  
longtime experience in choosing the  
right ropes!**



# Hoisting and closing ropes

Extract from our in stock rope range

## Compacted stranded ropes – Premium-Line



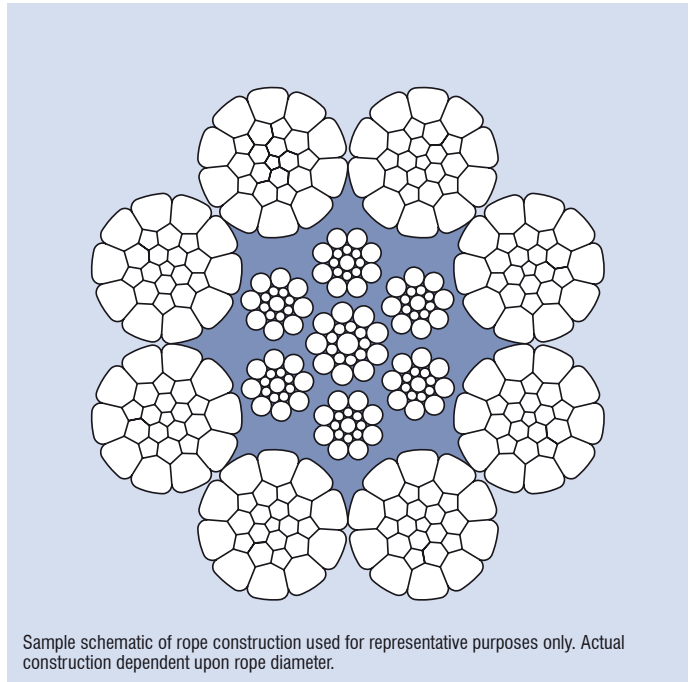
P 129

Round strand rope, non rotation resistant

### Technical data

Average fill factor	0,675
average spinning loss factor 1770 N/mm <sup>2</sup>	0,85
average spinning loss factor 1960 N/mm <sup>2</sup>	0,85
average spinning loss factor 2160 N/mm <sup>2</sup>	0,84
Core	plastic coated steel core – therefore increased structural strength
Lay type	choice of regular/ordinary lay or lang's lay
Lay direction	choice of right hand or left hand
Compacting	strands compacted – thereby extra wear resistant
Finish	choice of bright or galvanised
Rope diameter tolerance	0 / +4,5%

Diameter range	Number of load-bearing wires in the external strands	RCN according to ISO 4309
from 4 – 14	152	04
from 15 – 44	208	09
from 45 – 69	288	13
from 70 – 100	328	13



Sample schematic of rope construction used for representative purposes only. Actual construction dependent upon rope diameter.

**WARNING:** Never use with a swivel – failure to comply may result in serious damages and injuries

Nominal rope Ø mm	Weight approx. kg/100 m	Minimum breaking force F <sub>min</sub> 1770	Minimum breaking force F <sub>min</sub> 1960	Minimum breaking force F <sub>min</sub> 2160
		kN	kN	kN
14	92	156	173	188
15	106	179	199	217
16	121	204	226	246
17	136	230	255	278
18	153	258	286	312
19	170	288	319	347
20	189	319	354	385
21	208	352	389	424
22	228	386	428	465
23	250	422	468	509
24	272	459	509	554
25	295	498	552	601
26	319	539	597	650
27	344	581	643	701
28	370	626	693	754
29	397	671	743	809
30	425	718	795	866
31	457	772	855	932
32	487	823	911	992
33	518	875	969	1055
34	549	929	1030	1121
35	582	984	1090	1187
36	616	1041	1153	1256
38	686	1168	1298	1413
40	761	1285	1424	1551
42	838	1418	1574	1713
44	920	1556	1723	1876
46	1006	1700	1883	2050
48	1095	1851	2050	2233

Other rope diameters and constructions on enquiry.

Please refer to our operating manual stranded ropes! Available at [www.pfeifer.info/manual-strand-ropes](http://www.pfeifer.info/manual-strand-ropes)

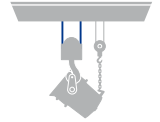
# Hoisting and closing ropes

Extract from our in stock rope range

**PFEIFER**

## Compacted stranded ropes – High-Performance-Line

■ Good properties at high temperatures and particular lubrication.



**P 929**

Round strand rope, non rotation resistant

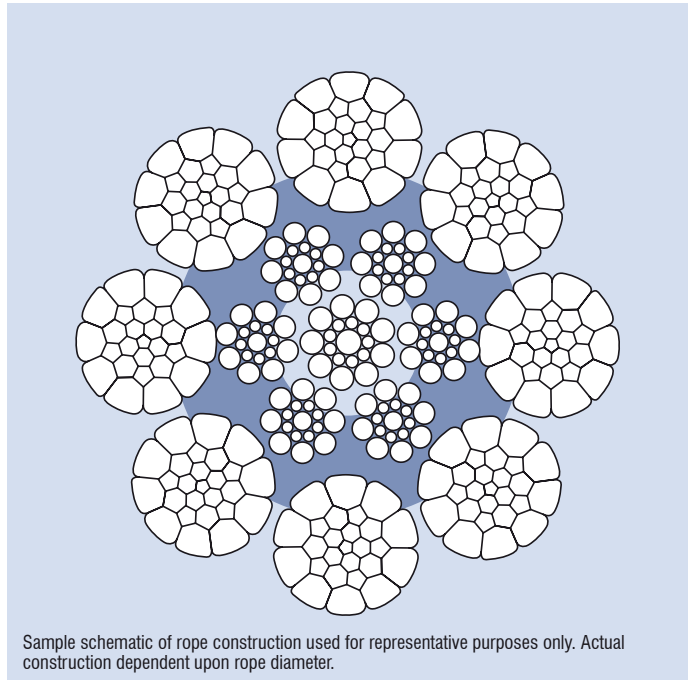
### Technical data

Average fill factor	0,66
average spinning loss factor	0,852
Core	plastic coated steel core – therefore increased structural strength
Lay type	choice of regular/ordinary lay or lang's lay
Lay direction	choice of right hand or left hand
Compacting	Compacted rope – therefore particularly resistance to crushing and abrasion
Finish	choice of bright or galvanised
Rope diameter tolerance	+2 %/+4 %

Diameter range	Number of load-bearing wires in the external strands	RCN according to ISO 4309
from 12 – 54	208	09
from 56 – 72	328	13+



**WARNING:** Never use with a swivel – failure to comply may result in serious damages and injuries



Nominal rope Ø mm	Weight approx. kg/100 m	Minimum breaking force F <sub>min</sub>	
		1960 kN	2160 kN
14	90	172	192
16	116	229	249
17	136	259	281
18	152	290	315
19	169	323	351
20	187	358	389
22	226	434	471
23	247	474	514
24	269	516	560
25	288	544	590,5
26	315	606	657
28	365	701	761
30	412	805	874
32	472	917	995
34	532	1035	1124
35	564	1097	1191
36	597	1161	1260
38	665	1293	1403
40	737	1433	1555
42	813	1580	1715
44	892	1734	1882
46	975	1895	2057
48	1061	2063	2240

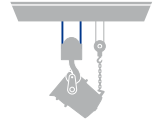
Other rope diameters and constructions on enquiry.

Please refer to our operating manual stranded ropes! Available at [www.pfeifer.info/manual-strand-ropes](http://www.pfeifer.info/manual-strand-ropes)

# Hoisting and closing ropes

Extract from our in stock rope range

## Uncompacted wire ropes – Premium-Line



P 124

Non-rotation-free high-performance rope

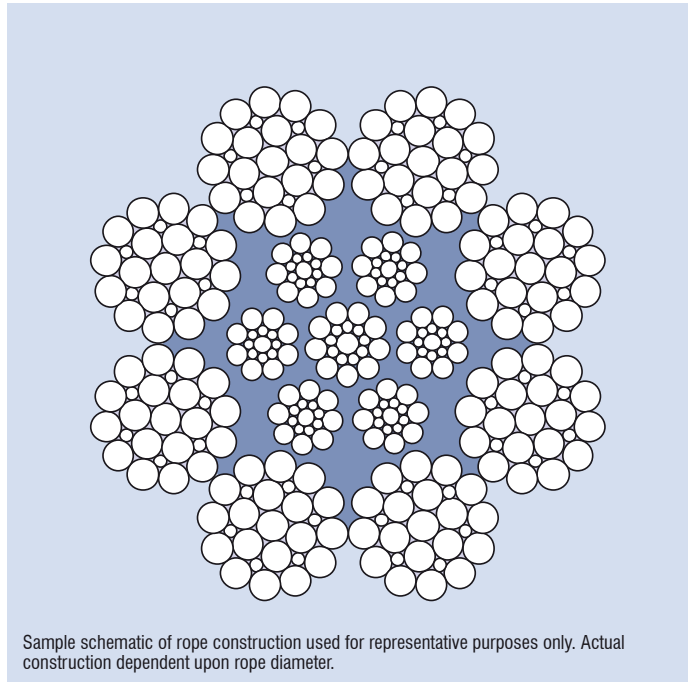
### Technical data

Average fill factor	0,6226
average spinning loss factor 1770 N/mm <sup>2</sup>	0,845
average spinning loss factor 1960 N/mm <sup>2</sup>	0,845
average spinning loss factor 2160 N/mm <sup>2</sup>	0,835
Core	plastic coated steel core – therefore increased structural strength
Lay type	Ordinary lay
Lay direction	choice of right hand or left hand
Compacting	not compacted
Finish	choice of bright or galvanised
Rope diameter tolerance	0/+ 4,5 %

Diameter range	Number of load-bearing wires in the external strands	RCN according to ISO 4309
from 4 – 49	152	06
from 50 – 69	288	13
from 70 – 90	328	13



**WARNING:** Never use with a swivel – failure to comply may result in serious damages and injuries



Nominal rope Ø mm	Weight approx. kg/100 m	Minimum breaking force F <sub>min</sub>	
		1770 kN	1960 kN
14	85	137	152
15	103	166	184
16	116	187	208
17	130	210	233
18	146	236	262
19	161	260	289
20	178	288	320
21	195	315	351
22	223	361	401
23	241	390	434
24	261	422	469
25	285	462	513
26	307	497	552
27	326	528	587
28	358	580	645
29	382	620	689
30	409	663	736
32	459	745	827
34	528	855	951
36	588	953	1058
38	660	1069	1188
40	728	1180	1311
42	806	1307	1452
44	885	1434	1594
46	956	1550	1723
48	1035	1678	1864

Please refer to our operating manual stranded ropes! Available at [www.pfeifer.info/manual-strand-ropes](http://www.pfeifer.info/manual-strand-ropes)



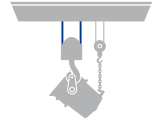
# Hoisting and closing ropes

Extract from our in stock rope range

**PFEIFER**

## Uncompacted wire ropes – Premium-Line

■ Good properties at high temperatures and particular lubrication.



**P 930**

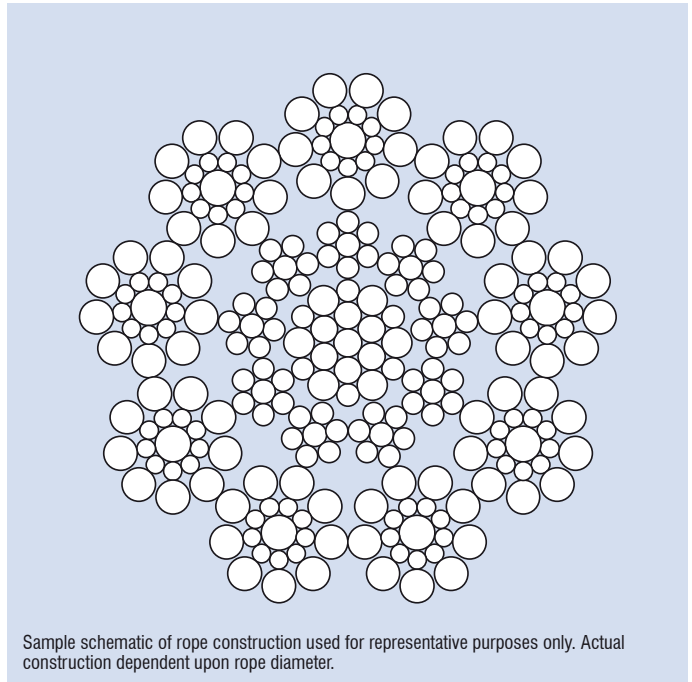
Round strand rope, non rotation resistant

### Technical data

Average fill factor	0,616
average spinning loss factor	0,81
Core	Steel core
Lay type	Ordinary lay
Lay direction	choice of right hand or left hand
Compacting	not compacted
Finish	bright

Diameter range	Number of load-bearing wires in the external strands	RCN according to ISO 4309
from 10 – 15	171	05
from 16 – 38	171	07

**WARNING:** Never use with a swivel – failure to comply may result in serious damages and injuries



Sample schematic of rope construction used for representative purposes only. Actual construction dependent upon rope diameter.

Nominal rope Ø	Weight approx.	Minimum breaking force F <sub>min</sub> 1960
mm	kg/100 m	kN
10	45	79
11	52	93
12	63	113
13	73	128
14	83	147
15	98	174
16	110	197
18	142	253
19	152	271
20	172	306
22	210	374
24	250	445
26	294	524
28	339	604
30	391	697
32	447	797
34	496	885
36	570	1016
38	623	1111

Other rope diameters and constructions on enquiry.

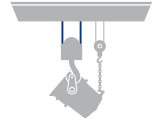
Please refer to our operating manual stranded ropes! Available at [www.pfeifer.info/manual-strand-ropes](http://www.pfeifer.info/manual-strand-ropes)

# Hoisting and closing ropes

Extract from our in stock rope range

## Uncompacted wire ropes – High-Performance-Line

■ Good properties at high temperatures and particular lubrication.



**P 923**

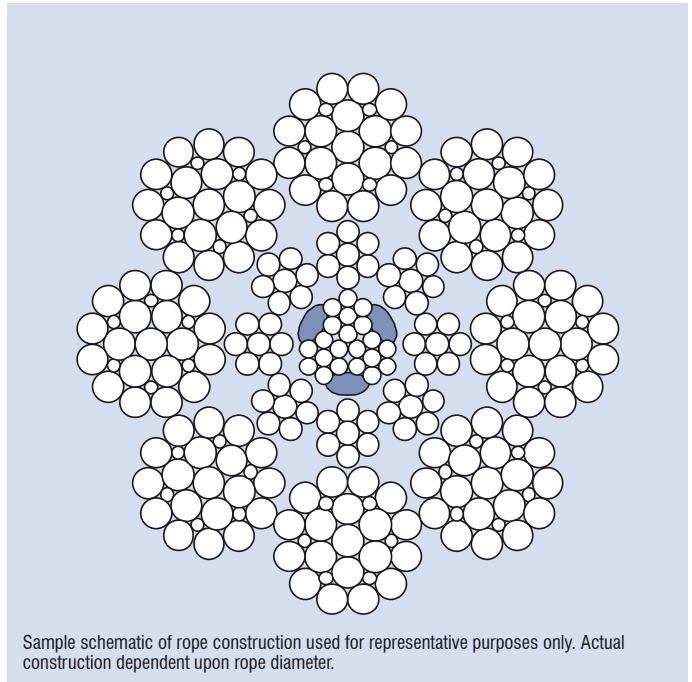
Non-rotation-free high-performance rope

### Technical data

Average fill factor	0,632
average spinning loss factor	0,81
Core	Steel core
Lay type	Ordinary lay
Lay direction	choice of right hand or left hand
Compacting	not compacted
Finish	bright

Diameter range	Number of load-bearing wires in the external strands	RCN according to ISO
	from 10 – 40	152 4309 06

**WARNING:** Never use with a swivel – failure to comply may result in serious damages and injuries



Sample schematic of rope construction used for representative purposes only. Actual construction dependent upon rope diameter.

Nominal rope Ø	Weight approx.	Minimum breaking force F <sub>min</sub> 1960
mm	kg/100 m	kN
14	84	156
15	97	179
16	114	202
18	144	253
20	179	315
22	216	382
24	248	437
26	302	532
28	350	618
30	401	707
32	456	805
36	566	998
40	697	1230

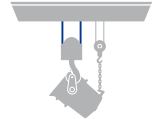
Please refer to our operating manual stranded ropes! Available at [www.pfeifer.info/manual-strand-ropes](http://www.pfeifer.info/manual-strand-ropes)

# Hoisting and closing ropes

Extract from our in stock rope range

**PFEIFER**

## Uncompacted wire ropes – High-Performance-Line



**P 324**

Non-rotation-free high-performance rope

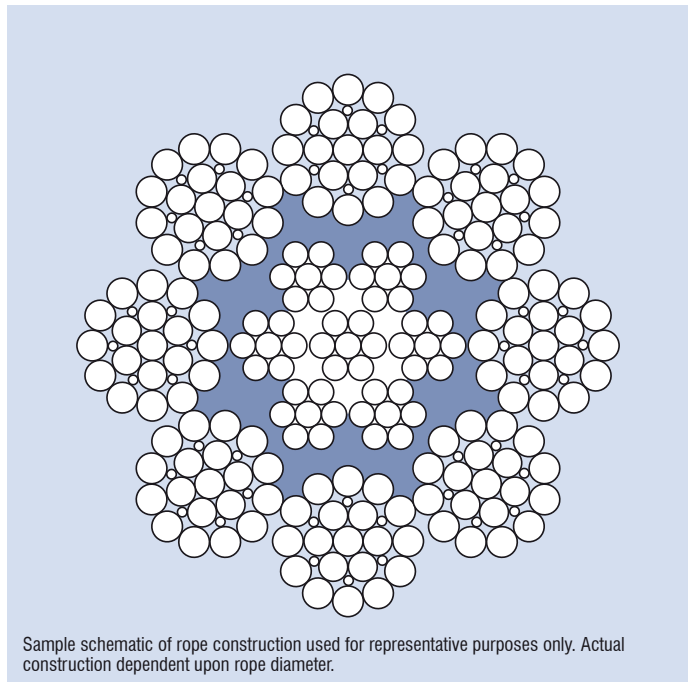
### Technical data

Average fill factor	0,606
average spinning loss factor	0,891
Core	plastic coated steel core – therefore increased structural strength
Lay type	Ordinary lay
Lay direction	choice of right hand or left hand
Compacting	not compacted
Finish	choice of bright or galvanised
Rope diameter tolerance	+2/+4 %

	Number of load-bearing wires in the external strands	RCN according to ISO 4309
Diameter range		
from 10 – 42	152	06



**WARNING:** Never use with a swivel – failure to comply may result in serious damages and injuries



Sample schematic of rope construction used for representative purposes only. Actual construction dependent upon rope diameter.

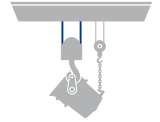
Nominal rope Ø	Weight approx.	Minimum breaking force F <sub>min</sub>	
		1960	2160
mm	kg/100 m	kN	kN
14	82	162,9	179,5
15	95	187	206,1
16	108	212,7	234,5
18	137	269,3	296,8
19	153	300,1	330,7
20	169	332,4	366,4
22	205	402,3	443,3
24	243	478,7	527,6
26	285	561,9	619,2
28	331	651,6	718,2
30	380	748,1	824,3
32	432	851,2	938
34	488	960,9	1058,9
36	548	1077,2	1187,1
38	610	1200,2	1322,6
40	676	1329,9	1465,6
42	745	1466,2	1615,8

Please refer to our operating manual stranded ropes! Available at [www.pfeifer.info/manual-strand-ropes](http://www.pfeifer.info/manual-strand-ropes)

# Hoisting and closing ropes

Extract from our in stock rope range

## Uncompacted wire ropes – Standard-Line



### PN 216/7

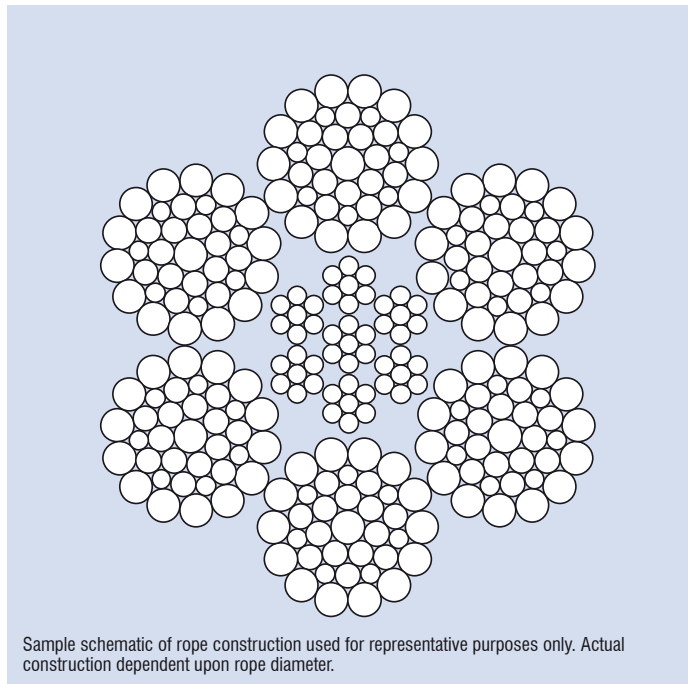
### Standard round strand ropes

#### Technical data

Average fill factor	0,59
Core	Steel core
Lay type	Ordinary lay
Lay direction	Right hand
Compacting	not compacted
Finish	choice of bright or galvanised
Rope diameter tolerance	+0/+5 %

Diameter range	Number of load-bearing wires in the external strands	RCN according to ISO
from 8 – 100	216	4309 09

**WARNING:** Never use with a swivel – failure to comply may result in serious damages and injuries



Sample schematic of rope construction used for representative purposes only. Actual construction dependent upon rope diameter.

Nominal rope Ø	Weight approx.	Minimum breaking force F <sub>min</sub>		
		1770	1960	2160
mm	kg/100 m	kN	kN	kN
8	26,2	40,3	44,7	49,2
9	33,1	51	56,5	62,3
10	40,9	63	69,8	76,9
11	49,5	76,2	84,4	93
12	58,9	90,7	100	111
13	69,1	106	118	130
14	80,2	124	137	151
15	92,6	142	158	174
16	105	161	179	197
18	133	204	226	249
20	164	252	279	308
22	198	305	338	372
24	236	363	402	443
26	276	426	472	520
28	321	494	547	603
32	419	645	715	787
34	473	728	806	888
36	530	817	904	997
38	591	910	1008	1110
40	654	1010	1120	1230
44	792	1220	1350	1490
48	942	1450	1610	1770
52	1110	1700	1890	2080
56	1280	1980	2190	2410
60	1470	2270	2510	2770

Other rope diameters and constructions on enquiry.

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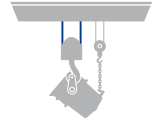


# Hoisting and closing ropes

Extract from our in stock rope range

**PFEIFER**

## Uncompacted wire ropes – Standard-Line



### PN 216

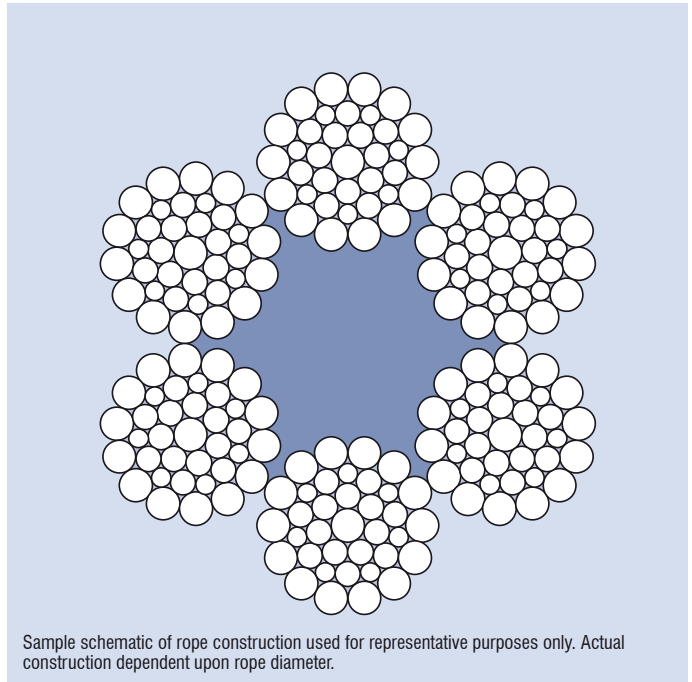
### Standard round strand ropes

#### Technical data

Average fill factor	0,5
Core	fibre core
Lay type	Ordinary lay
Lay direction	Right hand
Compacting	not compacted
Finish	choice of bright or galvanised
nominal metallic cross-sectional area factor C	0,393

Diameter range	Number of load-bearing wires in the external strands	RCN according to ISO
from 8 – 60	216	4309
		09

**WARNING:** Never use with a swivel – failure to comply may result in serious damages and injuries



Nominal rope Ø	Weight approx. kg/100 m	Minimum breaking force F <sub>min</sub>	
		1770 kN	1960 kN
14	71,9	114	127
16	94	150	166
18	119	189	210
20	147	234	259
22	178	283	313
24	211	336	373
26	248	395	437
28	288	458	507
32	376	598	662
36	476	757	838
40	587	935	1040
44	711	1130	1250
48	846	1350	1490

Other rope diameters and constructions on enquiry.

Please refer to our operating manual stranded ropes! Available at [www.pfeifer.info/manual-strand-ropes](http://www.pfeifer.info/manual-strand-ropes)

# Rope end terminations

Special end terminations  
on request

## Solid thimble PSH 519

Thimbles



### Technical data

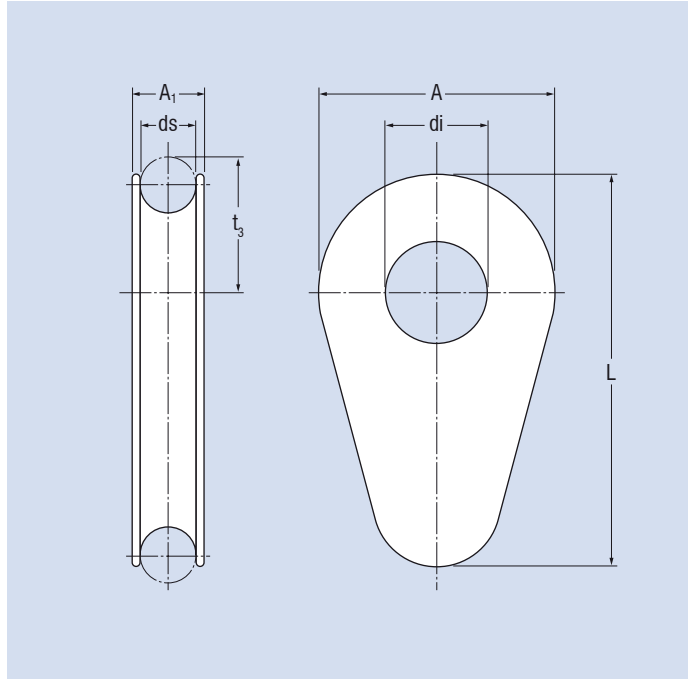
Material Cast steel (cold resistant to -40°C)  
Surface painted

### 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 mm	A mm	A <sub>1</sub> mm	A <sub>1</sub> Tol mm	di mm	di Tol mm	L mm	t <sub>3</sub> mm	WLL kN	Weight 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!

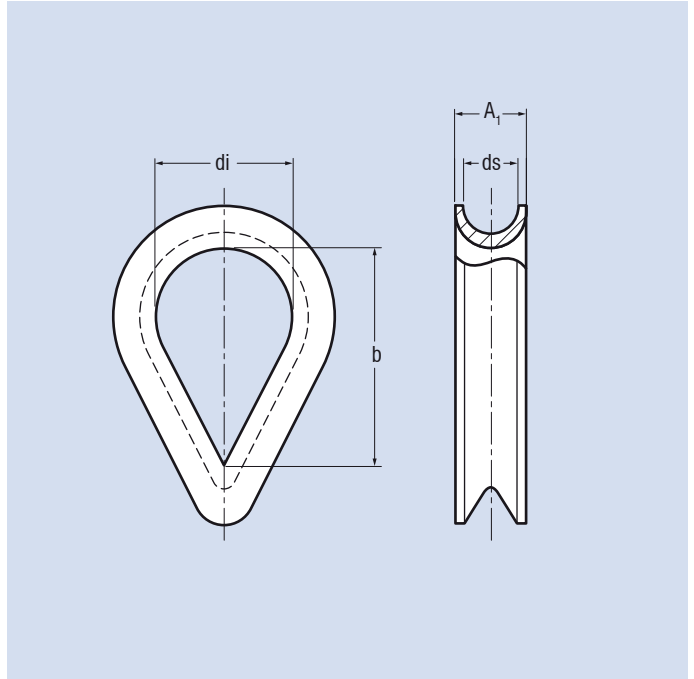
## Thimble similar to DIN 6899 521

## Thimbles



### Technical data

Material	Steel
Surface	zinc-plated



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 mm	A <sub>1</sub> mm	b mm	di mm	Weight kg
111332	14	12 – 13	17,5	51	32	0,1
111333	16	14 – 15	20	58	36	0,14
111334	18	16 – 17	22	64	40	0,19
111335	20	18 – 18	24,5	72	45	0,29
111336	22	19 – 20	27	80	50	0,55
111337	24	21 – 22	30	90	56	0,5
111338	26	23 – 24	33	99	62	0,59
111339	28	25 – 26	35	112	70	0,82
111340	30	27 – 28	37	120	75	1
111341	32	29 – 30	39	128	80	1,3
111342	34	31 – 32	41	152	95	1,6
111343	36	33 – 34	43	160	100	1,7
111345	38	35 – 36	45	176	110	1,62
111346	40	37 – 38	48	184	115	2,75
111347	42	39 – 40	50	192	120	3
111348	45	41 – 42	57	240	150	3,5
111349	50	43 – 47	—	245	160	5,4

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

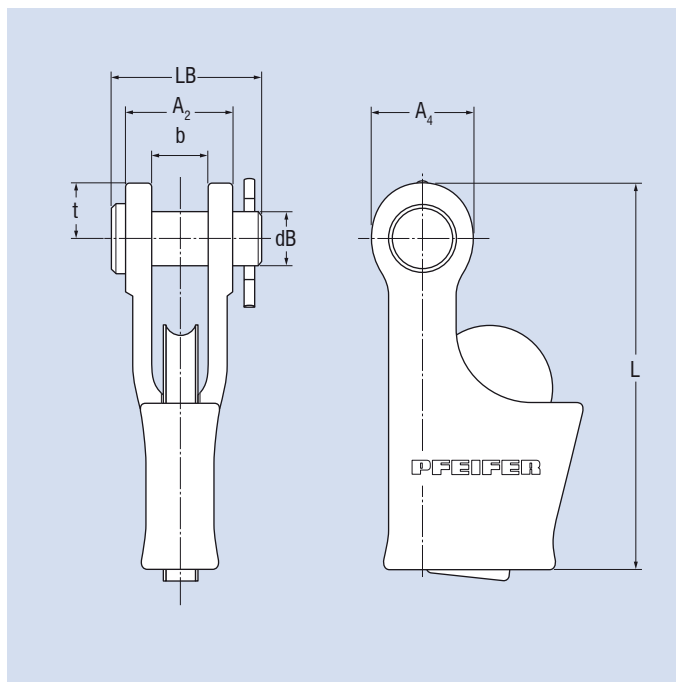
### Application area

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 <sub>2</sub>	A <sub>4</sub>	b	dB	LB	L	t	WLL	MBL	Weight
		mm	mm	mm	mm	mm	mm	mm	mm	kN	kN	kg
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!



## Rope socket Nemag 57A

Sockets



### Technical data

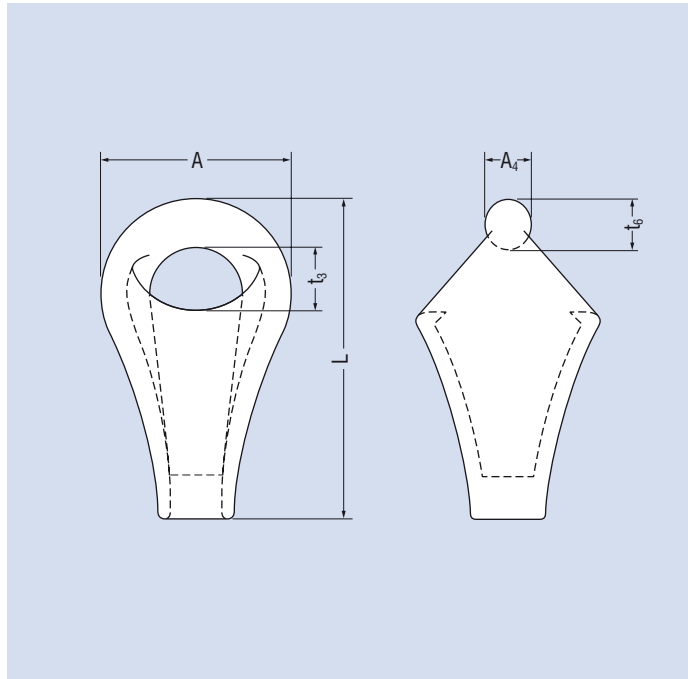
Material	Cast steel (cold resistant to -20°C)
Surface	Plain
Nominal tensile strength	≤ 2160 N/mm <sup>2</sup>

### Application area

Round strand ropes

### Combination products

Quick connecting link Nemag 548



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 mm	A mm	A <sub>4</sub> mm	L mm	t <sub>3</sub> mm	t <sub>6</sub> mm	MBL kN	WLL kg	Weight kg
214698	3	14 – 15	64	15,5	109	24	17,5	17,5	2500	0,6
235701	5	18 – 19	84	19	135	30	21	27,5	4500	1,3
235702	6	20 – 21	84	21	152	33	23	35	5000	1,7
214699	7	22 – 24	100	23	166	37	26	42,5	7000	2,3
199006	8	25 – 27	100	25	186	39	28	52,5	8000	3,2
214700	9	28 – 30	120	27	202	40	31	70	11000	4,1
235711	10	31 – 33	120	28,5	222	45	32	85	13000	5,2
178084	11	34 – 36	142	31,5	239	50	36	95	15000	6,4
166045	12	37 – 39	142	34,5	264	51	39	110	17000	7,9
171867	13	40 – 42	166	36,5	285	59	43	125	21000	9,5
171015	14	43 – 45	166	40	312	62	47	155	26000	11,2
167178	15	46 – 48	170	44	337	66	51	180	30000	13

The working load is the recommended maximum load for grabbing operations when Quick Release Links and Rope Pear Sockets are passing over a special cable sheave. For other applications a safety factor in line with official international and national guidelines has to be adhered to.

**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.

# PFEIFER-Repair-Service for sockets

## Your benefits

- +** PFEIFER guarantees you a **rope repair in original rope quality**.
- +** The casting of resin reaches **100 % of the breaking load of the original rope system** so you can use your crane rope safely as before.
- +** Of course the repair of ropes with the **original PFEIFER pouch socket system** is also possible.
- +** Certified service technicians come to the work site of your application with the **mobile repair service**.
- +** Repair of hoisting and luffing ropes of these manufacturers:
  - LIEBHERR
  - TEREX DEMAG
  - GROVE GMK new!
  - SENNEBOGEN
  - BAUER



## Our repair-services for a perfect result

- Localizing, marking and detaching of the damaged rope section professionally.
- Preparing the rope brush and casting the socket will be done in the specially designed PFEIFER pull-in device to achieve an optimal result.  
This procedure guarantees you a continued safe performance of your crane rope in your pouch socket system.
- Of course we document the repair and prepare an appropriate certificate.

**If your hoisting rope is damaged don't give up the easy and save handling of your crane rope with the original socket.**



**!** Mobile repairs of sockets require expertise and experience. Therefore these repairs are only done by specially trained and regularly audited employees. Each of our authorized employee has a certificate that he will be happy to show off.



# 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](http://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 gentle 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.



### End connection design

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



### Rope stocking



### Rope inspection



### Technical rope seminar

Interested in a seminar at your premises?

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



### 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.



### 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.

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.

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.**

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



Magnaflux Test



Rope Efficiency Test Facility

Multi Layer Spooling Test Tower

#### 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



Tension Fatigue Test Facility

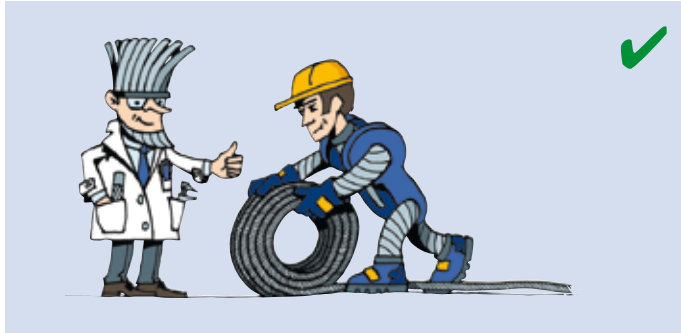


Pull Test Facility  
6,000 kN



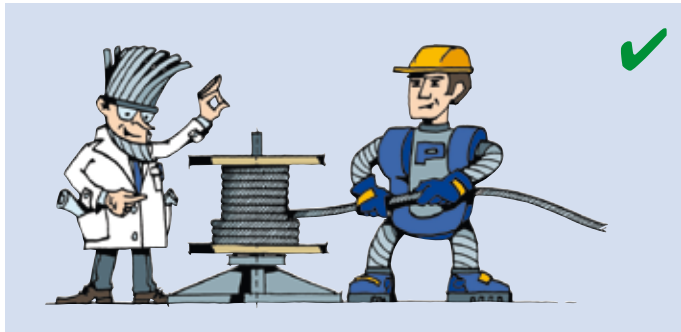
# Correct handling of wire ropes

## Spooling of wire ropes



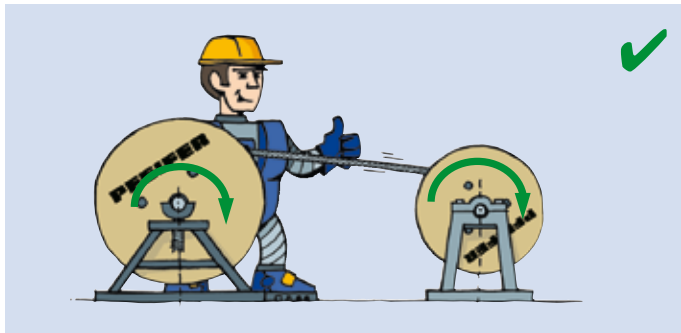
### Correct

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



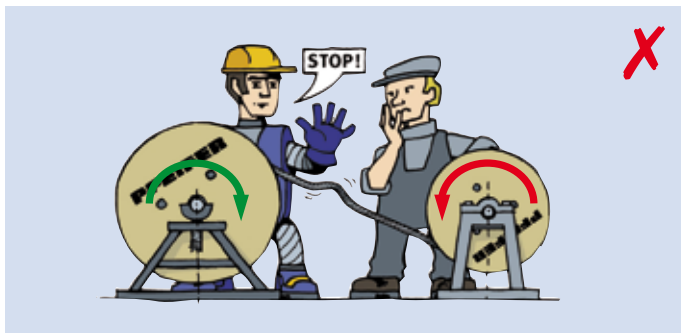
### Correct

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.

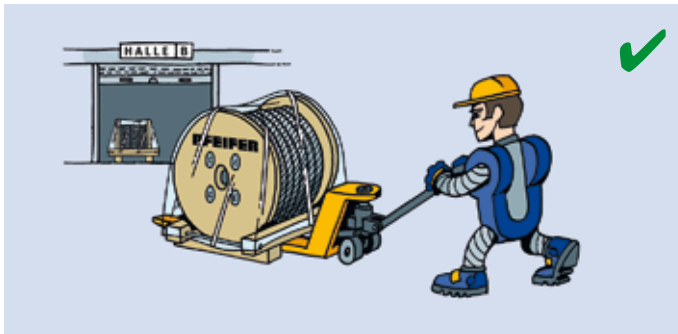


Detailed handling constructions you will find in our operating manual for stranded ropes in the PFEIFER download centre at:

→ [www.pfeifer.info/manual-strand-ropes](http://www.pfeifer.info/manual-strand-ropes)

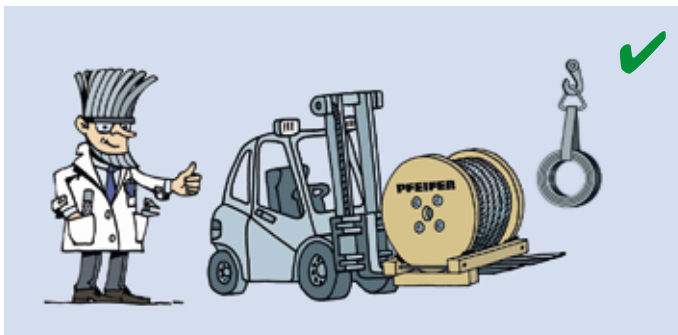


## Storage and transport of wire ropes



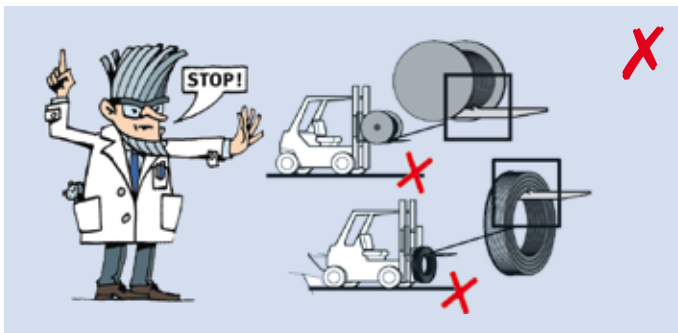
**Correct**

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**

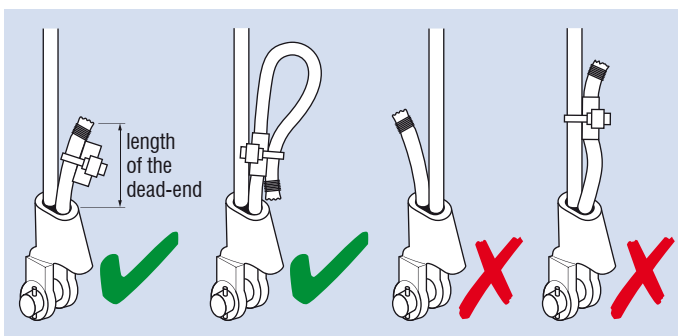
Protect the rope of crushes and kinks.



**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](http://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 and 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 it 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 <sup>a</sup> <i>n</i>	Number of visible outer wire breaks <sup>b</sup>					
		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 <sup>c</sup>	
		Classes M1 to M4 or class unknown <sup>d</sup>				All Classes	
		Ordinary lay		Langs lay		Ordinary and langs lay	
		over a length of					
		6 <i>d</i> <sup>e</sup>	30 <i>d</i> <sup>e</sup>	6 <i>d</i> <sup>e</sup>	30 <i>d</i> <sup>e</sup>	6 <i>d</i> <sup>e</sup>	30 <i>d</i> <sup>e</sup>
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

<sup>a</sup> 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*.

<sup>b</sup> A broken wire has two ends (counted as one wire).

<sup>c</sup> 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).

<sup>d</sup> Twice the number of broken wires listed may be applied to ropes on mechanisms whose classification is known to be M5 to M8.

<sup>e</sup> *d* = nominal rope diameter

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](http://www.pfeifer.info/manual-strand-ropes)



## 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 rusty 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 be discarded, if none of the criteria are completely but some partially fulfilled. For example: Light Corkscrew with some broken wires.

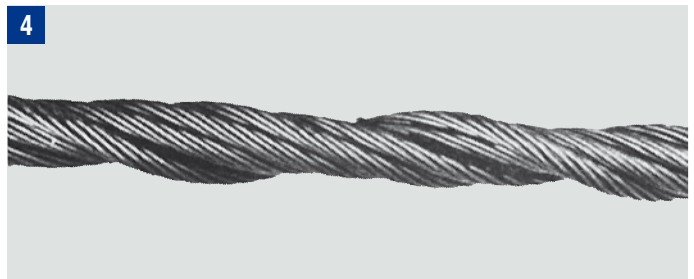
The above criteria are an excerpt from the ISO 4309 maintenance and care, inspection and storage. Consequently, these criteria do not replace the instructions and requirements for inspection and maintenance of wire ropes as written in the standard. For evaluation of the discard criteria please refer 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](mailto:wirerope@pfeifer.de) or via phone +49 (0) 83 31-937-301.

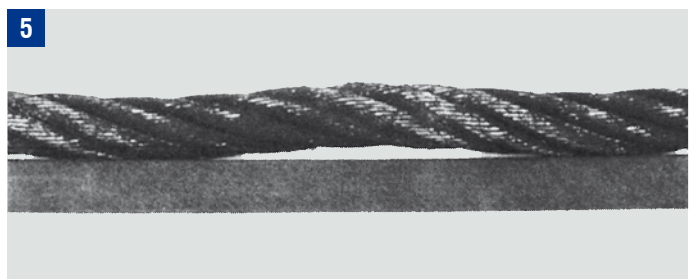
Looping on a wire rope



Through corrosion and wear heavy loose strand



Constriction due to a broken rope core



Flattened wire rope caused by over-ride



Corkscrew deformation



Basket deformation



Bend caused by a pinched rope sling



Kind caused by mechanical impact



## PFEIFER – at your service all over the world



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WEB www.pfeifer.info

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WEB www.pfeifer.us.com

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