YOUR ROPE IS
OUR PASSION

SPECIAL WIRE ROPES & ACCESSORIES – CRANES & CONSTRUCTION

CASAR
By WireCo

EDITION 09/2018

INTRODUCTION

WireCo® WorldGroup

Quality Products, Outstanding Service and Comprehensive Technical Support – It's what today's industries expect from their supplier partners. And that's what WireCo WorldGroup is all about.

WireCo WorldGroup is the global market, manufacturing and technical leader in wire and synthetic rope manufacturing, providing a consultative approach to offer customers a single, reliable source for performance matched solutions to fit their specific application and budget needs. But it doesn't stop there. WireCo WorldGroup offers clients the education and expertise needed to enhance product performance and value.

With our comprehensive range of trusted, global brands we deliver unmatched technical expertise and innovation as well as unparalleled quality assurance meeting and exceeding international quality certifications.

WireCo WorldGroup is on the ground everywhere you are – with manufacturing and distribution facilities all around the world and about 4,000 global employees supporting these efforts. Our customers enjoy global availability for a consistent, responsive supply no matter where and when they need it.

CASAR By WireCo

Mission critical applications call for the best rope. The CASAR products engineered in Germany deliver according to your specific needs. Challenge us with your requirements and our specialists will fulfill.

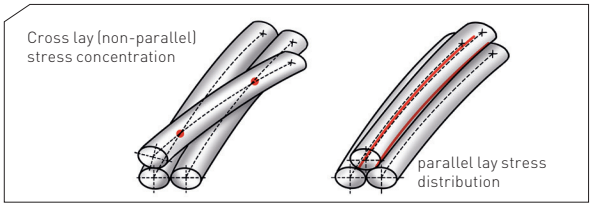
CONTENTS

GENERAL DEFINITIONS

PARALLEL LAY ROPES

Parallel Construction

In a standard rope all wires and strands have different lay lengths. The high stress concentration at the crossover point leads to an early internal failure. In a parallel lay rope all wires and strands have the same lay length. The linear contact leads to an optimal stress distribution. Furthermore the compacted parallel design leads to a higher fill factor and breaking strength.



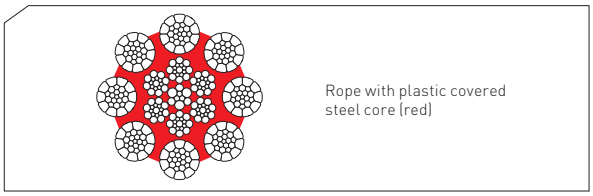
ROPES WITH PLASTIC COVERED STEEL CORE (SINCE 1972)

Plast rope

In a CASAR PLAST rope, the proportion of plastic to the steel components is thoroughly harmonized in order to fulfill the aspired rope geometry. A plastic coating with a very constant thickness and quality is extruded around the steel core. A thermal aftertreatment just before the closing of the rope ensures that the outer strands are deeply implanted in the plastic jacket, thus forming plastic edges which separate the strands.

The benefit of an internal plastic layer is diversified:

- Prevents internal wire breaks
- Prevents metal-to-metal contact
- Stabilizes the rope structure during installation and operation
- Seals in lubricant, reduces the maintenance effort
- Keeps out water and abrasive elements
- Absorbs dynamic energy
- Resistant to many chemical substances



LUBRICATED

Lubricated

As a standard feature, CASAR special wire ropes receive intensive lubrication during the production process. This in-process treatment will provide the rope with ample protection against corrosion and it is meant to reduce the friction between the elements which make up the rope as well as the friction between rope and sheaves or drums. This lubrication, however, only lasts for a limited time and should be reapplied periodically.

PRODUCTION TOLERANCE

Tolerance

CASAR special wire ropes are produced within a tolerance range between +0% and +4%. Generally the standard production tolerance is at the upper limit of the tolerance range, between +2% and +4%. For this reason CASAR special wire ropes fulfill the requirements of famous drum manufacturers. Of course, special tolerances or limited tolerance ranges can also be covered.

SWIVEL USE

Swivel

No swivel

Rotation resistant ropes can be used with a swivel. All other rope constructions may not be used with a swivel!

ISO 21669 – General guidance on swivel use (rotation-resistance)

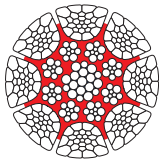
- Less than or equal to 1 turn/1000d lifting a load equivalent to 20%MBF, a swivel can be used
- Greater than 1 turn but no greater than 4 turns/1000d – a swivel may be used subject to the recommendations of the rope manufacturer and/or approval of a competent person
- Greater than 4 turns/1000d – a swivel should not be used

SWAGED ROPES (SINCE 2003)

Swaged

Swaged ropes are designed for heavy duty applications such as multiple layers spooling or scrap metal charging cranes:

- Extremely high pressure resistance
- Reduced diameter reduction under tension
- Strongly improved crushing resistance in crossovers
- Extremely smooth surface for less indentations or pressure
- High breaking load

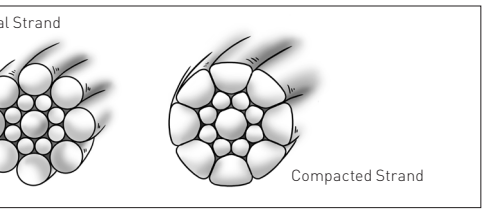


ROPES WITH COMPACTED STRANDS (SINCE 1978)

Compacted

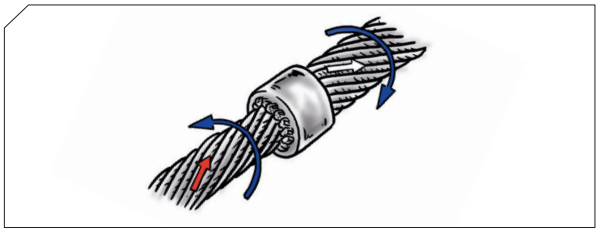
Ropes made of compacted strands have a higher breaking load, a greater flexibility and better rope-to-rope contact conditions than comparable ropes made out of conventional strands. Because of the thicker outer wires and the smaller exposed area they are more resistant to abrasion and corrosion. The formation of negative impressions is significantly impaired. The rope life time on multiple layer drums is optimized.

In order to produce a compacted strand, a conventional strand made of round wires is drawn through a compacting tool. During this procedure, the wires are plastically deformed, the strand diameter is reduced and the surface is made smooth. Resulting the contact conditions between the individual wires and the strand-to-strand contacts are improved.



ROTATION-RESISTANT ROPES SINCE 1949

In a conventional rope, an external load creates a torsional moment which tries to un-twist the rope. A rotation resistant steel wire rope has a steel core which is an independent rope, closed in the opposite direction to the outer strands. Under load, the core tries to twist the rope in one direction, the outer strands try to twist it in the opposite direction. The geometrical design of a rotation resistant wire rope is such that the torsional moments in the core and the outer strands compensate each other over a wide load spectrum, so that even with great lifting heights practically no rope twist occurs.



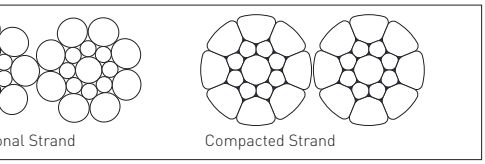
MULTIPLE LAYER SPOOLING

A drum coiling a rope in more than one layer is a multiple layer system with new demands to a wire rope.

- Low diameter reduction under tension
- Crushing resistance in crossovers and layer crossovers
- Extremely smooth surface for less indentations or pressure in crossovers

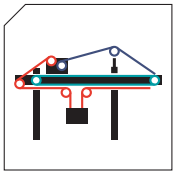
The following rope properties are required for a long service life:

- Lang's lay to prevent indentations
- Compacted outer strands to prevent indentations



ROPE SELECTION BY APPLICATION

CONTAINER CRANE

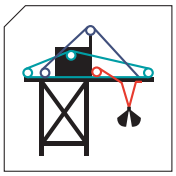


HOIST ROPE
CASAR TURBOPLAST
CASAR PARAPLAST
CASAR SUPERPLAST8

BOOM HOIST
CASAR TURBOPLAST
CASAR PARAPLAST

TROLLEY / CATENARY
CASAR TURBOPLAST

SHIP UNLOADER

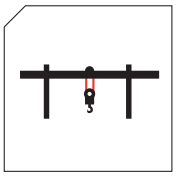


HOIST ROPE
CASAR TURBOPLAST

BOOM HOIST
CASAR TURBOPLAST

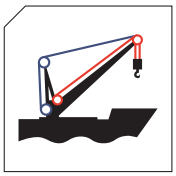
TROLLEY
CASAR TURBOPLAST

RUBBER TIRED GANTRY / RAIL MOUNTED GANTRY



HOIST ROPE
CASAR TURBOPLAST
CASAR PARAPLAST

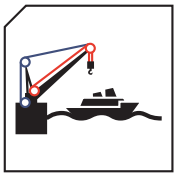
DECK CRANE



HOIST ROPE
CASAR POWERPLAST

BOOM HOIST
CASAR TURBOPLAST
CASAR PARAFIT

DOCKSIDE CRANE

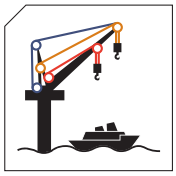


HOIST ROPE
CASAR TURBOPLAST
CASAR SUPERPLAST8
CASAR SUPERPLAST10MIX
CASAR EUROLIFT
CASAR STARLIFT

BOOM HOIST
CASAR TURBOPLAST
CASAR PARAPLAST

Please note: The use of rotation resistant ropes depends on the lifting height and the reeving system. Please contact your WireCo rope specialist for further advice.

OFFSHORE PEDESTAL CRANE / OFFSHORE

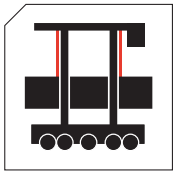


HOIST ROPE
CASAR EUROLIFT

BOOM HOIST
CASAR TURBOPLAST
CASAR PARAPLAST
CASAR SUPERPLAST8
CASAR PARAFIT

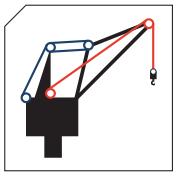
AUXILIARY HOIST
CASAR POWERPLAST
CASAR EUROLIFT

STRADDLE CARRIERS



HOIST ROPE
CASAR TURBOPLAST
CASAR PARAPLAST

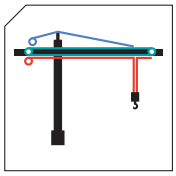
HARBOR MOBILE CRANE



HOIST ROPE
CASAR TURBOPLAST

BOOM HOIST
CASAR TURBOPLAST
CASAR PARAPLAST

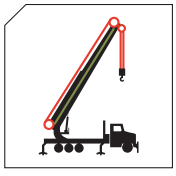
TOWER CRANE



HOIST ROPE
CASAR EUROLIFT
CASAR STARLIFT
CASAR STARLIFT PLUS
CASAR DOUBLEFIT

TROLLEY
CASAR ALPHALIFT

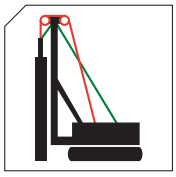
TELESCOPIC MOBILE CRANE



HOIST ROPE
CASAR EUROLIFT
CASAR STARLIFT
CASAR STARLIFT PLUS

RETRACTION ROPE
CASAR BETALIFT

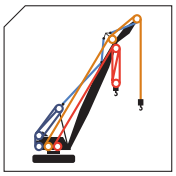
DRILLING / PILING



HOIST ROPE
CASAR POWERPLAST
CASAR EUROLIFT

FEED ROPE
CASAR TURBOPLAST

LATTICE BOOM CRAWLER CRANE

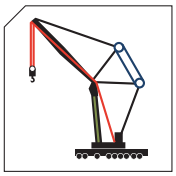


HOIST ROPE
CASAR EUROLIFT
CASAR STARLIFT
CASAR STARLIFT PLUS
CASAR DOUBLEFIT

BOOM HOIST
CASAR PARAPLAST
CASAR SUPERPLAST8
CASAR PARAFIT

AUXILIARY HOIST
CASAR EUROLIFT

LATTICE BOOM MOBILE CRANE

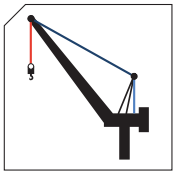


HOIST ROPE
CASAR EUROLIFT
CASAR STARLIFT
CASAR STARLIFT PLUS
CASAR DOUBLEFIT

BOOM HOIST
CASAR PARAPLAST
CASAR SUPERPLAST8
CASAR PARAFIT

RETRACTION ROPE
CASAR BETALIFT

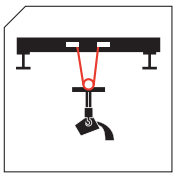
LUFFING-JIB TOWER CRANE



HOIST ROPE
CASAR EUROLIFT
CASAR STARLIFT
CASAR STARLIFT PLUS

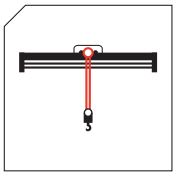
BOOM HOIST
CASAR PARAPLAST
CASAR SUPERPLAST8

STEELWORKS LADLE



HOIST ROPE
CASAR TURBOPLAST

OVERHEAD CRANE



HOIST ROPE
CASAR TURBOPLAST
CASAR PARAPLAST
CASAR SUPERPLAST8
CASAR SUPERPLAST10MIX

CASAR EUROLIFT
CASAR STARLIFT

Please note: The use of rotation resistant ropes depends on the lifting height and the reeving system. Please contact your WireCo rope specialist for further advice.

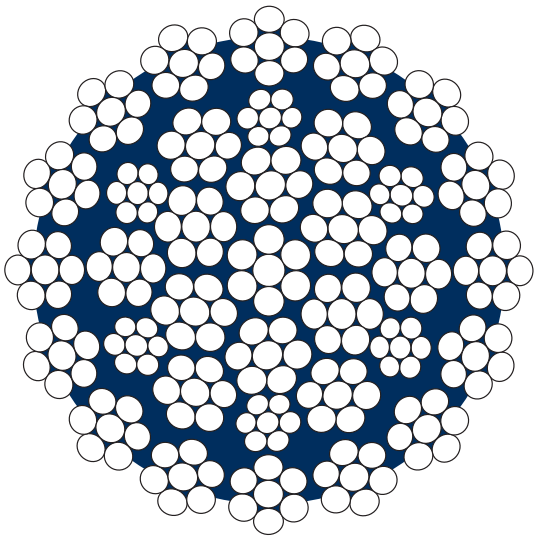
ROPE PROPERTIES

Rope Type		Rotation-Resistant					Non-Rotation-Resistant						
		STARLIFT	EUROLIFT	POWERPLAST	STARLIFT PLUS	DOUBLEFIT	ALPHALIFT	TURBOPLAST	SUPERPLAST8	SUPERPLAST10 MIX	PARAPLAST	BETALIFT	PARAFIT
Rope Properties													
Swaged Ropes						X							X
Compacted Strands			X	X	X	X		X	X	X	X	X	X
With internal plastic jacket				X		X		X	X	X	X		X
Parallel Design						X	X			X	X	X	X
Minimum Breaking Load													
Reduction of negative impressions and abrasion			+	+	+	++		+	++	++	+	++	++
Modulus of Elasticity [$*10^5$ N/mm^2]		1.10	0.95	0.94	*	*	1.18	1.02	1.07	*	*	*	*
Torque Factor [k] M = k*F*L		tf	tf	tf	tf	tf	0.075	0.092	0.080	*	*		*
Spooling													
Suitable for single layer spooling	Lang's Lay	X	X	X	X	X	X	X	X	X	X	X	
	Ordinary Lay	X	X	X	X	X	X	X	X	X	X	X	X
Suitable for multiple layer spooling up to 4 layers	Lang's Lay	X	X	X	X	X	X	X	X	X	X	X	
	Ordinary Lay					X							X
Suitable for multiple layer spooling above 4 layers	Lang's Lay		X	X	X	X		X	X	X	X		
	Ordinary Lay					X							X
Right hand lay drum requires left hand lay		X	X	X	X	X	X	X	X	X	X	X	X
Left hand lay drum requires right hand lay		X	X	X	X	X	X	X	X	X	X	X	X
Application													
Can be used with a swivel		X	X	X	X	X							
Suitable for single reeving and unguided load		X	X	X	X	X							
Suitable for / 2 reevings				X				X	X	X	X		X
Environment													
Operation temperature with standard lubrication	-50 – 75 °C	X	X		X	X							
	-50 – 115 °C			X				X	X	X	X		X
	-50 – 140 °C						X					X	
Sea Water Resistant Wires		X	X	X	X	X	X	X	X	X	X	X	X
Special Lubrication for Sea Water		X	X	X	X	X	X	X	X	X	X	X	X

* on request / TF = torque free

Special constructions and diameters available – please contact us directly.

CASAR **STARLIFT**



PROPERTIES

Swivel Lubricated Tolerance

APPLICATIONS

A very flexible rope with a core in a special design avoiding crossovers between the strands of core and preventing internal rope destruction. Hoist rope for mobile cranes, electrical hoists and other applications, where rotation resistant ropes are required.

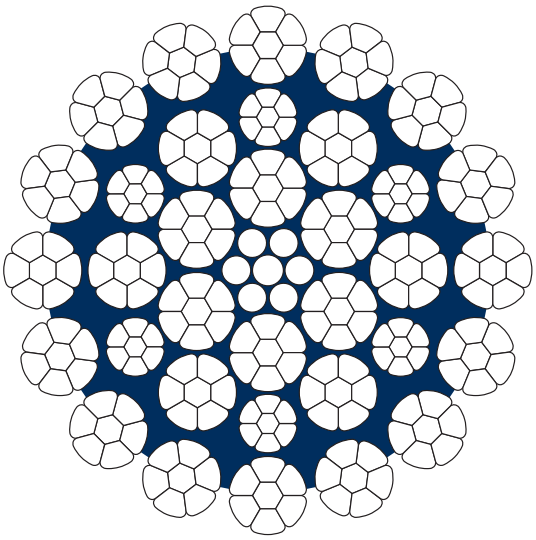
OVERVIEW

Diameter Range [mm]	7 – 50	50,8 – 72
RCN	23–2	23–2
Number of Outer Strands	16	16
Number of Wires	245	349
Number of Outer Load Bearing Wires	112	112
Average Fill Factor	0.653	
Average Nominal Metallic Area Factor C	0.513	
Average Spin Factor	0.76	

- Temperature range of use: –50°C to +75°C
- Available in ordinary lay and Lang's lay
- Available in right hand and left hand
- Available in galvanized and ungalvanized

Nominal Diameter	Weight	Minimum Breaking Force 1960 N/mm²	
mm	kg/m	kN	t [metric]
7	0.23	37.8	3.85
8	0.30	49.3	5.03
9	0.37	61.3	6.25
10	0.47	76.6	7.81
11	0.56	92.1	9.39
12	0.67	110.7	11.29
13	0.78	129.8	13.24
14	0.90	150.5	15.35
15	1.04	173.0	17.64
16	1.19	197.2	20.11
17	1.33	221.6	22.60
18	1.49	246.5	25.14
19	1.68	277.8	28.33
20	1.85	307.5	31.36
21	2.04	339.2	34.59
22	2.25	373.2	38.06
23	2.44	405.9	41.39
24	2.66	443.5	45.22
25	2.88	478.3	48.77
26	3.12	519.5	52.97
27	3.36	562.9	57.40
28	3.62	607.7	61.97
29	3.89	648.6	66.14
30	4.18	694.4	70.81
31	4.44	736.9	75.14
32	4.74	786.7	80.22
33	5.02	833.9	85.04
34	5.32	890.2	90.78
36	5.95	1,003,4	102.32
38	6.68	1,113,5	113.55
40	7.36	1,231,3	125.56
42	8.12	1,366,6	139.36
44	8.95	1,497,9	152.74
46	9.75	1,632,1	166.43
48	10.68	1,780,7	181.58
50	11.58	1,926,7	196.47
52	12.53	2,029,2	206.92
54	13.51	2,188,5	223.17
56	14.49	2,371,1	241.79
58	15.53	2,530,8	258.07
60	16.62	2,719,5	277.31

CASAR **STARLIFT PLUS**



PROPERTIES

Swivel | Lubricated | Tolerance | Compacted

APPLICATIONS

A very flexible rope with a core in a special design avoiding crossovers between the strands of core and preventing internal rope destruction. Hoist rope for mobile cranes, electrical hoists and other applications, where rotation resistant ropes are required.

OVERVIEW

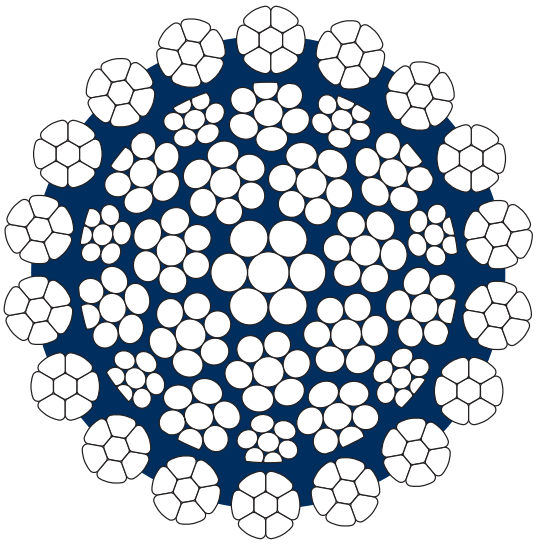
Diameter Range [mm]		10–56
RCN		23–2
Number of Outer Strands		16
Number of Wires		245
Number of Outer Load Bearing Wires		112
Average Fill Factor		0.716
Average Nominal Metallic Area Factor C		0.562
Average Spin Factor	*N/mm²	0.83 (1960)* / 0.82 (2160)*

- Temperature range of use: –50°C to +75°C
- Suitable for multilayer spooling in Lang's lay
- Available in ordinary lay and Lang's lay
- Available in right hand and left hand
- Available in galvanized and ungalvanized

Nominal Diameter	Weight	Minimum Breaking Force 1960 N/mm²		Minimum Breaking Force 2160 N/mm²	
mm	kg/m	kN	t [metric]	kN	t [metric]
10	0.50	92.0	9.38	98.0	9.99
11	0.60	111.0	11.32	119.0	12.13
12	0.72	132.0	13.46	144.0	14.68
13	0.84	155.0	15.81	169.0	17.23
14	0.97	179.0	18.25	195.0	19.88
15	1.11	206.0	21.01	225.0	22.94
16	1.27	235.0	23.96	257.0	26.21
17	1.41	261.0	26.61	285.0	29.06
18	1.61	298.0	30.39	325.0	33.14
19	1.78	329.0	33.55	359.0	36.61
20	1.99	367.0	37.42	401.0	40.89
21	2.18	402.0	40.99	439.0	44.77
22	2.39	442.0	45.07	483.0	49.25
23	2.61	483.0	49.25	527.0	53.74
24	2.84	525.0	53.54	573.0	58.43
25	3.09	571.0	58.23	623.0	63.53
26	3.32	615.0	62.71	671.0	68.42
27	3.62	669.0	68.22	730.0	74.44
28	3.88	719.0	73.32	784.0	79.95
29	4.15	768.0	78.32	838.0	85.45
30	4.47	827.0	84.33	903.0	92.08
31	4.75	879.0	89.63	959.0	97.79
32	5.05	934.0	95.24	1,019.0	103.91
33	5.42	1,003.0	102.28	1,095.0	111.66
34	5.70	1,054.0	107.48	1,150.0	117.27
36	6.42	1,187.0	121.04	1,296.0	132.16
38	7.15	1,322.0	134.81	1,443.0	147.15
40	7.93	1,467.0	149.59	1,601.0	163.26
42	8.73	1,616.0	164.79	1,764.0	179.88
44	9.57	1,770.0	180.49	1,932.0	197.01
46	10.46	1,935.0	197.32	2,112.0	215.37
48	11.43	2,115.0	215.67	2,309.0	235.45
50	12.41	2,297.0	234.23	2,507.0	255.65
52	13.43	2,486.0	253.50	2,713.0	276.65
54	14.56	2,695.0	274.82	2,941.0	299.90
56	15.56	2,879.0	293.58	3,142.0	320.40

Special constructions and diameters available – please contact us directly.

CASAR **EUROLIFT**



PROPERTIES

Swivel | Lubricated | Tolerance | Compacted

APPLICATIONS

Has a core in a special design avoiding crossover between the strands of core and preventing internal rope destruction. Hoist rope for mobile cranes, electrical hoists and other applications, where rotation-resistant ropes are required.

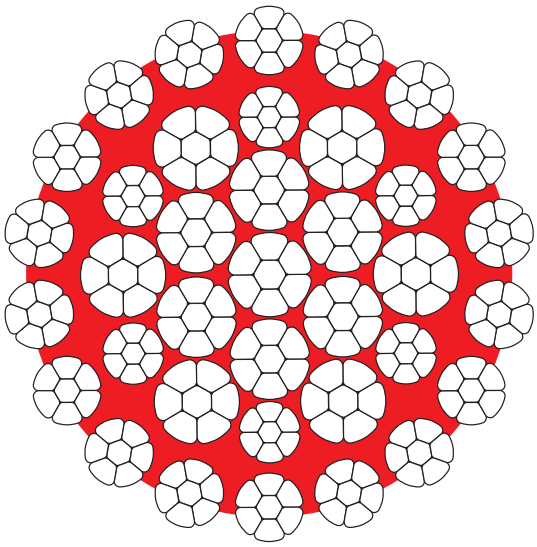
OVERVIEW

Diameter Range	10 – 34	34,93 – 60
RCN	23–3	23–3
Number of Outer Strands	18	18
Number of Wires	280	292
Number of Outer Load Bearing Wires	126	126
Average Fill Factor	0.720	
Average Nominal Metallic Area Factor C	0.565	
Average Spin Factor *N/mm²	0.82 (1960)* / 0.80 (2160)*	

- Temperature range of use: –50°C to +75°C
- Suitable for multilayer spooling in Lang's lay
- Available in ordinary lay and Lang's lay
- Available in right hand and left hand
- Available in galvanized and ungalvanized

Nominal Diameter	Weight	Minimum Breaking Force			
		1960 N/mm²		2160 N/mm²	
mm	kg/m	kN	t [metric]	kN	t [metric]
10	0.49	89.6	9.14	97.4	9.93
11	0.60	108.8	11.09	118.4	12.07
12	0.71	130.8	13.34	139.9	14.27
13	0.83	152.7	15.57	165.4	16.87
14	0.96	179.1	18.26	190.9	19.47
15	1.10	204.0	20.80	219.5	22.38
16	1.27	230.6	23.51	249.1	25.40
17	1.42	257.9	26.30	280.6	28.61
18	1.60	293.9	29.97	317.5	32.38
19	1.78	329.0	33.55	352.8	35.98
20	1.98	362.2	36.93	391.7	39.94
21	2.17	396.1	40.39	430.9	43.94
22	2.38	441.4	45.01	472.0	48.13
23	2.61	471.8	48.11	513.2	52.33
24	2.84	524.3	53.46	564.1	57.52
25	3.04	567.9	57.91	609.4	62.14
26	3.29	614.9	62.70	657.4	67.04
27	3.57	654.2	66.71	711.7	72.57
28	3.85	712.9	72.70	765.6	78.07
29	4.12	754.6	76.95	821.0	83.72
30	4.40	817.4	83.35	877.9	89.52
31	4.70	869.7	88.69	958.4	97.73
32	5.04	930.0	94.83	1,002.8	102.26
33	5.36	992.8	101.24	1,094.1	111.57
34	5.67	1,045.0	106.56	1,130.9	115.32
36	6.40	1,185.0	120.84	1,262.3	128.72
37	6.76	1,251.7	127.64	1,333.3	135.96
38	7.09	1,319.0	134.50	1,412.2	144.01
39	7.43	1,382.1	140.94	1,479.7	150.89
40	7.92	1,462.0	149.08	1,560.4	159.12
42	8.71	1,611.2	164.30	1,667.4	170.03
44	9.55	1,767.0	180.19	1,823.7	185.97
46	10.48	1,935.0	197.32	1,989.7	202.90
48	11.40	2,113.3	215.50	2,187.0	223.01
50	12.30	2,272.8	231.76	2,504.7	255.41
52	13.33	2,461.8	251.04	2,713.0	276.65
54	14.35	2,651.2	270.35	2,921.7	297.93
56	15.43	2,851.2	290.74	3,142.2	320.42
58	16.56	3,058.5	311.88	3,370.6	343.71
60	17.72	3,273.1	333.77	3,607.1	367.83

CASAR **POWERPLAST**

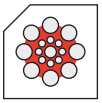


PROPERTIES


Swivel


Lubricated

Tolerance


Plast rope

Compacted

APPLICATIONS

Has a high breaking load and a good resistance against drum crushing. Hoist rope for deck cranes and offshore cranes, pull-in-riser and other applications in the marine environment, where rotation resistant-ropes are required.

OVERVIEW

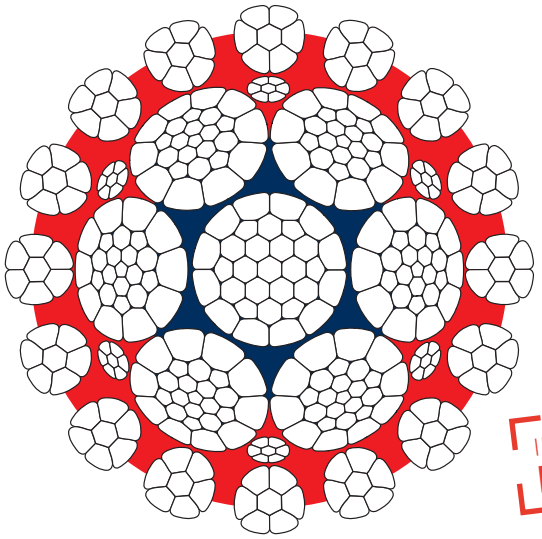
Diameter Range [mm]		12 – 56	57,15 – 72
RCN		23–3	28
Number of Outer Strands		18	18
Number of Wires		259	593
Number of Outer Load Bearing Wires		126	270
Average Fill Factor		0.727	
Average Nominal Metallic Area Factor C		0.571	
Average Spin Factor	*N/mm²	0.81	0.84 (1960)* / 0.81 (2160)*

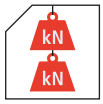
- Temperature range of use: –50°C to +115°C
- Suitable for multilayer spooling in Lang's lay
- Available in ordinary lay and Lang's lay
- Available in right hand and left hand
- Only available in galvanized execution

Nominal Diameter	Weight	Minimum Breaking Force 1960 N/mm²		Minimum Breaking Force 2160 N/mm²	
mm	kg/m	kN	t [metric]	kN	t [metric]
12	0.72	130.8	13.34	142.6	14.54
13	0.86	152.7	15.57	169.4	17.28
14	0.98	179.1	18.26	194.7	19.85
15	1.12	204.0	20.80	222.4	22.68
16	1.29	230.6	23.51	256.2	26.13
17	1.45	260.7	26.58	286.2	29.18
18	1.64	293.9	29.97	325.4	33.18
19	1.82	329.0	33.55	361.1	36.83
20	2.00	362.2	36.93	396.9	40.47
21	2.22	400.0	40.79	439.0	44.77
22	2.43	441.4	45.01	481.4	49.09
23	2.65	477.6	48.70	524.4	53.48
24	2.87	524.3	53.46	568.7	57.99
25	3.15	567.9	57.91	624.5	63.68
26	3.43	614.9	62.70	678.3	69.17
27	3.68	663.5	67.66	728.4	74.27
28	3.93	712.9	72.70	778.4	79.37
29	4.24	765.4	78.05	840.4	85.70
30	4.53	817.4	83.35	896.5	91.42
31	4.88	879.9	89.73	965.9	98.50
32	5.15	930.0	94.83	1,019.4	103.95
33	5.49	991.2	101.08	1,088.1	110.96
34	5.78	1,045.0	106.56	1,144.9	116.75
36	6.50	1,185.0	120.84	1,287.3	131.27
38	7.27	1,319.0	134.50	1,440.3	146.87
40	8.15	1,462.0	149.08	1,615.0	164.68
42	8.92	1,611.2	164.30	1,766.3	180.11
44	9.75	1,767.0	180.19	1,930.4	196.85
46	10.74	1,935.0	197.32	2,127.4	216.94
48	11.65	2,113.3	215.50	2,307.1	235.26
50	12.56	2,292.0	233.72	2,487.3	253.64
52	13.75	2,436.0	248.41	2,724.2	277.79
54	14.63	2,632.0	268.39	2,896.9	295.40
56	15.82	2,854.3	291.06	3,133.6	319.54
58	17.06	3,077.9	313.86	3,379.0	344.56
60	18.25	3,292.8	335.78	3,615.0	368.63

Special constructions and diameters available – please contact us directly.

CASAR **DOUBLEFIT**

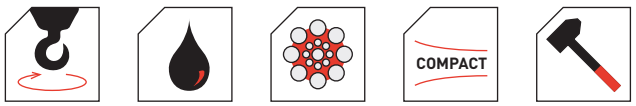




Very High Breaking Force

INNOVATIVE **DESIGN**

PROPERTIES



Swivel | Lubricated | Plast rope | Compacted | Swaged

APPLICATIONS

Latest generation of hoist rope especially developed for all kind of ambitious lifting applications. The swaging procedure generates an extrem circular rope surface providing an extraordinary multilayer spooling behaviour. Furthermore this technique ensures Doublefit to reach the highest breaking loads of all rotation resistant ropes from CASAR by using wires in standard tensile grades.

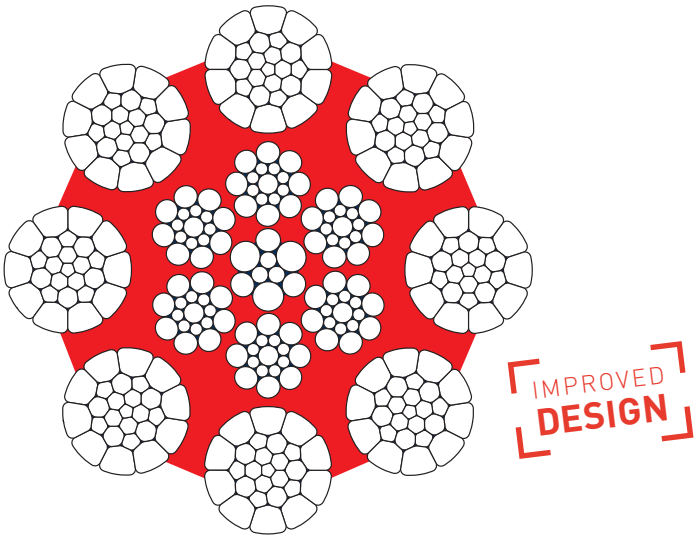
OVERVIEW

Diameter Range [mm]	18 – 60
RCN	23–2
Number of Outer Strands	16
Number of Wires	341
Number of Outer Load Bearing Wires	112
Average Fill Factor	0.770
Average Nominal Metallic Area Factor C	0.605
Average Spin Factor	0.85

- Temperature range of use: –50°C to +75°C
- Available in right hand and left hand
- Available in ordinary lay and Lang's lay
- Wires in standard tensile grades

Nominal Diameter	Weight	Minimum Breaking Force			
		1960 N/mm²		2160 N/mm²	
mm	kg/m	kN	t [metric]	kN	t [metric]
18	1.73	318.8	32.51	351.3	35.82
19	1.93	355.2	36.22	391.4	39.91
20	2.13	393.5	40.13	433.7	44.23
21	2.35	433.9	44.24	478.2	48.76
22	2.58	476.2	48.56	524.8	53.51
23	2.82	520.5	53.07	573.6	58.49
24	3.07	566.7	57.79	624.5	63.68
25	3.33	614.9	62.70	677.7	69.10
26	3.61	665.1	67.82	732.9	74.74
27	3.89	717.2	73.14	790.4	80.60
28	4.18	771.3	78.66	850.0	86.68
29	4.49	827.4	84.37	911.8	92.98
30	4.80	885.5	90.29	975.8	99.51
31	5.13	945.5	96.41	1,042.0	106.25
32	5.46	1,007.5	102.73	1,110.3	113.22
33	5.81	1,071.4	109.25	1,180.7	120.40
34	6.17	1,137.3	115.98	1,253.4	127.81
35	6.54	1,205.2	122.90	1,328.2	135.44
36	6.91	1,275.1	130.02	1,405.2	143.29
37	7.30	1,346.9	137.35	1,484.3	151.36
38	7.70	1,420.7	144.87	1,565.6	159.65
39	8.12	1,496.4	152.60	1,649.1	168.17
40	8.54	1,574.2	160.52	1,734.8	176.90
41	8.97	1,653.9	168.65	1,822.6	185.86
42	9.41	1,735.5	176.97	1,912.6	195.03
43	9.87	1,819.1	185.50	2,004.8	204.43
44	10.33	1,904.7	194.23	2,099.1	214.05
45	10.80	1,992.3	203.16	2,195.6	223.89
46	11.29	2,081.8	212.29	2,294.3	233.95
47	11.79	2,173.3	221.62	2,395.1	244.23
48	12.29	2,266.8	231.15	2,498.1	254.74
49	12.81	2,362.2	240.88	2,603.3	265.46
50	13.34	2,459.6	250.81	2,710.6	276.41
51	13.88	2,559.0	260.95	2,820.1	287.57
52	14.43	2,660.3	271.28	2,931.8	298.96
53	14.99	2,763.6	281.82	3,045.6	310.57
54	15.56	2,868.9	292.55	3,161.7	322.40
55	16.14	2,976.1	303.49	3,279.8	334.45
56	16.73	3,085.4	314.62	3,400.2	346.73
57	17.33	3,196.5	325.96	3,522.7	359.22
58	17.95	3,309.7	337.50	3,647.4	371.93
59	18.57	3,424.8	349.23	3,774.2	384.87
60	19.21	3,541.9	361.17	3,903.3	398.03

CASAR **TURBOPLAST**



PROPERTIES

No swivel | Lubricated | Tolerance | Plast rope | Compacted

APPLICATIONS

High breaking load and good resistance against crushing. Hoisting rope in multiple part reeving for smaller lifting heights as well as for twin hoist systems with left and right hand lay ropes for greater lifting heights.

OVERVIEW

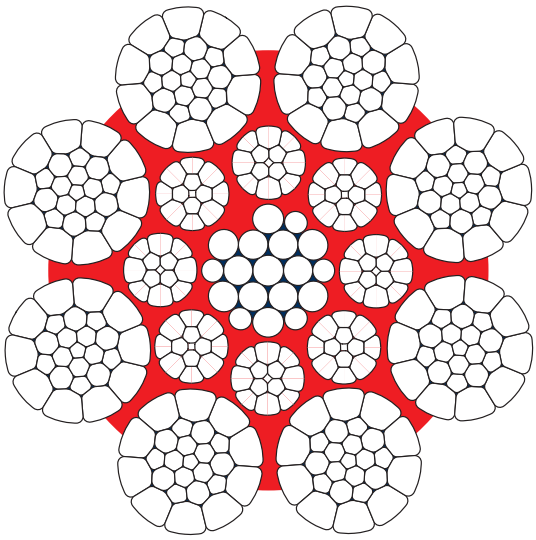
Diameter Range [mm]		8	9 – 24	25 – 48	50 – 72
RCN		09	09	09	11
Number of Outer Strands		8	8	8	8
Number of Wires		259	319	327	367
Number of Outer Load Bearing Wires		208	208	208	248
Average Fill Factor		0.664			
Average Nominal Metallic Area Factor C		0.522			
Average Spin Factor	*N/mm²	0.89 (1770)* / 0.88 (1960)* / 0.86 (2160)*			

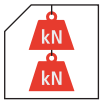
- Temperature range of use: –50°C to +115°C
- Suitable for multi-layer spooling in Lang's lay
- Available in ordinary lay and Lang's lay
- Available in right hand and left hand
- Available in galvanized and ungalvanized

Nominal Diameter	Weight	Minimum Breaking Force 1960 N/mm²		2160 N/mm²	
mm	kg/m	kN	t [metric]	kN	t [metric]
v	0.30	58.0	5.91	63.5	6.48
9	0.37	74.0	7.55	81.4	8.30
10	0.47	90.0	9.18	101.0	10.30
11	0.57	109.7	11.19	122.6	12.51
12	0.67	130.0	13.26	144.0	14.68
13	0.79	153.0	15.60	170.0	17.34
14	0.91	177.0	18.05	196.0	19.99
15	1.05	205.0	20.90	226.0	23.05
16	1.20	232.0	23.66	252.0	25.70
17	1.35	259.0	26.41	283.0	28.86
18	1.50	292.0	29.78	314.0	32.02
19	1.67	327.0	33.35	351.0	35.79
20	1.87	361.0	36.81	391.0	39.87
21	2.01	394.0	40.18	421.0	42.93
22	2.24	439.0	44.77	468.0	47.72
23	2.44	478.0	48.74	511.0	52.11
24	2.66	521.0	53.13	556.0	56.70
25	2.88	566.0	57.72	602.0	61.39
26	3.13	616.0	62.82	655.0	66.79
27	3.37	657.0	67.00	702.0	71.58
28	3.59	707.0	72.09	748.0	76.28
29	3.87	760.0	77.50	807.2	82.31
30	4.18	813.0	82.90	871.5	88.87
31	4.46	869.0	88.61	929.8	94.82
32	4.73	938.0	95.65	988.1	100.76
33	5.07	979.0	99.83	1,059.3	108.02
34	5.33	1,055.0	107.58	1,114.2	113.62
36	5.95	1,164.0	118.70	1,242.0	126.65
38	6.68	1,301.0	132.67	1,394.7	142.22
40	7.43	1,438.0	146.64	1,551.7	158.23
42	8.11	1,591.0	162.24	1,694.1	172.75
44	8.96	1,739.0	177.33	1,872.5	190.94
46	9.78	1,916.0	195.38	2,042.3	208.26
48	10.65	2,079.0	212.00	2,225.0	226.89
50	11.56	2,265.0	230.97	2,423.0	247.08
52	12.50	2,448.0	249.63	2,620.0	267.17
54	13.48	2,641.0	269.31	2,826.0	288.17
56	14.44	2,828.0	288.38	3,027.0	308.67
58	15.42	3,022.0	308.16	3,234.0	329.78
60	16.55	3,242.0	330.60	3,469.0	353.74

Special constructions and diameters available – please contact us directly.

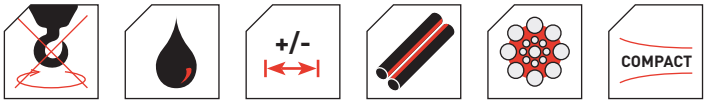
CASAR **PARAPLAST**





Very High Breaking Force

PROPERTIES



No swivel | Lubricated | Tolerance | Parallel Construction | Plast rope | Compacted

APPLICATIONS

Very fatigue resistant and very high minimum breaking load. Hoist rope for electrical hoists and lifting devices with multiple part reeving, whereas a rotation resistant rope is not needed due to great lifting heights, low number of falls or guided loads.

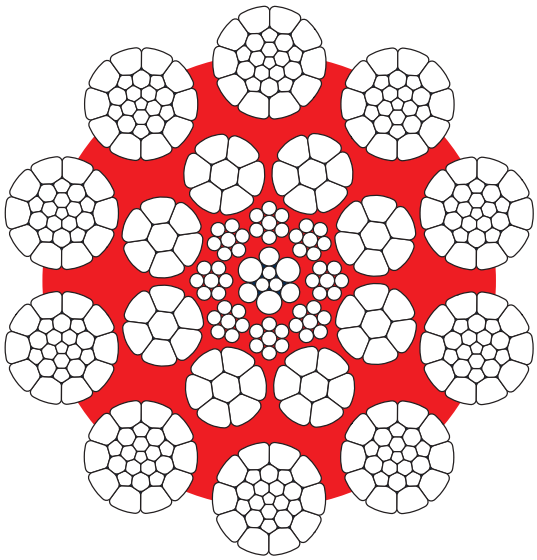
OVERVIEW

Diameter Range [mm]		11 – 32	33 – 50
RCN		09	09
Number of Outer Strands		8	8
Number of Wires		323	363
Number of Outer Load Bearing Wires		208	208
Average Fill Factor		0.709	
Average Nominal Metallic Area Factor C		0.557	
Average Spin Factor	*N/mm²	0.87 (1960)* / 0.86 (2160)*	

- Temperature range of use: –50°C to +115°C
- Suitable for multi-layer spooling
- Available in ordinary lay and Lang's lay
- Available in right hand and left hand
- Available in galvanized and ungalvanized

Nominal Diameter	Weight	Minimum Breaking Force 1960 N/mm²		Minimum Breaking Force 2160 N/mm²	
mm	kg/m	kN	t [metric]	kN	t [metric]
11	0.56	113.4	11.56	122.1	12.45
12	0.68	137.2	13.99	147.8	15.07
13	0.79	159.7	16.28	172.0	17.54
14	0.91	184.8	18.85	199.0	20.29
15	1.05	212.3	21.65	228.6	23.31
16	1.19	240.4	24.51	258.9	26.40
17	1.35	273.3	27.87	294.4	30.02
18	1.50	304.3	31.03	327.7	33.42
19	1.69	342.0	34.87	368.4	37.57
20	1.87	379.7	38.72	408.9	41.70
21	2.04	414.7	42.29	446.6	45.54
22	2.25	456.8	46.58	491.9	50.16
23	2.55	517.1	52.73	556.9	56.79
24	2.77	561.8	57.28	605.0	61.69
25	3.00	609.0	62.11	655.9	66.88
26	3.26	662.2	67.53	713.1	72.72
27	3.50	711.0	72.51	765.8	78.09
28	3.75	760.6	77.56	819.1	83.53
29	4.04	820.3	83.65	883.5	90.09
30	4.36	884.0	90.14	952.0	97.08
31	4.65	921.4	93.96	1,003.6	102.34
32	4.93	978.3	99.76	1,065.6	108.66
33	5.26	1,042.5	106.31	1,135.6	115.80
34	5.53	1,097.0	111.86	1,194.9	121.85
35	5.87	1,163.9	118.69	1,267.7	129.27
36	6.22	1,233.8	125.81	1,343.9	137.04
37	6.55	1,299.2	132.48	1,415.2	144.31
38	6.95	1,377.2	140.44	1,500.1	152.97
39	7.24	1,435.3	146.36	1,563.4	159.42
40	7.73	1,533.5	156.38	1,670.3	170.32
42	8.47	1,680.1	171.32	1,830.1	186.62
44	9.34	1,851.4	188.79	2,016.6	205.64
46	10.20	2,022.8	206.27	2,203.3	224.68
48	11.10	2,202.0	224.54	2,398.5	244.58
50	11.93	2,365.3	241.20	2,576.4	262.72

CASAR **SUPERPLAST8**

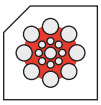


PROPERTIES


No swivel


Lubricated

Tolerance


Plast rope

Compacted

APPLICATIONS

Very high breaking load and good resistance against drum crushing. Hoisting rope in multiple part reeving for smaller lifting heights as well as for twin hoist systems with left and right hand lay ropes for greater lifting heights.

OVERVIEW

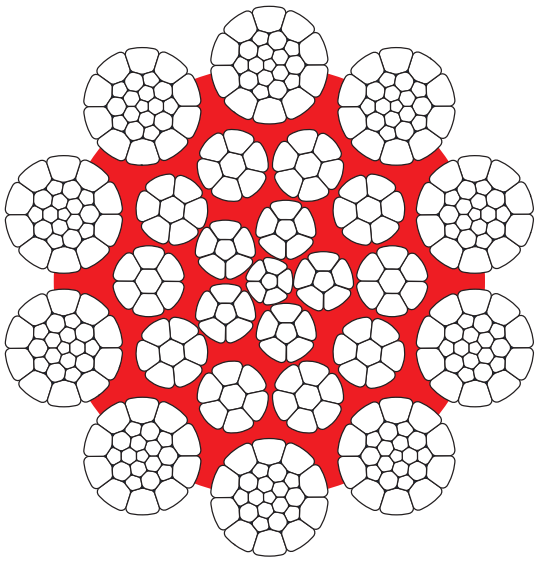
Diameter Range [mm]	10 – 66,68	68 – 76
RCN	11	→13
Number of Outer Strands	10	10
Number of Wires	381	519
Number of Outer Load Bearing Wires	260	310
Average Fill Factor	0.686	
Average Nominal Metallic Area Factor C	0.539	
Average Spin Factor *N/mm²	0.85 (1960)* / 0.84 (2160)*	

- Temperature range of use: –50°C to +115°C
- Suitable for multi-layer spooling
- Available in ordinary lay and Lang's lay
- Available in right hand and left hand
- Available in galvanized and ungalvanized

Nominal Diameter	Weight	Minimum Breaking Force 1960 N/mm²		2160 N/mm²	
mm	kg/m	kN	t [metric]	kN	t [metric]
10	0.47	90.9	9.27	99.6	10.16
11	0.57	108.9	11.10	119.3	12.17
12	0.66	127.2	12.97	139.4	14.21
13	0.78	151.8	15.48	166.2	16.95
14	0.89	173.8	17.72	190.4	19.42
15	1.03	199.8	20.37	218.9	22.32
16	1.18	226.5	23.10	248.1	25.30
17	1.35	260.0	26.51	284.8	29.04
18	1.51	292.8	29.86	320.8	32.71
19	1.67	320.4	32.67	351.0	35.79
20	1.85	358.2	36.53	394.8	40.26
21	2.04	395.2	40.30	435.6	44.42
22	2.24	432.2	44.07	473.5	48.28
23	2.46	473.0	48.23	518.2	52.84
24	2.69	517.4	52.76	566.9	57.81
25	2.89	559.6	57.06	613.4	62.55
26	3.13	604.9	61.68	662.7	67.58
27	3.36	646.8	65.96	708.6	72.26
28	3.61	698.9	71.27	762.0	77.70
29	3.83	737.8	75.24	808.3	82.42
30	4.13	796.8	81.25	872.9	89.01
31	4.38	846.7	86.34	927.5	94.58
32	4.82	925.9	94.42	1,014.3	103.43
33	5.03	968.4	98.75	1,060.9	108.18
34	5.42	1,046.0	106.66	1,145.9	116.85
36	6.06	1,172.5	119.56	1,284.5	130.98
38	6.66	1,282.5	130.78	1,405.0	143.27
40	7.41	1,429.3	145.75	1.565.8	159.67
42	8.17	1,581.5	161.27	1,732.6	176.68
44	8.93	1,725.8	175.98	1,890.7	192.80
46	9.90	1,899.3	193.68	2,080.7	212.17
48	10.75	2,068.9	210.97	2,266.6	231.13
50	11.55	2,232.3	227.63	2,445.5	249.37
52	12.51	2,421.3	246.91	2,652.6	270.49
54	13.61	2,626.5	267.83	2,877.4	293.42
56	14.73	2,853.4	290.97	3,126.0	318.77
58	15.59	3,004.3	306.36	3,291.3	335.62
60	16.79	3,245.0	330.90	3,555.0	362.51

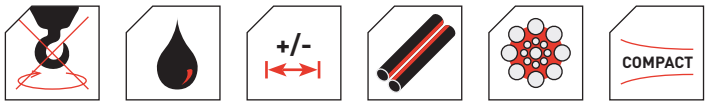
Special constructions and diameters available – please contact us directly.

CASAR **SUPERPLAST10 MIX**



High Breaking Force

PROPERTIES



No swivel | Lubricated | Tolerance | Parallel Construction | Plast rope | Compacted

APPLICATIONS

Very high bending fatigue performance and high minimum breaking load. Mainly overhead and industrial cranes where rotation resistant ropes are not required.

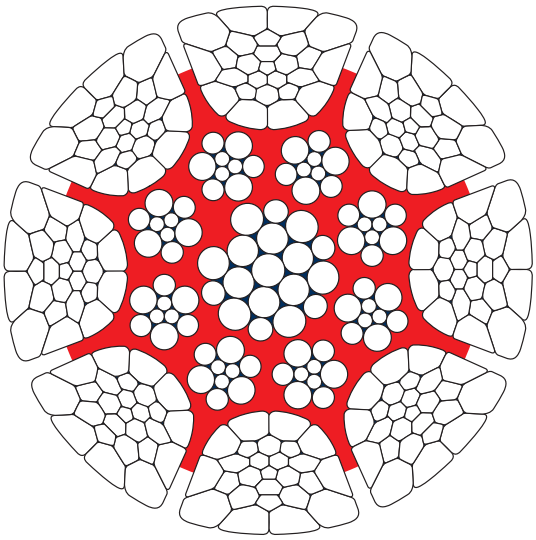
OVERVIEW

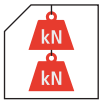
Diameter Range [mm]		16 – 57.15
RCN		11
Number of Outer Strands		10
Number of Wires		366
Number of Outer Load Bearing Wires		260
Average Fill Factor		0.700
Average Nominal Metallic Area Factor C		0.550
Average Spin Factor	*N/mm²	0.87 (1960)* / 0.85 (2160)*

- Temperature range of use: –50°C to +115°C
- Suitable for multi-layer spooling in Lang's lay
- Available in ordinary lay and Lang's lay
- Available in right hand and left hand
- Available in galvanized and ungalvanized

Nominal Diameter	Weight	Minimum Breaking Force 1960 N/mm²		Minimum Breaking Force 2160 N/mm²	
mm	kg/m	kN	t [metric]	kN	t [metric]
16	1.22	237.0	24.17	259.0	26.41
17	1.38	270.0	27.53	291.0	29.67
18	1.54	301.0	30.69	328.0	33.45
19	1.76	344.0	35.08	375.0	38.24
20	1.93	377.0	38.44	406.0	41.40
21	2.11	412.0	42.01	449.0	45.79
22	2.39	465.0	47.42	507.0	51.70
23	2.60	507.0	51.70	546.0	55.68
24	2.83	553.0	56.39	602.0	61.39
25	3.05	594.0	60.57	647.0	65.98
26	3.31	645.0	65.77	695.0	70.87
27	3.55	692.0	70.57	754.0	76.89
28	3.88	757.0	77.19	825.0	84.13
29	4.14	808.0	82.39	871.0	88.82
30	4.34	847.0	86.37	923.0	94.12
31	4.68	913.0	93.10	994.0	101.36
32	5.03	982.0	100.14	1,057.0	107.79
33	5.31	1,036.0	105.64	1,129.0	115.13
34	5.67	1,106.0	112.78	1,205.0	122.88
36	6.33	1,235.0	125.94	1,330.0	135.62
38	7.02	1,369.0	139.60	1,492.0	152.14
40	7.76	1,496.0	152.55	1,621.0	165.30
42	8.57	1,654.0	168.66	1,792.0	182.74
44	9.44	1,820.0	185.59	1,972.0	201.09
46	10.29	1,985.0	202.42	2,150.0	219.24
48	11.28	2,176.0	221.90	2,356.0	240.25
50	12.18	2,350.0	239.64	2,546.0	259.62
52	13.00	2,508.0	255.75	2,716.0	276.96
54	14.20	2,793.0	284.81	2,967.0	302.55
56	15.19	2,931.0	298.88	3,174.0	323.66

CASAR **PARAFIT**





Very High Breaking Force

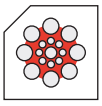
PROPERTIES

No swivel

Lubricated

Tolerance

Parallel Construction



Plast rope

Compacted

Swaged

APPLICATIONS

Boom hoist rope for all kind of crawler cranes and mobile cranes especially suited for multilayer spooling.

OVERVIEW

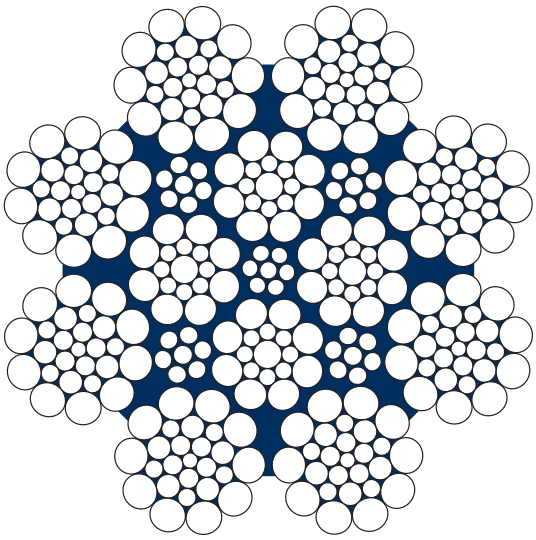
Diameter Range [mm]		14 – 50
RCN		09
Number of Outer Strands		8
Number of Wires		298
Number of Outer Load Bearing Wires		208
Average Fill Factor		0.744
Average Nominal Metallic Area Factor C		0.584
Average Spin Factor	*N/mm²	0.87 (1960)* / 0.86 (2160)*

- Temperature range of use: –50°C to +115°C
- Suitable for multi-layer spooling
- Only available in ordinary lay
- Available in right hand and left hand
- Available in galvanized and ungalvanized

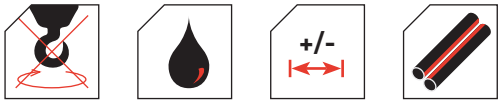
Nominal Diameter	Weight	Minimum Breaking Force 1960 N/mm²		Minimum Breaking Force 2160 N/mm²	
mm	kg/m	kN	t [metric]	kN	t [metric]
14	0.98	195.8	19.97	213.4	21.76
15	1.11	223.2	22.76	243.1	24.79
16	1.27	255.1	26.01	277.9	28.33
17	1.45	291.8	29.75	317.8	32.41
18	1.61	322.7	32.90	351.5	35.84
19	1.82	364.4	37.16	397.0	40.48
20	1.99	398.5	40.63	434.1	44.26
21	2.18	437.5	44.61	476.5	48.59
22	2.42	485.2	49.47	528.5	53.89
23	2.63	528.3	53.87	575.5	58.69
24	2.87	576.1	58.75	627.6	64.00
25	3.11	624.4	63.67	680.2	69.36
26	3.35	671.7	68.50	731.7	74.62
27	3.63	727.2	74.16	792.2	80.78
28	3.90	782.8	79.82	852.7	86.96
29	4.18	838.0	85.46	912.9	93.09
30	4.50	902.2	92.00	982.9	100.23
32	5.08	1,018.9	103.90	1,110.0	113.19
33	5.40	1,083.6	110.50	1,065.9	108.70
34	5.77	1,157.3	118.01	1,260.7	128.56
36	6.44	1,291.6	131.71	1,407.0	143.48
38	7.21	1,446.4	147.49	1,575.6	160.67
40	7.95	1,593.8	162.53	1,736.3	177.05
42	8.76	1,757.2	179.19	1,914.2	195.20
44	9.67	1,939.8	197.81	2,113.2	215.49
46	10.55	2,115.8	215.75	2,304.9	235.03
48	11.49	2,304.2	234.96	2,510.1	255.96
50	12.36	2,480.3	252.92	2,702.0	275.53

Special constructions and diameters available – please contact us directly.

CASAR **ALPHALIFT**



PROPERTIES



No swivel | Lubricated | Tolerance | Parallel Construction

APPLICATIONS

Very flexible construction with a high breaking load. Hoist rope for electrical hoist and other lifting devices, where rotation resistant ropes are not required.

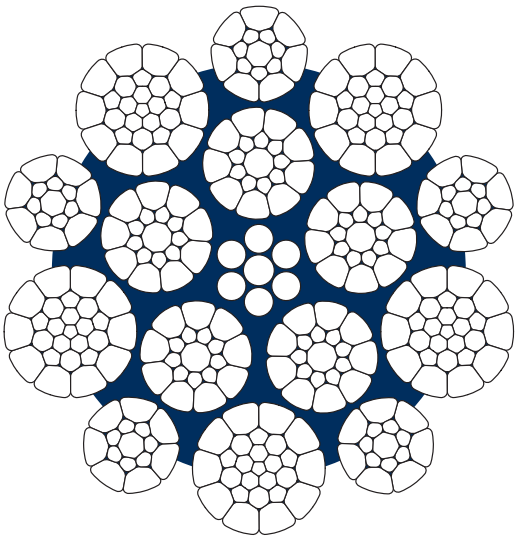
OVERVIEW

Diameter Range [mm]	4 – 5	5.5 – 6.5	7 – 9.53	10 – 27
RCN	02	07	07	06
Number of Outer Strands	8	8	8	8
Number of Wires	99	211	271	255
Number of Outer Load Bearing Wires	56	168	168	152
Average Fill Factor	0.655			
Average Nominal Metallic Area Factor C	0.514			
Average Spin Factor	0.86			

- Temperature range of use: –50°C to +140°C
- Available in ordinary lay and Lang's lay
- Available in right hand and left hand
- Available in galvanized and ungalvanized

Nominal Diameter	Weight	Minimum Breaking Force 1960 N/mm²		Minimum Breaking Force 2160 N/mm²	
mm	kg/m	kN	t [metric]	kN	t [metric]
4	0.07	13.0	1.33	14.3	1.46
5	0.11	21.1	2.15	23.2	2.37
6	0.16	31.5	3.21	34.7	3.54
7	0.21	42.6	4.34	47.0	4.79
8	0.28	55.0	5.61	60.6	6.18
9	0.36	72.0	7.34	79.3	8.09
10	0.45	87.3	8.90	92.5	9.43
11	0.55	107.2	10.93	117.0	11.93
12	0.64	126.3	12.88	137.8	14.05
13	0.75	146.6	14.95	159.9	16.31
14	0.86	168.7	17.20	184.1	18.77
15	1.01	197.0	20.09	214.9	21.92
16	1.14	222.5	22.69	242.8	24.75
17	1.28	250.3	25.52	273.1	27.85
18	1.44	282.8	28.84	308.5	31.46
19	1.63	319.9	32.62	349.0	35.59
20	1.80	352.0	35.89	384.0	39.16
21	2.00	391.6	39.93	427.2	43.57
22	2.20	430.2	43.87	469.4	47.86
23	2.39	467.4	47.66	509.9	52.00
24	2.58	504.7	51.47	550.6	56.15
25	2.78	545.3	55.61	594.9	60.67
26	3.00	588.8	60.04	642.4	65.51
27	3.24	635.5	64.80	693.3	70.70

CASAR **BETALIFT**



Very High Breaking Force

PROPERTIES

No swivel

Lubricated

Tolerance

Parallel Construction

Compacted

APPLICATIONS

Very flexible construction with an extremely high breaking load. Hoist rope for electrical hoist and other lifting devices, where rotation resistant ropes are not required.

OVERVIEW

Diameter Range [mm]	8 – 27
RCN	07
Number of Outer Strands	10
Number of Wires	307
Number of Outer Load Bearing Wires	205
Average Fill Factor	0.754
Average Nominal Metallic Area Factor C	0.592
Average Spin Factor	0.84

- Temperature range of use: –50°C to +140°C
- Suitable for multi-layer spooling in Lang's lay
- Available in ordinary lay and Lang's lay
- Available in right hand and left hand
- Available in galvanized and ungalvanized

Nominal Diameter	Weight	Minimum Breaking Force 1960 N/mm²		Minimum Breaking Force 2160 N/mm²	
mm	kg/m	kN	t [metric]	kN	t [metric]
8	0.31	62.1	6.33	68.4	6.97
9	0.40	79.5	8.11	87.6	8.93
10	0.49	97.3	9.93	107.2	10.92
11	0.58	118.4	12.08	130.5	13.29
12	0.71	140.1	14.30	154.4	15.73
13	0.83	164.6	16.80	181.4	18.48
14	0.96	190.8	19.47	210.3	21.42
15	1.11	219.1	22.36	241.5	24.60
16	1.26	250.6	25.57	276.2	28.13
17	1.43	280.5	28.63	309.2	31.49
18	1.59	317.1	32.36	349.5	35.59
19	1.76	352.7	35.99	388.6	39.58
20	1.99	389.4	39.73	429.1	43.71
21	2.16	432.0	44.08	476.1	48.49
22	2.35	472.0	48.17	520.2	52.98
23	2.58	515.2	52.57	567.7	57.82
24	2.84	561.8	57.32	619.1	63.05
25	3.08	608.0	62.04	670.1	68.25
26	3.30	660.2	67.37	727.6	74.10
27	3.54	712.1	72.66	784.7	79.93

Special constructions and diameters available – please contact us directly.

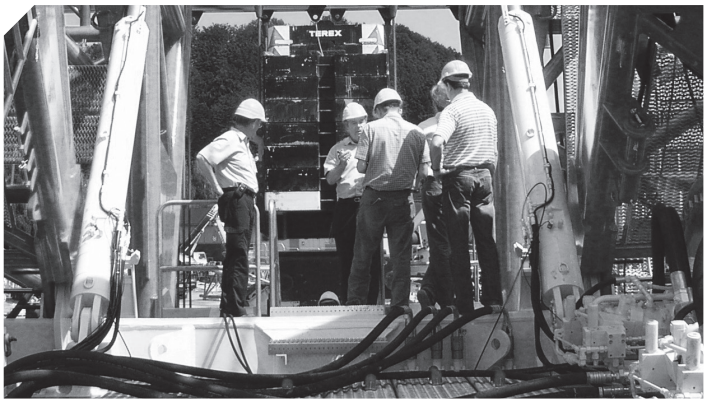
TECHNICAL SERVICES

OUR PROMISE

We listen closely to your application needs and will find the best rope solution for it. Besides the standard ropes special developments are available and we will find your tailor-made rope for your specific application.

QUICK SUPPORT ON THE JOBSITE

Our experienced engineering specialists bring decades of knowledge in order to improve the performance of your equipment or to help you finding out what causes trouble. Our consulting service includes training, support on the installation, maintenance and inspection of our ropes as well as on-site non-destructive inspection and other ways to investigate in rope damages.



SOPHISTICATED INDOOR SERVICE

With our modern analyzing equipment we can perform in-depth analysis of your rope along with a detailed inspection report. This includes magnetic and microscopic analysis as well as bending fatigue, tensile and other dynamic and static tests. Our deep knowledge in ropes is the foundation to interpret the data in a way that a solid solution to your problem can be determined.

CHALLENGE US

Our team is ready to support you, with extensive experience in rope design, production, research & development and all types of rope applications.

Please contact us for any support from our engineers at:
sales@casaraustralia.com.au

Kath Darr: 0438 167 516

and

Office: 1300 947 326

DISCARD CRITERIA

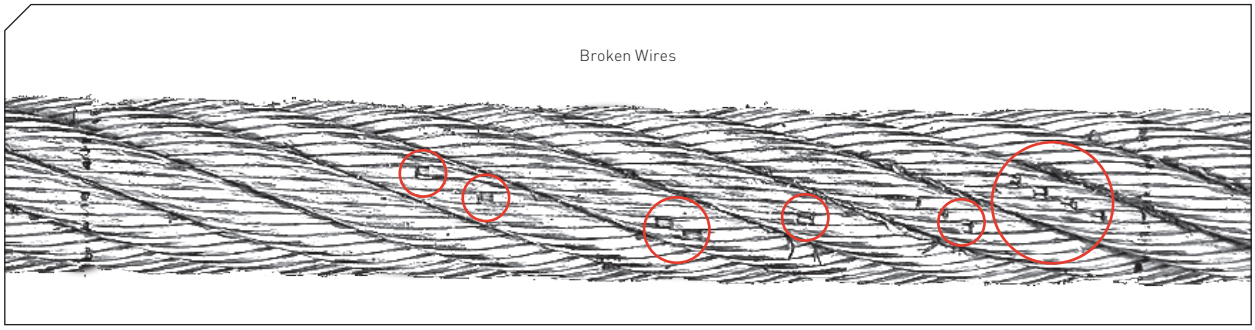
DISCARD CRITERIA ACCORDING TO ISO 4309:2010

Wire ropes should be visually inspected at frequent intervals by a competent person to make sure that the rope is in a safe condition and has not reached one of the following criteria:

1. Visible broken wires (see the following tables)
2. Reduction in rope diameter
3. Fracture of strands
4. Corrosion
5. Deformation and damage

In the tables on the next page you can find the number of visible broken wires for ropes working in steel sheaves.

NOTE: Ropes having outer strands of Seale construction where the number of wires in each strand is 19 or less (e.g. 6x19 Seale for single-layer and parallel-closed ropes and 18×19 Seale– WSC for rotation-resistant ropes) are placed in this table two colums to the left of that column in which the construction would normally be placed based on the number of wires in the outer layer of strands.



DISCARD CRITERIA

DISCARD CRITERIA ACCORDING TO ISO 4309:2010

SINGLE-LAYER AND PARALLEL-CLOSED ROPES

RCN	01	02	03	04	05	06	07	08	09	10	11	12	13	
Number of load-bearing wires in the outer strands of the rope[1] *n*	*n*≤50	51≤*n*≤75	76≤*n*≤100	101≤*n*≤120	121≤*n*≤140	141≤*n*≤160	161≤*n*≤180	181≤*n*≤200	201≤*n*≤220	221≤*n*≤240	241≤*n*≤260	261≤*n*≤280	281≤*n*≤300	*n*>300
Number of visible broken outer wires[2]														
Rope Working (Single-Layer Drum)[3] (Classes M1 to M4 or class unknown[4])														
Ordinary Lay (sZ, zS)														
Over a length of 6*d*[5]	2	3	4	5	6	6	7	8	9	10	10	11	12	0,04 × n
Over a length of 30*d*[5]	4	6	8	10	11	13	14	16	18	19	21	22	24	0,08 × n
Lang Lay (sS, zZ)														
Over a length of 6*d*[5]	1	2	2	2	3	3	4	4	4	5	5	6	6	0,02 × n
Over a length of 30*d*[5]	2	3	4	5	6	6	7	8	9	10	10	11	12	0,04 × n
Rope Spooling (Multi-Layer Drum)[6] (All classes)														
Ordinary and Lang lay														
Over a length of 6*d*[5]	4	6	8	10	12	12	14	16	18	20	20	22	24	0,08 × n
Over a length of 30*d*[5]	8	12	16	20	22	26	28	32	36	38	42	44	48	0,16 × n

ROTATION-RESISTANT ROPES

RCN	21	22	23–1	23–2	23–3	24	25	26	27	28	29	30	31	
Outer Strands	**4**	**3 | 4**						↗ **11**						
Number of load-bearing wires in the outer strands of the rope[1] *n*	*n*≤100	*n*≥100	71≤*n*≤100	101≤*n*≤120	121≤*n*≤140	141≤*n*≤160	161≤*n*≤180	181≤*n*≤200	201≤*n*≤220	221≤*n*≤240	241≤*n*≤260	261≤*n*≤280	281≤*n*≤300	*n*>300
Number of visible broken outer wires[2]														
Rope Working (Single-Layer Drum)[3]														
Over a length of 6*d*[5]	2	2	2	3	3	3	4	4	4	5	5	6	6	6
Over a length of 30*d*[5]	4	4	4	5	5	6	7	8	9	10	10	11	12	12
Rope Spooling (Multi-Layer Drum)[6]														
Over a length of 6*d*[5]	2	4	4	5	6	6	7	8	9	10	10	11	12	12
Over a length of 30*d*[5]	4	8	8	10	11	13	14	16	18	19	21	22	24	24

1) For the purposes of this International Standard, Filler wires are not regarded as load-bearing wires and are not included in the values of *n*.
2) A broken wire has two ends (counted as one wire).
3) Sections of rope working in steel sheaves and/or spooling on a single-layer drum
4) Twice the number of broken wires listed may be applied to ropes on mechanisms whose classification is known to be M5 to M8.
5) *d* = nominal diameter of rope.
6) Sections of rope spooling on a multi-layer drum. 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)

Classes M1 to M4 equates to mechanism group $1E_m$ to $1A_m$
Classes M5 to M8 equates to mechanism group 2_m to 5_m
Please pay attention to the country- / application-specific standards.

Special constructions and diameters available – please contact us directly.

ACCESSORIES

CASAR
By WireCo

CASAR **LUBRICANTS**

PRIMARY WIRE ROPE LUBRICANTS

Our standard primary lubrication products are state-of-the-art and can be used for a large number of standard rope types: elevator, excavator, crane and even fishing wire ropes. The benefit for the rope manufacturer is simple – one product for all rope types.

The special products developed for this field of application can be used for all types of mobile cranes, revolving tower cranes and dockside cranes. These primary lubrication products provide weathering resistance and are characterised by outstanding wear protection and corrosion protection properties. UNOLIT 130 G is especially suitable for highly-stressed ropes with immediate plastic layer.

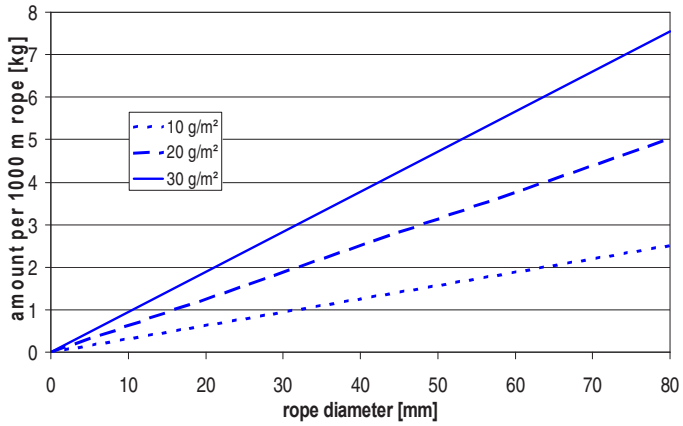
ELASKON

Product	Package Size	Description
Containing Solvent		
ELASKON 30	25 kg hobbock 8 kg bucket 600 ml spray can	A maintenance lubricant for wire ropes. After evaporation of the solvent a touch prove film is formed on the surfaces. It is moisture infiltrating and has good adhesive power as well as excellent corrosion protection abilities. Universal use.
ELASKON SK-U (fluid)	25 kg hobbock 17 kg cannister 600 ml spray can	A maintenance lubricant for wire ropes. After evaporation of the solvent a touch prove film is formed on the surfaces. It is moisture infiltrating and has good adhesive power as well as excellent corrosion protection abilities. Universal use.
UNOLIT SPRAY OIL	17.5 kg cannister 600 ml spray can	A maintenance lubricant for wire ropes. The product contains graphite as solid lubricant and offers therefore excellent lubricating characteristics especially in moving ropes. As recommended by leading rope manufacturers splice knots may be protected with this product. It has very good creep characteristic and penetrates the rope completely.

Eurolift – Use Unolift Spray Oil or SK-U fluid

Starlift (Pro, Plus, Xtra) – Use Unolit Spray Oil, Elaskon 30 or SK-U fluid

All other ropes – Use Elaskon 30



hoisting rope ≤ 30 g/m²
locked coil ≤ 15 g/m²
nonmoving rope ≤ 75 g/m²

principle:
less is more,
but lubricate constantly!

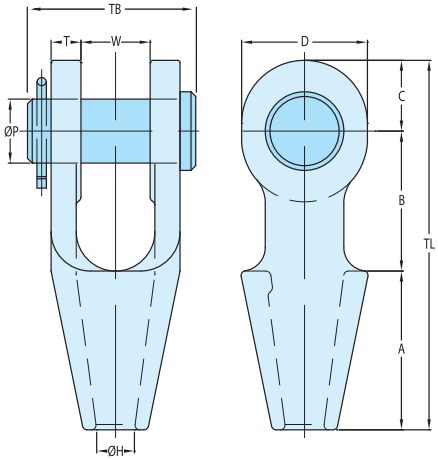
Special constructions and diameters available – please contact us directly.

QUALITY END FITTINGS MANUFACTURED IN EUROPE

OPEN SPELTER SOCKETS WITH PIN

Quenched and tempered cast steel

ROPEBLOCK



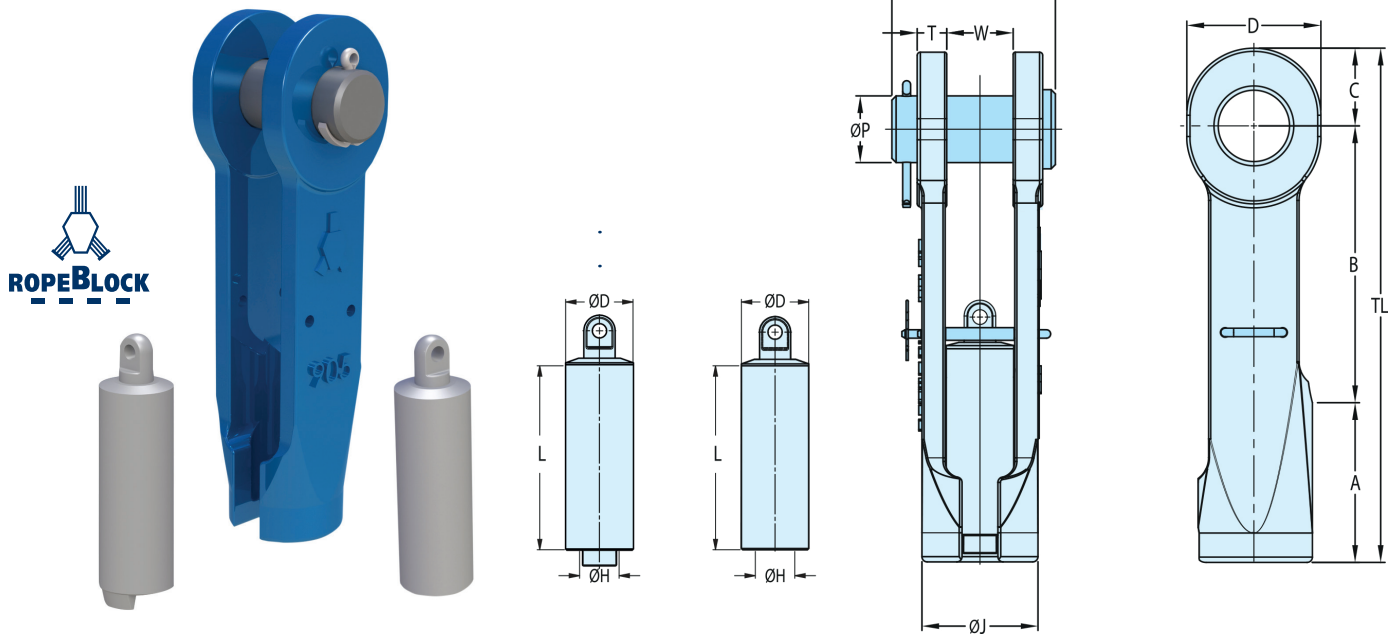
Model No.	Minimum Breaking Load	For wire Ø	Strand Ø	Dimensions										Weight
				A	B	C	D	ØH	ØP	T	TL	TB	W	
	M tons	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	kg
OSS 196 P	8	6-7	-	50	40	19	34	9	16	9	109	51	19	0.4
OSS 197 P	12	8-10	-	57	45	22	42	13	20	11	124	63	21	0.7
OSS 198 P	20	11-13	-	64	51	27	50	15	25	12	142	67	25	1
OSS 199 P	25	14-16	13	76	63	32	58	18	30	14	171	85	32	1.8
OSS 100 P	40	18-19	14-16	89	76	40	70	22	35	16	205	95	38	3
OSS 104 P	55	20-22	18-19	101	89	45	80	25	41	19	235	110	44	4.6
OSS 108 P	75	23-26	20-22	114	101	60	104	29	51	22	275	128	51	8
OSS 111 P	90	27-30	23-26	127	114	65	114	33	57	25	306	142	57	11
OSS 115 P	125	31-36	27-28	139	127	72	126	39	63	28	338	155	63	15
OSS 118 P	150	37-39	30-32	152	162	80	142	42	70	30	394	177	76	22
OSS 120 P	170	40-42	33-35	165	165	88	156	45	76	33	418	187	76	27
OSS 125 P	225	43-48	36-40	191	178	100	176	52	89	39	469	215	89	41
OSS 128 P	280	49-54	42-45	216	228	108	194	59	95	45	552	244	101	60
OSS 130 P	360	55-60	46-48	229	254	120	210	64	108	53	603	275	113	88
OSS 132 P	425	61-68	50-54	248	273	133	236	75	121	60	654	300	127	118
OSS 135 P	460	69-75	56-62	279	279	138	240	81	127	73	696	335	133	155
OSS 138 P	560	76-80	64-67	305	286	146	252	88	133	76	737	355	146	186
OSS 140 P	625	81-86	69-76	330	298	160	290	92	140	79	788	375	159	227
OSS 142 P	720	87-93	78-86	356	318	178	320	99	152	83	852	400	171	283
OSS 144 P	875	94-102	88-96	381	343	190	350	108	178	89	914	435	191	374
OSS 146 P	1200	108-115	98-110	450	480	215	400	129	195	100	1145	465	205	539
OSS 150 P	1400	120-130	112-124	500	500	250	450	147	220	110	1250	525	225	761
OSS 155 P	1600	135-140	125-132	540	497	263	480	157	240	140	1300	590	230	1067
OSS 160 P	2000	142-153	133-143	585	505	275	500	171	255	140	1365	610	250	1172
OSS 165 P	2220	154-165	144-154	630	530	300	550	185	275	150	1460	640	260	1441
OSS 170 P	2500	166-178	155-166	680	570	310	570	199	295	150	1560	660	280	1615
OSS 175 P	2800	180-191	167-179	725	600	325	600	213	310	155	1650	689	300	1907
OSS 180 P	3200	192-204	180-191	775	620	345	640	229	330	160	1740	720	320	2239

PLEASE NOTE: ALSO AVAILABLE WITH BOLT & NUT

PLEASE NOTE: ALL FITTINGS ARE AVAILABLE EX-STOCK IN GALVANISED FINISH, NOT IN BLUE AS SHOWN ABOVE – BLUE AVAILABLE ON REQUEST.

SUPER REEVE CONNECTOR SOCKETS WITH PIN

Quenched and tempered cast steel



Model No.	Minimum Breaking Load	For wire Ø	Dimensions													Weight
			A	B	C	ØH	ØP	T	W	D	ØD	ØJ	L	TB	TL	
	M tons	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	kg
SCS 901 P	20	11-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SCS 902 P	25	13-16	85	133	32	19	30	14	32	58	32	56	98	85	250	3.1
SCS 903 P	40	16-19	90	160	40	22	35	16	38	70	40	65	114	95	290	4.8
SCS 904 P	55	20-22	107	184	45	26	41	19	44	80	44	77	130	110	336	8
SCS 905 P	75	23-26	115	211	60	31	50	22	51	104	52	88	142	128	386	12
SCS 906 P	90	27-29	140	215	65	34	57	25	57	114	58	96	159	142	420	16
SCS 907 P	125	30-32	150	260	73	36	63	28	63	126	64	110	177	155	483	23
SCS 908 P	125	33-36	170	260	73	40	64	28	69	126	68	114	197	160	503	25
SCS 902 P.SR	25	13-16	85	133	32	19	30	14	32	58	32	56	98	85	250	3.1
SCS 903 P.SR	40	16-19	90	160	40	22	35	16	38	70	40	65	114	95	290	4.8
SCS 904 P.SR	55	20-22	107	184	45	26	41	19	44	80	44	77	130	110	336	8
SCS 905 P.SR	75	23-26	115	211	60	31	50	22	51	104	52	88	142	128	386	12
SCS 906 P.SR	90	27-29	140	215	65	34	57	25	57	114	58	96	159	142	420	16
SCS 907 P.SR	125	30-32	150	260	73	36	63	28	63	126	64	110	177	155	483	23
SCS 908 P.SR	125	33-36	170	260	73	40	64	28	69	126	68	114	197	160	503	25
SCS 909 P.SR	150	37-39	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SCS 910 P.SR	170	40-42	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SCS 911 P.SR	225	43-48	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SCS 912 P.SR	280	49-54	225	373	108	60	95	45	101	194	105	185	280	244	706	93

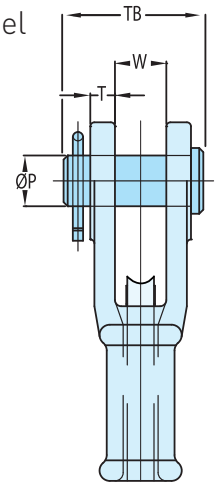
PLEASE NOTE: ALSO AVAILABLE WITH BOLT & NUT

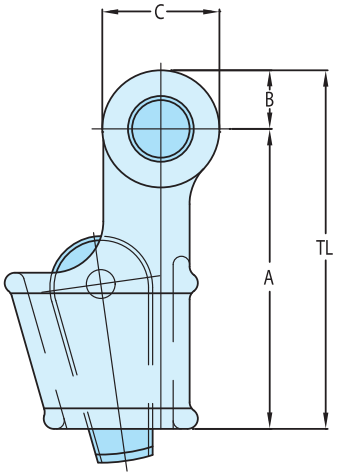
PLEASE NOTE: ALL FITTINGS ARE AVAILABLE EX-STOCK IN GALVANISED FINISH,
NOT IN BLUE AS SHOWN ABOVE – BLUE AVAILABLE ON REQUEST.

Special constructions and diameters available – please contact us directly.

OPEN WEDGE SOCKETS WITH PIN

Quenched and tempered cast steel





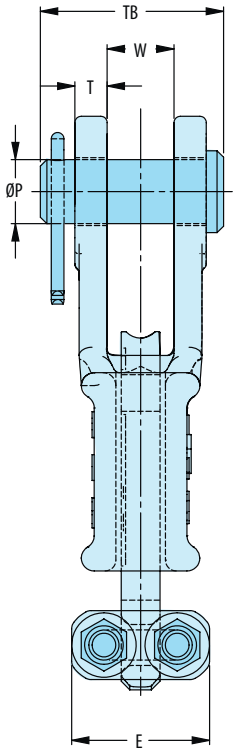
Model No.	Minimum Breaking Load	For wire Ø	Dimensions								Weight
			A	B	C	ØP	T	TL	TB	W	
	M tons	mm	mm	mm	mm	mm	mm	mm	mm	mm	kg
OWS 0.25 P	8	7-8	110	18	36	16	9	128	51	18	0.8
OWS 0.5 P	12	9-10	145	23	46	21	11	168	63	21	1.7
OWS 1 P	20	11-13	146	29	57	25	12	175	67	25	2.1
OWS 2 P	25	14-16	176	35	70	30	15	211	85	31	4
OWS 3 P	40	18-19	210	40	80	35	16	250	95	38	7
OWS 4 P	55	20-22	238	48	95	41	18	285	110	44	10
OWS 5 P	75	23-26	275	55	110	51	22	330	128	51	15
OWS 6 P	90	27-29	310	65	130	57	25	375	142	57	21
OWS 7 P	110	30-32	350	73	146	63	28	423	155	63	31
OWS 8 P	125	34-36	400	74	148	64	28	474	160	70	37
OWS 9 P	150	37-39	450	80	142	70	30	530	177	77	51
OWS 10 P	170	40-42	500	87	160	76	33	587	187	76	64
OWS 11 P	225	43-48	550	100	186	89	39	650	215	89	96
OWS 12 P	280	49-52	640	105	205	95	46	745	244	101	130
OWS 13 P	360	54-58	660	125	250	108	54	785	275	114	180
OWS 14 P	425	60-68	835	135	270	121	60	970	300	127	275
OWS 15 P	460	72-76	1000	150	300	133	76	1150	355	146	440
OWS 16 P	625	81-86	1100	150	300	140	79	1250	375	159	510

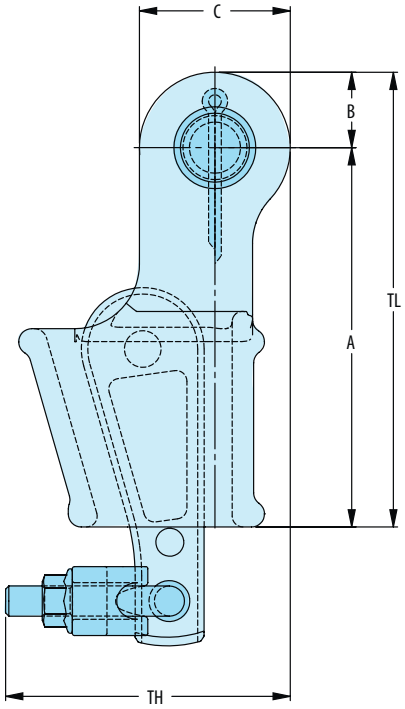
PLEASE NOTE: ALSO AVAILABLE WITH BOLT & NUT

PLEASE NOTE: ALL FITTINGS ARE AVAILABLE EX-STOCK IN GALVANISED FINISH, NOT IN BLUE AS SHOWN ABOVE – BLUE AVAILABLE ON REQUEST.

TAILGRIP OPEN WEDGE SOCKETS WITH PIN

Quenched and tempered cast steel





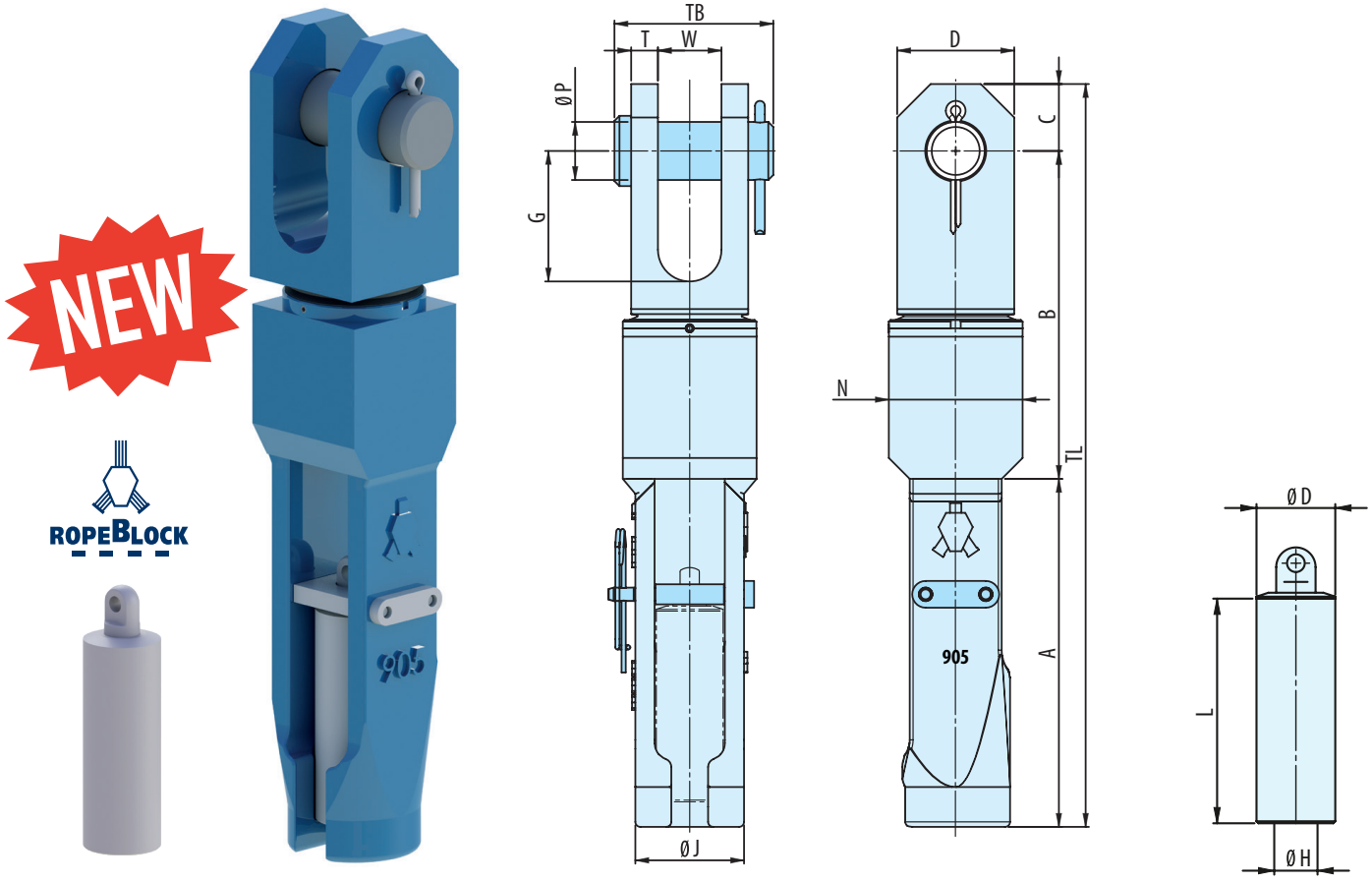
Model No.	Minimum Breaking Load	For wire Ø	Dimensions										Weight
	M tons	mm	A mm	B mm	C mm	E mm	ØP mm	T mm	TH mm	TL mm	TB mm	W mm	kg
OWS-TG 0.5 P	12	9-10	145	23	46	40	21	11	76	168	63	21	1.9
OWS-TG 1 P	20	11-13	146	29	57	55	25	12	100	175	67	25	2.4
OWS-TG 2 P	25	14-16	176	35	70	64	30	15	125	211	85	31	5
OWS-TG 3 P	40	18-19	210	40	80	68	35	16	142	250	95	38	8
OWS-TG 4 P	55	20-22	238	48	95	74	41	18	164	285	110	44	11
OWS-TG 5 P	75	23-26	275	55	110	84	51	22	189	330	128	51	16
OWS-TG 6 P	90	27-29	310	65	130	95	57	25	217	375	142	57	23
OWS-TG 7 P	110	30-32	350	73	146	105	63	28	238	423	155	63	34

PLEASE NOTE: ALSO AVAILABLE WITH BOLT & NUT

PLEASE NOTE: ALL FITTINGS ARE AVAILABLE EX-STOCK IN GALVANISED FINISH, NOT IN BLUE AS SHOWN ABOVE – BLUE AVAILABLE ON REQUEST.

SUPER REEVE CONNECTOR SWIVEL SOCKETS WITH PIN

Quenched and tempered cast steel



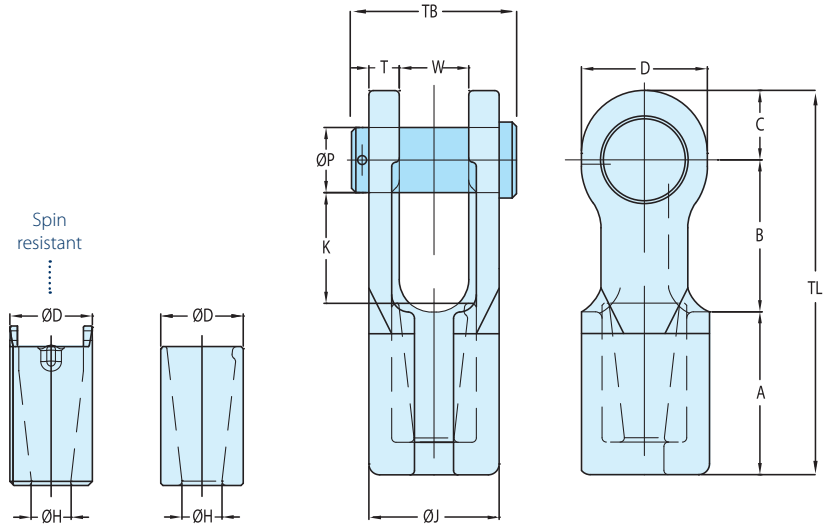
Model No.	Minimum Breaking Load	For wire Ø	Dimensions															Weight
	M tons	mm	A mm	B mm	C mm	ØH mm	ØP mm	T mm	W mm	G mm	D mm	ØD mm	ØJ mm	N mm	L mm	TB mm	TL mm	kg
SCS-SW 902 P	25	13-16	186	229	32	19	30	14	32	63	55	32	56	70	98	85	447	6
SCS-SW 903 P	40	16-19	208	274	40	22	35	16	38	78	70	40	65	80	114	95	522	10
SCS-SW 904 P	55	20-22	246	301	50	26	41	19	44	85	80	44	77	85	130	110	597	17
SCS-SW 905 P	75	23-26	266	319	60	31	50	22	51	85	100	52	88	95	142	128	645	22
SCS-SW 906 P	90	27-29	290	361	70	34	57	25	57	95	115	58	96	110	159	142	721	31
SCS-SW 907 P	125	30-32	337	417	70	36	63	28	63	110	125	64	110	130	177	155	844	49
SCS-SW 908 P	125	33-36	357	417	90	40	64	28	69	110	125	68	114	130	197	160	864	-

PLEASE NOTE: ALSO AVAILABLE WITH BOLT & NUT

PLEASE NOTE: ALL FITTINGS ARE AVAILABLE EX-STOCK IN GALVANISED FINISH, NOT IN BLUE AS SHOWN ABOVE – BLUE AVAILABLE ON REQUEST.

FAST CONNECTOR SOCKET WITH PIN FOR LUFF ROPES

Quenched and tempered cast steel



Model No.	Reeving Aid	Minimum Breaking Load	For wire Ø	Dimensions													Weight
				A	B	C	ØH	ØP	T	W	D	ØD	ØJ	K	TB	TL	
		M tons	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm				mm	kg
FCS 701 P	-	20	11-13	62	61	27	15	25	12	25	50	33	49	46	67	150	1.6
FCS 702 P	-	25	13-16	72	78	32	18	30	14	32	58	38	60	59	85	182	2.6
FCS 703 P	-	40	16-19	85	93	40	21	35	16	38	70	45	70	69	95	218	4.5
FCS 704 P	-	55	20-22	102	106	45	24	41	19	44	80	50	82	81	110	253	6.5
FCS 705 P	-	75	23-26	115	123	60	28	51	22	51	104	60	95	90	128	298	11
FCS 706 P	-	90	27-29	140	152	65	32	57	25	57	114	70	107	116	142	357	16
FCS 705 P.SR	T 705	75	23-26	115	123	60	28	51	22	51	104	60	95	90	128	298	11
FCS 706 P.SR	T 706	90	27-29	140	152	65	32	57	25	57	114	70	107	116	142	357	16
FCS 707 P.SR	T 706	125	30-32	150	159	73	36	63	28	63	126	80	119	120	155	382	18
FCS 708 P.SR	T 706	125	33-36	160	171	73	39	64	28	69	126	85	125	130	160	404	23
FCS 709 P.SR	T 709	150	37-39	176	187	80	42	70	30	76	142	90	136	142	177	443	29
FCS 710 P.SR	T 709	170	40-42	188	198	88	45	76	33	76	156	95	142	150	187	474	36
FCS 711 P.SR	T 711	225	43-48	210	232	100	52	89	39	89	176	110	167	175	215	542	58

PLEASE NOTE: ALSO AVAILABLE WITH BOLT & NUT

PLEASE NOTE: ALL FITTINGS ARE AVAILABLE EX-STOCK IN GALVANISED FINISH,
NOT IN BLUE AS SHOWN ABOVE – BLUE AVAILABLE ON REQUEST.

REEVING TOOL

Special constructions and diameters available – please contact us directly.

CASAR **RESIN SPELTER BUTTONS**

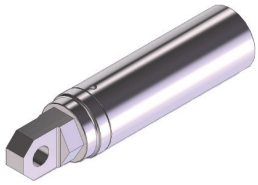
RESIN SPELTER BUTTONS FOR TEREX CRANE HOIST ROPES

WireCo's Resin Spelter Buttons are intended to be a replacement for Terex's swaged buttons used on hoist ropes and attached to the original socket. To choose the proper Resin Spelter Button for a Terex crane's hoist, match the button Type, the rope diameter, the button diameter and the overall length dimension with the current button on the crane. These buttons are to be attached only to approved hoist ropes from Casar or Oliveira by WireCo WorldGroup or their authorized distributors. Please read and understand the Warnings and Instructions for Resin Spelter Button Kit.

Shown below are the Resin Spelter Buttons currently available for Terex cranes. For convenience, the size Wirelock® kit required for attaching this button is indicated.

TYPE A

TYPE B



TYPE C

Resin Spelter Button Description	Type	Rope Diameter	Button Diameter	Button Length	Maximum Tensile Grade	Size Wirelock® Kit Required	Broom Length
		mm	mm	mm	N/mm²	cc	mm
RSBTX-26-52-209	A	26	52	209	2160	250	123
RSBTX-28-56-201	C	28	56	201	2160	250	120
RSBTX-28-58-204	A	28	58	204	2260	250	130
RSBTX-32-64.5-263	A	32	64.5	263	2260*	250	170
RSBTX-40-80-371	B	40	80	371	2160	500	215

*Increased wire strength

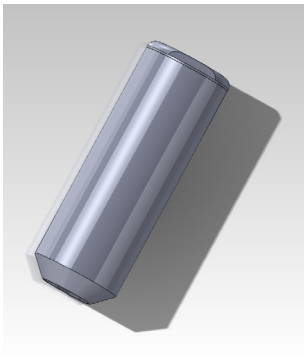
For Terex button dimensions not shown, please inquire. Do not substitute "nearly the same" buttons.

RESIN SPELTER BUTTONS FOR LIEBHERR CRANE HOIST ROPES

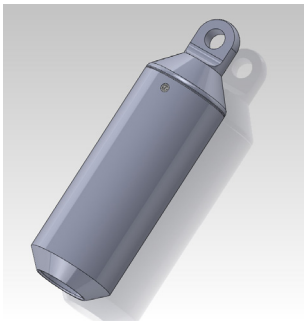
WireCo's Resin Spelter Buttons are intended to be a replacement for Liebherr's swaged buttons used on hoist ropes and attached to the original socket. To choose the proper Resin Spelter Button for a Liebherr crane's hoist, match the rope diameter, the button diameter and the overall length dimension with the current button on the crane. These buttons are to be attached only to approved hoist ropes from Casar or Oliveira by WireCo WorldGroup or their authorized distributors. Please read and understand the Warnings and Instructions for Resin Spelter Button Kit.

Shown below are the Resin Spelter Buttons currently available for Liebherr crane hoist ropes. For convenience, the size Wirelock® kit required for attaching the button is indicated.

TYPE A



TYPE B



Resin Spelter Button Description	Type	Rope Diameter	Button Diameter	Button Length	Maximum Tensile Grade	Size Wirelock® Kit Required	Broom Length
		mm	mm	mm	N/mm²	cc	mm
RSBLEB-15-30-90	A	13, 14, 15	30	90	2160	100	65
RSBLEB-17-36-108	A	16, 17, 18	36	108	2160	100	80
RSBLEB-21-44-126	A	19, 20, 21	44	126	2160	100	95
RSBLEB-23-52-175	B	23	52	175	2160	250	100
RSBLEB-25-52-175	B	24, 25, 26	52	175	2160	250	100
RSBLEB-28-58-203	B	27, 28	58	203	2160	250	125
RSBLEB-32-65-220	B	32	65	220	1960*	250	138

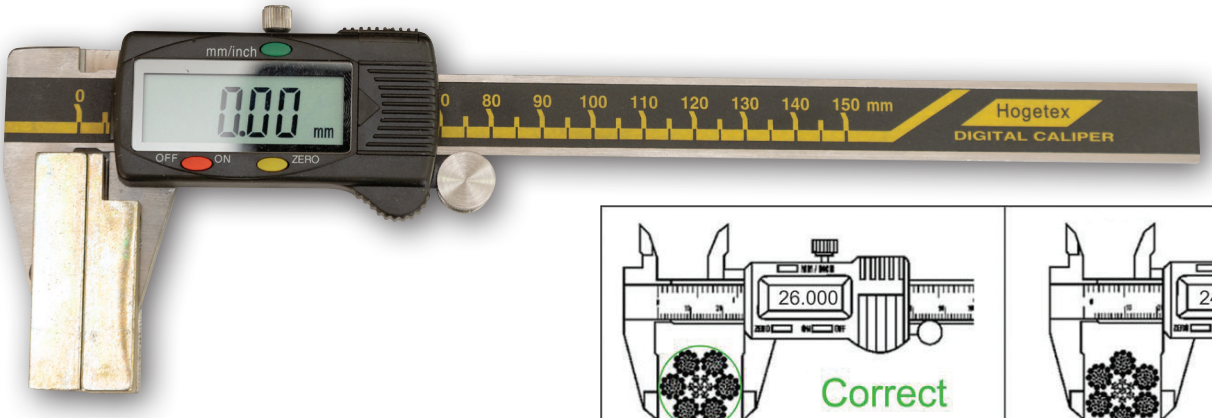
* *Increased wire strength

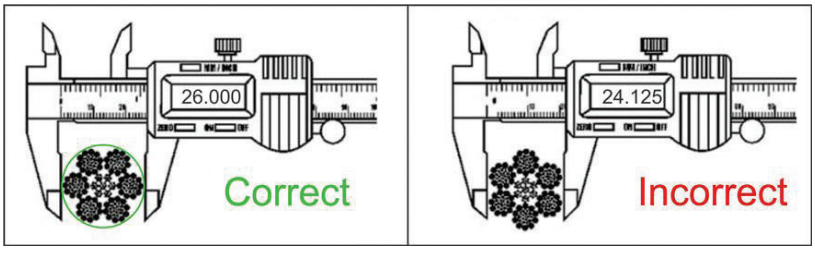
For Liebherr button dimensions not shown, please inquire. Do not substitute "nearly the same" buttons.

CASAR **SHEAVE GAUGES**

Sizes Available: 8-30mm, 31-50mm, 51-80mm

CASAR **CALIPERS**





Product specifications are subject to change without notice or obligation. The shown photographs, drawings or cross sections are only for illustrative purposes, the images can vary depending on requested diameter and current status of technical development.

The information supplied in this brochure is only a guideline for rope selection. Please contact us for any information or advice on the use of our ropes or if you have any doubt in selecting a rope for a specific application.

Any warranty, expressed or implied as to quality, performance or fitness for use of WireCo WorldGroup products is always premised on the condition that the published strengths apply only to new, unused products, that the mechanical equipment on which such products are used is properly designed and maintained, that such products are properly stored, handled, used and maintained, and properly inspected on a regular basis during the period of use.

Seller shall not be liable under any circumstances for consequential or incidental damages or secondary charges including but not limited to personal injury, labor costs, a loss of profits resulting from the use of said products or from said products being incorporated in or becoming a component of any other product.

Please note: Not all products are available in all countries according to local requirements. Please consult your local Casar distributor for more information.

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