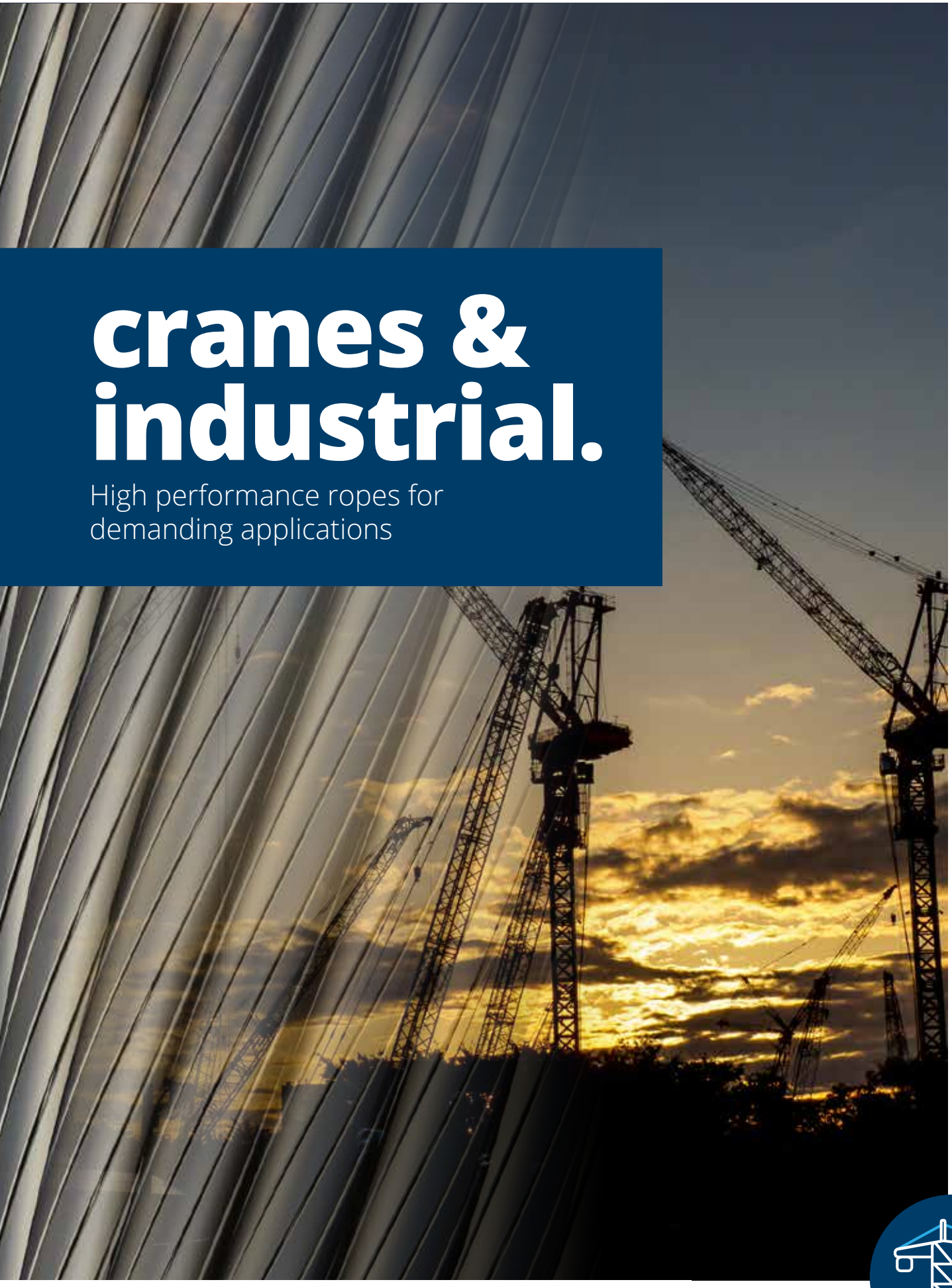
BRIDON · BEKAERT
THE ROPES GROUP



cranes & industrial.

High performance ropes for demanding applications

BRIDON · BEKAERT

THE ROPES GROUP

Bridon-Bekaert Ropes Group is the world's premier supplier of mission-critical advanced cords, steel wire ropes, and synthetic fibre ropes.

As a leading innovator, developer and producer of the best performing ropes and advanced cords globally, the Group provides superior value solutions to the oil & gas, mining, crane, elevator and other industrial sectors.

Two of the most enduring wire and rope pioneers joined forces in 2016 to make this ambition real. Bridon-Bekaert Ropes Group has a global manufacturing footprint and employs approximately 2500 people worldwide.

market leading rope solutions for cranes & industrial.

Bridon-Bekaert's comprehensive range of cranes & industrial ropes offer enhanced products for demanding applications where high levels of fatigue performance, diameter stability and crush resistance, together with lubricants offering a wide operating temperature range and improved corrosion resistance. These crane ropes have achieved enhanced service lives with fewer ropes changes, resulting is less downtime and significant cost savings.

BRIDON

BlueStrand

our brands.

a BRIDON · BEKAERT Ropes Group Brand

High Performance Brands

BRIDON®

WRI®

ScanRope®

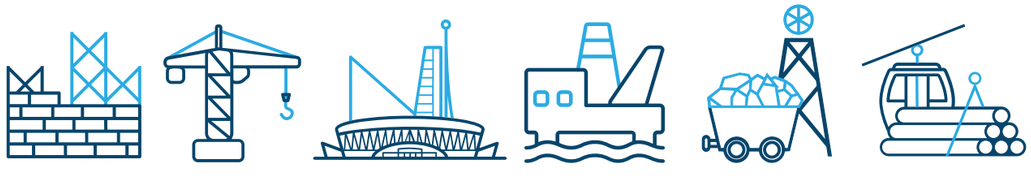
Value Brands

BlueStrand

CIMAF®

PRODINSA®

we are active in many markets.



Ropes 360

Ropes 360 services:

Installation
- Expertise
- Equipment hire
- Warranty assurance
- Support new technology

Inspection
- Rope inspection
- MRT/NDE

Maintenance
- Re-lubrication
- Aftermarket equipment and lubricant sales
- Cut-back and termination

Rope Life Management
- Safety
- Manage downtime with planned mainenance
- Rope lifecycle cost reductions
- Value service offering

BBtec

The Bridon-Bekaert Technology Centre (BBtec) is our centre of excellence for rope technology development, testing, analysis and verifcation.

BBtec is equipped with unique equipment capable of testing steel/synthetic ropes and wires. It has extensive forensic analysis laboratory facilities and specialists capable of conducting detailed forensic evaluation of new or retired ropes.

BBtec accelerates Bridon-Bekaert's new product development, involving the latest rope technologies to increase safety, performance and operational life of ropes working in demanding and hostile environments typical to our core markets in the Oil and Gas, Mining, and Construction sectors.

technologies.

Polymer Technologies

PLASTIC IMPREGNATION

High performance plastic impregnation is designed to offer an internal cushioning layer to the inter-strand contact points especially between core to cover on multi-strand low rotation ropes improving bend fatigue and core service life.

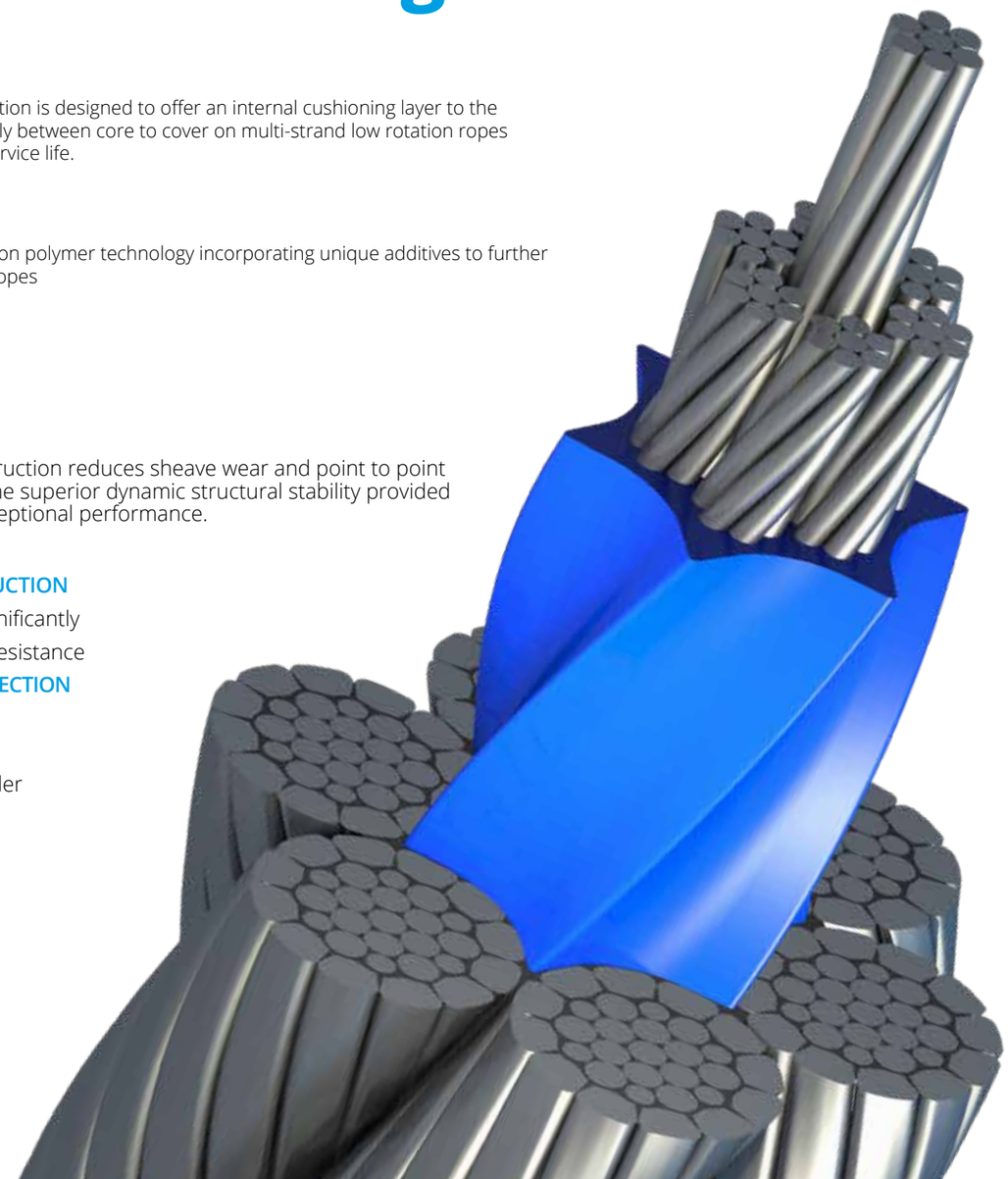
NXG

Advanced next generation low friction polymer technology incorporating unique additives to further enhance fatigue life of plasticated ropes

Bristar®

DYFORM BRISTAR ropes construction reduces sheave wear and point to point loading, which combined with the superior dynamic structural stability provided by the Bristar core, ensures exceptional performance.

- **HIGH PERFORMANCE CONSTRUCTION**
  Improved strand positioning significantly increases fatigue life and wear resistance
- **GREATER INTERNAL ROPE PROTECTION**
  Enhanced core life
- **INCREASED ROPE STABILITY**
  Enhanced diameter stability under load improves drum spooling performance and reduces rope crushing



Rope Compaction

DYFORM

Bridon-Bekaert manufactures ropes using a unique Dyforming process that compacts the strands as shown below. The smooth surface of the “Dyform” product provides improved rope to sheave contact leading to reduced wear on both rope and sheave. Increased cross-sectional steel area increases breaking load and improves inter - wire contact ensures that the rope will operate with lower internal stress levels resulting in longer bending fatigue life and lower costs.

DYFORM®

MAX TECHNOLOGY

Bridon-Bekaert manufactures ropes using rotary hammer swaging and a unique roller compaction process that compacts the outer rope surface as shown. In comparison to traditional Dyform ropes the Max technology further improves rope to sheave contact and improved diameter stability leading to reduced wear on both rope and sheave. Further increased cross-sectional steel area provides a robust construction with high breaking force and excellent crush resistance. Improved inter-wire contact ensures optimum spooling performance offering maximum resistance to damage for exceptional service life in the most demanding multi-layer drum applications.

DYFORM 8 MAX

CONSTRUCTEX

Lubricants

BRILUBE® FIT

- Traditional wire rope lubricants suitable for a wide range of offshore applications
- Corrosion protection
- Wear resistant

BRILUBE® ULTRA

- Developed to perform in more challenging environments
- Enhanced rope lubricant, manufactured with a unique hybrid grease.
- A wide operating temperature range suitable for active heave compensation systems and warmer tropical climates.
- Along with a three stage corrosion protection system with a unique ‘water wash off’ performance.

EU Ecolabel

EU Ecolabel : UK/027/016

port & maritime.

Product Selection
Port & Maritime

✔ INDICATES BRIDON-BEKAERT'S RECOMMENDED ROPE PER APPLICATION

Mobile harbour cranes

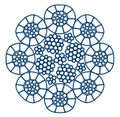
✔ Dyform 8 / PI / Bristar

Dyform 6 / PI / Bristar

Ship to shore cranes

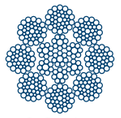
✔ Dyform 6 / PI / Bristar

✔ Dyform8 / PI / Bristar

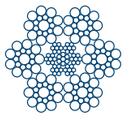


Dyform DSC8 MAX

*for boom hoist only



8 Series

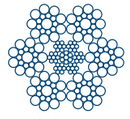


6 Series

Container handlers

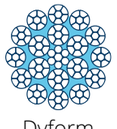
✔ Dyform 6 / PI / Bristar

✔ Dyform 8 / PI / Bristar



6 Series

Bulk unloader cranes



✔ Dyform 18 / PI

✔ Dyform 8 / PI / Bristar

✔ Dyform DSC8 MAX

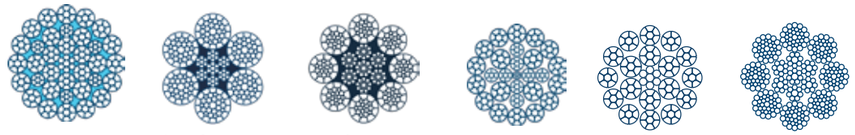
*for boom hoist only

Dyform 6 / PI / Bristar

Product Selection
Port & Maritime

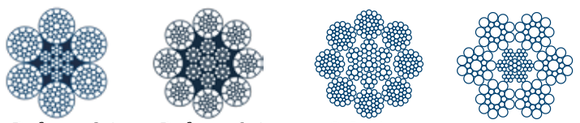
✔ INDICATES BRIDON-BEKAERT'S RECOMMENDED ROPE PER APPLICATION

Ship cranes
Pedestal cranes / knuckle boom cranes



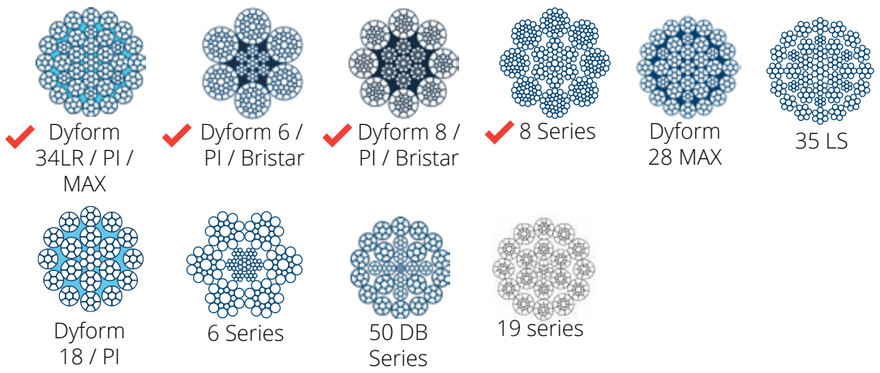
✔ Dyform 34LR / PI / MAX
✔ Dyform 6 / PI / Bristar
✔ Dyform 8 / PI / Bristar
50DB Series
Dyform 18
8 Series

Ship lifter



✔ Dyform 6 / PI / Bristar
✔ Dyform 8 / PI / Bristar
8 Series
6 Series

Floating cranes



✔ Dyform 34LR / PI / MAX
✔ Dyform 6 / PI / Bristar
✔ Dyform 8 / PI / Bristar
✔ 8 Series
Dyform 28 MAX
35 LS
Dyform 18 / PI
6 Series
50 DB Series
19 series

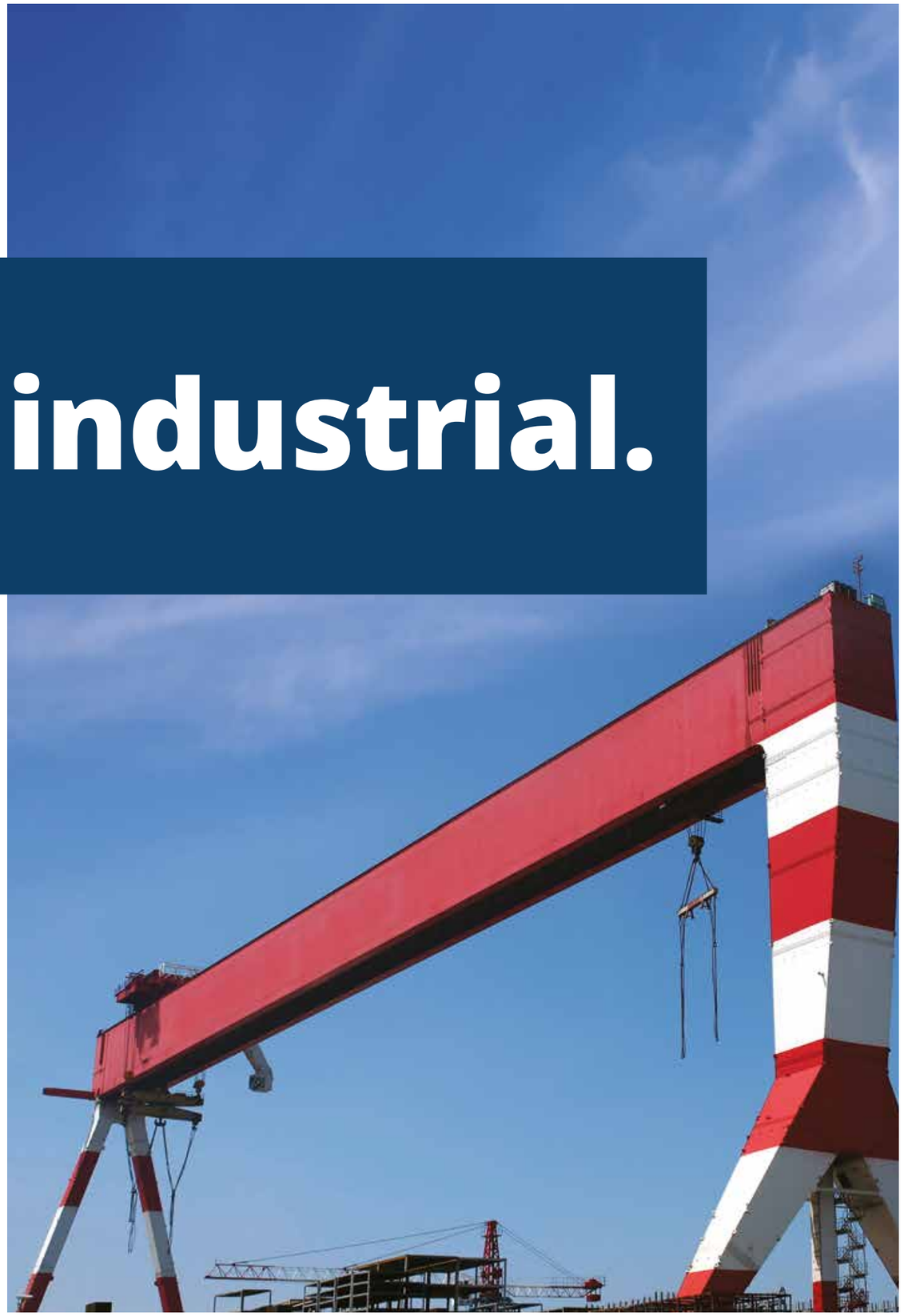
Offshore cranes
Pedestal cranes

✔ Dyform 34LR / PI / MAX
✔ Dyform 8 / PI / Bristar
✔ Dyform DSC8 MAX
*for boom hoist only
Dyform 6 / PI / Bristar
Dyform 18 / PI
Dyform 28 MAX
35 LS

Ship derrick cranes

✔ Dyform 34LR / PI / MAX
✔ Dyform 6 / PI / Bristar
✔ Dyform 8 / PI / Bristar
✔ 6 Series
8 Series
Dyform DSC8 MAX
*for boom hoist only
Dyform 28 MAX

35 LS
Dyform 18 / PI
50 DB Series



industrial.

Product Selection
Industrial

✔ INDICATES BRIDON-BEKAERT'S RECOMMENDED ROPE PER APPLICATION

Overhead hoist / gantry cranes
E.O.T. / Outdoor / Indoor in text / CDQ cranes

✔ Dyform 6 / PI / Bristar | ✔ Dyform 8 / PI / Bristar | 8 Series | 6 Series

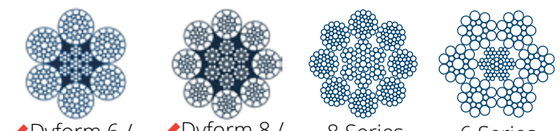
Steel works ladle / charging cranes

✔ Dyform 8 / PI / Bristar | ✔ Dyform 6 / PI / Bristar | 8 Series

Steel works blast furnace skips

✔ Brifill | ✔ Dyform 6 / PI / Bristar | ✔ Dyform 8 / PI / Bristar | 8 Series

Cold rolling / looper car



✔ Dyform 6 / PI / Bristar | ✔ Dyform 8 / PI / Bristar | 8 Series | 6 Series

construction.

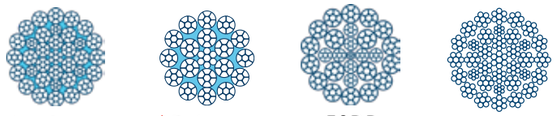
Product Selection
Construction

✔ INDICATES BRIDON-BEKAERT'S RECOMMENDED ROPE PER APPLICATION

Tower cranes
Flat top / high top / luffing / derrick / heavy load

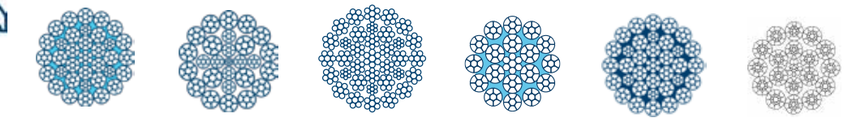
✔ Dyform 34LR / PI
✔ 50DB Series
✔ Dyform 8 / PI / Bristar
Dyform 18 PI
35 LS
19 Series

Telescopic Mobile cranes
All terrain / Telescopic / Rough terrain



✔ Dyform 34LR / PI
✔ Dyform 18 PI
50DB Series
35 LS

Truck mounted cranes



✔ Dyform 34LR / PI
✔ 50 DB Series
✔ 35 LS
Dyform 18 PI
Dyform 28 MAX
19 Series

Product Selection
Construction

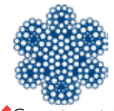
✔ INDICATES BRIDON-BEKAERT'S RECOMMENDED ROPE PER APPLICATION

Crawler cranes
Lattice boom

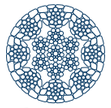
✔ Dyform 34LR / PI / MAX

✔ Dyform 28 MAX

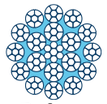
✔ Dyform DSC8 MAX
*for boom hoist only



✔ Constructex
*for boom hoist only



Dyform 8 MAX



Dyform 18 PI

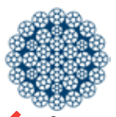
Dyform 6 / PI / Bristar

Dyform 50DB

Dyform 8 / PI / Bristar

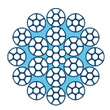
Foundation Works
Rotary drilling / Piling / Diaphram walling

✔ Dyform 34LR / PI / MAX

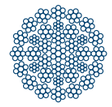


✔ Dyform 28 MAX

50DB Series



Dyform 18 PI



35 LS

19 Series

our products.

BRIDON

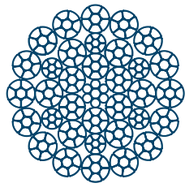
Dyform 34LR series

Dyform 8 Series

Dyform 6 Series

BlueStrand

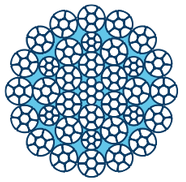
* ALL ROPES AVAILABLE IN DIFFERENT LAYS
* OTHER GRADES AVAILABLE ON REQUEST
* CUSTOM ROPE CAN BE MADE AVAILABLE UPON REQUEST



Dyform 34LR

The Dyform 34 LR is a high performance compacted low rotational rope that combines varying multistrand rope designs to achieve excellent rotation resistance in high lift operations.

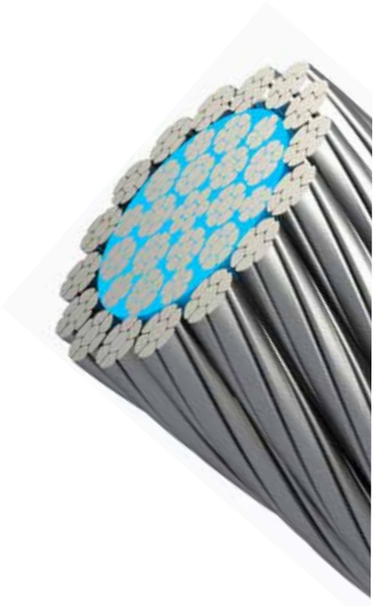
- Excellent rotation resistance
- Highly efficient due to its flexibility
- Suitable for single part and multi part reeving
- Suitable for single part reeving of an unguided load



Dyform 34LR PI

The Dyform 34 LR PI is a high performance compacted low rotational rope that combines varying multistrand rope designs to achieve excellent rotation resistance in high lift operations. It incorporates a plastic layer (PI) between the inner and outer part of the rope to enhance fatigue life.

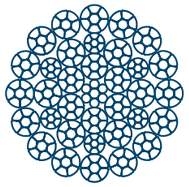
- Stable rope construction
- Higher bending fatigue performance



product table.

BRIDON		Dyform 34LR / PI							
Diameter		Nominal length mass		Minimum Breaking Force					
				EIP/1960			EEIP/2160		
mm	inch	kg/m	lb/ft	kN	Tons (short)	Tonnes (metric)	kN	Tons (short)	Tonnes (metric)
	3/8	0.454	0.305	82	9.2	8.36	86	9.7	8.77
10.0		0.500	0.336	90.8	10.2	9.25	95.3	10.7	9.71
11.0		0.610	0.410	109	12.3	11.1	115	12.9	11.7
	7/16	0.610	0.410	111	12.5	11.3	117	13.2	11.9
12.0		0.720	0.484	130	14.6	13.2	137	15.4	13.9
	1/2	0.808	0.543	146	16.4	14.8	153	17.2	15.6
13.0		0.850	0.571	153	17.2	15.6	161	18.1	16.4
14.0		0.980	0.659	179	20.1	18.2	191	21.5	19.5
	9/16	1.02	0.687	185	20.8	18.8	201	22.6	20.5
15.0		1.13	0.759	204	22.9	20.8	214	24.1	21.8
	5/8	1.28	0.860	232	26.1	23.6	251	28.2	25.6
16.0		1.28	0.860	232	26.1	23.6	251	28.2	25.6
17.0		1.45	0.974	262	29.4	26.7	275	30.9	28
18.0		1.62	1.09	298	33.5	30.4	319	35.9	32.5
19.0		1.81	1.22	331	37.2	33.7	356	40.0	36.3
	3/4	1.81	1.22	331	37.2	33.7	356	40.0	36.3
20.0		2.00	1.34	370	41.6	37.7	397	44.6	40.5
21.0		2.21	1.49	400	45.0	40.7	420	47.2	42.8
22.0		2.42	1.63	442	49.7	45.1	482	54.2	49.1
	7/8	2.42	1.63	448	50.4	45.7	487	54.7	49.6
23.0		2.65	1.78	480	54.0	48.9	504	56.7	51.3
24.0		2.88	1.94	528	59.3	53.8	569	64.0	58.0
25.0		3.13	2.10	568	63.8	57.9	595	66.9	60.6
	1	3.23	2.17	586	65.9	59.7	623	70.0	63.5
26.0		3.38	2.27	618	69.5	63.0	660	74.2	67.3
27.0		3.65	2.45	662	74.4	67.5	694	78.0	70.7
28.0		3.92	2.63	712	80.0	72.6	758	85.2	77.3
	1 1/8	4.09	2.75	743	83.5	75.7	779	87.6	79.4
29.0		4.21	2.83	764	85.9	77.9	801	90.0	81.6
30.0		4.50	3.02	823	92.5	83.9	857	96.3	87.3
	1 1/4	5.12	3.44	919	103.3	93.7	1008	113.3	102.8
32.0		5.12	3.44	919	103.3	93.7	1008	113.3	102.8
34.0		5.87	3.94	1050	118.0	107	1151	129.4	117.3
	1 3/8	6.18	4.15	1100	123.6	112	1214	136.5	123.8
35.0		6.22	4.18	1110	124.8	113	1214	136.5	123.8
36.0		6.58	4.42	1170	131.5	119	1287	144.7	131.2
38.0		7.33	4.93	1310	147.2	133	1444	162.3	147.2
	1 1/2	7.36	4.95	1310	147.2	133	1444	162.3	147.2
40.0		8.12	5.46	1450	163.0	147	1590	178.7	162.1
	1 5/8	8.66	5.82	1550	174.2	158	1695	190.5	172.8
42.0		8.95	6.01	1600	179.8	163	1758	197.6	179.2
44.0		9.83	6.61	1750	196.7	178	1925	216.4	196.2
46.0		10.7	7.19	1920	215.8	195			
	1 7/8	11.5	7.73	2050	230.4	209			
48.0		11.7	7.86	2090	234.9	213			
50.0		12.7	8.53	2270	255.2	231			
50.8	2	13.1	8.80	2340	263.0	238			

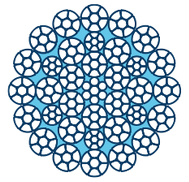
This table is for guidance purposes only with no guarantee or warranty (express or implied) as to its accuracy. The products described may be subject to change without notice, and should not be relied on without further advice from Bridon-Bekaert. The cross section image is for reference only. Actual cross sections vary due to diameter. Visit www.bridon-bekaert.com for the most up-to-date data.



Dyform 34LR MAX

Dyform 34 LR MAX is a high performance compacted low rotational rope that consists of varying multistrand rope designs which have undergone a final rope compacting process.

- ✓ Highest breaking strength
- ✓ Excellent rotation resistance
- ✓ Improved crush resistance
- ✓ Accurate diameter and tight diameter tolerance



Dyform 34LR PI MAX

Dyform 34 LR PI MAX is a high performance compacted low rotational rope that consists of varying multistrand rope designs which have undergone a final rope compacting process. It incorporates a plastic layer (PI) between the inner and outer part of the rope.

- ✓ Higher bending fatigue performance
- ✓ Maintenance of internal lubricant

product table.

BRIDON				Dyform 34LR MAX / PI		
Diameter		Nominal length mass		Minimum Breaking Force EEIP/2160		
mm	inch	kg/m	lb/ft	kN	Tons (short)	Tonnes (metric)
12.0		.740	.498	153	17.2	15.6
	1/2	.842	.566	171	19.2	17.4
13.0		.887	.596	179	20.1	18.3
14.0		1.04	.702	208	23.4	21.2
	9/16	1.09	.733	216	24.3	22.0
15.0		1.21	.814	239	26.9	24.4
	5/8	1.37	.919	272	30.6	27.7
16.0		1.37	.919	272	30.6	27.7
17.0		1.58	1.06	307	34.5	31.3
18.0		1.78	1.20	344	38.7	35.1
19.0		1.99	1.34	385	43.3	39.3
	3/4	1.99	1.34	385	43.3	39.3
20.0		2.21	1.49	424	47.7	43.2
22.0		2.69	1.81	524	58.9	53.4
	7/8	2.69	1.81	524	58.9	53.4
24.0		3.20	2.15	611	68.7	62.3
	1	3.36	2.26	684	76.9	69.7
26.0		3.56	2.39	705	79.3	71.9
28.0		4.11	2.76	818	91.9	83.0
	1 1/8	4.55	3.06	848	95.3	86.5
30.0		5.02	3.37	935	105	95.3
	1 1/4	5.57	3.74	1085	122	111
32.0		5.57	3.74	1085	122	111
34.0		6.32	4.25	1180	133	120
	1 3/8	6.79	4.56	1240	139	126
36.0		7.11	4.78	1320	148	135
38.0		7.95	5.34	1480	166	151
	1 1/2	8.07	5.42	1480	166	151
40.0		8.82	5.93	1630	183	166
	1 5/8	9.46	6.36	1730	194	176
42.0		9.72	6.53	1780	200	182
44.0		10.6	7.12	1930	217	197
	1 3/4	10.8	7.29	1930	217	197
46.0		11.6	7.77	2120	238	216
	1 7/8	12.4	8.30	2300	259	235
48.0		12.6	8.44	2300	259	235
50.0		13.6	9.17	2500	281	255
	2	14.0	9.43	2560	288	261
52.0		14.9	10.0	2720	306	277

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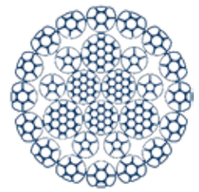
Dyform 28 MAX / PI



Dyform 28 MAX is a high performance compacted rotational resistant rope specifically designed for demanding applications such as deep foundation works including piling and drilling rigs as well as diaphragm walling. Optionally, it incorporates a plastic layer (PI) between the inner and outer part of the rope.

- Superior crushing resistance
- Excellent wear resistance
- Robust and stable rope construction
- Tightly controlled diameter tolerance

BRIDON Dyform 28 MAX / PI

Diameter		Nominal length mass		Minimum Breaking Force MAX		
mm	inch	kg/m	lb/ft	kN	Tons (short)	Tonnes (metric)
12.0		.740	.498	153	17.2	15.6
	1/2	.842	.566	171	19.2	17.4
13.0		.887	.596	179	20.1	18.3
14.0		1.04	.702	208	23.4	21.2
	9/16	1.09	.733	216	24.3	22.0
15.0		1.21	.814	239	26.9	24.4
	5/8	1.37	.919	272	30.6	27.7
16.0		1.37	.919	272	30.6	27.7
17.0		1.58	1.06	307	34.5	31.3
18.0		1.78	1.20	344	38.7	35.1
19.0		1.99	1.34	385	43.3	39.3
	3/4	1.99	1.34	385	43.3	39.3
20.0		2.21	1.49	424	47.7	43.2
22.0		2.69	1.81	524	58.9	53.4
	7/8	2.69	1.81	524	58.9	53.4
24.0		3.20	2.15	611	68.7	62.3
	1	3.36	2.26	684	76.9	69.7
26.0		3.56	2.39	705	79.2	71.9
28.0		4.11	2.76	818	91.5	83.0
	1 1/8	4.55	3.06	848	95.3	86.5
30.0		5.02	3.37	935	105	95.3
	1 1/4	5.57	3.74	1085	122	111
32.0		5.57	3.74	1085	122	111
34.0		6.32	4.25	1180	133	120
	1 3/8	6.79	4.56	1240	139	126
36.0		7.11	4.78	1320	148	135
38.0		7.95	5.34	1480	166	151
	1 1/2	8.07	5.42	1480	166	151
40.0		8.82	5.93	1630	183	166
	1 5/8	9.46	6.36	1730	194	176
42.0		9.72	6.53	1780	200	182
44.0		10.6	7.12	1930	217	197
	1 3/4	10.8	7.29	1930	217	197
46.0		11.6	7.77	2120	238	216
	1 7/8	12.4	8.30	2300	259	235
48.0		12.6	8.44	2300	259	235
50.0		13.6	9.17	2500	281	255
	2	14.0	9.43	2560	288	261
52.0		14.9	10.0	2720	306	277

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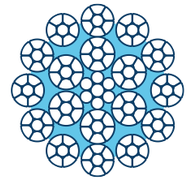
Dyform 18 PI



Dyform 18 PI is a high performance compacted rotational resistant rope which incorporates a plastic layer between the inner and outer part of the rope.

- Good wear characteristics due to ist smooth exterior profile
- Improved bending fatigue performance
- Robust and stable rope construction
- Diameter stability, requirement of multi layered spooling

BRIDON Dyform 18 PI

Diameter		Nominal length mass		Minimum Breaking Force EEIP/2160		
mm	inch	kg/m	lb/ft	kN	Tons (short)	Tonnes (metric)
	3/8	0.454	0.305	76.6	8.61	7.81
10.0		0.500	0.336	84.4	9.49	8.61
11.0		0.605	0.407	104	11.7	10.6
	7/16	0.617	0.415	104	11.7	10.6
12.0		0.720	0.484	122	13.7	12.4
	1/2	0.806	0.542	136	15.3	13.9
13.0		0.845	0.568	143	16.1	14.6
14.0		0.980	0.659	165	18.5	16.8
	9/16	1.02	0.686	172	19.3	17.5
15.0		1.13	0.756	190	21.4	19.4
	5/8	1.26	0.847	216	24.3	22.0
16.0		1.28	0.860	216	24.3	22.0
17.0		1.45	0.971	244	27.4	24.9
18.0		1.62	1.09	274	30.8	27.9
19.0		1.81	1.21	306	34.4	31.2
	3/4	1.81	1.22	306	34.4	31.2
20.0		2.00	1.34	337	37.9	34.4
21.0		2.21	1.48	372	41.8	37.9
22.0		2.42	1.63	416	46.8	42.4
	7/8	2.47	1.66	416	46.8	42.4
23.0		2.65	1.78	446	50.1	45.5
24.0		2.88	1.94	486	54.6	49.6
25.0		3.13	2.10	527	59.2	53.7
	1	3.23	2.17	544	61.1	55.5
26.0		3.38	2.27	570	64.1	58.1
27.0		3.65	2.45	615	69.1	62.7
28.0		3.92	2.63	661	74.3	67.4
	1 1/8	4.08	2.74	688	77.3	70.2
29.0		4.21	2.83	709	79.7	72.3
30.0		4.50	3.02	759	85.3	77.4
	1 1/4	5.04	3.39	863	97.0	88.0
32.0		5.12	3.44	863	97.0	88.0
34.0		5.78	3.88	975	110	99.4
	1 3/8	6.10	4.10	1030	116	105
36.0		6.48	4.35	1090	123	111
38.0		7.22	4.85	1210	136	123
	1 1/2	7.26	4.88	1210	136	123

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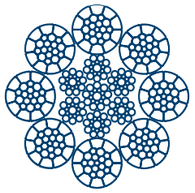
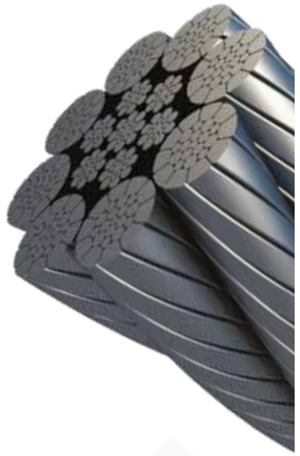
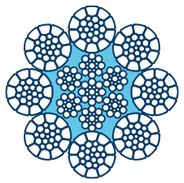


Dyform 8

Dyform 8 is a high performance compacted single layer constructed rope with 8 outer strands.

- ✓ Good bending fatigue performance
- ✓ Very flexible rope construction
- ✓ Smooth profile created by the number of outer strands

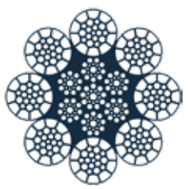




Dyform 8 PI

Dyform 8 PI is a high performance compacted single layer constructed rope which incorporates a plastic layer below the 8 outer strands.

- ✓ Improved bending fatigue performance
- ✓ Stable rope construction
- ✓ Diameter stability, requirement of multi-layered spooling



Dyform Bristar 8

Dyform Bristar 8 is a high performance compacted single layer constructed rope which incorporates an engineered extruded plastic profile between the 8 outer strands and the rope core for cranes and industrial applications including mobile, crawler and tower cranes.

- ✓ Outstanding bending fatigue performance
- ✓ Very stable rope construction
- ✓ Improved support of outer strands in service

product table.

BRIDON	Dyform 8 / PI / Bristar								
Diameter		Nominal length mass		Minimum Breaking Force					
				EIP/1960			EEIP/2160		
mm	inch	kg/m	lb/ft	kN	Tons (short)	Tonnes (metric)	kN	Tons (short)	Tonnes (metric)
	3/8	0.427	0.287	86.2	9.69	8.79	90.1	10.1	9.19
10.0		0.471	0.316	89.2	10.00	9.10	93.2	10.5	9.50
11.0		0.570	0.383	110	12.4	11.2	115	12.9	11.7
	7/16	0.582	0.391	110	12.4	11.2	115	12.9	11.7
12.0		0.678	0.456	128	14.4	13.1	134	15.1	13.7
	1/2	0.760	0.510	144	16.2	14.7	150	16.9	15.3
13.0		0.796	0.535	150	16.9	15.3	157	17.6	16.0
14.0		0.923	0.620	174	19.6	17.7	182	20.5	18.6
	9/16	0.961	0.646	181	20.3	18.5	189	21.2	19.3
15.0		1.06	0.712	198	22.3	20.2	207	23.3	21.1
	5/8	1.19	0.798	226	25.4	23.0	236	26.5	24.1
16.0		1.21	0.810	226	25.4	23.0	236	26.5	24.1
17.0		1.36	0.915	255	28.7	26.0	267	30	27.2
18.0		1.53	1.03	286	32.1	29.2	299	33.6	30.5
19.0		1.70	1.14	318	35.7	32.4	333	37.4	34
	3/4	1.71	1.15	318	35.7	32.4	333	37.4	34
20.0		1.88	1.27	353	39.7	36.0	369	41.5	37.6
22.0		2.28	1.53	427	48.0	43.5	446	50.1	45.5
	7/8	2.33	1.56	427	48.0	43.5	446	50.1	45.5
24.0		2.71	1.82	508	57.1	51.8	531	59.7	54.1
	1	3.04	2.04	569	64.0	58.0	595	66.9	60.7
26.0		3.18	2.14	596	67.0	60.8	623	70	63.5
28.0		3.69	2.48	691	77.7	70.5	723	81.3	73.7
	1 1/8	3.85	2.58	720	80.9	73.4	753	84.6	76.8
30.0		4.24	2.85	794	89.2	81.0	830	93.3	84.6
	1 1/4	4.75	3.19	903	102	92.1	944	106	96.3
32.0		4.82	3.24	903	102	92.1	944	106	96.3
34.0		5.44	3.66	1020	115	104	1070	120	109
	1 3/8	5.75	3.86	1080	121	110	1130	127	115
36.0		6.10	4.10		128	116	1200	135	122
38.0		6.80	4.57	1270	143	130	1330	149	136
	1 1/2	6.84	4.59	1270	143	130	1330	149	136
40.0		7.54	5.06	1410	158	144	1480	166	151
	1 5/8	8.02	5.39	1500	169	153	1570	176	160
42.0		8.31	5.58	1560	175	159	1630	183	166
44.0		9.12	6.13	1710	192	174	1790	201	183
	1 3/4	9.31	6.25	1710	192	174	1790	201	183
46.0		9.97	6.70	1870	210	191	1950	219	199
	1 7/8	10.7	7.18	2030	228	207	2130	239	217
48.0		10.9	7.29	2030	228	207	2130	239	217
50.0		11.8	7.91	2210	248	225	2310	260	236

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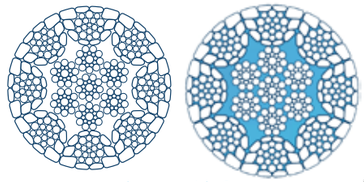
Dyform 8 MAX / PI



Dyform 8 Max is a high performance compacted single layer constructed rope with 8 outer strands which has undergone a final rope compaction process and performs excellent in multilayer drum applications. Optionally, it incorporates a plastic layer (PI) between the inner and outer part of the rope.

- Very high breaking strength
- Good crush resistance
- Accurate rope diameter and tight tolerance

BRIDON		Dyform 8 MAX / PI				
Diameter		Nominal length mass		Minimum Breaking Force		
				MAX		
mm	inch	kg/m	lbs/ft	kN	Tons (short)	Tonnes (metric)
22		2.42	1.63	512	51.4	52.2
24		2.88	1.94	544	61.1	55.5
	1	3.23	2.17	610	68.6	62.2
26		3.38	2.27	639	71.8	65.2
28		3.92	2.64	741	83.3	75.6
	1-1/8”	4.09	2.75	773	86.9	78.8
30		4.5	3.03	851	95.7	86.8
	1-1/4”	5.04	3.39	968	109	98.7
32		5.12	3.44	968	109	98.7

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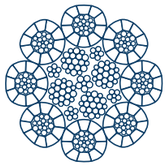
Dyform DSC8 MAX



Dyform DSC8 Max is a high performance compacted double seale closed, parallel laid construction rope, with all the strands within the rope being spun/ twisted together in one operation. The rope is then subjected to a final compacting process. Ideal for high demanding boom hoisting operations. This type of rope can only be used where both ends are fixed and the load prevented from rotating.

- Highest breaking strength
- Excellent crush resistance
- Improved wear characteristics due to ist smooth exterior profile

BRIDON		Dyform DSC8 MAX				
Diameter		Nominal length mass		Minimum Breaking Force		
				MAX		
mm	inch	kg/m	lbs/ft	kN	Tons (short)	Tonnes (metric)
	1	2.33	3.46	707	79.5	72.1
26		2.44	3.63	740	83.2	75.5
28		2.83	4.21	858	96.4	87.5
	1 1/8	2.95	4.38	894	100	91.2
30		3.25	4.83	986	111	101
	1 1/4	3.64	5.41	1120	126	114
32		3.7	5.5	1120	126	114

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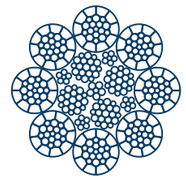
DYFORM 8 SERIES

Dyform DSC8



Dyform DSC8 is a high performance compacted double seale closed, parallel laid construction rope, with all the strands within the rope being spun/ twisted together in one operation. Ideal for high demanding boom hoisting operations. This type of rope can only be used where both ends are fixed and the load prevented from rotating.

product benefits

- Very high breaking strength
- Good crush resistance
- Accurate rope diameter and tight tolerance

BRIDON		Dyform DSC8							
Diameter		Nominal length mass		Minimum Breaking Force					
				EIP/1960			EEIP/2160		
mm	inch	kg/m	lb/ft	kN	Tons (short)	Tonnes (metric)	kN	Tons (short)	Tonnes (metric)
10		0.49	0.33	94	10.6	9.6	103.6	11.6	10.6
11		0.6	0.40	113.6	12.8	11.6	125.2	14.1	12.8
	7/16	0.61	0.41	113.6	12.8	11.6	125.2	14.1	12.8
12		0.71	0.48	135.5	15.2	13.8	149.3	16.8	15.2
	1/2	0.8	0.54	151.2	17.0	15.4	166.5	18.7	17.0
13		0.83	0.56	156	17.5	15.9	174.5	19.6	17.8
14		0.97	0.65	184.1	20.7	18.8	202.8	22.8	20.7
15		1.11	0.75	212.5	23.9	21.7	234.2	26.3	23.9
	5/8	1.26	0.85	241.9	27.2	24.7	266.5	30.0	27.2
16		1.27	0.85	241.9	27.2	24.7	266.5	30.0	27.2
17		1.43	0.96	275.0	30.9	28.0	302.0	33.9	30.8
18		1.61	1.08	308.4	34.7	31.4	339.8	38.2	34.6
19		1.79	1.20	340.3	38.3	34.7	375	42.2	38.2
	3/4	1.81	1.22	340.3	38.3	34.7	375	42.2	38.2
20		1.99	1.34	379	42.6	38.6	417.7	47.0	42.6
22		2.4	1.61	458.9	51.6	46.8	505.7	56.8	51.6
	7/8	2.44	1.64	458.9	51.6	46.8	505.7	56.8	51.6
24		2.86	1.92	542.8	61.0	55.4	598.2	67.2	61.0
	1	3.2	2.15	607.4	68.3	61.9	668.0	75.1	68.1
26		3.36	2.26	636	71.5	64.9	700.9	78.8	71.5
28		3.89	2.61	742.4	83.4	75.7	818.1	92.0	83.4
	1.1/8	4.06	2.73	776.3	87.3	79.2	853.5	95.94	87.0
30		4.47	3.00	855.3	96.1	87.2	942.6	106.0	96.1
32		5.02	3.37	968.2	108.8	98.7	1067	119.9	108.8
	1.1/4	5.08	3.41	968.2	108.8	98.7	1067	119.9	108.8

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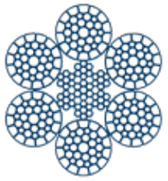
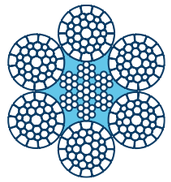


Dyform 6

Dyform 6 is a high performance compacted single layer constructed rope for various cranes and industrial applications.

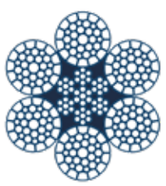
- ✓ High strength
- ✓ Robust crush resistant rope construction



Dyform 6 PI

Dyform 6 PI is a high performance compacted single layer constructed rope with a plastic layer (PI) between the 6 outer strands and the rope core for various cranes and industrial applications.

- ✓ Improved bending fatigue performance
- ✓ Better retention of internal lubrication



Dyform Bristar 6

Dyform Bristar 6 is a high performance compacted single layer constructed rope which incorporates an engineered extruded plastic profile between the 6 outer strands and the rope core for various cranes and industrial applications.

- ✓ Outstanding bending fatigue performance
- ✓ Improved support of outer strands in service

DYFORM 6 SERIES

product table.

BRIDON Dyform 6 / PI / Bristar

Diameter		Nominal length mass		Minimum Breaking Force					
				EIP/1960			EEIP/2160		
mm	inch	kg/m	lb/ft	kN	Tons (short)	Tonnes (metric)	kN	Tons (short)	Tonness (metric)
	5/16	0.289	0.194	55.2	6.20	5.63	57.5	6.46	5.86
8.00		0.294	0.197	55.2	6.20	5.63	57.5	6.46	5.86
9.00		0.372	0.250	69.9	7.86	7.13	72.8	8.18	7.42
	3/8	0.416	0.280	78.2	8.79	7.97	81.5	9.16	8.31
10.0		0.459	0.308	86.2	9.69	8.79	89.9	10.1	9.17
11.0		0.555	0.373	106	11.9	10.8	109	12.3	11.1
	7/16	0.567	0.381	106	11.9	10.8	109	12.3	11.1
12.0		0.661	0.444	124	13.9	12.6	129	14.5	13.2
	1/2	0.740	0.497	136	15.3	13.9	145	16.3	14.8
13.0		0.776	0.521	142	16.0	14.5	152	17.1	15.5
14.0		0.900	0.605	165	18.5	16.8	176	19.8	17.9
	9/16	0.937	0.630	172	19.3	17.5	183	20.6	18.7
15.0		1.03	0.694	190	21.4	19.4	202	22.7	20.6
	5/8	1.16	0.777	212	23.8	21.6	230	25.9	23.5
16.0		1.18	0.790	212	23.8	21.6	230	25.9	23.5
17.0		1.33	0.891	239	26.9	24.4	260	29.2	26.5
18.0		1.49	1.00	268	30.1	27.3	291	32.7	29.7
19.0		1.66	1.11	299	33.6	30.5	324	36.4	33.0
	3/4	1.67	1.12	299	33.6	30.5	324	36.4	33.0
20.0		1.84	1.23	331	37.2	33.8	359	40.4	36.6
22.0		2.22	1.49	401	45.1	40.9	435	48.9	44.4
	7/8	2.27	1.52	401	45.1	40.9	435	48.9	44.4
24.0		2.64	1.78	477	53.6	48.6	518	58.2	52.8
	1	2.96	1.99	534	60.0	54.5	580	65.2	59.1
26.0		3.10	2.09	560	62.9	57.1	607	68.2	61.9
28.0		3.60	2.42	649	73.0	66.2	704	79.1	71.8
	1 1/8	3.75	2.52	676	76.0	68.9	734	82.5	74.8
30.0		4.13	2.78	745	83.7	76.0	809	90.9	82.5
	1 1/4	4.63	3.11	848	95.3	86.5	920	103	93.8
32.0		4.70	3.16	848	95.3	86.5	920	103	93.8
34.0		5.31	3.57	957	108	97.6	1040	117	106
	1 3/8	5.60	3.76	1010	114	103	1100	124	112
36.0		5.95	4.00	1070	120	109	1160	130	118
38.0		6.63	4.45	1200	135	122	1300	146	133
	1 1/2	6.66	4.48	1200	135	122	1300	146	133
40.0		7.34	4.93	1320	148	135	1440	162	147
	1 5/8	7.82	5.25	1410	158	144	1530	172	156
42.0		8.10	5.44	1460	164	149	1580	178	161
44.0		8.89	5.97	1600	180	163	1740	196	177
	1 3/4	9.07	6.09	1600	180	163	1740	196	177
46.0		9.71	6.53	1750	197	178	1900	214	194
	1 7/8	10.4	7.00	1910	215	195	2070	233	211
48.0		10.6	7.11	1910	215	195	2070	233	211
50.0		11.5	7.71	2070	233	211	2250	253	229

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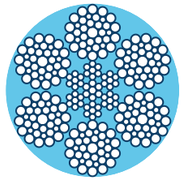
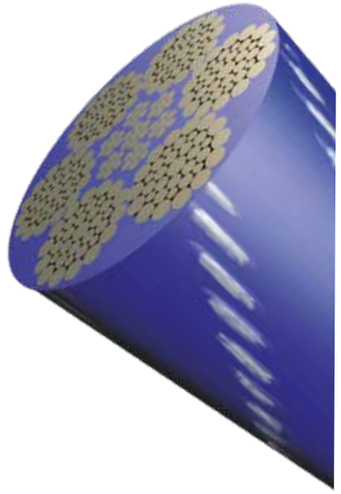
BriFill



BriFill is produced by totally encapsulating a completed rope with a synthetic material. The material is injected internally into the rope and leaves a minimal thickness of material on the external surface.

- Crush resistant, robust rope construction
- Increased fatigue performance
- Reduced rope stretch/ elongation in service



BRIDON BriFill

Diameter		Nominal length mass		Minimum Breaking Force								
				IP/1770			EIP/1960			EEIP/2160		
mm	inch	kg/m	lb/ft	kN	Tons (short)	Tonnes (metric)	kN	Tons (short)	Tonnes (metric)	kN	Tons (short)	Tonnes (metric)
	5/8	1.02	0.688	161	18.1	16.4	183	20.6	18.7	202	22.7	20.6
16.0		1.02	0.688	161	18.1	16.4	183	20.6	18.7	202	22.7	20.6
18.0		1.30	0.871	204	22.9	20.8	226	25.4	23.0	249	28.0	25.4
19.0		1.45	0.975	228	25.6	23.2	262	29.4	26.7	288	32.4	29.4
	3/4	1.45	0.975	228	25.6	23.2	262	29.4	26.7	288	32.4	29.4
20.0		1.60	1.08	252	28.3	25.7	279	31.4	28.4	308	34.6	31.4
22.0		1.98	1.33	308	34.6	31.4	354	39.8	36.1	390	43.8	39.8
	7/8	1.98	1.33	308	34.6	31.4	354	39.8	36.1	390	43.8	39.7
24.0		2.30	1.55	363	40.8	37.0	402	45.2	41.0	443	49.8	45.2
	1	2.58	1.73	399	44.9	40.7	460	51.7	46.9	506	56.9	51.6
26.0		2.70	1.82	426	47.9	43.4	472	53.1	48.1	520	58.5	53.0
28.0		3.14	2.11	494	55.5	50.4	547	61.5	55.8	603	67.8	61.5
	1 1/8	3.27	2.19	503	56.5	51.3	578	65.0	59.0	636	71.5	64.9
	1 1/4	4.10	2.75	645	72.5	65.8	715	80.4	72.9	787	88.5	80.3
32.0		4.10	2.75	645	72.5	65.8	715	80.4	72.9	787	88.5	80.3
	1 3/8	4.88	3.28	743	83.5	75.7	854	96.0	87.1	943	106	96.2
36.0		5.18	3.48	817	91.8	83.3	904	102	92.2	997	112	102
38.0		5.81	3.90	910	102	92.8	1010	114	103	1110	125	113
	1 1/2	5.81	3.90	910	102	92.8	1010	114	103	1110	125	113
40.0		6.40	4.30	1010	114	103	1120	126	114	1230	138	125
	1 5/8	6.81	4.58	1020	115	104	1170	132	119	1300	146	133
44.0		7.90	5.31	1220	137	124	1360	153	139	1500	169	153
	1 3/4	7.90	5.31	1220	137	124	1360	153	139	1500	169	153
	1 7/8	9.22	6.19	1450	163	148	1610	181	164	1770	199	180
48.0		9.22	6.19	1450	163	148	1610	181	164	1770	199	180

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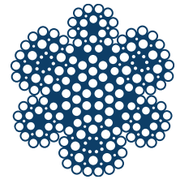
Constructex



Constructex is produced by rotary swaging a completed rope after manufacture. This swaging process reduces the rope diameter and reforms the profile of the outer strands, providing a rope that performs excellent in multilayer drum applications.

- Excellent service life in the most demanding applications
- Robust crush resistant rope construction
- Recommended for multi layered spooling
- Improved wear characteristics

BRIDON Constructex

Diameter		Nominal length mass		Minimum Breaking Force		
				CTX		
mm	inch	kg/m	lb/ft	kN	Tons (short)	Tonnes (metric)
	5/8	1.34	0.900	227	25.5	23.1
16.0		1.34	0.900	227	25.5	23.1
19.0		1.64	1.102	325	36.5	33.1
	3/4	1.64	1.102	325	36.5	33.1
22.0		2.23	1.498	432	48.6	44.1
	7/8	2.23	1.498	432	48.5	44.1
	1	2.98	2.002	556	62.5	56.7
	1 1/8	3.87	2.601	707	79.5	72.1
	1 1/4	4.76	3.199	868	97.6	88.5
32.0		4.76	3.199	868	97.6	88.5
	1 3/8	5.66	3.803	1060	119	108
38.0		6.85	4.603	1240	139	126
	1 1/2	6.85	4.603	1240	139	126
	1 5/8	7.89	5.302	1440	162	147
44.0		9.23	6.202	1650	185	168
	1 3/4	9.23	6.202	1650	185	168

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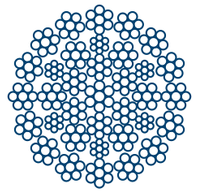
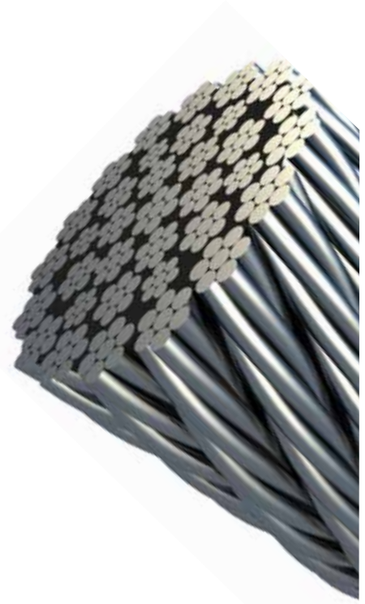
35LS



35LS is a conventional low rotation resistant rope consisting of three layers of strands the inner two layers spun in the opposite direction to the outer layer of strands manufactured in accordance with EN 12385.

- Rotation resistant
- Flexible rope construction
- For use on single layer drums only



BlueStrand 35LS						
Diameter		Nominal length mass		Minimum Breaking Force EIP/1960		
mm	inch	kg/m	lb/ft	kN	Tons (short)	Tonnes (metric)
10		0.45		75.5		7.69
11		0.54		91.3		9.31
12		0.65		109		11.1
13		0.76		128		13.0
14		0.88		148		15.1
15		1.01		170		17.3
16		1.15		193		19.7
18		1.46		244		24.9
19		1.62		272		27.8
20		1.80		302		30.8
21		1.98		333		33.9
22		2.18		365		37.2
23		2.38		399		40.7
24		2.59		435		44.3
25		2.81		472		48.1
26		3.04		510		52.0
28		3.53		592		60.3
32		4.61		773		78.8

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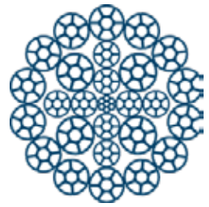
50 DB Series



50 DB Series ropes are compacted rotation resistant constructions consisting of a inner part with an outer layer of strands spun in the opposite direction.

- Rotation resistant
- Good wear characteristics due to ist smooth exterior profile
- High category breaking strength
- Recommended for limited lifting heights only

BlueStrand 50 DB Series						
Diameter		Nominal length mass		Minimum Breaking Force EIP/1960		
mm	inch	kg/m	lb/ft	kN	Tons (short)	Tonnes (metric)
	5/16	0.297	0.200	57.2	6.43	5.83
8.00		0.302	0.203	57.2	6.43	5.83
9.00		0.382	0.257	72.4	8.14	7.38
	3/8	0.428	0.288	81.1	9.12	8.27
10.0		0.472	0.317	89.4	10.0	9.12
11.0		0.571	0.384	108	12.1	11.0
	7/16	0.583	0.392	108	12.1	11.0
12.0		0.680	0.457	129	14.5	13.2
	1/2	0.761	0.512	144	16.2	14.7
13.0		0.798	0.536	151	17.0	15.4
14.0		0.925	0.622	175	19.7	17.8
	9/16	0.964	0.647	183	20.6	18.7
15.0		1.06	0.714	201	22.6	20.5
	5/8	1.19	0.799	229	25.7	23.4
16.0		1.21	0.812	229	25.7	23.4
17.0		1.36	0.917	258	29.0	26.3
18.0		1.53	1.03	289	32.5	29.5
19.0		1.70	1.14	323	36.3	32.9
	3/4	1.71	1.15	323	36.3	32.9
20.0		1.89	1.27	357	40.1	36.4
21.0		2.08	1.40	393	44.2	40.1
22.0		2.28	1.54	432	48.6	44.1
	7/8	2.33	1.57	422	47.4	43.0
23.0		2.50	1.68	473	53.2	48.2
24.0		2.72	1.83	515	57.9	52.5
25.0		2.95	1.98	559	62.8	57.0
	1	3.05	2.05	576	64.7	58.7
26.0		3.19	2.14	604	67.9	61.6

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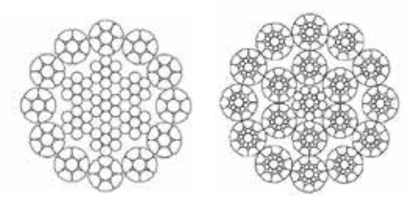
19 Series



The 19 series with its rotation resistant rope constructions, partly compacted, focuses on the tower crane application.

- Rotation resistant
- Good wear characteristics due to its smooth exterior profile
- High category breaking strength
- Recommended for limited lifting heights only

BlueStrand 19 Series

Diameter		Nominal length mass		Minimum Breaking Force EIP/1960		
mm	inch	kg/m	lb/ft	kN	Tons (short)	Tonnes (metric)
8	5/16	0.27		47	10.6	4.8
9		0.34		59	13.2	6.0
10		0.42		74	16.5	7.5
11		0.51		88	19.8	9.0
12		0.61		106	23.8	10.8
13	1/2	0.71		124	27.8	12.6
14	9/16	0.83		143	32.2	14.6
15		0.95		165	37.0	16.8
16	5/8	1.15		199	44.8	20.3
17		1.29		225	50.5	22.9
18		1.45		252	56.7	25.7
19	3/4	1.61		280	63.1	28.6
20		1.79		311	69.9	31.7
21		1.97		343	77.2	35.0
22	7/8	2.17		377	84.7	38.4
23		2.37		412	92.6	42.0
24		2.58		448	100.8	45.7
25		2.80		486	109.3	49.6

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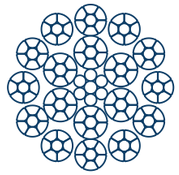
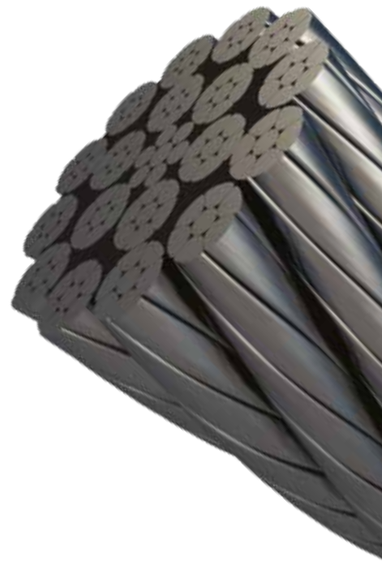
18 Series



The 18 series is a compacted rotation resistant rope construction consisting of a inner part with an outer layer of strands spun in the opposite direction.

- Rotation resistant
- Good wear characteristics due to its smooth exterior profile
- High category breaking strength
- Recommended for limited lifting heights only



BlueStrand 18 Series

Diameter		Nominal length mass		Minimum Breaking Force EIP/1960		
mm	inch	kg/m	lb/ft	kN	Tons (short)	Tonnes (metric)
	3/8	0.454	0.305	76.6	8.61	7.81
10.0		0.500	0.336	84.4	9.49	8.61
11.0		0.605	0.407	104	11.7	10.6
	7/16	0.617	0.415	104	11.7	10.6
12.0		0.720	0.484	122	13.7	12.4
	1/2	0.806	0.542	136	15.3	13.9
13.0		0.845	0.568	143	16.1	14.6
14.0		0.980	0.659	165	18.5	16.8
	9/16	1.02	0.686	172	19.3	17.5
15.0		1.13	0.756	190	21.4	19.4
	5/8	1.26	0.847	216	24.3	22.0
16.0		1.28	0.860	216	24.3	22.0
17.0		1.45	0.971	244	27.4	24.9
18.0		1.62	1.09	274	30.8	27.9
19.0		1.81	1.21	306	34.4	31.2
	3/4	1.81	1.22	306	34.4	31.2
20.0		2.00	1.34	337	37.9	34.4
21.0		2.21	1.48	372	41.8	37.9
22.0		2.42	1.63	416	46.8	42.4
	7/8	2.47	1.66	416	46.8	42.4
23.0		2.65	1.78	446	50.1	45.5
24.0		2.88	1.94	486	54.6	49.6
25.0		3.13	2.10	527	59.2	53.7
	1	3.23	2.17	544	61.1	55.5
26.0		3.38	2.27	570	64.1	58.1
27.0		3.65	2.45	615	69.1	62.7
28.0		3.92	2.63	661	74.3	67.4
	1 1/8	4.08	2.74	688	77.3	70.2
29.0		4.21	2.83	709	79.7	72.3
30.0		4.50	3.02	759	85.3	77.4
	1 1/4	5.04	3.39	863	97.0	88.0
32.0		5.12	3.44	863	97.0	88.0
34.0		5.78	3.88	975	110	99.4
	1 3/8	6.10	4.10	1030	116	105
36.0		6.48	4.35	1090	123	111
38.0		7.22	4.85	1210	136	123
	1 1/2	7.26	4.88	1210	136	123

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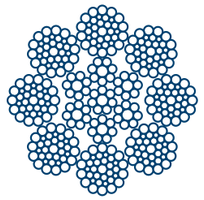
8 Series



The 8 series is a range of general purpose 8 stranded galvanised ropes produced with a steel core, fully lubricated during manufacture producing in accordance with EN 12385.

- ✓ Flexible and solid rope construction
- ✓ Higher performance level compared to 6 series
- ✓ For use on single layer drums only

BlueStrand 8 Series

Diameter		Nominal length mass		Minimum Breaking Force					
				EIP/1960			EEIP/2160		
mm	inch	kg/m	lb/ft	kN	Tons (short)	Tonnes (metric)	kN	Tons (short)	Tonnes (metric)
12.0		0.586	0.394	100	11.2	10.2	111	12.5	11.3
	1/2	0.656	0.441	113	12.7	11.5	124	13.9	12.6
13.0		0.688	0.462	118	13.3	12.0	130	14.6	13.3
14.0		0.798	0.536	137	15.4	14.0	151	17.0	15.4
	9/16	0.831	0.558	142	16.0	14.5	157	17.6	16.0
	5/8	1.03	0.689	179	20.1	18.3	197	22.1	20.1
16.0		1.04	0.700	179	20.1	18.3	197	22.1	20.1
18.0		1.32	0.886	226	25.4	23.0	249	28.0	25.4
19.0		1.47	0.987	252	28.3	25.7	278	31.2	28.3
	3/4	1.48	0.993	252	28.3	25.7	278	31.2	28.3
20.0		1.63	1.09	279	31.4	28.4	308	34.6	31.4
22.0		1.97	1.32	338	38.0	34.5	372	41.8	37.9
	7/8	2.01	1.35	338	38.0	34.5	372	41.8	37.9
24.0		2.34	1.58	402	45.2	41.0	443	49.8	45.2
	1	2.63	1.76	450	50.6	45.9	496	55.8	50.6
26.0		2.75	1.85	472	53.1	48.1	520	58.5	53.0
28.0		3.19	2.14	547	61.5	55.8	603	67.8	61.5
	1 1/8	3.32	2.23	570	64.1	58.1	628	70.6	64.0
30.0		3.66	2.46	628	70.6	64.0	692	77.8	70.6
	1 1/4	4.10	2.76	715	80.4	72.9	787	88.5	80.3
32.0		4.17	2.80	715	80.4	72.9	787	88.5	80.3
34.0		4.70	3.16	807	90.7	82.3	889	100	90.7
	1 3/8	4.96	3.34	851	95.7	86.8	938	105	95.6
36.0		5.27	3.54	904	102	92.2	997	112	102
38.0		5.88	3.95	1010	114	103	1110	125	113
	1 1/2	5.91	3.97	1010	114	103	1110	125	113

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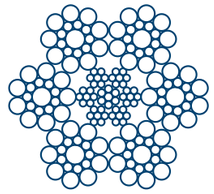
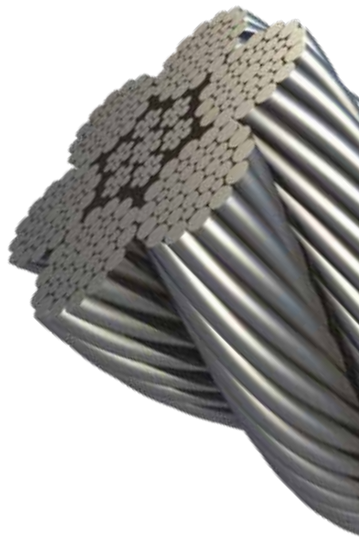
6 Series



The 6 series is a range of general purpose 6 stranded galvanised ropes produced with a steel core, fully lubricated during manufacture producing in accordance with EN 12385.

- ✓ Fit-for-purpose, robust rope construction
- ✓ Fully lubricated during manufacture
- ✓ For use on single layer drums only



BlueStrand 6 Series

Diameter		Nominal length mass		Minimum Breaking Force								
				IP/1770			EIP/1960			EEIP/2160		
mm	inch	kg/m	lb/ft	kN	Tons (short)	Tonnes (metric)	kN	Tons (short)	Tonnes (metric)	kN	Tons (short)	Tonnes (metric)
6.00		0.144	0.097	22.7	2.55	2.31	25.1	2.82	2.56			
	1/4	0.161	0.108	26.2	2.94	2.67	30.2	3.40	3.08			
7.00		0.196	0.132	30.9	3.47	3.15	34.2	3.84	3.49			
	5/16	0.252	0.169	40.7	4.58	4.15	46.9	5.27	4.78			
8.00		0.256	0.172	40.3	4.53	4.11	44.7	5.02	4.56			
9.00		0.324	0.218	51.0	5.73	5.20	56.5	6.35	5.76			
	3/8	0.363	0.244	58.4	6.56	5.95	67.2	7.55	6.85			
10.0		0.400	0.269	63.0	7.08	6.42	69.8	7.85	7.12			
11.0		0.494	0.332	79.1	8.89	8.07	90.7	10.20	9.25			
	7/16	0.494	0.332	79.1	8.89	8.06	90.7	10.2	9.25	100	11.2	10.2
12.0		0.576	0.387	90.7	10.2	9.25	100	11.2	10.2	111	12.5	11.3
	1/2	0.645	0.434	102	11.5	10.4	118	13.3	12.1	130	14.6	13.2
13.0		0.676	0.454	106	11.9	10.8	118	13.3	12.0	130	14.6	13.3
14.0		0.784	0.527	124	13.9	12.6	137	15.4	14.0	151	17.0	15.4
	9/16	0.817	0.549	129	14.5	13.2	149	16.8	15.2	165	18.5	16.8
	5/8	1.02	0.688	161	18.1	16.4	183	20.6	18.7	202	22.7	20.6
16.0		1.02	0.688	161	18.1	16.4	183	20.6	18.7	202	22.7	20.6
18.0		1.30	0.871	204	22.9	20.8	226	25.4	23.0	249	28.0	25.4
19.0		1.45	0.975	228	25.6	23.2	262	29.4	26.7	288	32.4	29.4
	3/4	1.45	0.975	228	25.6	23.2	262	29.4	26.7	288	32.4	29.4
20.0		1.60	1.08	252	28.3	25.7	279	31.4	28.4	308	34.6	31.4
22.0		1.98	1.33	308	34.6	31.4	354	39.8	36.1	390	43.8	39.8
	7/8	1.98	1.33	308	34.6	31.4	354	39.8	36.1	390	43.8	39.7
24.0		2.30	1.55	363	40.8	37.0	402	45.2	41.0	443	49.8	45.2
	1	2.58	1.73	399	44.9	40.7	460	51.7	46.9	506	56.9	51.6
26.0		2.70	1.82	426	47.9	43.4	472	53.1	48.1	520	58.5	53.0
28.0		3.14	2.11	494	55.5	50.4	547	61.5	55.8	603	67.8	61.5
	1 1/8	3.27	2.19	503	56.5	51.3	578	65.0	59.0	636	71.5	64.9
	1 1/4	4.10	2.75	645	72.5	65.8	715	79.9	72.9	787	87.9	80.3
32.0		4.10	2.75	645	72.5	65.8	715	80.4	72.9	787	88.5	80.3
	1 3/8	4.88	3.28	743	83.5	75.7	854	96.0	87.1	943	106	96.2
36.0		5.18	3.48	817	91.8	83.3	904	102	92.2	997	112	102
38.0		5.81	3.90	910	102	92.8	1010	114	103	1110	125	113
	1 1/2	5.81	3.90	910	102	92.8	1010	114	103	1110	125	113
40.0		6.40	4.30	1010	114	103	1120	126	114	1230	138	125
	1 5/8	6.81	4.58	1020	115	104	1170	132	119	1300	146	133
44.0		7.90	5.31	1220	137	124	1360	153	139	1500	169	153
	1 3/4	7.90	5.31	1220	137	124	1360	153	139	1500	169	153
	1 7/8	9.22	6.19	1450	163	148	1610	181	164	1770	199	180
48.0		9.22	6.19	1450	163	148	1610	181	164	1770	199	180
	2	10.3	6.94	1530	172	156	1760	198	179	1930	217	197
52.0		10.8	7.27	1700	191	173	1890	212	193	2080	234	212
	2 1/8	11.7	7.83	1710	192	174	1970	221	201	2160	243	220
56.0		12.5	8.43	1980	223	202	2190	246	223	2410	271	246
	2 1/4	13.1	8.78	1910	215	195	2200	247	224	2420	272	247
60.0		14.6	9.81	2270	255	231	2510	282	256	2770	311	282
	2 3/8	14.6	9.78	2270	255	231	2510	282	256	2770	311	282

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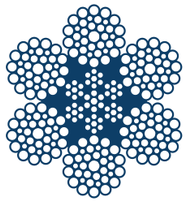
general guidance.

General guidance on rope selection

Wire rope guidance

To help you understand the complex nature of wire rope this guide aims to impart an understanding of the key factors that need to be considered and correctly balanced when choosing which type of rope will provide optimum service life and safety for a specific task, type of machinery and working environment.



An example rope nomenclature for the rope shown above is given below;

6 x 36WS - IWRC 1960 B sZ

What it means;

6 = numbers of strands

36 = number of wires in each strand

1-7-7+7-14 = Lay-up of wires in the strand

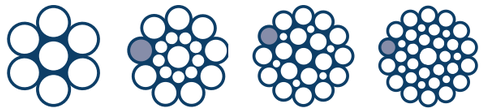
IWRC = Type of core

1960 = Rope grade

B = Drawn galvanised B(Zn)

sZ = Right Hand Ordinary (RHO) Lay

Equal lay strand constructions



7-wires (1-6) | Seale 19S(1-9-9) | Filler 25F (1-6-6F-12) | Warrington Seale 36WS (1-7-7+7-14)

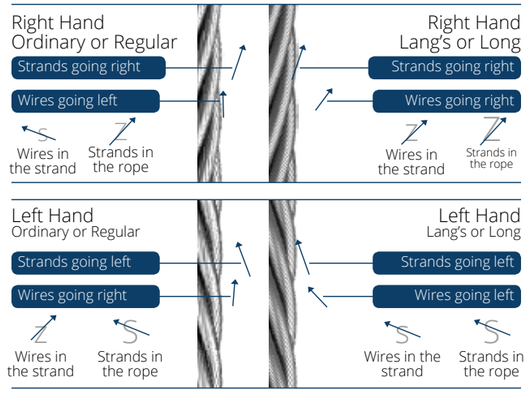
6-stranded rope constructions

(for example nominal diameter 22mm)

6x7 Outer wire 2.2mm² Metallic area 3.8mm² | 6x19S Outer wire 1.8mm² Metallic area 2.5mm² | 6x25F Outer wire 1.5mm² Metallic area 1.8mm² | 6x36WS Outer wire 1.3mm² Metallic area 1.3mm²

The rope lay of a wire rope may be described as;

sZ = Right hand ordinary/regular lay
zZ = Right hand lang's lay
aZ = Right hand alternate lay
zS = Left hand ordinary/regular lay
sS = Left hand lang's lay
aS = Left hand alternate lay



Lang's lay ropes offer greater wear resistance and minimise spooling damage at the cross-over zones when multi-layer wound on winch drum.

Wire ropes can also be swaged or Dyformed after completion, further increasing the steel fill factor, whilst creating a smooth surface to the exterior of the rope.

Cores

Steel Wire ropes are supplied with either fibre or steel cores, the choice being largely dependent on the use for which the rope is intended.

The principal function of the core is to provide support to the strands and maintain them in the correct positions under working conditions.

Steel Cores

Steel cores comprise an independent wire rope (IWRC) or in the case of small ropes, a wire strand (WSC). Such cores prove advantageous in severe working conditions involving low factors of safety, high operating speeds, wide fleet angles and are more resistant to crushing on drums and pulleys. The steel core provides better support for the outer strands, so that the rope retains its shape, resulting in a more effective distribution of stress in the individual wires.

Preforming

Generally, ropes are supplied preformed. In a preformed rope the wires and strands are given the helix they take up in the completed rope.

Coatings

Zinc Coated Wire Ropes – Galvanising
Zinc coatings provide sacrificial protection to the underlying steel wire for protection against corrosion where the rope is exposed to corrosive agents – salt, water, moisture, weather etc.

Various coat weights of zinc are available for particular application; Bridon is ready to advise on the alternative procedures for achieving corrosion protection of wire rope appropriate to the particular environment and manner of usage.

Rope Grades

Rope Grade	Approximate Equivalent API 9A Grade
1770	IPS
1860	EIPS
1960	EIPS
2160	EEIP

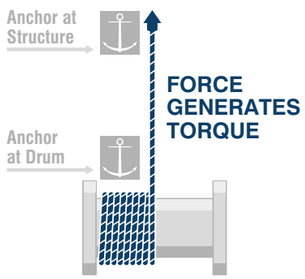
Definition of Breaking Loads and Forces

1. Minimum Breaking Force: The force, in kilonewtons or pounds force below which the rope shall not break when tested to destruction.
2. Minimum Breaking Load: The load in tonnes or tons corresponding to the minimum breaking force.
3. Minimum aggregate breaking force: The value calculated from the product of the sum of the cross-sectional metallic areas of all the individual wires in the rope and the tensile strength grades(s) of the wires.

Note: The minimum aggregate breaking force is sometimes used when Regulations permit, particularly in Europe. There is a direct relationship between minimum aggregate breaking force and minimum breaking force (through the spinning loss) and users must be absolutely sure that they are comparing like for like when ordering replacement ropes.

When selecting a steel wire rope to suit a particular application the following characteristics should be taken into consideration.

- Strength
- Rotation resistance
- Fatigue resistance
- Resistance to wear and abrasion
- Resistance to crushing
- Resistance to corrosion
- Rope extension



Strength

The responsibility for determining the minimum strength of a rope for use in a given system rests with the manufacturer of the machine, appliance, or lifting equipment. As part of this process the manufacturer of the machine, appliance or lifting equipment will need to be aware of any local regulations, standards or codes of practice which might govern the design factor of the rope (often referred to nowadays as the coefficient of utilisation), and other factors which might influence the design of sheaves and drums, the shape of the groove profiles and corresponding radius, the drum pitch and the angle of fleet, all of which have an effect on rope performance.

Once the strength (referred to as minimum breaking force or minimum breaking load) of the rope has been determined it is then necessary to consider which type of rope will be suitable for the intended duty. It is important therefore for the designer to be fully aware of the properties, characteristics and limitations on use of the many different kinds of steel wire ropes which are available.

IMPORTANT NOTE FOR CRANE OPERATORS

Bridon-Bekaert recommends that once the machine, appliance or lifting equipment has been taken into service, any replacement rope should possess the required characteristics for the duty in question and should, as a minimum, at least comply with the minimum guaranteed breaking force stated by the original equipment manufacturer.

Resistance to Rotation

It is important to determine whether there is a requirement to use a low rotation or rotation resistant rope. Such ropes are often referred to as multi - strand ropes.

Six or eight strand rope constructions are usually selected unless load rotation on a single part system or “cabling” on a multi - part reeving system are likely to cause operational problems.

When loaded, steel wire ropes will generate:

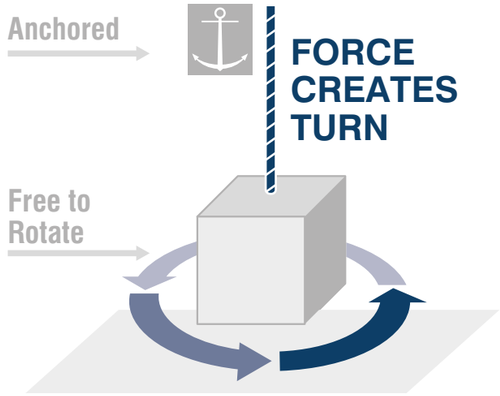
- “Torque” if both ends are fixed
- “Turn” if one end is unrestrained

Torque

When both ends of a rope are fixed, the applied force generates “torque” at the fixing points.

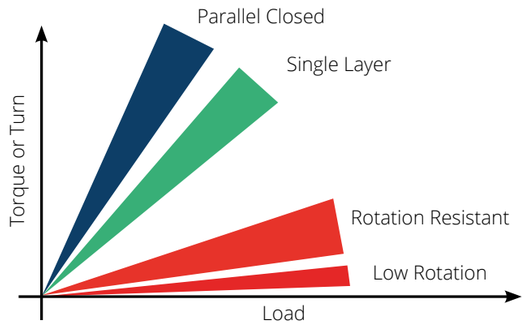
Turn

When one end of a rope is free to rotate, the applied load causes the rope to turn.



The torque or turn generated will increase as the load applied increases. The degree to which a wire rope generates torque or turn will be influenced by the construction of the rope. Having recognised what can happen when a rope is loaded it is necessary to select the correct type of rope. It should be noted that all ropes will rotate to some degree when loaded.

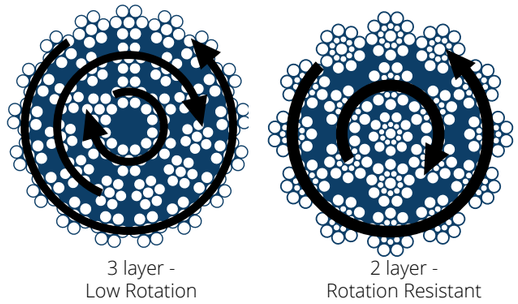
The diagram below serves to illustrate the differences in rotational properties between the four basic types of stranded rope.



Specific information including the torque factor and the turn value expressed in degrees per lay length for individual rope constructions can be found on page 47.

The tendency for any rope to turn will increase as the height of lift increases. In a multi - part reeving system the tendency for the rope to cable will increase as the spacing between the parts of rope decreases. Selection of the correct rope will help to prevent “cabling” and rotation of the load.

“Endurance” low rotation and rotation resistant ropes ensure that problems associated with cabling and load rotation are minimised.



Bridon is pleased to offer advice on any specific problems associated with rope rotation.

Fatigue Resistance

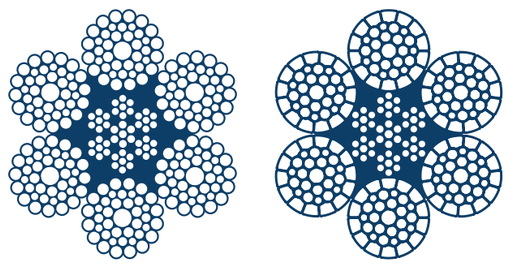
Steel wire ropes are likely to deteriorate due to bend fatigue when subjected to bending around a sheave or drum. The rate of deterioration will be influenced by the number of sheaves in the system, the diameter of the sheaves and drum, and the loading conditions.

Bridon carries out extensive testing on their products, providing comparative fatigue data to allow customers to make an informed choice.

When selecting a wire rope for an application where bending fatigue is a principal cause of deterioration it is important to select a rope containing small wires e.g.

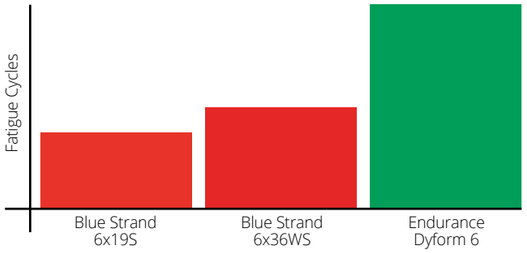
6x36WS(1-7-7+7-14) as opposed to a 6x19S(1-9-9).

Additional resistance to fatigue leading to real cost savings can be achieved by selecting a “Dyform” wire rope.



The smooth surface of the “Dyform” product provides improved rope to sheave contact leading to reduced wear on both rope and sheave . Increased cross-sectional steel area and improved inter - wire contact ensures that the rope will operate with lower internal stress levels resulting in longer bending fatigue life and lower costs.

This graph illustrates a “doubling” in life when moving

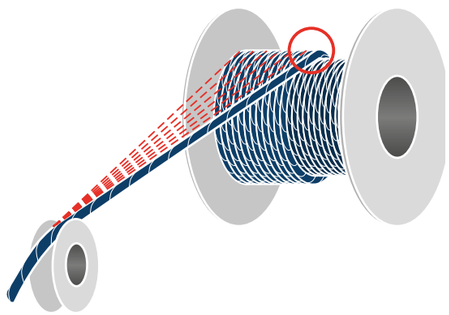


from Blue Strand 6x36 to Endurance Dyform 6. This same relationship can be found when moving from any construction into an equivalent Dyform construction e.g. 18x7 to Endurance Dyform 18 or 35x7 to Endurance Dyform 34LR.

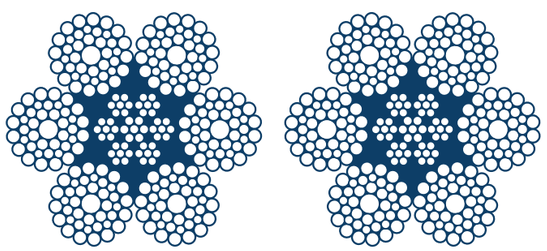
Resistance to Abrasive Wear

Abrasive wear can take place between rope and sheave and between rope and drum but the greatest cause of abrasion is often through “interference” at the drum.

If abrasion is determined to be a major factor in rope deterioration then a wire rope with relatively large outer wires should be selected.

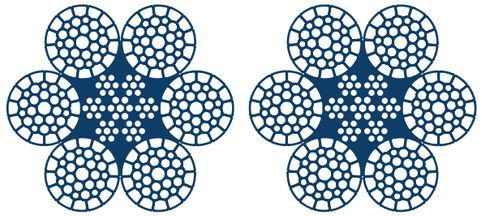


Wire rope on adjacent drum laps can cause point contact and accelerated wear .



Non Dyform wire rope on adjacent drum laps can cause point contact and accelerated wear.

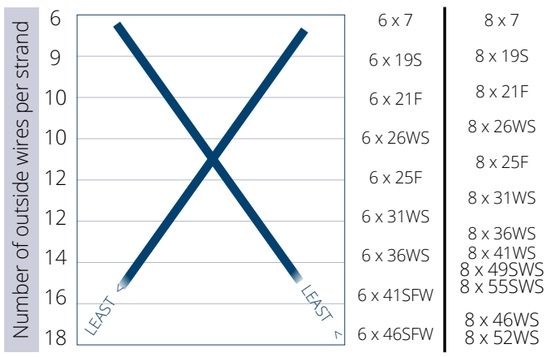
Selection of a Dyform product will reduce abrasion through improved contact conditions.



The smooth surface of Dyform rope creates better contact and leads to longer life.

Abrasion Resistance vs Bending Fatigue Resistance

When choosing a rope for a specific application it is often necessary to reach a balance between the two important rope characteristics of abrasion resistance and the resistance to bending fatigue. An established method of determining the best construction for the rope for the particular operating conditions is by use of the “X- Chart”. By referring to this chart when selecting a rope, the mid-point of the “X” comes closest to a balance between resistance to abrasion and resistance to bending fatigue. As with most engineering challenges, some degree of compromise and trade off of the two properties may be required in order to choose the best rope for the application. This will ultimately depend on the prevailing conditions under which the rope will be expected to operate in and the need to reach an efficient, economical solution.

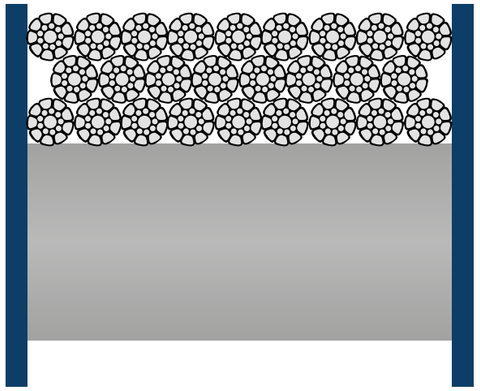


Crush Resistance

In multi - layer coiling applications where there is more than one layer of rope on the drum it is essential to install the rope with some back tension. Bridon recommends a minimum installation tension of between 2.5% and 10% of the minimum breaking force of the rope. If this is not achieved, or in certain applications where high pressure on underlying rope layers is inevitable e.g. a boom hoist rope raising a boom from the horizontal position, severe crushing damage can be caused to underlying layers. Selection of a steel core as opposed to a fibre core will help this situation. Additional resistance to crushing is offered by a Dyform rope resulting from its high steel fill-factor.

Dyform ropes are recommended for multi - layer coiling operations where crushing on lower layers is inevitable.

Rotary hammer swaged Constructex ropes excel to combat problem spooling to minimise damage and crushing on the drum.



Corrosion resistance

If the wire rope is to be used in a corrosive environment then a galvanised coating is recommended. If corrosion is not a significant issue then a bright rope can be selected.

Where moisture can penetrate the rope and attack the core, plastic impregnation (PI) can be considered.

In order to minimise the effects of corrosion it is important to select a wire rope with a suitable manufacturing lubricant. Further advantages can be gained by lubricating the rope regularly whilst it is in service.

Properties of Extension of Steel Wire Ropes

Any assembly of steel wires spun into a helical formation either as a strand or wire rope, when subjected to a tensile load, can extend in three separate phases, depending on the magnitude of the applied load.

There are also other factors which produce rope extension which are very small and can normally be ignored.

Phase 1 - Initial or Permanent Constructional Extension
At the commencement of loading a new rope, extension is created by the bedding down of the assembled wires with a corresponding reduction in overall diameter. This reduction in diameter creates an excess length of wire which is accommodated by a lengthening of the helical lay. When sufficiently large bearing areas have been generated on adjacent wires to withstand the circumferential compressive loads, this mechanically created extension ceases and the extension in Phase 2 commences. The Initial Extension of any rope cannot be accurately determined by calculation and has no elastic properties.

The practical value of this characteristic depends upon many factors, the most important being the type and construction of rope, the range of loads and the number and frequency of the cycles of operation. It is not possible to quote exact values for the various constructions of rope in use, but the following approximate values may be employed to give reasonably accurate results.

	% of rope length	
	Fibre Core	Steel Core
Lightly loaded Factor of safety about 8:1	0.25	0.125
Normally loaded Factor of safety about 5:1	0.50	0.25
Heavily loaded Factor of safety about 3:1	0.75	0.50
Heavily loaded with many bends and/or deflections	Up to 2.00	Up to 1.00

The above figures are for guidance purposes. More precise figures are available upon request.

Phase 2 - Elastic Extension
Following Phase 1, the rope extends in a manner which complies approximately with Hookes Law (stress is proportional to strain) until the Limit of Proportionality or Elastic Limit is reached.

It is important to note that wire ropes do not possess a Young’s Modulus of Elasticity, but an ‘apparent’ Modulus of Elasticity can be determined between two fixed loads.

The Modulus of Elasticity also varies with different rope constructions, but generally increases as the cross-sectional area of steel increases.

By using the values given, it is possible to make a reasonable estimate of elastic extension, but if greater accuracy is required it is advisable to carry out a modulus test on an actual sample of the rope.

$$\text{Elastic Extension} = \frac{WL}{EA} \text{ mm}$$

W = load applied (kN)
L = rope length (m)
EA = axial stiffness MN

Phase 3 - Permanent Extension
The permanent, non-elastic extension of the steel caused by tensile loads exceeding the yield point of the material.

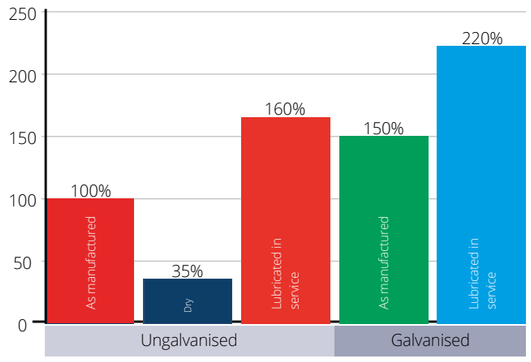
If the load exceeds the Limit of Proportionality, the rate of extension will accelerate as the load is increased, until a loading is reached at which continuous extension will commence, causing the wire rope to fracture without any further increase of load.

Lubrication

During the wire rope manufacturing process, the space between the wires is normally filled with petroleum based grease, these greases having a temperature operating range typically of 0°C to +60°C. Synthetic grease with an operating temperature range of -40°C to +90°C may be incorporated. It is important when specifying a particular rope to consider the type of lubricant required for the application and the amount of lubricant required on the exterior of the rope, as the tendency is to produce ropes with less grease on their exterior.

Lubricants may be applied to wire ropes during service to both increase their fatigue performance and protect the ropes from corrosion.

Typical wire rope bend fatigue results
(Bridon Endurance Dyform 34LR)



General Notes

Galvanized

The Bridon group has the capability to offer any crane product in either Bright or Galvanized finish. Typically, cranes use Bright ropes in North American and Galvanized ropes in the European Union and the GOM. Globally, local usage standards, application conditions and preference may define the actual rope finish selected.

Smooth Drum

"When using multi-strand, rotation resistant products in multi-layer applications, the use of Lebus type grooved drums may provide superior spooling performance over smooth faced drums."

Minimum Breaking Force

Many wire rope applications, mobile cranes and deep water mooring systems in particular benefit from very high strength to weight ratios. As a result, designers are constantly pushing the specific strength envelope of the wire rope used in their products. Bridon and many other rope companies have responded to these requirements with innovative materials and manufacturing techniques to push rope strengths past the highest values listed in national and international standards.

Properties like strength, fatigue life, crush resistance and stability of physical properties are a function of the materials used, geometry of the design and manufacturing processes employed in the specific rope configuration. Optimizing the configuration to produce highest strength is not achieved without effecting other properties. Fatigue life and long term stability of physical properties are most affected by the techniques employed to produce extremely high strength wire rope. Because of these effects, characteristics of extremely high strength rope need to be understood for specific applications. Please contact Bridon Technical sales to review your specific use.

Cross Sections

The cross section image is for reference only. Actual cross sections vary due to diameter.

Assessing the safe operating condition of steel wire ropes

Bridon-Bekaert recommends that the condition assessment of wire rope be carried out by a suitably qualified competent person against the requirements of BS ISO 4309.

Table 1: Rope Category Numbers for Non-Rotation Resistant Rope

Brand Name	Rope	Strand	RCN
6 Series 6x19	6 x 19S-IWRC 6 x 25F-IWRC 6 x 26WS-IWRC	1-9-9 1-6-6F-12 1-5-5+5-10	02 04 06
6 Series 6x36	6 x 31WS-IWRC 6 x 36WS-IWRC 6 x 41WS-IWRC	1-6-6+6-12 1-7-7+7-14 1-8-8+8-16	08 09 11
Dyform 6 Series Dyform 6	6 x K19S-IWRC 6 x K26WS-IWRC 6 x K36WS-IWRC 6 x K41WS-IWRC	1-9-9 1-5-5+5-10 1-7-7+7-14 1-8-8+8-16	02 06 09 11
Dyform 6 Series Dyform Bristar 6	6 x K19S-EPIWRC 6 x K26WS-EPIWRC 6 x K36WS-EPIWRC 6 x K41WS-EPIWRC	1-9-9 1-5-5+5-10 1-7-7+7-14 1-8-8+8-16	02 06 09 11
Dyform 8 Series Dyform 8	8 x K19S-IWRC 8 x K26WS-IWRC 8 x K36WS-IWRC	1-9-9 1-5-5+5-10 1-7-7+7-14	04 09 13
Dyform 8 Series Dyform 8PI	8 x K19S-EPIWRC 8 x K26WS-EPIWRC 8 x K36WS-EPIWRC	1-9-9 1-5-5+5-10 1-7-7+7-14	04 09 13
Dyform 8 Series Dyform DSC8	8 x K19S-PWRC 8 x K26WS-PWRC	1-9-9 1-5-5+5-10	04 09
8 Series	8 x 19S-IWRC 8 x 25F-IWRC 8 x 36WS-IWRC	1-9-9 1-6-6F-12 1-7-7+7-14	04 06 13
Constructex	K(3x40FC+3x24FC)-PWRC	FC-8-8-8F-16 FC-6-6F-12	06

Discard Criteria: Single-layer and parallel closed ropes

For guidance on discard of steel wire ropes, the tables below taken from (1) should be used. When using this information in an official capacity, the latest version of the standard should be checked.

Table 3 - Single-layer and Parallel-closed Ropes

Rope category number RCN	Total number of load-bearing wires in the outer layer of strands in the rope (a) (n)	Number of visible outer broken wires (b)					
		Sections of rope working in steel sheaves and/or spooling on a single-layer spooling drum Wire breaks randomly distributed				Sections of rope spooling on a multi-layer spooling drum (c)	
		Classes M1 to M4 or class unknown (d)				All classes	
		Ordinary Lay		Lang's Lay		Ord & Lang's	
		Over a length of 6d (e)	Over a length of 30d (e)	Over a length of 6d (e)	Over a length of 30d (e)	Over a length of 6d (e)	Over a length of 30d (e)
01	n ≤ 50	2	4	1	2	4	8
02	51≤ n ≤75	3	6	2	3	6	12
03	76≤ n ≤100	4	8	2	4	8	16
04	101≤ n ≤120	5	10	2	5	10	20
05	121≤ n ≤140	6	11	3	6	12	22
06	141≤ n ≤160	6	13	3	6	12	26
07	161≤ n ≤180	7	14	4	7	14	28
08	181≤ n ≤200	8	16	4	8	16	32
09	201≤ n ≤220	9	18	4	9	18	36
10	221≤ n ≤240	10	19	5	10	20	38
11	241≤ n ≤260	10	21	5	10	20	42
12	261≤ n ≤280	11	22	6	11	22	44
13	281≤ n ≤300	12	24	6	12	24	48
	n >300	0,04 x n	0,08 x n	0,02 x n	0,04 x n	0,08 x n	

(1) BS ISO 4309 2017 Cranes- Wire Ropes- Care, Maintenance, Installation, Examination, and Discard.

Table 2: Rope Category Numbers for Rotation Resistant Rope

Brand Name	Rope	Strand	RCN
18 Series	18 x K7-WSC	1-6	23-1
50DB Series	26 x K7-WSC	1-6	23-1
Dyform 34LR	35(W) x K7-WSC 35(W) x K19S-WSC	1-6 1-9-9	23-2 31
35LS	35(W) x 7-WSC 35(W) x 19S-WSC	1-6 1-9-9	23-2 31

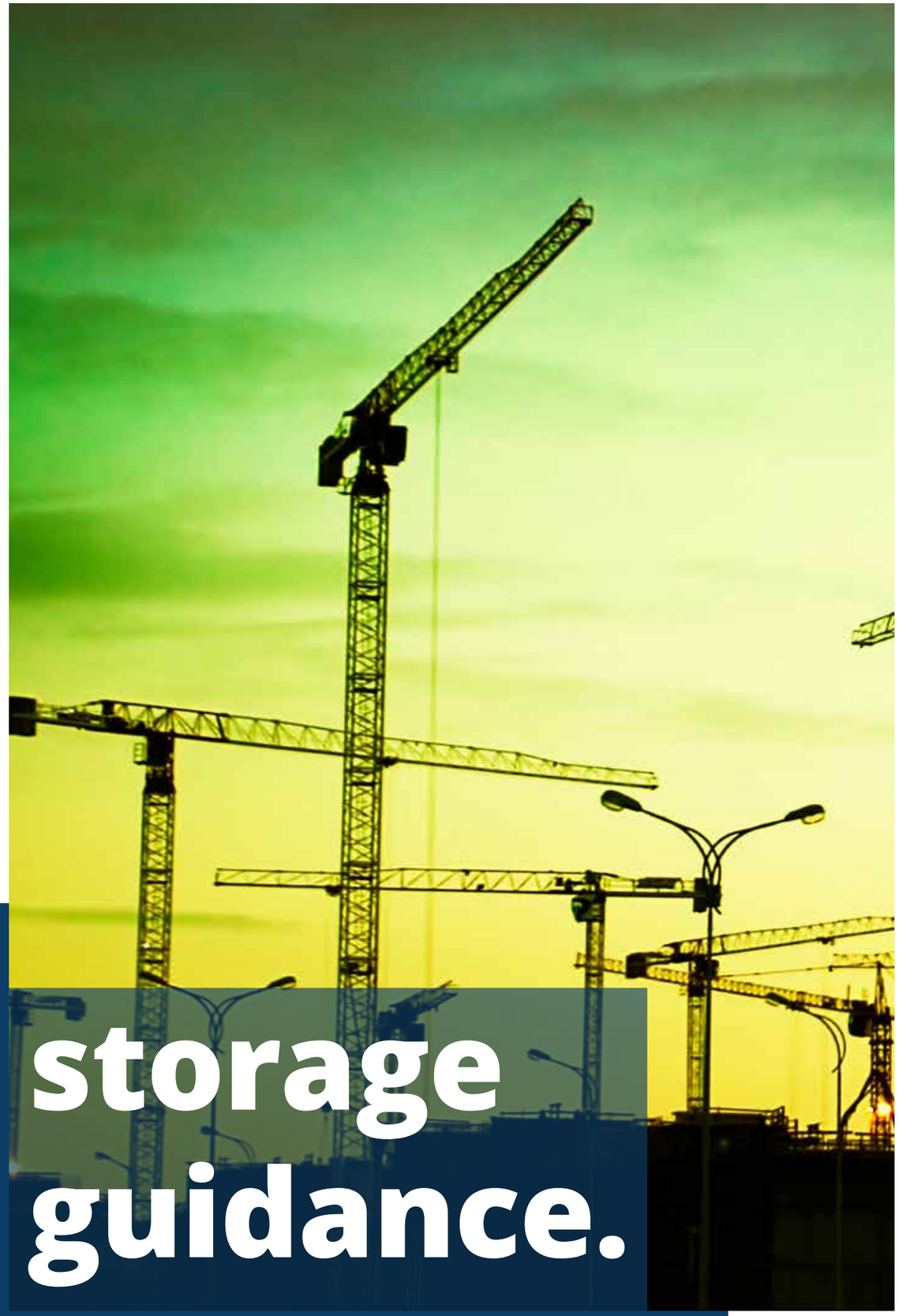
Discard criteria: Rotation-resistant ropes

For guidance on discard of steel wire ropes, the tables below taken from (1) should be used. When using this information in an official capacity, the latest version of the standard should be checked.

Table 4 - Rotation-Resistant Ropes

Rope category number RCN	Total number of load-bearing wires in the outer layer of strands in the rope (a) (n)	Number of visible outer broken wires (b)			
		Sections of rope working in steel sheaves and/or spooling on a single-layer spooling drum Wire breaks randomly distributed		Sections of rope spooling on a multi-layer spooling drum (c)	
		Over a length of 6d (d)	Over a length of 30d (d)	Over a length of 6d (d)	Over a length of 30d (d)
21	4 strands n ≤ 100	2	4	2	4
	3 or 4 strands n ≤100	2	4	4	8
	At least 11 outer strands				
23-1	71≤ n ≤100	2	4	4	8
23-2	101≤ n ≤120	3	5	5	10
23-3	121≤ n ≤140	3	5	6	11
24	141≤ n ≤160	3	6	6	13
25	161≤ n ≤180	4	7	7	14
26	181≤ n ≤200	4	8	8	16
27	121≤ n ≤220	4	9	9	18
28	221≤ n ≤240	5	10	10	19
29	241≤ n ≤260	5	10	10	21
30	261≤ n ≤280	6	11	11	22
31	281≤ n ≤300	6	12	12	24
	n >300	6	12	12	24

(1) BS ISO 4309 2017 Cranes- Wire Ropes- Care, Maintenance, Installation, Examination, and Discard.



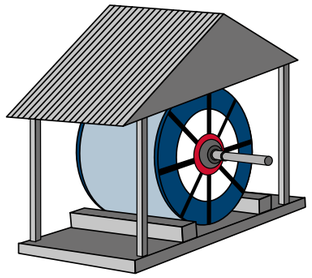
storage guidance.

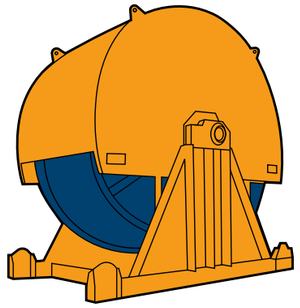
WIRE ROPE STORAGE

Ensure all ropes being taken into storage are clearly identified and are accompanied with a manufacturers certificate.

Store the rope off the ground or floor in a clean, dry, well-ventilated, covered location. If it is not possible to store it inside, cover it with waterproof material or a suitable structure to protect the rope from the sun and rain.

Note: Coverings should be such that water drains away, not become trapped.



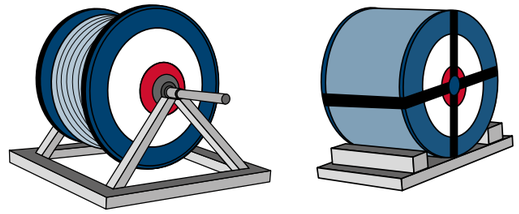


Ensure the floor or ground is level and capable of supporting the total mass of rope and reel. Bearers may be required to distribute the loading, although most steel reels will be supplied on cradles.

Make sure that there is a free flow of air around the rope and that it is isolated from direct contact with the floor or ground, chemical fumes, moisture, steam and other corrosive agents.

WARNING: Failure to comply with these recommendations can result in the rope becoming contaminated with harmful materials and foreign debris. These contaminants can induce corrosion and render the rope unsafe for use.

If supplied on a reel without a cradle, the whole package should be supported on a simple frame or cradle that is located on the ground and is capable of supporting the total mass of rope plus reel.



WARNING: Under no circumstances should the reel be lifted with the aid of the cradle, unless the cradle has been specifically designed, clearly identified and rated that it may be used for lifting purposes.

Rotate the reel periodically during long periods of storage, particularly in warm environments and climates, to minimise the migration of lubricant from the rope.

For very large reels of rope, where storing undercover is not practical, the reels will have been supplied on a cradle and the reel should be covered particularly for long term storage, with special protective sheet/tarpaulin to provide protection from the sun, wind, rain, etc.

WARNING: Properties of the rope may be affected i.e. reduction in breaking strength, if the rope is stored for long periods at elevated temperatures e.g. none temperature controlled warehouse; bottom of mine shaft, etc.

To minimise the possibility of condensation being trapped between the rope and the packaging, the covering may be secured direct to the cradle. This will allow air to the underside of the reel and rope.

Note 1: The picture illustrates packaging provided by Bridon-Bekaert where the wrapping on the supply reel is already anchored to the cradle and provision for ventilation is provided.

Note 2: The packaging material can be supplied with reflective outer coating and/or insulation to aid temperature control.

Reels which have been supplied fully wrapped may suffer from a build up of condensation between the rope and the packaging material, which can result in corrosion and deterioration of the rope. In these situations it may be necessary to replace the packaging or to ventilate the packaging.

Wire ropes in storage should not be exposed to temperatures above 90°C

Note: Extended exposure to high ambient temperatures can result in a significant higher rope temperature. Hence, where possible to optimise the service life of the rope, ambient temperatures should be maintained below 50°C

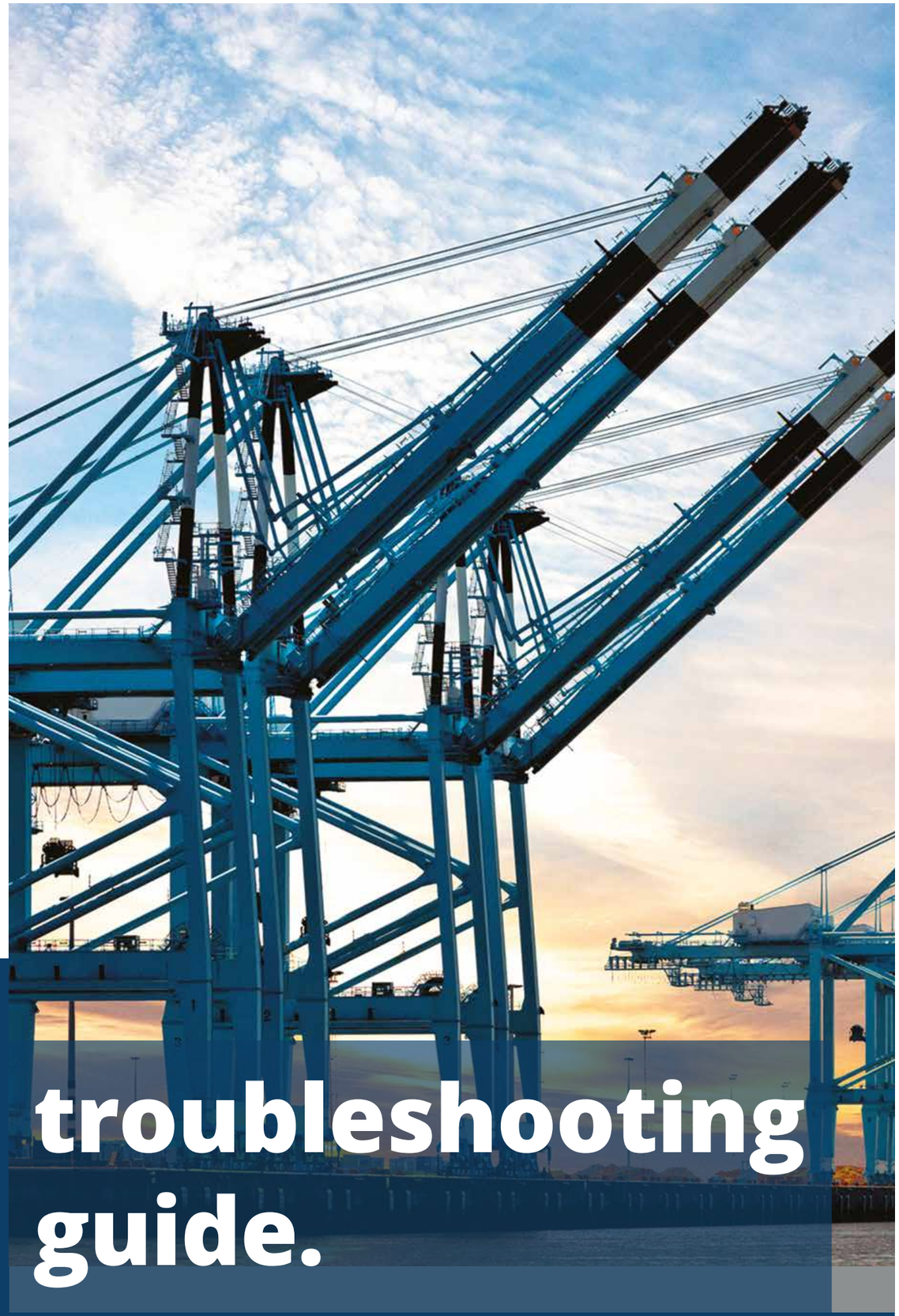
Make sure that the rope is protected in such a manner that it will not be exposed to any accidental damage either during storage or when placing the rope in, or taking the rope out of storage.

Wire ropes should be protected from windblown debris (sand, shot blast grit, etc) and stored away from welding activities.

Wire ropes in storage should routinely (ideally every six months) and prior to being taken into use/service be inspected by a competent person for signs of damage/ deterioration to either the rope or packaging. During the inspection, if signs of migration and/or deterioration of manufacturing lubricant are evident
a suitable rope dressing which is compatible with the manufacturing lubricant should be applied. Contact Bridon-Bekaert or the rope supplier and follow the original equipment manufacturers instruction manual for guidance on recommended products or types of rope dressings, methods of application and equipment necessary to apply the dressing. Please contact Bridon-Bekaert for further advice on limitations to the storage of wire ropes.

Note: It is good practice to remove rope from the store on a 'first in, first out' basis, to minimise the time held in storage.

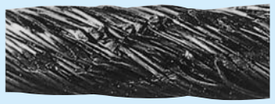
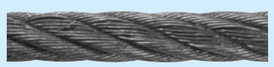
WARNING: Failure to apply the correct rope dressing can render the original manufacturing lubricant ineffective and reduce rope performance.

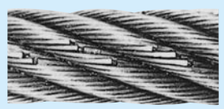
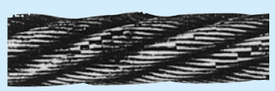


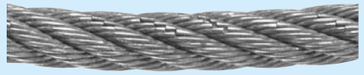
troubleshooting guide.

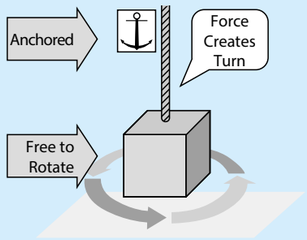
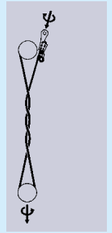
Troubleshooting Guide

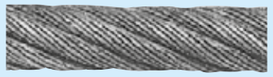
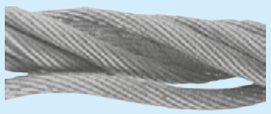
The following is a simplified guide to common wire rope problems. More detailed advice can be obtained from any Bridon-Bekaert distributor. In the event of no other standard being applicable, Bridon-Bekaert recommends that ropes are inspected/examined in accordance with ISO 4309.

PROBLEM	CAUSE/ACTION
Mechanical damage caused by the rope contacting the structure of the installation on which it is operating or an external structure - usually of a localised nature. 	• Generally results from operational conditions. • Check sheave guards and support/guide sheaves to ensure that the rope has not "jumped out" of the intended reeving system. • Review operating conditions.
Opening of strands in rotation resistant, low rotation and parallel closed ropes - in extreme circumstances the rope may develop a "birdcage distortion" or protrusion of inner strands. **Note - rotation resistant and low rotation ropes are designed with a specific strand gap which may be apparent on delivery in an off tension condition. These gaps will close under load and will have no effect on the operational performance of the rope.** 	• Check sheave and drum groove radii using sheave gauge to ensure that they are no smaller than nominal rope radius +5% - Bridon-Bekaert recommends that the sheave and drum groove radii are checked prior to any rope installation. • Repair or replace drum/sheaves if necessary. • Check fleet angles in the reeving system - a fleet angle in excess of 1.5 degrees may cause distortion. • Check installation method - turn induced during installation can cause excessive rope rotation resulting in distortion. • Check if the rope has been cut "on site " prior to installation or cut to remove a damaged portion from the end of the rope. If so, was the correct cutting procedure used? Incorrect cutting of rotation resistant, low rotation and parallel closed ropes can cause distortion in operation. • Rope may have experienced a shock load.
Broken wires or crushed or flattened rope on lower layers at crossover points in multi - layer coiling situations. **Wire breaks usually resulting from crushing or abrasion.** 	• Check tension on underlying layers. Bridon-Bekaert recommends an installation tension of between 2% and 10 % of the minimum breaking force of the wire rope. Care should be taken to ensure that tension is retained in service. Insufficient tension will result in these lower layers being more prone to crushing damage. • Review wire rope construction. Dyform wire ropes are more resistant to crushing on underlying layers than conventional rope constructions. • Do not use more rope than necessary. • Check drum diameter. Insufficient bending ratio increases tread pressure.

PROBLEM	CAUSE/ACTION
Wires looping from strands. 	• Insufficient service dressing. • Consider alternative rope construction. • If wires are looping out of the rope underneath a crossover point, there may be insufficient tension on the lower wraps on the drum. • Check for areas of rope crushing or distortion.
"Pigtail" or severe spiralling in rope. 	• Check that the sheave and drum diameter is large enough - Bridon-Bekaert recommends a minimum ratio of the drum/ sheave to nominal rope diameter of 18:1. • Indicates that the rope has run over a small radius or sharp edge. • Check to see if the rope has "jumped off" a sheave and has run over a shaft.
Two single axial lines of broken wires running along the length of the rope approximately 120 degrees apart indicating that the rope is being "nipped" in a tight sheave. 	• Check sheave and drum groove radii using sheave gauge to ensure that they are no smaller than nominal rope radius + 5% - Bridon-Bekaert would recommend that the sheave/drum groove radii are checked prior to any rope installation. • Repair or replace drum/sheaves if necessary.
One line of broken wires running along the length of the rope indicating insufficient support for the rope, generally caused by oversize sheave or drum grooving. 	• Check to see if the groove diameter is no greater than 15 % greater than the nominal rope diameter. • Repair or replace drum/sheaves if necessary. • Check for contact damage.
Short rope life resulting from evenly/randomly distributed bend fatigue wire breaks caused by bending through the reeving system. **Fatique induced wire breaks are characterised by flat ends on the broken wires.** 	• Bending fatigue is accelerated as the load increases and as the bending radius decreases (see G6). Consider whether either factor can be improved. • Check wire rope construction - Dyform ropes are capable of doubling the bending fatigue life of a conventional steel wire rope.

PROBLEM	CAUSE/ACTION
Short rope life resulting from localised bend fatigue wire breaks. **Fatique induced wire breaks are characterised by flat ends on the broken wires.** 	• Bending fatigue is accelerated as the load increases and as the bending radius decreases (see G6). Consider whether either factor can be improved. • Check wire rope construction - Dyform ropes are capable of doubling the bending fatigue life of a conventional steel wire rope. • Localised fatigue breaks indicate continuous repetitive bends over a short length. Consider whether it is economic to periodically shorten the rope in order to move the rope through the system and progressively expose fresh rope to the severe bending zone. In order to facilitate this procedure it may be necessary to begin operating with a slightly longer length of rope.
Broken rope - ropes are likely to break when subjected to substantial overload or misuse particularly when a rope has already been subjected to mechanical damage. **Corrosion of the rope both internally and/or externally can also result in a significant loss in metallic area. The rope strength is reduced to a level where it is unable to sustain the normal working load.** 	• Review operating conditions.
Wave or corkscrew deformations normally associated with multistrand ropes. 	• Check sheave and drum groove radii using sheave gauge to ensure that they are no smaller than nominal rope radius +5% - Bridon-Bekaert recommends that the sheave/drum groove radii are checked prior to any rope installation. • Repair or replace drum/sheaves if necessary. • Check fleet angles in the reeving system - a fleet angle in excess of 1.5 degrees may cause distortion (see C1.6 and C1.7). • Check that rope end has been secured in accordance with manufacturers instructions (see C4). • Check operating conditions for induced turn.

PROBLEM	CAUSE/ACTION
Rotation of the load in a single fall system. 	• Review rope selection. • Consider use of rotation resistant or low rotation rope.
Rotation of the load in a multi - fall system resulting in "cabling" of the rope falls. **Possibly due to induced turn during installation or operation.** 	• Review rope selection. • Consider use of rotation resistant or low rotation rope. • Review installation procedure (Section C) or operating procedures.
Core protrusion or broken core in single layer six or eight strand rope. 	• Caused by repetitive shock loading - review operating conditions.
Rope accumulating or "stacking" at drum flange - due to insufficient fleet angle. 	• Review drum design with original equipment manufacturer - consider adding rope kicker, fleeting sheave etc.

PROBLEM	CAUSE/ACTION
Sunken wraps of rope on the drum normally associated with insufficient support from lower layers of rope or grooving. 	• Check correct rope diameter. • If grooved drum check groove pitch. • Check tension on underlying layers - Bridon-Bekaert recommend an installation tension of between 2% and 10% of the minimum breaking force of the wire rope - Care should be taken to ensure that tension is retained in service. Insufficient tension will result in these lower layers being more prone to crushing damage. • Make sure that the correct rope length is being used. Too much rope (which may not be necessary) may aggravate the problem.
Short rope life induced by excessive wear and abrasion. 	• Check fleet angle to drum. • Check general alignment of sheaves in the reeving system. • Check that all sheaves are free to rotate. • Review rope selection. The smooth surface of Dyform wire ropes gives better contact with drum and sheaves and offers improved resistance to “interference” betweeen adjacent laps of rope.
External corrosion. 	• Consider selection of galvanised rope. • Review level and type of service dressing.
Internal corrosion. 	• Consider selection of galvanised rope. • Review frequency amount and type of service dressing. • Consider selection of plastic impregnated (PI) wire rope.

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