Wire Rope

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All the **Coordinated Wire Rope** companies supply the highest quality crane ropes made in the USA, Canada and Europe. We specialize in servicing the container cranes in the ports of Long Beach and Los Angeles. Our other emphasis is with Diepa Rope which is one of the oldest and most respected in Europe. We offer Crane ropes for all applications.

In order for a wire rope to be used safely in any application it must be inspected regularly in a proper manner. ASME standards such as B30.5 (mobile cranes) and B30.2 (overhead cranes) are two safety standards that provide detailed inspection procedures and retirement criteria. Both Standards specify that all running ropes should be visually inspected daily. The inspection should be more than just a quick look.

A quick look may not reveal all the evidence of damage or broken wires sufficient to require removal from service. The inspection must be done carefully and in enough light so that broken wires and damage can be observed. Special care should be taken when inspecting portions of the rope subjected to repetitive wear such as the following:

- ☐ **Step up and cross over points on the drum**
- ☐ **Repetitive pick up points**
- ☐ **Areas of the rope operating through a reverse bend in the reeving system**
- ☐ **Equalizer sheaves**

The inspection should be concerned with determining rope wear or damage which require the rope to be retired or replaced immediately. The inspection should be looking for the following:

- ☐ **Distortions such as kinking, crushing, unlaying, birdcaging, strand distortion or core protrusion**
- ☐ **Corrosion**
- ☐ **Broken or cut strands**
- ☐ **Number, type and distribution of broken wires**
- ☐ **Lubrication condition**

General Guidance on Rope Selection

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 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 fleet angle, 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 operators

Bridon 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 Rotation Resistant rope.

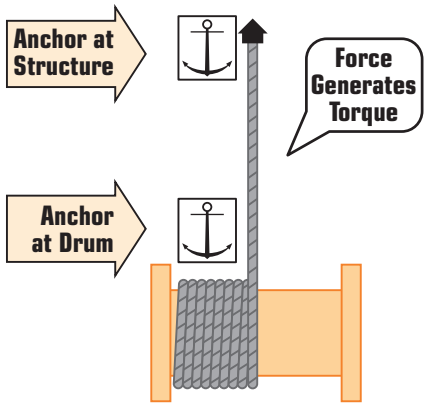
Six or eight strand rope constructions are usually selected unless load rotation on a single part system or "cabling" on a multi - part reeving system are likely to cause operational problems.

When loaded, steel wire ropes will generate:

- "Torque" if both ends are fixed.
- "Turn" if one end is unrestrained.

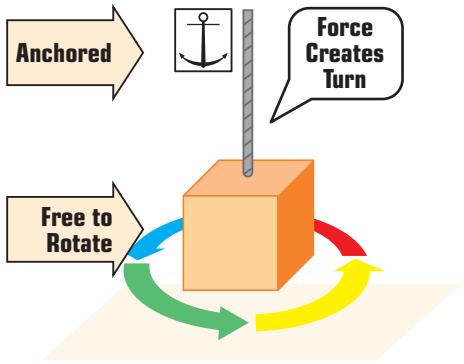
Torque

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



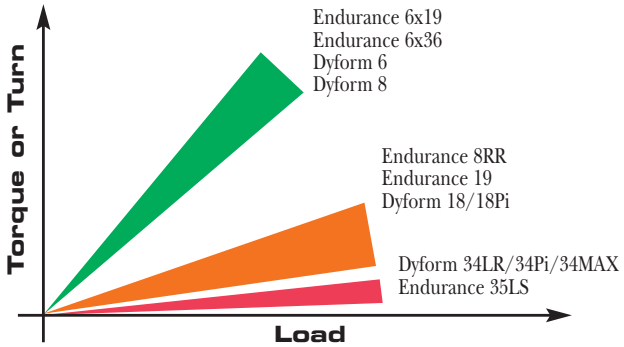
Turn

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 recognized 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 three basic types of stranded rope.



Standard 6X19 & 6X36 Classification

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Diameter		Approx mass IWRC		EIP min breaking force IWRC		EEIP min breaking force IWRC	
Inch	mm	Lb/ft	kg/ft	Tons	kN	Tons	kN
1/4		0.12	0.05	3.40	30.3		
	7	0.14	0.06	3.80	34.2	4.2	37.7
5/16		0.18	0.08	5.27	46.9		
	8	0.18	0.08	5.00	44.7	5.5	49.2
	9	0.23	0.11	6.40	56.5	7.0	62.3
3/8		0.26	0.11	7.55	67.2		
	10	0.29	0.13	7.80	69.8	8.3	76.9
	11	0.35	0.16	9.50	84.4	10.5	93.0
7/16		0.35	0.15	10.20	90.7	11.2	99.6
	12	0.41	0.19	11.40	101.0	12.4	110.7
1/2		0.46	0.20	13.30	118.4	14.6	129.9
	13	0.48	0.22	13.30	118.0	14.6	130.0
	14	0.56	0.25	15.40	137.0	17.0	151.0
9/16		0.58	0.26	16.80	149.5	18.5	164.7
5/8		0.72	0.32	20.60	183.3	22.7	202.0
	16	0.73	0.33	20.10	179.0	22.1	197.0
	18	0.93	0.42	25.40	226.0	28.0	249.0
	19	1.03	0.47	28.30	252.0	31.2	278.0
3/4		1.04	0.46	29.40	261.7	32.4	288.4
	20	1.15	0.52	31.40	279.0	34.6	308.0
	22	1.39	0.63	38.00	338.0	41.8	372.0
7/8		1.41	0.62	39.80	354.2	43.8	389.8
	24	1.65	0.75	45.20	402.0	49.8	443.0
1		1.85	0.82	51.70	460.1	56.9	506.4
	26	1.94	0.88	53.10	472.0	58.4	520.0
	28	2.24	1.02	61.05	547.0	67.8	603.0
1-1/8		2.34	1.03	65.00	578.5	71.5	636.4
1-1/4		2.89	1.28	79.90	711.1	87.9	782.3
	32	2.93	1.33	80.40	715.0	88.5	787.0
1-3/8		3.49	1.54	96.00	854.4	106.0	943.4
	36	3.71	1.68	101.60	904.0	112.1	997.0
1-1/2		4.16	1.84	114.0	1014.6	125.0	1112.5
	40	4.58	2.08	125.90	1120.0	138.3	1230.0
1-5/8		4.88	2.15	132.0	1174.8	146.0	1299.4
	44	5.54	2.51	151.7	1350.0	167.4	1489.0
1-3/4		5.66	2.50	153.0	1361.7	169.0	1504.1
1-7/8		6.49	2.86	174.0	1548.6	192.0	1708.8
	48	6.60	2.99	181.0	1610.0	199.2	1772.0
2		7.39	3.26	198.0	1762.2	217.0	1931.3

Endurance DYFORM® 18/18PI

- **High strength** Rotation Resistant rope incorporating Dyform strands - confirmed by Bridon's "Powercheck" testing of a sample from each production length.
- **Good resistance to rotation -** confirmed by Bridon's unique "Twistcheck" type testing program.
- **Superior bending fatigue life** when compared with conventional multistrand ropes - confirmed by laboratory testing and extensive field experience.
- **Excellent resistance to crushing and abrasion** resulting from the overall compactness and robustness of the rope and the Dyform strands - recommended when multi-layer spooling is involved.
- **Reduced elongation** results from increased steel content and the Dyform process.
- **Optional plastic coating of IWRC** to further extend fatigue life, improve structural stability and resistance to corrosion.

Table of sizes, mass and minimum breaking force - Endurance Dyform® 18/18PI

Diameter		Approx mass WSC		Min breaking force Rope grade Dyform	
in	mm	lb/ft	kg/ft	tons	kN
3/8		0.31	0.14	8.3	73.9
	10	0.34	0.15	9.5	84.3
	11	0.41	0.19	11.8	105.0
7/16		0.42	0.19	11.2	99.7
	12	0.49	0.22	13.6	121.0
1/2		0.55	0.24	14.6	129.9
	13	0.58	0.26	16.5	147.0
	14	0.67	0.30	18.8	167.0
9/16		0.70	0.31	19.2	170.9
5/8		0.86	0.38	22.7	202.0
	16	0.88	0.40	24.6	219.0
	18	1.11	0.50	31.2	278.0
	19	1.23	0.56	34.2	304.0
3/4		1.24	0.55	32.4	288.4
	20	1.37	0.62	37.7	335.0
	22	1.66	0.75	45.5	405.0
7/8		1.69	0.75	43.8	389.8
	24	1.97	0.89	54.2	482.0
1		2.21	0.98	57.5	511.6
	26	2.31	1.05	64.3	572.0
	28	2.68	1.22	74.4	662.0
1 1/8		2.79	1.23	71.5	636.4
1 1/4		3.45	1.52	87.9	782.3
	32	3.50	1.59	96.6	859.0
1 3/8		4.17	1.84	106.0	943.9
1 1/2		4.97	2.19	125.0	1112.5

NOTE: all sizes Powerchecked

Visit our website:
www.coordinatedcompanies.com

Endurance DYFORM® 6/6PI

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- **Strongest of all ropes** in the six strand product range - confirmed by Bridon's "Powercheck" testing of a sample from each production length.
- **Superior bending fatigue life** when compared with conventional six strand ropes - confirmed by laboratory testing and extensive field experience.
- **Excellent resistance to crushing and abrasion** resulting from the overall compactness and robustness of the rope and the Dyform strands - recommended when multi-layer spooling is involved.
- **Reduced elongation** results from increased steel content and the Dyform process.
- **Optional plastic coating of IWRC** to further extend fatigue life, improve structural stability and resistance to corrosion.

Table of sizes, mass and minimum breaking force - Endurance Dyform® 6/6PI

Diameter		Approx mass WSC		Min breaking force Rope grade Dyform	
in	mm	lb/ft	kg/ft	tons	kN
3/8		0.28	0.12	8.8	78.3
	10	0.32	0.14	9.6	85.3
	11	0.39	0.18	11.0	98.1
7/16		0.38	0.17	11.9	105.9
	12	0.44	0.20	12.8	114.0
1/2		0.50	0.22	15.3	136.2
	13	0.54	0.24	16.5	147.0
	14	0.63	0.29	19.0	169.0
9/16		0.63	0.28	19.3	171.8
5/8		0.78	0.35	22.7	202.0
	16	0.79	0.36	24.4	217.0
	18	1.03	0.47	30.9	275.0
	19	1.12	0.51	33.9	302.0
3/4		1.13	0.50	32.4	288.4
	20	1.22	0.55	37.4	333.0
	22	1.46	0.66	44.7	398.0
7/8		1.53	0.68	43.8	389.8
	24	1.79	0.81	54.7	487.0
1		2.00	0.88	57.5	511.8
	26	2.10	0.95	64.7	576.0
	28	2.41	1.09	74.7	665.0
1 1/8		2.54	1.12	71.5	636.4
1 1/4		3.13	1.38	87.9	782.3
	32	3.15	1.43	94.9	844.0
1 3/8		3.79	1.67	106.0	943.4
	36	3.98	1.80	119.1	1060.0
1 1/2		4.51	1.99	125.0	1112.5

NOTE: All sizes Powerchecked

Endurance DYFORM® 8/8PI

- **High breaking force -** confirmed by Bridon's "Powercheck" testing of a sample from each production length.
- **Superior bending fatigue life** when compared with other conventional eight strand ropes - confirmed by laboratory testing and extensive field experience.
- **Excellent resistance to crushing and abrasion** resulting from the overall compactness and robustness of the rope and the Dyform strands - recommended when multi-layer spooling is involved.
- **Reduced elongation** results from increased steel content and the Dyform process.
- **Optional plastic coating of IWRC** to further extend fatigue life, improve structural stability and resistance to corrosion.

Table of sizes, mass and minimum breaking force - Endurance Dyform® 8/8PI

Diameter		Approx mass WSC		Min breaking force Rope grade Dyform	
in	mm	lb/ft	kg/ft	tons	kN
3/8		0.32	0.14	9.7	86.3
	10	0.30	0.14	9.8	87.3
	11	0.38	0.17	11.8	105.0
7/16		0.40	0.18	12.4	110.4
	12	0.44	0.20	14.2	126.0
1/2		0.51	0.23	16.2	143.7
	13	0.52	0.23	16.5	147.0
	14	0.60	0.27	19.2	171.0
9/16		0.65	0.29	20.3	180.7
5/8		0.80	0.35	25.0	222.5
	16	0.78	0.35	25.2	224.0
	18	1.01	0.46	31.8	283.0
	19	1.12	0.51	35.5	316.0
3/4		1.16	0.51	36.0	320.4
	20	1.24	0.56	39.3	350.0
	22	1.49	0.68	47.7	424.0
7/8		1.58	0.70	48.3	429.4
	24	1.78	0.81	56.8	505.0
1		2.05	0.91	62.8	558.5
	26	2.12	0.96	66.5	592.0
	28	2.47	1.12	77.2	687.0
1 1/8		2.60	1.15	79.0	703.1
1 1/4		3.22	1.42	98.0	872.2
	32	3.26	1.48	100.8	897.0
1 3/8		3.90	1.72	117.0	1041.3
	36	4.07	1.85	127.9	1138.0
1 1/2		4.62	2.04	138.0	1228.2

NOTE: All sizes Powerchecked

Constructex®

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- Nine Strand rope made up of three different strand constructions. Each outside strand manufactured with a soft plastic center.
- **High strength** - confirmed by Bridon's "Powercheck" testing of a sample.
- **Excellent resistance to crushing and wear** resulting from the overall compactness and robustness of the rope.
- **Flexible construction** with good fatigue life in most applications.

Table of sizes, mass and minimum breaking force - Constructex®

Diameter	Approx mass		Minimum breaking force	
in	lb/ft	kg/ft	tons	kN
5/8	0.9	0.39	25.5	226.9
3/4	1.1	0.50	36.5	324.7
7/8	1.5	0.68	48.5	431.5
1	2.0	0.91	62.5	556.0
1 1/8	2.6	1.18	79.5	707.3
1 1/4	3.2	1.45	97.6	868.3
1 3/8	3.8	1.72	119	1058.7
1 1/2	4.6	2.09	139	1236.7
1 5/8	5.3	2.41	162	1441.3
1 3/4	6.2	2.81	185	1645.9

NOTE: All sizes Powerchecked

BRIDON Endurance

Visit our website:
www.coordinatedcompanies.com

Spezialdrahtseile/Special Wire Ropes

The Special Characteristics of DIEPA Special Wire Ropes

- Only high quality wires are used. The tolerances of these wires are more restricted than those allowed under the standards for wires. Additionally, our suppliers are required to supply wires with higher values in torsion and bending.
- For ropes with plastic inserts, only that plastic material, which offers the best mechanical and performance capabilities, the polyamide, is selected. And from within the polyamide family only the best performing is used, namely the Polyamide 12.
- Together with a well known petrochemical company, a special lubricant was developed. This is especially effective against corrosion over a long period of time. The inner parts of the ropes, “the ropes critical area”, are thoroughly bathed with this special lubricant during their individual stranding.
- Self designed and constructed stranding machines, closing machines, and aggregates provide for highest stranding precision. A very extensive number of modern machinery is available. Therefore, every rope in each of the offered diameters is manufactured with the highest quality, in the most appropriate machine.
- The different constructions of Diepa Special Wire Ropes are specially designed for specific applications. Our many decades of experience allow us to recommend the most appropriate rope.
- Because of their special construction and solid structure, Diepa Special Wire Ropes are less affected by higher rope strain from the ropes reeving system, the inappropriate handling of rope, the installing of the rope, or during applications under critical conditions.

→ **Long rope life + High rope’s safety throughout service life = Profitability**

Diepa Special Crane Ropes in Stock

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PRODUCT CODE	LAY	MINIMUM BREAKING GRADE	STRENGTH
D1200			
7mm	L/RHOL	1960N/mm	9306 pounds
9mm	RHOL	1960N/mm	15,399 pounds
10mm	RHOL	1960N/mm	19,018 pounds
1/2"	RHOL	1960N/mm	30,572 pounds
14mm	RHOL	1960N/mm	37,317 pounds
9/16"	RHOL	1960N/mm	38,890 pounds
5/8"	RHOL	1960N/mm	47,882 pounds
3/4"	RHOL	1960N/mm	69,013 pounds
7/8"	RHO	1960N/mm	93,966 pounds
1"	RHOL	1960N/mm	122,741 pounds
D1315CZ			
6mm	RHOL	1960N/mm	7441 pounds
8mm	RHLL	1960N/mm	13,218 pounds
8mm	RHLL (Gal)	2160N/mm	14,207 pounds
9mm	RHLL	1960N/mm	16,725 pounds
9mm	RHLL	2160N/mm	17,984 pounds
10mm	RHLL	1770N/mm	18,524 pounds
10mm	RHLL	2160N/mm	22,168 pounds
11mm	RHLL	1960N/mm	25,178 pounds
11mm	RHLL	2160N/mm	26,976 pounds
12mm	RHLL	2160N/mm	31,922 pounds
13mm	L/RHLL	2160N/mm	37,766 pounds
14mm	RHLL	2160N/mm	43,611 pounds
14mm	RHLL(Gal)	2160N/mm	43,611 pounds
16mm	RHLL	2160N/mm	57,549 pounds
17mm	RHLL	1960N/mm	60,022 pounds
18mm	RHLL	2160N/mm	72,610 pounds
19mm	L/RHLL(Gal)	2160N/mm	80,478 pounds
20mm	RHLL	1960N/mm	83,401 pounds
21mm	LHLL	1960N/mm	92,617 pounds
21mm	RHLL	2160N/mm	99,362 pounds
22mm	RHLL	2160N/mm	109,028 pounds
23mm	RHLL	2160N/mm	118,694 pounds
24mm	RHLL	2160N/mm	128,810 pounds
25mm	RHLL	2160N/mm	137,353 pounds
28mm	RHLL	2160N/mm	174,894 pounds
34mm	RHLL	2160N/mm	255,373 pounds
B65			
26mm	RHLL	2160N/mm	154,887 pounds

PRODUCT CODE	LAY	MINIMUM BREAKING GRADE	STRENGTH
S321			
6mm	L/RHOL	1960N/mm	6,564 pounds
7mm	L/RHOL	1960N/mm	8,925 pounds
8mm	L/RHOL	1960N/mm	9,824 pounds
9mm	L/RHOL	1960N/mm	14,229 pounds
11mm	L/RHOL	1960N/mm	21,603 pounds
PZ371			
1/4"	RHOL	1960N/mm	7,149 pounds
5/16"	RHOL	1960N/mm	12,500 pounds
3/8"	RHOL	1960N/mm	17,900 pounds
10mm	RHOL	1770N/mm	17,939 pounds
11mm	RHOL	1960N/mm	24,054 pounds
12mm	RHOL	1960N/mm	28,744 pounds
1/2"	RHOL	1960N/mm	32,000 pounds
9/16"	RHOL	1960N/mm	40,500 pounds
5/8"	RHOL	1960N/mm	50,000 pounds
3/4"	RHOL	1960N/mm	72,000 pounds
7/8"	RHOL	1960N/mm	98,100 pounds
1"	RHOL	1960N/mm	128,100 pounds
SKZ8			
6.5mm	RHOL(Gal-Plas)	2160N/mm	10,026 pounds
9mm	RHOL(Gal-Plas)	1960N/mm	17,422 pounds
10mm	RHOL / Plas	2160N/mm	23,829 pounds
11mm	RHOL	2160N/mm	28,744 pounds
12mm	RHOL	1960N/mm	30,573 pounds
13mm	RHOL	1960N/mm	35,743 pounds
14mm	RHOL	1960N/mm	42,038 pounds
16mm	RHOL	2160N/mm	60,696 pounds
18mm	RHOL	1960N/mm	69,913 pounds
19mm	RHOL	2160N/mm	84,750 pounds
20mm	RHOL	2160N/mm	94,641 pounds
22mm	RHOL	1960N/mm	105,431 pounds
24mm	RHOL	2160N/mm	136,229 pounds
25mm	RHOL	2160N/mm	146,794 pounds
28mm	RHOL	2160N/mm	184,786 pounds
SUPER 24			
3/4"	RHOL	2160N/mm	81,827 pounds
7/8"	RHOL	2160N/mm	111,286 pounds

Contact your Coordinated Companies representative and ask for the recommended Diepa crane rope for your particular needs. We have the right rope for virtually any application and would be happy to assist you in choosing a crane rope that will give you the most service for your money.

Typical Examples of Wire Rope Deterioration

1 Mechanical damage due to rope movement over sharp edge projection while under load.

2 Localized wear due to abrasion on supporting structure.

3 Narrow path of wear resulting in fatigue fractures, caused by working in a grossly oversize groove, or over small support rollers.

4 Two parallel paths of broken wires indicative of bending through an undersize groove in the sheave.

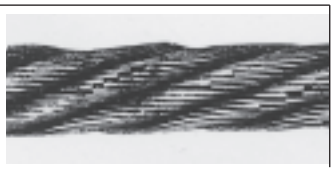
5 Severe wear, associated with high tread pressure.

6 Severe wear in Langs Lay, caused by abrasion.

7 Severe corrosion.

8 Internal corrosion while external surface shows little evidence of deterioration.

9 Typical wire fractures as a result of bend fatigue.



10 Wire fractures at the strand, or core interface, as distinct from 'crown' fractures.

11 Break up of IWRC resulting from high stress application.

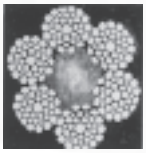
12 Looped wires as a result of torsional imbalance and/or shock loading.

13 Typical example of localized wear and deformation.

14 Multi strand rope 'bird caged' due to torsional imbalance.

15 Protrusion of rope center resulting from build up of turn.

16 Substantial wear and severe internal corrosion.



Troubleshooting Guide

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The following is a simplified guide to common wire rope problems. In the event of no other standard being applicable, it is recommended that ropes are inspected/examined in accordance with ASME B30.5.

Problem	Cause/Action
Mechanical damage caused by the rope contacting the structure of the crane on which it is operating or an external structure - usually of a localized 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 ropes - in extreme circumstances the rope may develop a "birdcage distortion" or protrusion of inner strands. **Note - Rotation Resistant 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 +2.5% - Bridon 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 (see page 95). • Check installation method - turn induced during installation can cause excessive rope rotation resulting in distortion (See pages 86 to 90). • 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 (See page 88 to 89). • 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 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.
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. • Possible fleet angle problems causing rope rotation.
"Pigtail" or severe spiralling in rope.	• Check that the sheave and drum diameter is large enough - Bridon 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.

Troubleshooting Guide (cont.)

Problem	Cause Action
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 + 2.5% - Bridon 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 characterized by flat ends on the broken wires.	• Bending fatigue is accelerated as the load increases and as the bending radius decreases (see page 74). 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.
Short rope life resulting from localized bend fatigue wire breaks. Fatique induced wire breaks are characterized by flat ends on the broken wires.	• Bending fatigue is accelerated as the load increases and as the bending radius decreases (see page 74). 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. • Localized 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 +2.5% - Bridon 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 page 76) • Check that rope end has been secured in accordance with manufacturers instructions (see page 88 & 89). • Check operating conditions for induced turn.
Rotation of the load in a single fall system.	• Review rope selection. • Consider use of Rotation Resistant 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 (see page 76 to 78 cabling calc.) • Consider use of Rotation Resistant rope. • Review installation procedure (see page 87 to 90) or operating procedures.

Troubleshooting Guide (cont.)

Problem	Cause Action
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.
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 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 galvanized rope. • Review level and type of service dressing.
Internal corrosion.	• Consider selection of galvanized rope. • Review frequency amount and type of service dressing. • Consider selection of plastic impregnated (PI) wire rope.

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Decimal & Metric Conversion Table

Fractional Equivalent (In)	Decimal Equivalent (In)	Metric Equivalent (mm)
1/64	.0156	.397
1/32	.0312	.794
3/64	.0469	1.191
1/16	.0625	1.588
5/64	.0781	1.984
3/32	.0938	2.381
7/64	.1094	2.778
1/8	.1250	3.175
9/64	.1406	3.572
5/32	.1562	3.969
11/64	.1719	4.366
3/16	.1875	4.762
13/64	.2031	5.159
7/32	.2188	5.556
15/64	.2344	5.953
1/4	.2500	6.350
17/64	.2656	6.747
9/32	.2812	7.144
19/64	.2969	7.541
21/64	.3281	8.334
11/32	.3438	8.731
23/64	.3594	9.128
3/8	.3750	9.525
25/64	.3906	9.922
13/32	.4062	10.319
27/64	.4219	10.716
7/16	.4375	11.112
29/64	.4531	11.509
15/32	.4688	11.906
31/64	.4844	12.303
1/2	.5000	12.700

Fractional Equivalent (In)	Decimal Equivalent (In)	Metric Equivalent (mm)
33/64	.5156	13.097
17/32	.5312	13.494
35/64	.5469	13.891
9/16	.5625	14.288
37/64	.5781	14.684
19/32	.5938	15.081
39/64	.6094	15.478
5/8	.6250	15.875
41/64	.6406	16.272
21/32	.6562	16.669
43/64	.6719	17.065
11/16	.6875	17.462
45/64	.7031	17.859
23/32	.7188	18.256
47/64	.7344	18.653
3/4	.7500	19.050
49/64	.7656	19.447
25/32	.7812	19.844
51/64	.7969	20.241
13/16	.8125	20.638
53/64	.8281	21.034
27/32	.8438	21.431
55/64	.8594	21.828
7/8	.8750	22.225
57/64	.8906	22.622
29/32	.9062	23.019
59/64	.9219	23.416
15/16	.9375	23.812
61/64	.9531	24.209
31/32	.9688	24.606
1	1.000	25.400