

**um** usha martin®



**CRANE  
ROPE**



# OUR WORLD

Usha Martin is one of the largest manufacturers of wire ropes in the world. Our journey of more than six decades has been focused on manufacturing excellence, product innovation, technology upgradation and customer satisfaction which resulted in establishing Usha Martin crane ropes as one of the preferred and trusted brands in the world.

Our manufacturing architecture includes latest generation of machineries starting from automatic pickling plant, state-of-the-art patenting furnaces and high speed straight-through wire drawing machines for producing high quality highest tensile wires that are required for manufacturing high performance crane ropes. Our quality management system has been certified as per ISO 9001: 2015 standard along with manufacturing assessment certification from ABS, API, SNI, DNV-GL and Lloyds.

Our crane ropes are extensively used in high-capacity cranes installed in renowned ports of the world and by world-class crane manufacturing companies in non-critical and critical applications. Our crane ropes are developed to perform smoothly in extreme temperatures as well as in challenging environmental conditions.

Our desire to excel and be at the top is manifested through our group dynamics having manufacturing bases in India, Thailand, Dubai & United Kingdom, distribution centres spread over all continents, Global Design Centre in Italy and service centres in India, Netherland, Scotland & Singapore. Our service module through the Customer Value Management (CVM) initiative has elevated us from a wire rope supplier to Lifting Solution Provider and enabled us to partner the growth process with our customers.

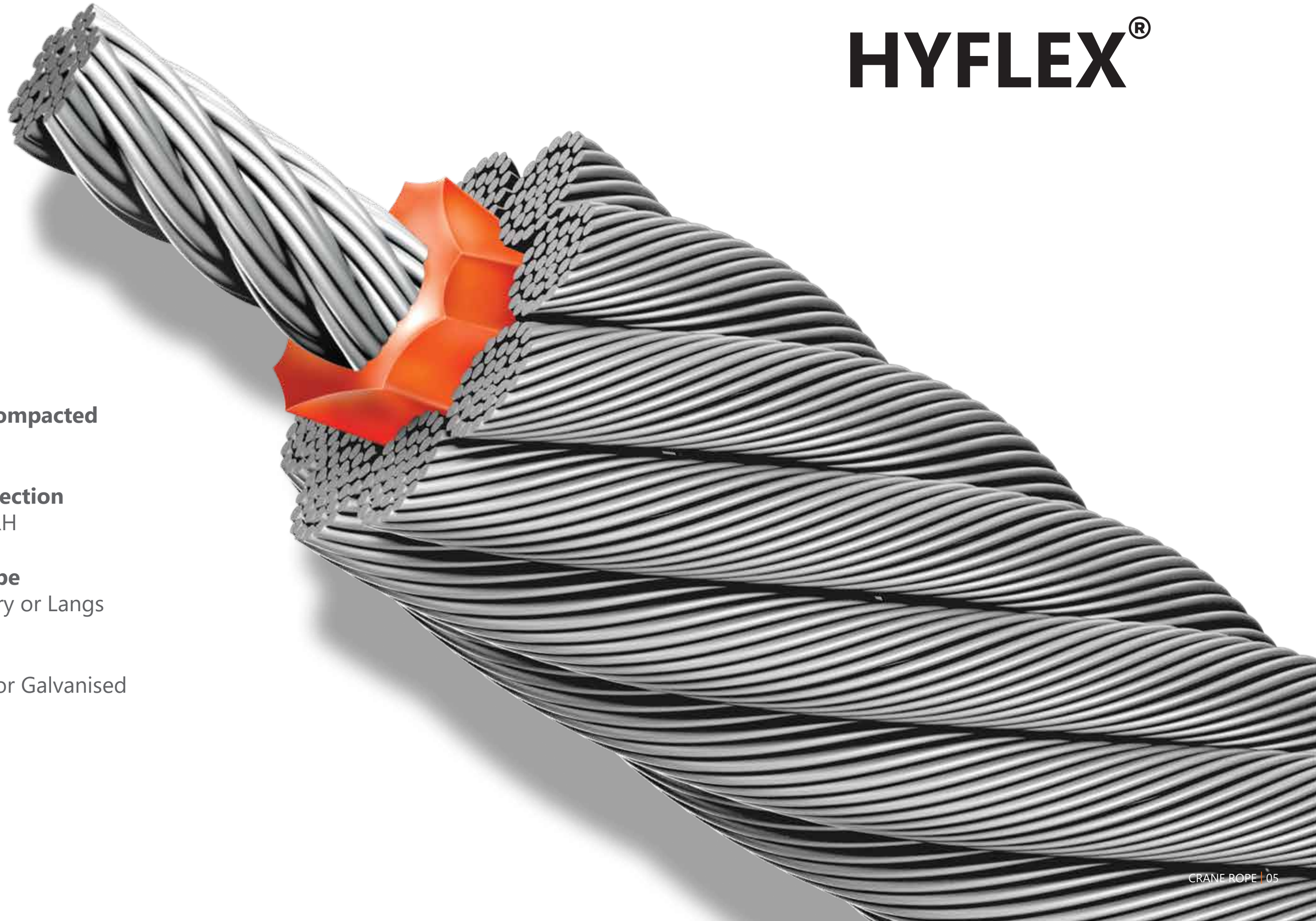
# GUIDE TO APPLICATION & ROPE SELECTION

	DOCK-SIDE / DECK CRANES / OFF-SHORE PEDESTAL			TOWER CRANES		MOBILE AND CRAWLER CRANES		CONTAINER CRANES / UNLOADERS			PILLING	LADLE CRANES	
TYPICAL APPLICATIONS													
	MAIN HOIST	BOOM HOIST	WHIP HOIST	MAIN HOIST	STAY	TROLLEY	MAIN HOIST	BOOM HOIST	MAIN HOIST	BOOM HOIST	TROLLEY/RACKING	HOIST	HOIST
<b>HYFLEX 6/6P POWERFORM 6/6P</b>	X	✓	X	X	✓	✓	X	✓	✓	✓	✓	!	✓
<b>HYFLEX 8/8P POWERFORM 8/8P</b>	!	✓	X	X	✓	✓	X	✓	✓	✓	✓	X	✓
<b>HYFLEX 4</b>	✓	X	X	X	X	X	✓	X	X	X	X	!	X
<b>HYFLEX 18/18P POWERFORM 18/18P</b>	✓	X	✓	✓	X	X	✓	X	X	X	X	✓	X
<b>HYFLEX 35/35P POWERFORM 35/35P</b>	✓	X	✓	✓	X	X	✓	X	X	X	X	✓	X

Key: ✓ Recommended    ! Allowed    X Not Recommended



# HYFLEX<sup>®</sup>

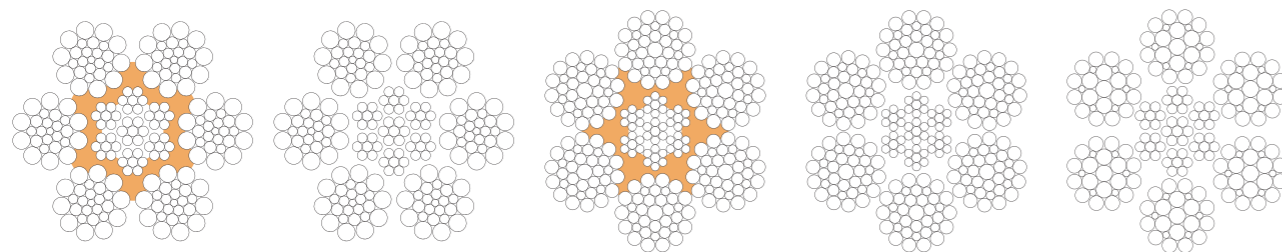


- **Non Compacted**
- **Lay direction**  
LH or RH
- **Lay Type**  
Ordinary or Langs
- **Finish**  
Bright or Galvanised

# HYFLEX® 6/6P

NOMINAL ROPE DIAMETER		Approx. Mass	MINIMUM BREAKING FORCE		
mm	in		1770 GRADE	1960 GRADE	2160 GRADE
mm	in	kg/100m	kN	kN	kN
8		27.3	43.3	47.9	52.8
9		34.6	54.8	60.6	66.8
10		42.7	67.6	74.9	82.5
11		51.7	81.8	90.6	100
12		61.5	97.4	108	119
	1/2	68.9	109	121	133
13		72.7	114	127	139
14		83.7	133	147	162
	5/8	108	171	190	209
16		110	174	192	212
17		124	197	218	240
18		139	220	244	269
19		155	246	272	300
20		172	272	301	332
22		208	329	365	402
	7/8	212	336	372	410
24	15/16	248	392	434	478
25		269	425	471	519
	1	277	438	485	535
26		291	460	509	561
28		337	533	591	651
	1-1/8	351	556	615	678
30		387	612	678	747
	1-1/4	433	686	760	837
32		440	697	771	850
36		557	876	970	1069
40		688	1082	1198	1320
44		832	1270	1406	1549
48	1-7/8	990	1511	1673	1844
52		1162	1773	1964	2164
56		1348	2056	2277	2510
60	2-3/8	1547	2361	2614	2881

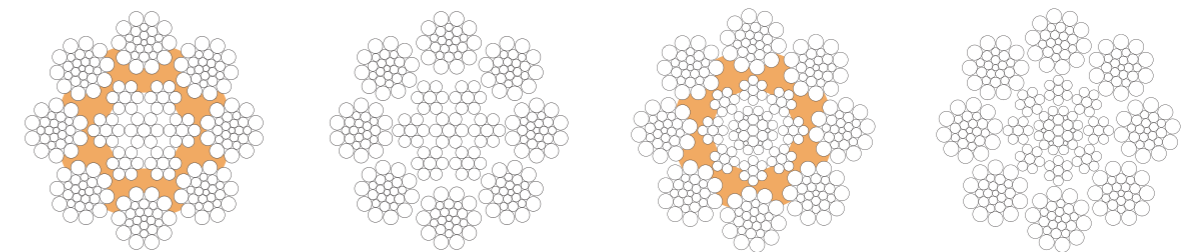
- Excellent shock resistance
- Enhanced resistance to fleet angle if plastic impregnated



# HYFLEX® 8/8P

NOMINAL ROPE DIAMETER		Approx. Mass	MINIMUM BREAKING FORCE	
mm	in		1960 GRADE	2160 GRADE
mm	in	kg/100m	kN	kN
10		43.5	72.9	81.4
11		52.6	86.1	96.5
12		62.6	105	117
	1/2	70.2	123	131
13		73.5	124	138
14		85.3	143	160
15		97.9	164	183
16	5/8	111	187	208
17		126	211	239
18		141	239	267
19	3/4	157	269	300
20		176	295	331
22		213	356	400
	7/8	217	360	402
24		253	423	475
	1	284	470	525
26		297	500	562
28		345	572	642
	1-1/8	359	596	665
30		396	656	733
32	1-1/4	451	747	836
34		509	843	945
36		570	935	1053
38	1-1/2	635	1043	1172
40		704t	1162	1313
42		785	1305	1462
44		862	1412	1577
	1-3/4	879	1441	1613
46		942	1543	1731
48		1025	1680	1885
50		1113	1833	2065
	2	1148	1882	2101
52		1203	1972	2202

- Enhanced resistance to fleet angle if plastic impregnated
- Greater surface contact area resulting from the eight strand construction



# HYFLEX® 35/35 P

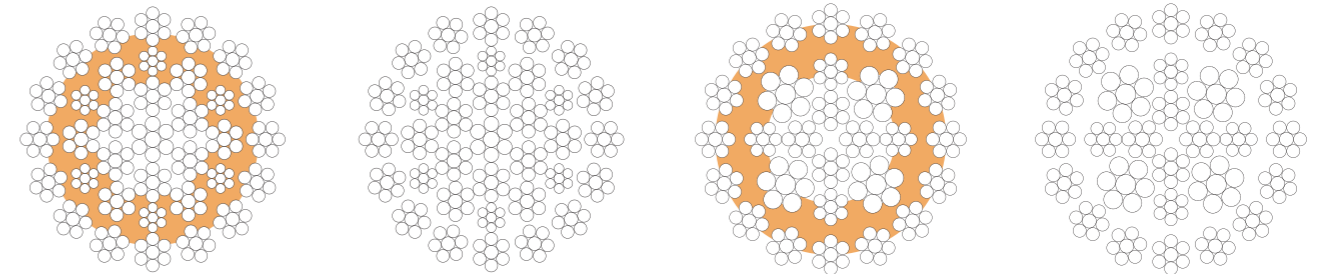
NOMINAL ROPE DIAMETER		Approx. Mass	MINIMUM BREAKING FORCE	
mm	in		1960 GRADE	2160 GRADE
10		44.8	76.0	86.5
11		54.2	91.0	104
12		64.5	107	125
	1/2	72.3	123	137
13		75.7	128	146
14		87.8	148	168
15		101	170	194
	5/8	113	190	218
16		115	194	221
17		129	219	247
18		145	242	277
19	3/4	163	277	312
20		179	301	337
21		198	335	370
22		217	370	412
	7/8	221	376	418

Table continued on next page

# HYFLEX® 35/35 P

NOMINAL ROPE DIAMETER		Approx. Mass	MINIMUM BREAKING FORCE	
mm	in		1960 GRADE	2160 GRADE
24		258	441	498
25		280	479	540
	1	289	491	546
26		303	517	581
28		351	599	681
	1-1/8	366	621	704
30		403	679	775
	1-1/4	452	761	786
32		459	769	865
35	1-3/8	547	945	1044
36		581	983	1085
38	1-1/2	650	1078	1205
40		717	1202	1335
42		790	1227	1352
44		867	1347	1484
	1-3/4	885	1375	1515
46		948	1472	1622
48		1032	1603	1766
50		1120	1740	1917
	2	1156	1796	1979
52		1211	1881	2072

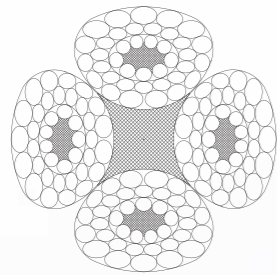
- Excellent non-rotational properties
- High flexibility and handling properties
- High resistance to side pressure and crushing



# HYFLEX® 4

NOMINAL ROPE DIAMETER	Approx. Mass	MINIMUM BREAKING FORCE	
		1770 GRADE	1960 GRADE
mm	kg/100m	kN	kN
16	109	160	177
18	138	203	225
20	170	250	277
22	206	303	335
24	245	360	399
25	266	391	433
26	287	423	468
28	333	490	543
30	383	564	624
32	435	641	710
33.5	477	703	778
34	491	723	801
35.5	536	788	873
36	551	811	898
38	614	904	1001

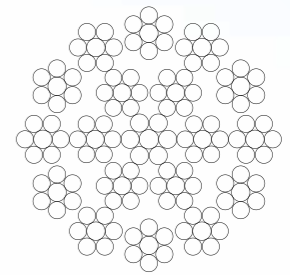
- Torque balanced rope



# HYFLEX® 18

NOMINAL ROPE DIAMETER		Approx. Mass	MINIMUM BREAKING FORCE	
mm	in		1960 GRADE	2160 GRADE
mm	in	kg/100m	kN	kN
6		15.7	25.0	27.0
7		21.3	34.0	37.0
8		27.8	45.0	49.0
9		35.2	57.0	61.0
10		43.5	70.0	76.0
11		52.6	84.0	91.0
12		62.6	101	109
	1/2	70.1	113	121
13		73.5	118	127
14		85.3	137	148
15		97.9	157	169
16	5/8	111	180	194
17		126	203	219
18		141	226	244
	3/4	158	253	273
20		174	279	301
22		211	339	366
	7/8	215	346	374

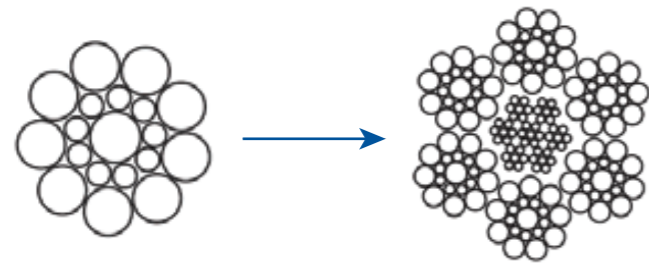
- Good resistance to rotation
- High flexibility and handling properties



# POWERFORM<sup>®</sup>

- **Compacted**
- **Lay direction**  
LH or RH
- **Lay Type**  
Ordinary or Langs
- **Finish**  
Bright or Galvanised

# POWERFORM® COMPACTED ROPE

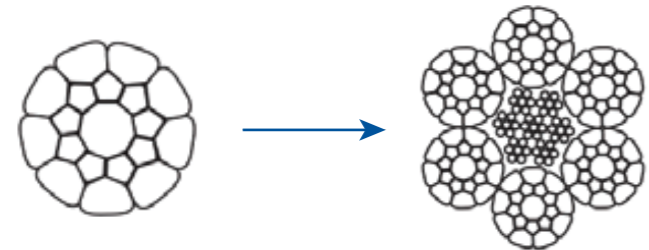


Conventional Strand

Conventional Rope

A Powerform® compacted rope is a steel wire rope which has been manufactured using individually compacted strands.

During the compaction process the outside diameter of the strand is reduced and steel moves into the empty voids between the wires within the strand.



Compacted Strand

Compacted Rope

The forming process also produces a very smooth exterior strand surface.



Conventional

Compacted

The compacted strand has very favourable internal contact conditions when compared with the point contact of round wires within a normal strand.



Conventional

Compacted

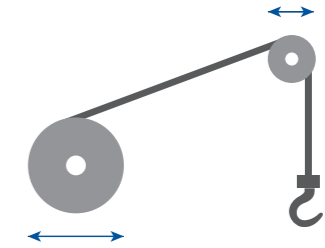
Exterior contact conditions are equally favourable. The smooth surface of the compacted rope offers a wider bearing surface to the sheave or drum groove.

Inter strand contact and contact between adjacent laps of rope on the winch drum is also improved.

# POWERFORM® SELECTION

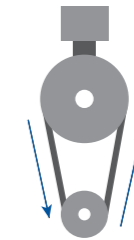
## Optimised crane design

The breaking load to size relationship can allow crane manufacturers to optimise the design of crane components such as the winch drum and sheaves whilst still complying with international crane design standards.



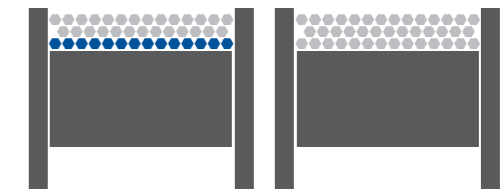
## Long life

Laboratory fatigue testing indicates that it is possible to achieve a significant increase in rope life when comparing a Powerform® rope with a conventional rope of equivalent construction.



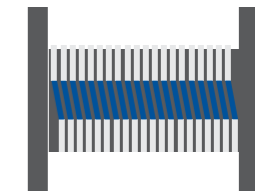
## Greater resistance to crushing in multi-layer coiling situations

Powerform® ropes are recommended for all multi-layer coiling situations where crushing on lower layers is inevitable. The more solid cross section of the Powerform® rope offers much greater resistance to this type of damage.



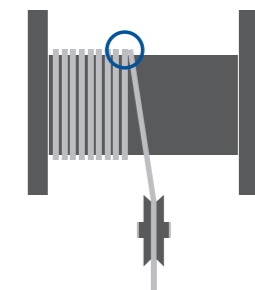
## More effective resistance to crushing at crossover points

Because of the higher steel fill factor Powerform® ropes offer much better resistance to crushing damage at crossover points on the winch drum.



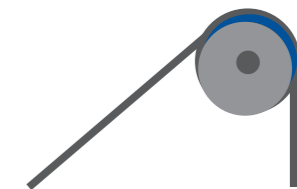
## Greater resistance to "side crushing" at the drum

Abrasive wear between adjacent laps of rope which is normally most severe where the rope moves on and off the drum can be minimised by using a Powerform® rope.



## Reduced wear on sheaves

The smooth exterior of the Powerform® rope can lead to reduced abrasive wear on both the sheave and rope.



# POWERFORM® 6/6P

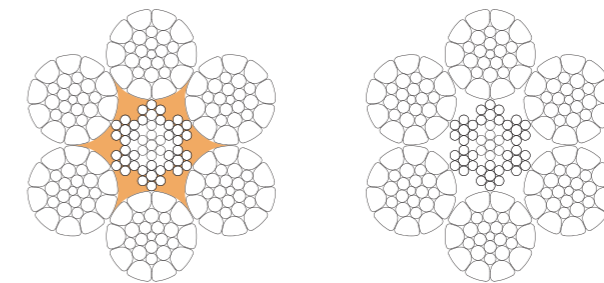
NOMINAL ROPE DIAMETER		Approx. Mass	MINIMUM BREAKING FORCE		
mm	in		1770 GRADE	1960 GRADE	2160 GRADE
10		46.0	75.4	83.5	92.0
11		55.7	91.0	101	111
12		66.2	108	120	132
	1/2	74.2	121	134	148
13		77.7	127	141	155
14		90.2	148	163	180
15		104	170	188	207
	5/8	116	190	211	232
16		118	193	214	236
17		133	218	241	266
18		149	244	270	298
19	3/4	166	272	301	332
20		184	302	334	368
22		223	365	404	445
	7/8	227	372	412	454
24		265	434	481	530
25		288	471	522	575
	1	297	487	539	594

Table continued on next page

# POWERFORM® 6/6P

NOMINAL ROPE DIAMETER		Approx. Mass	MINIMUM BREAKING FORCE		
mm	in		1770 GRADE	1960 GRADE	2160 GRADE
26		311	510	564	622
28		361	591	654	721
	1-1/8	376	615	681	751
30		414	679	751	828
	1-1/4	454	760	841	927
32		461	764	846	932
34		520	860	953	1050
35	1-3/8	549	910	1007	1110
36		583	967	1071	1180
38	1-1/2	650	1073	1189	1310
40		720	1196	1325	1460
42		794	1319	1461	1610
44		871	1442	1597	1760
	1-3/4	889	1475	1633	1800
46		952	1582	1751	1930
48	1-7/8	1040	1721	1906	2100
50		1130	1868	2069	2280
	2	1160	1926	2132	2350
52		1220	2016	2232	2460
54	2-1/8	1310	2172	2405	2650
56		1410	2335	2586	2850
58		1510	2508	2777	3060
60	2-3/8	1640	2712	3004	3310

- Improved MBF
- Excellent shock resistance
- Good resistance to side pressure and crushing
- Enhanced resistance to fleet angle if plastic impregnated



# POWERFORM® 8/8P

NOMINAL ROPE DIAMETER		Approx. Mass	MINIMUM BREAKING FORCE	
mm	in		1960 GRADE	2160 GRADE
10		46.0	87.8	94.0
11		55.7	106	114
12		66.2	126	135
	1/2	74.2	142	152
13		77.7	148	159
14		90.2	172	184
15		104	198	211
16	5/8	118	225	241
17		133	254	272
18		149	284	304
19	3/4	166	317	339
20		184	351	376
22		223	425	455
	7/8	227	434	464
24		265	506	541
	1	297	567	606

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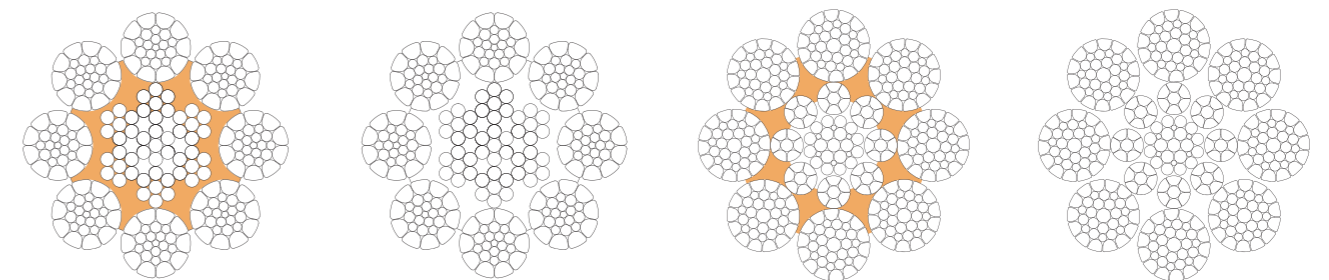


# POWERFORM® 8/8P

NOMINAL ROPE DIAMETER		Approx. Mass	MINIMUM BREAKING FORCE	
mm	in		1960 GRADE	2160 GRADE
26		311	594	635
28		361	688	737
	1-1/8	376	717	767
30		414	790	846
32	1-1/4	471	899	960
34		532	1013	1083
36		596	1138	1218
38	1-1/2	664	1268	1357
40		736	1405	1503
42		811	1535	1651
44		891	1700	1819
	1-3/4	909	1735	1856
46		973	1858	1985
48		1060	2023	2162
50		1150	2200	2349
	2	1187	2266	2425
52		1244	2374	2541

Note: Rope wt. mentioned above is correspondence to the 1960 grade.  
For 2160 grade, Rope wt. will be approx. 5% higher.

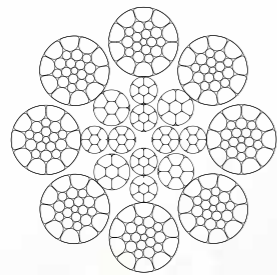
- High MBF
- Enhanced resistance to fleet angle if plastic impregnated
- Smoother contact surface in respect to conventional hoist rope



# POWERFORM<sup>®</sup> 8 Max

NOMINAL ROPE DIAMETER		Approx. Mass kg/100m	MINIMUM BREAKING FORCE	
mm	in		2160 kN	
10		49.0	102	
11		59.3	123	
12		70.6	147	
	1/2	79.0	165	
13		82.8	172	
14		96.0	200	
15		110	230	
	5/8	123	257	
16		125	261	
17		142	295	
18		159	331	
19	3/4	177	368	
20		196	408	
22		237	494	
	7/8	242	504	
24		282	588	
25		306	638	
	1	316	658	
26		331	690	
28		384	800	
	1-1/8	400	833	
30		441	918	
	1-1/2	494	1030	

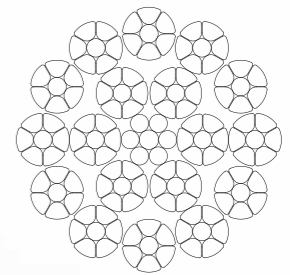
- Extremely high MBF
- High resistance to side pressure and crushing



# POWERFORM<sup>®</sup> 18

NOMINAL ROPE DIAMETER		Approx. Mass kg/100m	MINIMUM BREAKING FORCE	
mm	in		1960 kN	2160 kN
6		17.5	29.4	
7		23.8	38.0	
8		31.0	51.8	
9		39.3	64.6	
10		48.5	80.8	
11		58.7	101	111
12		69.8	116	127
	1/2	78.2	135	148
13		82.0	141	155
14		95.1	160	177
15		109	182	201
16	5/8	124	209	232
17		140	237	262
18		157	266	295
	3/4	175	291	322
20		194	320	359
22		235	379	424
24		279	462	523
	1	313	517	585
26		328	542	613
28		380	632	710
30		437	721	809
32	1-1/4	497	820	920

- Good rotational stability
- Good resistance to side pressure and crushing



# POWERFORM® 35/35 P

NOMINAL ROPE DIAMETER		Approx. Mass	MINIMUM BREAKING FORCE	
mm	in		1960 GRADE	2160 GRADE
10		49.0	91.0	100
11		59.3	111	121
12		70.6	131	144
	1/2	79.0	148	161
13		82.8	155	169
14		96.0	180	196
15		110	207	225
	5/8	123	234	252
16		125	238	256
17		142	269	289
18		159	301	324
19	3/4	181	336	361
20		200	372	400
22		242	450	484
	7/8	247	459	494

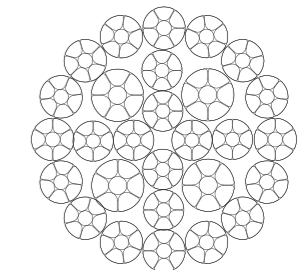
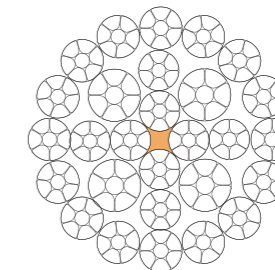
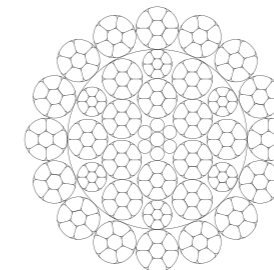
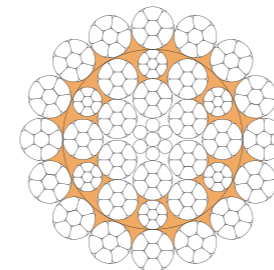
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# POWERFORM® 35/35 P

NOMINAL ROPE DIAMETER		Approx. Mass	MINIMUM BREAKING FORCE	
mm	in		1960 GRADE	2160 GRADE
24		288	536	576
25		313	581	625
	1	323	600	645
26		338	629	676
28		392	729	788
	1-1/8	408	759	817
30		450	837	904
	1-1/4	504	937	1010
32		512	952	1040
34		578	1080	1160
35	1-3/8	610	1130	1220
36		648	1210	1300
38		722	1340	1440
	1-1/2	800	1490	1600
40		800	1490	1600
42		882	1643	
44		968	1803	
	1-3/4	990	1840	
46		1058	1971	
48		1152	2146	
50		1250	2328	
	2	1290	2403	
52		1352	2518	
60		1800	3353	
64		2048	3814	
66		2178	4057	

- Extremely high MBF
- Excellent non-rotational properties
- High fatigue life and increased abrasion
- Enhanced resistance to fleet angle if plastic impregnated



## STORAGE & PRE-INSTALLATION PROCEDURE

Crane ropes, like any machine or spares, deteriorate during storage as well as in service. Therefore, the assurance of safety and economy in use of the equipment, dictates the requirement for a procedure of proper storage, handling and installation of crane ropes.

### STORAGE

- Store rope in a clean, dry, well ventilated, dust free undercover location.
- Cover the rope with water proof material and/or canopy, if not stored inside.
- Storage should be free from steam, chemical fumes or any other corrosive agent.
- Avoid direct contact of rope with floor.
- Place reels, preferably over a frame or cradle and allow flow of air under the reel.
- Avoid rope exposure to elevated temperatures.
- Avoid handling damages to wire ropes.
- Ensure that tag/markings is intact and follow 'first in, first out' principle.
- Inspect rope periodically and apply suitable rope dressing compatible with manufactured lubricant, whenever necessary.
- Rotate reel periodically, say after every 3 months, particularly in warm environment.

### BEFORE INSTALLATION

- Before re-equipping the appliance, all grooves in drums and pulleys should be checked to ensure that they will correctly accept the replacement rope.
- Sheave groove diameter should be larger than the nominal rope diameter by about 5% to 10% and ideally at least 2.5% greater than the actual diameter of the new rope.
- The diameter of the new rope shall be measured with the rope under no tension and the value recorded. Maintain fleet angle at minimum during installation
- Prior to rope cutting, always follow proper procedure of rope seizing
- Never pull the rope from stationary coil or reel
- Avoid contact with ground while unwinding the rope
- Keep the reel on a suitable stand with braking arrangement
- Avoid formation of kink/ bends in the rope during handling
- Follow 'top to top' or 'bottom to bottom' practice for rope transfer from reel to drum / winch.

### RUNNING IN PROCEDURE

- Run the newly installed wire rope in and out six times over its maximum working length with a load approx. 25% of safe working load at reduce speed.
- Repeat this procedure with load at 50% of safe working load.
- Continue the same procedure with load at 100% of safe working load.

### SEIZING PROCEDURE

The purpose of seizing a rotation resistant wire rope is to prevent relative movement of individual strands of inner core as well as outer layer and thereby preserving its designed integrity and rotational balance. Therefore, before cutting any rotation resistant wire rope, tightly double seize with soft steel wire of suitable size, on either side of the intended cut. The length of each seizing should be at least equal to  $2 \times D_{\text{rope dia.}}$  and each of the seizing should be spaced approximately  $6 \times D_{\text{rope dia.}}$

- Use of adhesive tape in lieu of seizing is strictly discouraged.
- Fusing of cut ends is strongly recommended.

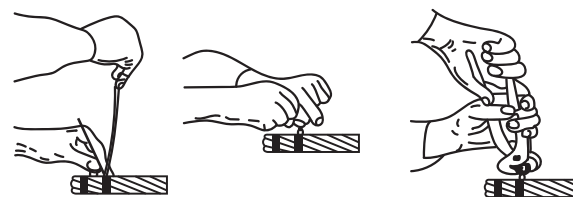
Powerform 18/Hyflex 18 | Powerform 35/Hyflex 35

For 6.0 mm to 24.0 mm wire rope, use 1.0 mm wire

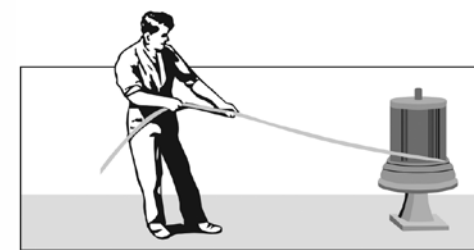
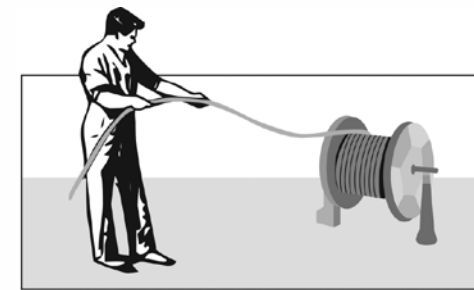
For 25.0 mm to 36.0 mm wire rope, use 1.6 mm wire

For 37.0 mm to 56.0 mm wire rope, use 2.0 mm wire

Double seizing and end fusing mandatory



## HANDLING & INSTALLATION



### 6/8 STRANDED ROPE

- Never pull out rope from stationary coil.
- Place rope reel on ground and roll out straight.
- If heavy, place coil on turntable and pull the end away from coil.
- Prevent contamination with dust, grit, moisture, chemicals and other harmful material.
- Put a shaft of adequate strength through reel bore and place in a suitable stand.
- Allow reel to rotate freely and be braked to avoid overrun.
- Provide back tension for multilayer spooling and ensure to wind tightly, particularly the bottom layer.
- Maintain constant tension while reeving and avoid layer cross-over.
- Avoid formation of loops or kinks.
- Avoid reverse bending during reeving. Wind/Unwind 'top to top' or 'bottom to bottom'.
- Take special care while releasing the outboard end of rope from supplied reel or coil.
- Maintain fleet angle at minimum during installation.
- Check that the grooves of all sheaves are as recommended and sheaves are free to rotate.
- Check the diameter and pitch of drum grooves, and ensure that these are as recommended.
- 'Run' the new rope by running the equipment slowly, with a low load for a number of cycles.
- Inspect that the rope spools correctly on the drum and no slackness or cross-over occurs.

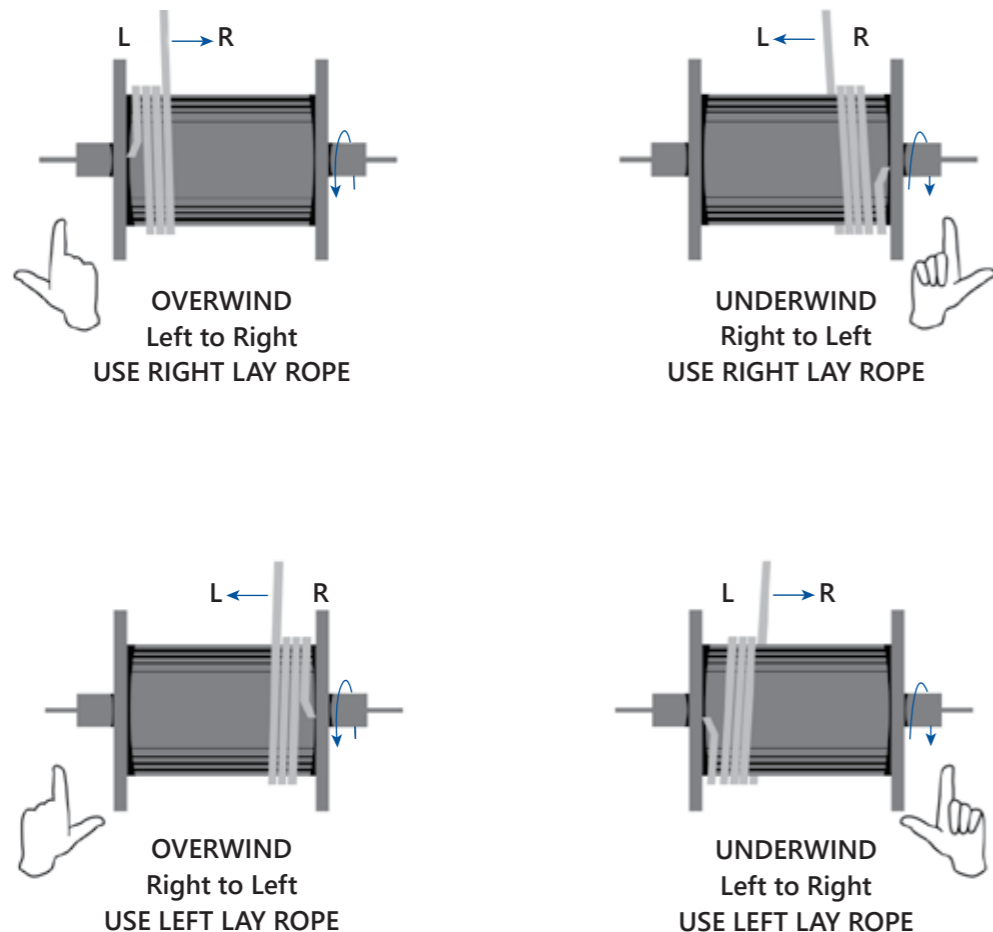
Note: The user should always refer relevant standard/regulations like EN-12385, ISO 4309 for wire rope care, maintenance & installation.

# HANDLING & INSTALLATION

## HANDLING OF MULTI-STRAND ROTATION RESISTANT ROPES:

Since rotation resistance wire ropes have special layering and arrangements of strands that are very sensitive, therefore they require careful handling and installation in order to avoid deterioration, hoisting problems and pre-mature removal of wire ropes. The recommendations are given below to be followed in addition to the general mentioned method.

- The rope should be paid off in the correct manner to ensure that the turn is neither put in nor taken out.
- A small rope of short length, say up to 100 mtr, may be unrolled along the ground but should always be kept under control. Never pull a rope from a stationary coil.
- Ropes in larger sizes or longer lengths should always be procured on reels, and transferring these to coils should be avoided.
- A long length of rope on a reel has a high moment of inertia. Proper braking arrangements must be made to prevent overrun, which may lead to loop formation. A simple braking mechanism consists of a wooden plank acting against the reel flange.
- If, for any reason a loop does form, ensure that this does not tighten to cause a kink, which may lead to distortion of the rope, requiring its immediate discard.
- The rope should be smoothly paid out in a straight line from the reel, mounted on a stand and supported by a shaft. If the space available does not permit the same, the reel and stand must be placed to limit the fleet angle of installation to 1° 30, i.e., for 1 mtr width between flanges to 40 mtr of horizontal distance. If space allows for a longer run, then it can be used with advantage.
- Care should be taken to avoid the reel being placed in such a position that will set up a reverse bend during reeving, i.e., for an under-winding drum, the rope should be taken off the bottom of the reel.
- Multi-strand ropes are generally supplied with fixed ends, unless otherwise specified. If, for any reason, it is necessary to cut a rope at the site, at least three tight servings of soft seizing wire should be applied on either side before cutting.



# DISCARD CRITERIA

Crane ropes must be removed from service if the examination reveals that the rope deterioration has exceeded limits of certain criteria. A general retirement plan states that one of the factors listed below, severe enough, can cause rope discard. However, rope deterioration and decision to discard, almost always, is the result of cumulative effect of combination of these factors.

Broken Wires | Diameter Reduction | Corrosion | Deformation

## NUMBER & CHARACTERISTICS OF BROKEN WIRES

Crane rope must be considered for discard if number of visible broken wires equals or exceeds the allowable limit. For 6 and 8 strand wire ropes, occurrence of wire breakages, to a large extent is on the outer surface, whereas for rotation-resistant wire ropes, majority of wire breakages are expected to occur internally and require specialized examination techniques to reveal.

The table below specifies the number of visible broken wires, which when equalled or exceeded requires mandatory discard of ropes working on steel sheaves.



- Wire breaks in the strand valley, generally, indicate internal rope deterioration and require closer inspection of the rope equal to 6 x d.
- Broken wires at, or adjacent to the termination, require the termination to be remade by shortening the rope, otherwise the rope should be discarded.
- Concentrated close group of broken wires in a rope length of 6 x d or in any one strand, requires discard of the rope even if the number given above are not reached.
- Complete fracture of one strand or collapse of core requires immediate discard of the wire rope.

Product	Construction	Section of rope working in steel sheaves and / or spooling on a single layer drum				Section of rope spooling on a multi-layer drum			
		No. of visible broken wires in wire rope length equals				No. of visible broken wires in wire rope length equals			
		(Ordinary lay)		(Langs lay)		(Ordinary lay)		(Langs lay)	
		6 x d	30 x d	6 x d	30 x d	6 x d	30 x d	6 x d	30 x d
HYFLEX 4	4X39	2	4	2	4	4	8	4	8
	6X25F	5	10	2	5	10	20	10	20
HYFLEX 6/ POWERFORM 6	6X29F	6	11	3	6	12	22	12	22
	6X26WS	6	13	3	6	12	26	12	26
	6X31WS	8	16	4	8	16	32	16	32
	6X36WS	9	18	4	9	18	36	18	36
	6X41WS	10	21	5	10	20	42	20	42
HYFLEX 8/ POWERFORM 8	8X25F	6	13	3	6	12	26	12	26
	8X26WS	9	18	4	9	18	36	18	36
	8X31WS	10	21	5	10	20	42	20	42
	8X36WS	12	24	6	12	24	48	24	48
	8X41WS	13	26	6	13	26	52	26	52
HYFLEX 18/ POWERFORM 18	18X7	2	4	2	4	4	8	4	8
	18X19S	4	8	4	8	8	16	8	16
	18X26WS	6	12	6	12	12	24	12	24
HYFLEX 35/ POWERFORM 35	35X7	3	5	3	5	5	10	5	10
	35X19S	6	12	6	12	12	24	12	24
	35X26WS	6	12	6	12	12	24	12	24

# RECOMMENDED DO'S & DON'TS

## DO'S

- Lubricate ropes with good quality acid free and moisture free lubricant
- Regularly inspect the sheaves, rollers or pulleys - the life of a rope largely depends on their conditions
- Inspect ropes and fittings/terminations periodically

## DON'TS

- Do not allow ropes in store to deteriorate
- Do not mishandle ropes when uncoiling or unreeling & allow kinks to form
- Do not use lang's lay with swivel for 6/8 standard rope
- Do not use a rope with too large groove diameter on drums and pulleys
- Do not cut a rope without seizing
- Do not load the rope beyond its safe working load. Reduction of safety factor may jeopardise not only rope, but also equipment, job and men

METRIC – IMPERIAL DIAMETER CONVERSION

in.	mm.	in.	mm.	in.	mm.	in.	mm.	in.	mm.	in.	mm.
5/32	3.97	1/2	12.7	15/16	23.8	11/2	38.1	21/2	63.5	41/4	108.0
3/16	4.76	9/16	14.3	1	25.4	15/16	41.3	23/4	69.9	41/2	114.3
7/32	5.56	5/8	15.9	11/16	27.0	13/4	44.5	3	76.2	43/4	120.7
1/4	6.35	11/16	17.5	11/8	28.6	17/8	47.6	31/4	82.6	5	127.0
5/16	7.94	3/4	19.0	13/16	30.2	2	50.8	31/2	88.9		
3/8	9.53	13/16	20.6	11/4	31.8	21/8	54.0	33/4	95.3		
7/16	11.1	7/8	22.2	13/8	34.9	21/4	57.2	4	101.6		

CONVERSION TABLE

Length	1m	= 1000 mm	= 3.281ft	= 39.37 inch
Force	1kN	= 101.97kp	= 0.10197 t metric-f	= 224lbs-f
Tensile Strength	1N/mm <sup>2</sup>	= 0.10197 kp/mm <sup>2</sup>	= 145.04 p.s.i.	= 10 bar
Cross Section	1 mm <sup>2</sup>	= 0.00155 sq.inch		
Weight	1 metric t	= 1000 kg = 1.102 short t	= 0.9842 long t	= 2204.6 lbs
Weight per Length Unit	1 kg/m	= 0.672 lbs/ft		



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