

**GR8**  
**INDUSTRIES**



steel wire rope for  
lifting machines



labour

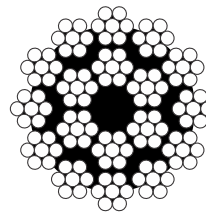
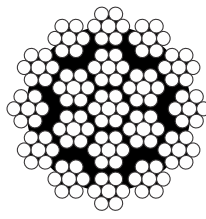
Department:  
Labour  
REPUBLIC OF SOUTH AFRICA

# 19x7+IWRC

# 18x7+FC

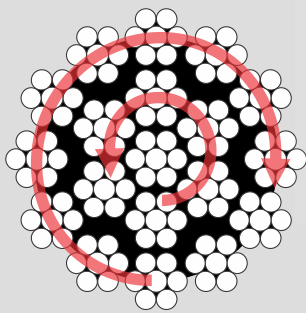
made to EN12835 specifications

lay-up of wires 1-6

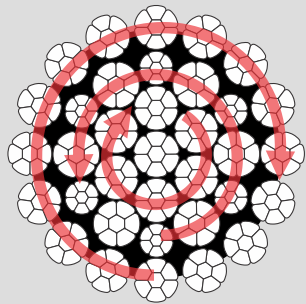


SWR dia [mm]	19x7+IWRC			
	Weight [kg/m]	Minimum breaking load		
		1770 N/mm <sup>2</sup> [kN]	1960 N/mm <sup>2</sup> [kN]	2160 N/mm <sup>2</sup> [kN]
6	0.14	20.9	23.1	24.3
7	0.20	28.4	31.5	33.1
8	0.26	37.2	41.1	43.2
9	0.32	47.0	52.1	54.7
10	0.40	58.1	64.3	67.6
11	0.49	70.2	77.8	81.8
12	0.58	83.6	92.6	97.3
13	0.68	98.1	108.6	114.2
14	0.79	113.8	126.0	132.4
16	1.03	148.6	164.6	173.0
18	1.30	188.1	208.3	218.9
20	1.60	232.2	257.2	270.3
22	1.94	281.1	311.2	327.0
24	2.31	334.4	370.3	389.2
26	2.71	392.5	434.6	456.8
28	3.14	455.2	504.0	529.7

18x7+FC		
Weight [kg/m]	Minimum breaking load	
	1770 N/mm <sup>2</sup> [kN]	1960 N/mm <sup>2</sup> [kN]
0.14	20.9	-
0.19	28.4	-
0.25	37.2	-
0.32	47.0	-
0.40	58.1	64.3
0.49	70.2	77.8
0.57	83.6	92.6
0.67	98.1	109.0
0.79	114.0	126.0
1.01	148.6	165.0
1.26	188.0	208.0
1.58	232.0	257.0
1.849	281.0	311.0
2.200	334.0	370.0
2.582	392.0	435.0
2.995	455.0	504.0



2-layer  
Rotation Resistant  
19x7



3-layer  
Rotation Resistant  
35x7

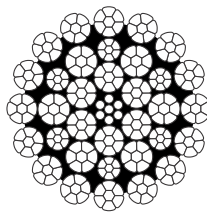
## Rotation resistant wire rope

In a conventional rope, an external load creates a force which tries to untwist the rope. A rotation resistant rope has a steel core which is an independent rope, closed in the opposite direction to the outer strands. Under load, the core twists the rope in one direction while the outer strands try to twist in the opposite direction. The core and the outer strands compensate each other so that practically no rope twist occurs.

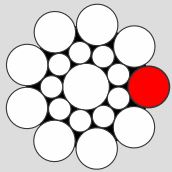
2-Layer ropes have a larger tendency to rotate than 3-layer ropes and develop only about 55% - 75% of their breaking strength when one end is allowed to rotate freely. This increases to between 95%-100% for 3-layer ropes.

2-Layer ropes have shown to break up from the inside as they are not able to evenly distribute the radial forces and because of internal strand cross overs and the resultant notching stresses cause the rope core to break prematurely.

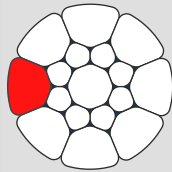
**35x7 WMC Compact**  
 made to EN12835 specifications  
 lay-up of wires 1-6



SWR dia	Weight	Minimum breaking load	
		1960 N/mm <sup>2</sup>	2160 N/mm <sup>2</sup>
[mm]	[kg/m]	[kN]	[kN]
14	0.98	180.0	192.0
16	1.29	223.2	246.0
18	1.56	282.5	311.0
19	1.73	314.8	347.0
20	2.01	357.0	394.0
22	2.41	430.0	474.0
24	2.84	505.0	551.0
26	3.35	598.0	652.0
28	3.91	696.0	760.0
30	4.46	794.0	866.0
32	5.03	896.0	977.0
34	5.74	1023.0	1105.0
36	6.42	1141.0	1235.0
38	7.18	1279.0	1381.0
40	7.93	1412.0	1525.0
42	8.70	1549.0	1673.0



round strand



compact strand

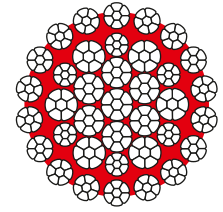
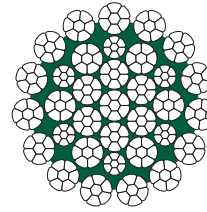
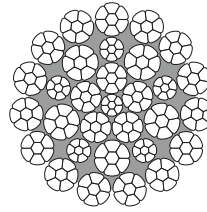
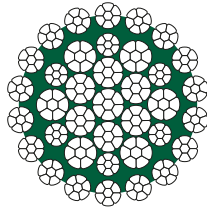
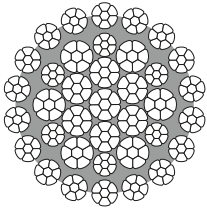
**Compact strands**

Diameter for diameter compact strand ropes have a higher breaking force than conventional round strand ropes.

The shaping of the outer wires spreads the contact between wires over a larger area and increases fatigue life, while the lubricant remains within the strand and prevents water and other ingress getting into the strands.



# Rotation-resistant wire ropes



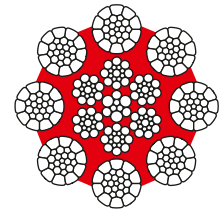
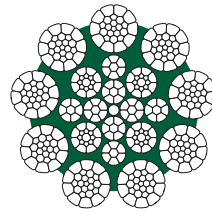
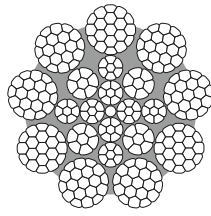
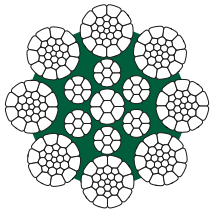
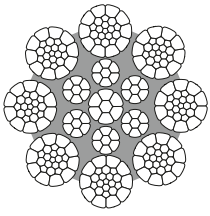
SWR dia [mm]	NR Maxipact		
	Weight [kg/m]	Minimum breaking load [kN]	
		1960N/mm <sup>2</sup>	2160N/mm <sup>2</sup>
10	-	-	-
11	-	-	-
12	-	-	-
13	0.816	157.8	165.7
14	0.949	183.3	192.5
15	1.088	209.6	220.6
16	1.245	239.4	251.4
17	1.398	269.7	283.4
18	1.562	302.5	317.7
19	1.757	338.9	355.9
20	1.930	374.2	393.0
21	2.139	412.2	432.9
22	2.342	452.0	474.7
23	2.560	494.8	519.6
24	2.790	540.3	567.4
25	3.043	587.1	616.6
26	3.270	634.2	666.1
27	3.544	683.6	717.9
28	3.802	734.0	770.9
30	4.391	846.3	888.8
32	4.977	959.6	1007.8
34	5.586	1079.3	1133.0
36	6.314	1221.5	1282.8
38	7.014	1352.4	1418.4
40	7.744	1495.0	1569.0
42	8.519	1645.2	1730.0
44	9.400	1818.6	1909.6
46	10.374	1995.7	2095.4
48	11.320	2184.3	2293.9
50	12.042	2331.7	2451.2
52	13.226	2548.8	2676.4
54	14.128	2731.2	2868.3

SWR dia [mm]	NR15 Maxilift		
	Weight [kg/m]	Minimum breaking load [kN]	
		1960N/mm <sup>2</sup>	2160N/mm <sup>2</sup>
10	0.480	92.2	96.9
11	0.563	108.4	113.9
12	0.683	130.8	137.3
13	0.793	152.4	160.0
14	0.929	178.8	187.7
15	1.075	206.3	216.6
16	1.219	234.1	245.8
17	1.383	265.4	278.7
18	1.553	298.4	313.4
19	1.718	329.5	346.1
20	1.909	370.0	388.6
21	2.107	406.3	426.7
22	2.315	446.3	468.7
23	2.519	487.0	511.4
24	2.757	531.5	558.1
25	2.988	576.3	605.2
26	3.229	624.1	655.4
27	3.468	669.1	702.6
28	3.737	721.0	757.2
30	4.299	828.8	870.4
32	4.848	935.5	982.4
34	5.512	1063.9	1117.3
36	6.253	1202.5	1262.9
38	6.909	1330.8	1397.6
40	7.665	1477.9	1552.1
42	8.493	1644.2	1726.7
44	9.201	1780.5	1868.7
46	10.128	1949.4	2047.2
48	10.902	2106.3	2212.0
50	11.958	2314.9	2431.1
52	-	-	-
54	-	-	-

SWR dia [mm]	Powerplast		
	Weight [kg/m]	Minimum breaking load [kN]	
		1960N/mm <sup>2</sup>	2160N/mm <sup>2</sup>
10	-	-	-
11	-	-	-
12	0.72	130.8	142.6
13	0.86	152.7	169.4
14	0.98	179.1	194.7
15	1.12	204.0	222.4
16	1.29	230.6	256.2
17	1.45	260.7	286.2
18	1.64	293.9	325.4
19	1.82	329.0	361.1
20	2.00	362.2	396.9
21	2.22	400.0	439.0
22	2.43	441.4	481.4
23	2.65	477.6	524.4
24	2.87	524.3	568.7
25	3.15	567.9	624.5
26	3.43	614.9	678.3
27	3.68	663.5	728.4
28	3.93	712.9	778.4
30	4.53	817.4	896.5
32	5.15	930.0	1019.4
34	5.78	1045.0	1144.9
36	6.50	1185.0	1287.3
38	7.27	1319.0	1440.3
40	8.15	1462.0	1615.0
42	8.92	1611.2	1766.3
44	9.75	1767.0	1930.4
46	10.74	1935.0	2127.4
48	11.65	2113.3	2307.1
50	12.56	2292.0	2487.3
52	13.75	2436.0	2724.2
54	14.63	2632.0	2896.9



# Non-Rotation-resistant wire ropes



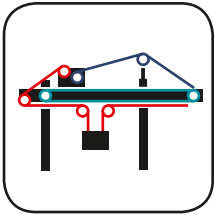
SWR dia	HD 8 K		
	Weight	Minimum breaking load	
		1960N/mm <sup>2</sup>	2160N/mm <sup>2</sup>
[mm]	[kg/m]	[kN]	[kN]
8	0.284	-	58.0
9	0.362	-	73.6
10	0.458	-	92.4
11	0.553	-	112.0
12	0.649	126.0	133.0
13	0.769	149.0	156.0
14	0.896	173.0	182.0
15	1.034	201.0	211.0
16	1.148	221.0	232.0
17	-	-	-
18	1.479	285.0	299.0
19	1.632	314.0	330.0
20	1.838	354.0	372.0
21	-	-	-
22	2.173	419.0	439.0
23	-	-	-
24	2.548	510.0	535.0
25	-	-	-
26	3.054	589.0	618.0
27	-	-	-
28	3.554	686.0	719.0
29	-	-	-
30	4.128	794.0	833.0
31	-	-	-
32	4.694	905.0	949.0
33	-	-	-
34	5.261	1018.0	1067.0
36	5.969	1148.0	1204.0
38	6.612	1271.0	1332.0
40	7.298	1410.0	1479.0
42	7.978	1538.0	1613.0
44	9.001	1736.0	1820.0

HD 9 K		
Weight	Minimum breaking load	
	1960N/mm <sup>2</sup>	2160N/mm <sup>2</sup>
[kg/m]	[kN]	[kN]
-	-	-
0.373	69.5	74.9
0.459	86.0	92.2
0.554	104.0	111.0
0.650	122.0	132.0
0.790	148.0	159.0
0.899	168.0	181.0
1.052	198.0	213.0
1.188	223.0	240.0
-	-	-
1.491	280.0	301.0
1.698	318.0	343.0
1.856	349.0	375.0
-	-	-
2.249	423.0	455.0
-	-	-
2.688	505.0	543.0
2.907	546.0	587.0
3.163	593.0	638.0
-	-	-
3.642	683.0	734.0
-	-	-
4.207	807.0	848.0
-	-	-
4.826	929.0	975.0
-	-	-
5.472	1050.0	1102.0
6.118	1173.0	1232.0
6.791	1307.0	1372.0
-	-	-
-	-	-
-	-	-

Turboplast		
Weight	Minimum breaking load	
	1960N/mm <sup>2</sup>	2160N/mm <sup>2</sup>
[kg/m]	[kN]	[kN]
0.29	56.6	63.5
0.37	73.0	81.4
0.46	88.7	101.0
0.56	107.5	121.0
0.66	127.4	144.0
0.78	151.3	170.0
0.90	174.8	196.0
1.04	202.7	226.0
1.18	229.4	252.0
1.33	255.4	283.0
1.47	288.2	314.0
1.64	323.5	351.0
1.83	355.5	391.0
1.97	388.5	421.0
2.19	433.7	468.0
2.39	471.4	511.0
2.61	514.3	556.0
2.82	558.2	602.0
3.07	607.8	655.0
3.31	647.7	702.0
3.53	697.3	748.0
3.79	736.9	800.0
4.10	789.3	864.0
4.37	843.3	911.0
4.64	911.0	968.0
4.98	950.1	1037.0
5.23	1024.9	1091.0
5.83	1129.2	1217.0
6.55	1262.6	1366.0
7.29	1395.5	1520.0
7.96	1543.8	1660.0
8.79	1687.4	1834.0

# Wire rope selection for lifting machines

## CONTAINER CRANE



### HOIST ROPE

- OLIVEIRA HD 8 K (Option PPI)
- CASAR TURBOPLAST

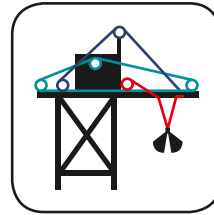
### BOOM HOIST

- OLIVEIRA HD 8 K (Option PPI)
- CASAR TURBOPLAST

### TROLLEY

- OLIVEIRA HD 8 K (Option PPI)
- CASAR TURBOPLAST

## SHIP UNLOADER



### HOIST ROPE

- OLIVEIRA HD 8 K (Option PPI)
- CASAR TURBOPLAST

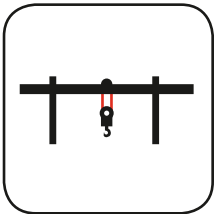
### BOOM HOIST

- OLIVEIRA HD 8 K (Option PPI)
- CASAR TURBOPLAST

### TROLLEY

- OLIVEIRA HD 8 K (Option PPI)
- CASAR TURBOPLAST

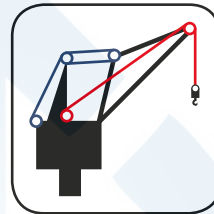
## RUBBER TIRED GANTRY / RAIL MOUNTED GANTRY



### HOIST ROPE

- CASAR TURBOPLAST
- OLIVEIRA HD 8 K (Option PPI)
- OLIVEIRA DP 8 K (Option PPI)

## HARBOR MOBILE CRANE



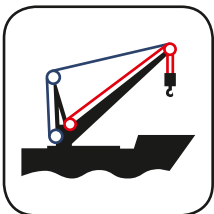
### HOIST ROPE

- OLIVEIRA HD 8 K (Option PPI)
- CASAR TURBOPLAST

### BOOM HOIST

- OLIVEIRA HD 8 K (Option PPI)
- CASAR TURBOPLAST

## DECK CRANE



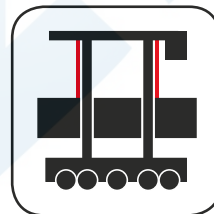
### HOIST ROPE

- OLIVEIRA NR MAXIPACT (Option PPI)
- OLIVEIRA NR 15 MAXILIFT (Option PPI)

### BOOM HOIST

- OLIVEIRA HD 8 K (Option PPI)
- CASAR TURBOPLAST

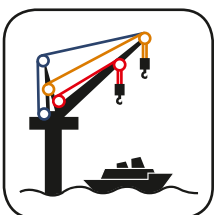
## STRADDLE CARRIERS



### HOIST ROPE

- OLIVEIRA HD 8 K (Option PPI)
- OLIVEIRA DP 8 K (Option PPI)
- CASAR TURBOPLAST

## OFFSHORE PEDESTAL CRANE



### HOIST ROPE

- OLIVEIRA NR MAXIPACT (Option PPI)

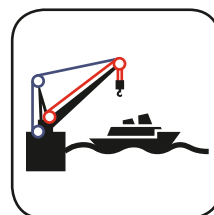
### BOOM HOIST

- OLIVEIRA HD 8 K (Option PPI)
- CASAR TURBOPLAST

### AUXILIARY HOIST

- OLIVEIRA NR MAXIPACT (Option PPI)
- CASAR POWERPLAST

## DOCKSIDE CRANE



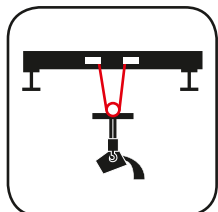
### HOIST ROPE

- CASAR TURBOPLAST
- CASAR STRATOPLAST
- CASAR SUPERPLAST8
- CASAR SUPERPLAST10
- CASAR EUROLIFT
- CASAR STARLIFT

### BOOM HOIST

- CASAR TURBOPLAST
- CASAR PARAPLAST

## STEELWORKS LADLE

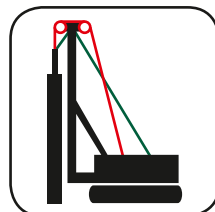


### HOIST ROPE

- OLIVEIRA HD 8 K (Option PPI)
- OLIVEIRA SC 8 C (Option PPI)
- OLIVEIRA SC 6 K
- CASAR TURBOPLAST

Please note: Option PPI if temperature is below 115 degrees C on the surface of the rope!

## DRILLING / PILING



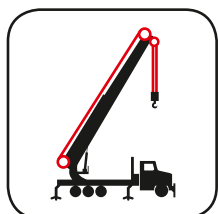
### HOIST ROPE

- OLIVEIRA NR 15 MAXILIFT (Option PPI)
- CASAR POWERPLAST

### FEED ROPE

- OLIVEIRA HD 8 K (Option PPI)
- CASAR TURBOPLAST

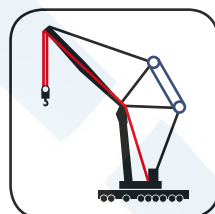
## TELESCOPIC MOBILE CRANE



### HOIST ROPE

- OLIVEIRA NR MAXIPACT (Option PPI)
- OLIVEIRA NR 15 MAXILIFT (Option PPI)

## LATTICE BOOM MOBILE CRANE



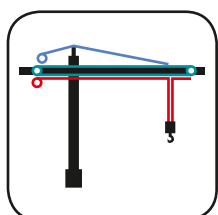
### HOIST ROPE

- OLIVEIRA NR MAXIPACT (Option PPI)
- OLIVEIRA NR 15 MAXILIFT (Option PPI)
- OLIVEIRA LT 24 K

### BOOM HOIST

- OLIVEIRA DP 8 K (Option PPI)
- OLIVEIRA HD 8 K (Option PPI)

## TOWER CRANE



### HOIST ROPE

- OLIVEIRA TOWERLIFT 15
- OLIVEIRA LT 24 C
- OLIVEIRA LT 24 K

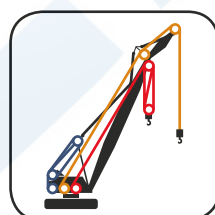
### BOOM PENDANT

- OLIVEIRA HD 8 K (Option PPI)

### TROLLEY

- OLIVEIRA SC 8 C (Option PPI)
- OLIVEIRA SC 6 K

## LATTICE BOOM CRAWLER CRANE



### HOIST ROPE

- OLIVEIRA NR MAXIPACT (Option PPI)
- OLIVEIRA NR 15 MAXILIFT (Option PPI)
- OLIVEIRA LT 24 K

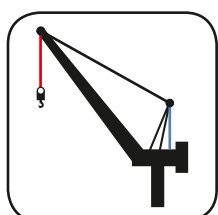
### BOOM HOIST

- OLIVEIRA DP 8 K (Option PPI)
- OLIVEIRA HD 8 K (Option PPI)

### AUXILIARY HOIST

- OLIVEIRA NR MAXIPACT (Option PPI)
- OLIVEIRA NR 15 MAXILIFT (Option PPI)

## LUFFING-JIB TOWER CRANE



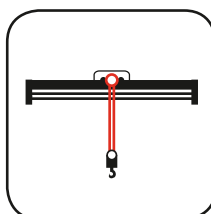
### HOIST ROPE

- OLIVEIRA NR MAXIPACT (Option PPI)
- OLIVEIRA NR 15 MAXILIFT (Option PPI)

### BOOM PENDANT

- OLIVEIRA HD 8 K (Option PPI)
- OLIVEIRA DP 8 K (Option PPI)

## OVERHEAD CRANE



### HOIST ROPE

- CASAR TURBOPLAST
- CASAR STRATOPLAST
- CASAR PARAPLAST
- CASAR SUPERPLAST8
- CASAR SUPERPLAST10MIX
- CASAR SUPERPLAST10

Please note: The use of rotation resistant ropes depends on the lifting height and the reeving system.

Please contact your WireCo rope specialist for further advice.

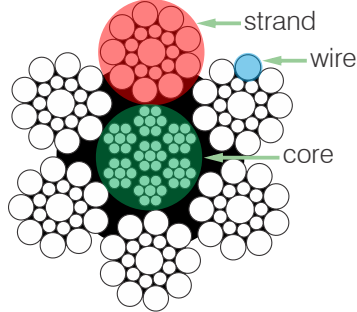
# General information



Wire rope is made by spinning individual wires together to form a strand and then closing a number of strands helically around a centre core to form the rope.

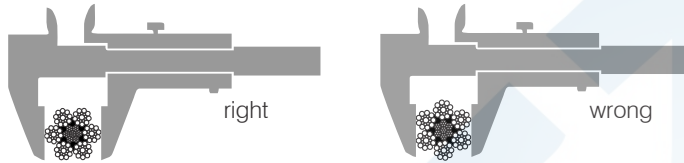
## Core

Steel wire ropes are supplied with either fibre or steel cores, the choice being dependent on the use for which the rope is intended. The principle function of the core is to provide support to the strands and maintain them in the correct positions under working conditions.



## Diameter

Measurements are taken at 2 points at least one meter apart and 2 diameters are measured at 90° one from the other. The average thus obtained is the practical diameter.



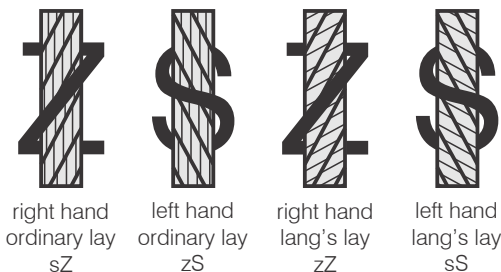
## Rope grades

Wire ropes are supplied in various Tensile Strength grades to meet the varied requirements on many applications.

Rope grade designation	Equivalent rope grade
IPS	1770
EIPS	1960
EEIPS	2160

## Rope lay

When the wires in the outer strands lie in the same direction as the strands themselves, this is known as Lang's Lay and when they lie in the opposition direction to the strands, this is known as Ordinary or Regular Lay. Ordinary lay ropes are generally used because of their stability, however Lang's lay has increased resistance to abrasion and is more flexible.



## Lubrication

Wire ropes are lubricated as protection against oxidization and to reduce friction between wire and strands. During the closing of the rope, all wires and all strands are lubricated. The type of lubrication varies according to the application. Re-lubrication should be carried out periodically to extend the lifespan of the rope.

## Galvanising

Zinc coating known as galvanising provides sacrificial protection to the underlying steel wire for protection against corrosion, where the rope is exposed to corrosive agents such as salt, water and moisture. Galvanised rope generally has a lower breaking load than bright ropes (uncoated). For hoisting equipment in locations where corrosive conditions are present, heavily lubricated bright ropes are usually preferred to galvanised.

## Preformed wire rope

Generally, ropes are supplied preformed. In preformed rope the wires and strands are pre-shaped by running the rope through a preforming head, giving it the helix it takes up, prior to assembly into the finished rope. This prevents the wires from straightening and leaves them relaxed in their normal positions. The benefits of this process are:

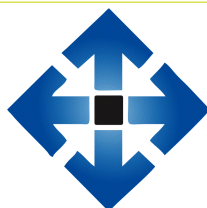
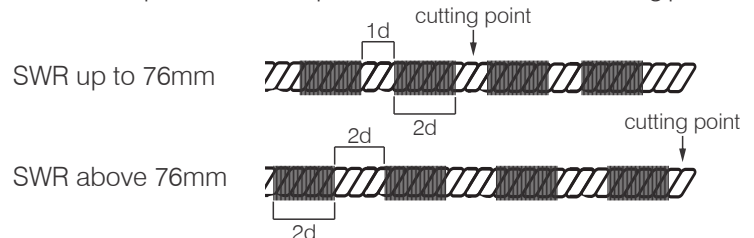
- the exposed ends do not untwist
- broken wire ends lie flat
- easy handling during installation
- less prone to kinking and twisting

Rotating resistant ropes should not be regarded as preformed.

## Cutting wire rope

When cutting wire rope up to 76mm diameter, a minimum of 2 wire servings, each twice the rope diameter in length and placed one rope diameter apart, should be placed either side of the cutting point.

For wires above 76mm diameter, a minimum of 4 wire servings, each twice the rope diameter in length and placed two rope diameters apart, should be placed either side of the cutting point.



**GR8**  
**INDUSTRIES**

JOHANNESBURG (HEAD OFFICE) +2711 869 0566

sales@gr8industries.co.za  
www.gr8industries.co.za