usha martin

ESTD.1986
Safe Lifters
DEALERS IN LIFTING EQUIPMENTS
Pundol Apartments, Shop No. 5 & 6,160 M.G. Road, Pune - 411001. (India)
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Wire Rope Construction

A wire rope is made up of individual steel wires spun into a strand. A number of strands are closed over a central core thus producing a rope. These are known as round strand ropes. There are usually six strands to a rope, strands consisting of several layers of wires spun over a central king wire. The number and size of wires must offer the best compromise possible between large wires for maximum corrosion protection and resistance to abrasion, and smaller wires for the necessary flexibility and handling.

Compacted Rope

Rope in which the strands, prior to closing of the rope, (or the rope itself), are subjected to a diameter reduction through a compacting process such as drawing - hence Dyform - rolling or swaging. The metallic cross - sectional area of the wires remain almost unaltered whereas their shape (profile) changes. A construction of wire ropes is expressed in simple terms.

a Number of strandsb
b Number of wires in the strand
c Lay - up of wires in the strandd
d Type of coree
e Direction of rope lay e.g. 6x36 (14/7 & 7/7/1) IWRC Right hand ordinary (regular).

Rope Lays

Ordinary (Regular) Lay

Ropes in which the direction of the lay of the outer layer of wires in the strands is opposite to the direction of lay of the strands in the rope.

Lang's Lay

Ropes in which the direction of lay of the outer layer of wires in the strands is the same as the direction of lay of the strands in the rope.

Right hand ordinary lay

Right hand Lang's lay

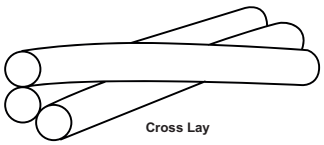
The advantage of using Lang's lay is that a rope so constructed offers a better wearing surface when in use, and therefore can be expected, in many cases, to survive for a longer period than an ordinary lay rope. Six and eight stranded Lang's lay ropes produce relatively high torque values under working conditions and must not be used on applications where one end of the rope is free to rotate or where problems from rope turn are likely to occur.

Ordinary lay is easier to handle than Lang's lay, less liable to kinking and untwisting, and less likely to failure from crushing and distortion.

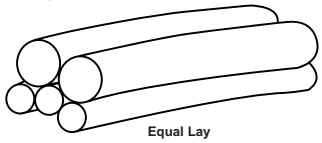
Unless otherwise stated, ropes are supplied right hand lay. Left hand lay can be supplied for special applications.

Equal (Parallel) Lay Strand Constructions

In this type of rope all layers of wires have the same length of lay. Each wire in each layer lies either in a bed formed by the interstices or in valleys between the wires of an underlying wire. The use of equal lay strands avoids deformation, internal wear and secondary bending stress which result from the point of contact between wires in the cross lay type.



Cross Lay



Equal Lay

Consequently, equal lay ropes have a longer life than cross lay ropes.

Cores

Steel wire ropes are supplied with either fiber 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.

Fiber Cores

For most applications 'Fiberfilm' polypropylene is used although natural fibers are still available.

The advantages of man-made fiber cores are: Reduction of internal corrosion due to non-absorption of moisture.

Ability to withstand mild acids and alkalis. Resistance to rotting.

Wire Ropes

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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 that they take up in the completed rope.

Note: *Rotation-resistant ropes should be considered as 'non-preformed' when cutting.*

Advantages of preformed ropes:

Exposed ends will not untwist
Broken wire ends lie flat
Easy to handle during installation
Less prone to kinking and are free from liveliness and twisting tendencies.

Coatings

Zinc coated wire ropes-galvanizing

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 applications; 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.

Protective Sheathing

Ropes and strands protected by synthetic sheathing can provide excellent additional corrosion protection where environmental conditions dictate, such as deep water mooring lines etc, the plastic sheath providing a barrier between the rope and the environment. The method of extrusion employed for these ropes results in a finished product which will meet all the environmental and mechanical demands required of the rope. The standard range of coverings include polypropylene, P.V.C and polyethylene.

Rope Grades

Rope Grad	Minimum Tensile Strength	Approximate Equivalent API 9A Grade
1770	1770N/mm	IPS
1860	1860 N/mm	EIPS
1960	1960 N/mm	EIPS
2160	2160 N/mm	EEIP

Definitions of Breaking Forces and Loads

1 **Minimum breaking force.** The force, in kilonewtons, below which the rope shall not break when tested to destruction.
2 **Minimum breaking load.** The load, in tonnes, 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 grade(s) of the wires. The total metallic area is directly proportional to the square of the nominal diameter of the rope.

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.*

Wire Ropes

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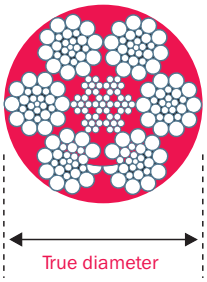
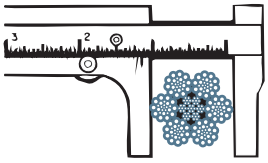
How to measure wire rope diameter

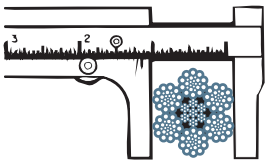
The correct diameter of a wire rope is the diameter of a circum -scribed circle that will enclose all the strands. It's the largest cross-sectional measurement as shown here.

You should make the measurement carefully with calipers. The illustrations





Correct



Incorrect

metric conversion and equivalents

As we move toward metric measure-ments, it will become increasingly necessary to convert English units into SI – International System of Units – (or metrics), and vice versa. The following table and conversion factors are included in this handbook to help you.

ROPE DIAMETER

In measuring rope diameter, the industry is leaning toward a "soft" conversion to metric during the transition period. For example, a 1" diameter rope converts to 25.4 mm in metrics. Using the soft conversion, this is changed to the whole metric size that most nearly parallels the 1" size range, or 26 mm. In sizes smaller than 5/8", the rope diameter is rounded to the nearest 0.5 mm.

STRENGTHS AND WEIGHTS

The following table gives the closest equivalent metric diameters for rope sizes up through 4 inches. Again, these metric sizes are based on the industry's "soft" conversion.

Since rope minimum breaking force and weight per unit of length vary for different types and grade of ropes, the following con version factors are given to help you convert the figures you need:

> To convert rope weight in pounds per foot (lb/ft) to kilograms per meter (kg/m), multiply by 1.488.

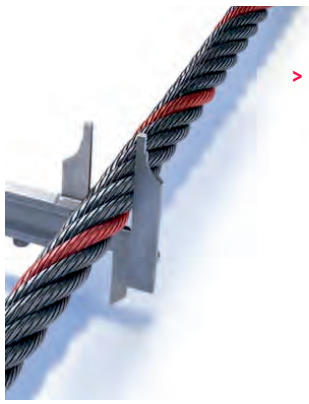
> To convert rope minimum breaking force in tons (T) to kilonewtons (kN), multiply by 8.897;1 lb equals 4.448 newtons (N).

Nominal Wire Rope Diameter

Inches	Millimeters	Inches	Millimeters
1/4	6	21/8	54
5/16	8	21/4	56
3/8	10	23/8	60
7/16	11	21/2	64
1/2	12	25/8	66
9/16	14	23/4	69
5/8	16	27/8	72
3/4	19	3	75
7/8	22	31/8	79
1	25	31/4	81
11/8	28	33/8	85
11/4	32	31/2	87
13/8	35	33/4	94
11/2	38	4	100
15/8	42		
13/4	44		
17/8	47		
2	50		

> To convert rope minimum breaking force in tons (T) to kilograms (kg), multiply by 907.2.

Note:
The Newton (a unit of force) is the correct unit for measurement of minimum breaking force in the sI system of units. We have included a conversion factor from tons to kilograms because a rope's minimum breaking force is often referred to in terms of



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Wire Ropes

Wire rope end treatments

Preparation for Installation

Most ropes are shipped with the ends seized as they are prepared for cutting. You can usually install seized ropes without further preparation. In some cases, though, tight openings in drums and wedge sockets – or even complicated reeving systems – require special end preparation. Then, the strands must be tightly held without increasing the rope diameter. In such cases, the ends are tapered and welded, or the ends fused. It's sometimes necessary to provide a loop or link to which a lighter line is fastened to pull the rope into place or around sheaves. Some of these special end preparations are shown here.

Except for Flex-X 35, any end preparation that results in the welding or fusing of the rope must be cut off in a manner that leaves the strands and wires free to adjust before you clamp the rope or seat it in an end termination. The welded ends must remain on Flex-X 35 rope.

Steel End Link

Cut with Ends Fused

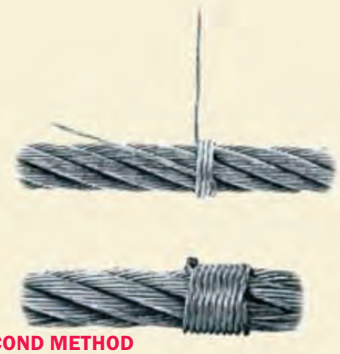
Tapered and Welded End

Seized End

TWO TECHNIQUES FOR SEIZING CUT ENDS

When a rope is to be cut – even though it has been preformed – you should carefully seize it to prevent displacement or relative move-ment of the wires or strands. You may use either seizing strand, annealed wire or heavy duty tape. The important point is that you must draw the servings down tight to prevent any strand being even slightly displaced. After all the seizings are secure, then you may cut the rope. Normally, one seizing on each side of the cut is suffcient. For non-preformed or rotation-resistant ropes, a minimum of two seizings on each side is recommended. These should be spaced six rope diameters apart.

1. 2. 3.



FIRST METHOD

1. Wind seizing strand around rope for a length equal to the rope diameter, keeping wraps parallel, close together and in tension. Twist ends of strand to-gether by hand.

2. Continue twisting with pliers to take up slack and tighten.

3. Twist strand tightly against serving,winding twisted strand into knot before cutting off ends of the strand. Pound knot snugly against rope.

SECOND METHOD

1. Lay one end of the seizing strand or wire in the groove between two strands in the wire rope and wrap the other end tightly over the portion in the groove.

2. Complete steps 2 and 3 at left.

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Wire Ropes

How to extend rope service life

Avoid Twisting of New Wire Rope During Installation

> Handle the rope properly from the reel or coil to your equipment and, on smooth-faced drums, spool with wraps tight and close together on the first layer.

How long will your rope last? There is not a simple answer but, rather, there are several factors involved, including:

- The manner in which you install and "break in" your new rope
- The operating technique and work habits of the machine operators.
- Physical maintenance of the rope throughout its service life.
- Physical maintenance of the system in which your rope operates.

RECOMMENDED PRACTICES

We've outlined several recommended practices you may use to extend your rope's useful life. It's also important to note that all sections of this handbook, in some respect, also review ways to help you get greater useful life from your rope, and that's why you need to thoroughly understand all the material here

INSTALL YOUR ROPE CORRECTLY

The primary concern when installing a new rope is to not trap any twist in the rope system. Proper handling of the rope from the reel or coil to your equipment will help avoid this situation. Another important step on smooth faced drums is to spool with wraps tight and close together on the frst layer. This layer forms the foundation for succeeding layers. Finally, spool the remaining rope on the drum with tension approximating 1% to 2% of the rope's minimum breaking force.

BREAK IN YOUR NEW ROPE PROPERLY

When you install a new operating rope, you should first run it for a brief period of time with no load. Then, for best results, run it under controlled loads and speeds to enable the wires and strands in the rope to adjust to themselves.

"CONSTRUCTIONAL" STRETCH

When frst put into service, new ropes normally elongate while strands go through a process of seating with one another and with the rope core. This is called "constructional" stretch because it is inherent in the construction of the rope, and the amount of elongation may vary from one rope to another. For standard ropes, this stretch will be about 1/4% to 1% of the rope's length.

When constructional stretch needs to be minimized, ropes may be factory prestretched. Please specify when placing your order.

Another type of stretch, "elastic" stretch, results from recoverable deformation of the metal itself.

CUT OFF ENDS TO MOVE WEAR POINTS

If you observe wear developing in a localized area, it may be benefcial to cut off short lengths of rope. This may require an original length slightly longer than you normally use. When severe abrasion or numerous fatigue breaks occur near one end or at any one concentrated area – such as drag ropes on draglines or closing lines in clamshell buckets, for example – the movement of this worn section can prolong rope life.

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Wire Ropes

CLEAN AND LUBRICATE REGULARLY TO REDUCE WEAR

We lubricate our wire rope during manufac-ture so that the strands – as well as the individual wires in the strands – may move and adjust as the rope moves and bends. But no wire rope can be lubricated suffciently dur-ing manufacture to last its entire life. That's why it's important to lubricate periodically throughout the life of the rope.The surface of some ropes may become cov-ered with dirt, rock dust or other material during their operation. This can prevent field-applied lubricants from properly pen-etrating into the rope, so it's a good practice to clean these ropes before you lubricate them. The lubricant you apply should be light-bodied enough to pene-trate to the rope's core. You can normally apply lubricant by using one of three methods: drip it on rope, spray it on or brush it on. In all cases, you should apply it at a place where the rope is Wire breaks from vibration fatigue occur at end termina-tions, so short lengths cut off there with reattachment of the socket may prolong the rope's life. When broken wires are found, you should cut off sections of rope. In the case of a socket, you should cut off at least fve or six feet. In the case of clips or clamps, you should cut off the entire length covered by them. Where there is an equalizing sheave, such as that found in many overhead cranes, fatigue is localized at rope tangency points to the equalizing sheave. Rope life will be increased if you shift this point by cutting off a short length at the end of one of the drums. Be sure to make this cutoff bending such as around a sheave. We recommend you apply it at the top of the bend because that's where the rope's strands are spread by bending and more easily penetrated. In addition, there are pres-sure lubricators available commercially. Your rope's service life will be directly proportional to the effectiveness of the method you use and the amount of lubricant that reaches the rope's working parts.

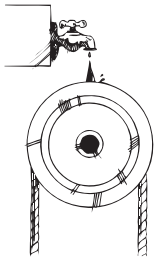
A proper lubricant must reduce friction, pro-tect against corrosion and adhere to every wire. It should also be pliable and not crack or separate when cold – yet not drip when warm. Never apply heavy grease to the rope because it can trap excessive grit, which can damage the rope. Nor should you apply used "engine oil" because it contains materials that can damage the rope. For unusual conditions, you can specify special lubricants that we can apply at the factory. before significant wear occurs at the equalizing sheave, and always do so at the same drum.

REVERSING ENDS

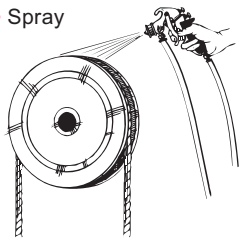
Frequently, the most severe deterioration occurs at a point too far from the end or is too long to allow the worn section to be cut off. In such cases, you may turn the rope end for end to bring a less worn section into the area where conditions are most damaging. This practice is beneficial for incline rope and dragginess. The change must be made well before the wear reaches the removal criteria. When changing ends, be careful to avoid kinking or otherwise damaging the rope.

Three methods of Applying Lubrication:

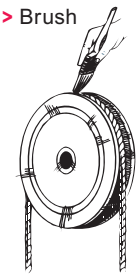
> Drip



> Spray



> Brush



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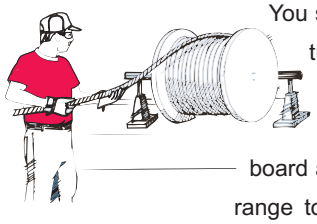
Wire Ropes

How to unreel, uncoil and store wire rope

THE RIGHT WAY TO UNREEL AND UNCOIL A WIRE ROPE

Correct Ways to UnReel and UnCoil Wire Rope



There is always a danger of kinking a wire rope if you improperly unreel or uncoil it. You should mount a reel on jacks or a turntable so that it will revolve as you pull the rope off. Apply sufficient tension by means of a board acting as a brake against the reel range to keep slack from accumulating. With a coil, stand it on edge and roll it in a straight line away from the free end. You may also place a coil on a revolving stand and pull the rope as you would from a reel on a turntable.

HOW TO STORE WIRE ROPE PROPERLY

We recommend you store your wire rope under a roof or a weatherproof covering so that moisture cannot reach it. Similarly, you must avoid acid fumes or any other corrosive atmosphere – including ocean spray – in order to protect the rope from rust. If you're storing a reel for a lengthy period, you may want to order your rope with a protective wrap. If not, at least coat the outer layers of rope with a good rope lubricant.

If you ever take a rope out of service and want to store it for future use, you should place it on a reel after you've thoroughly cleaned and relubricated it. Give the same storage considerations to your used rope as you would your new rope.

Be sure to keep your wire rope in storage away from steam or hot water pipes, heated air ducts or any other source of heat that can thin out lubricant and cause it to drain out of your rope.

THE THREE STAGES OF KINKING

1. **THE START:** A rope should never be allowed to accumulate twist as shown here because it will loop and eventually form a kink. If this loop is removed before being pulled down tight, you can normally avoid the kink.

2. **THE KINK:** By now, the damage is done, and the rope must not be used.

3. THE RESULT: Even if the wires do not appear badly damaged, the rope is still damaged and must be replaced.

If a twist develops, remove the twist from the rope before a kink can form.

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Wire Ropes

Wire rope inspection

All wire ropes will wear out eventually and gradually lose work capability throughout their service life. That's why periodic inspections are critical. Applicable industry standards such as ASME B30.2 for overhead and gantry cranes or federal regulations such as OSHA refer to specifc inspection criteria for varied applications.

THREE PURPOSES FOR INSPECTION

Regular inspection of wire rope and equipment should be performed for three good reasons:

- It reveals the rope's condition and indicates the need for replacement.
- It can indicate if you're using the most suitable type of rope.
- It makes possible the discovery and correction of faults in equipment or operation that can cause costly accelerated rope wear.

WHAT TO LOOK FOR

Here's what happens when a wire breaks under tensile load exceeding its strength. It's typically recognized by the "cup and cone" appearance at the point of failure. The necking down of the wire at the point of failure to form the cup and cone indicates failure has occurred while the wire retained its ductility.

This is a wire with a distinct fatigue break. It's recognized by the square end perpendicular to the wire. This break was produced by a torsion machine that's used to measure the ductility. This break is similar to wire failures in the feld caused by fatigue.

HOW OFTEN

All wire ropes should be thoroughly inspected at regular intervals. The longer it has been in service or the more severe the service, the more thoroughly and frequently it should be inspected. Be sure to maintain records of each inspection.

APPOINT A QUALIFIED PERSON TO INSPECT

Inspections should be carried out by a person who has learned through special training or practical experience what to look for and who knows how to judge the importance of any abnormal conditions they may discover. It is the inspector's responsibility to obtain and follow the proper inspection criteria for each application inspected.

Wire Rope Inspection. If you need further assistance with our ropes, contact our Product engineering Department.

An example of fatigue failure of a wire rope subjected to heavy loads over small sheaves. The breaks in the valleys of the strands are caused by "strand nicking." There may be crown breaks, too.

A wire rope that has been subjected to repeated bending over sheaves under normal loads. This results in fatigue breaks in individual wires these breaks are square and usually in the crown of the strands.

Inspect your Wire Rope Regularly

Inspection should be performed by a person with special training or practical experience.

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Wire Ropes

Wire rope wear, abuse – and removal criteria

Know when to remove your Wire Rope

The chart on the facing page offers a guide for removal, based on the number of wires involved.

TYPICAL EVIDENCE OF WEAR AND ABUSE

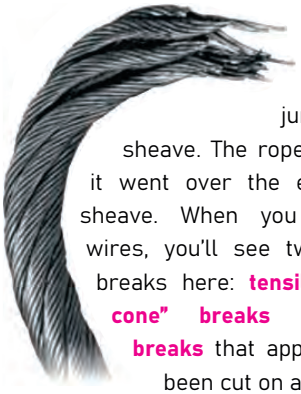
A "birdcage" is caused by sudden release of tension and the resulting rebound of rope. These strands and wires will not be returned to their original positions. The rope should be replaced immediately.

A typical failure of a rotary drill line with a poor cutoff practice. These wires have been subjected to continued **Peening, causing fatigue type failures.** A predetermined, regularly scheduled cutoff practice can help eliminate this type of problem.

This is **localized wear** over an equal-ized sheave. The danger here is that it's invisible during the rope's operation, and that's why you need to inspect this portion of an operating rope regularly. The rope should be pulled off the sheave during inspection and bent to check for broken wires.

This is a wire rope with a **high strand** a condition in which one or more strands are worn before adjoining strands. This is caused by improper socketing or seizing, kinks or dog-legs. At top, you see a closeup of the concentration of wear. At bottom, you see how it recurs every sixth strand in a 6 strand rope.

A **kinked wire rope** is shown here. It's caused by pulling down a loop in a slack line during handling, installation or operation. Note the distortion of the strands and individual wires. This rope must be replaced.



Here's a wire rope that has jumped a sheave. The rope **"curled"** as it went over the edge of the sheave. When you study the wires, you'll see two types of breaks here: **tensile "cup and cone" breaks and shear breaks** that appear to have been cut on an angle.

drum crushing is caused by small drums, high loads and multiple winding conditions.

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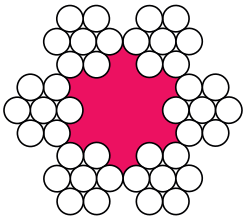
Wire Ropes

6x7+FC

Minimum Breaking Force Factor K = 0,332

Nominal Length Mass Factor W = 0,345

		1770		1960		1570(AISI)	
Diameter	kg/100M	kN	Kg	kN	Kg	kN	Kg
1,0	0,35	0,59	60	0,65	66	0,52	53
1,5	0,78	1,32	135	1,46	149	1,17	120
2,0	1,38	2,35	240	2,60	265	2,08	213
2,5	2,16	3,67	374	4,07	415	3,26	332
3,0	3,11	5,29	539	5,86	597	4,69	478
4,0	5,52	9,40	958	10,41	1.061	8,34	850
5,0	8,63	14,69	1.498	16,27	1.658	13,03	1.328
6,0	12,42	21,20	2.156	23,40	2.388	18,80	1.913
8,0	22,08	37,60	3.834	41,60	4.245	33,40	3.401
10,0	34,50	58,80	5.99	65,10	6.633	52,10	5.313
12,0	49,68	84,60	8.626	93,70	9.552	75,10	7.651
14,0	67,62	115,20	11.741	127,50	13.001	102,20	10.414
16,0	88,32	150,40	15.335	166,60	16.981	133,40	13.602

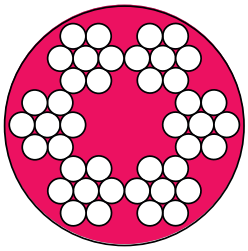


6x7 Coated

Minimum Breaking Force Factor K = 0,332

Nominal Length Mass Factor W = 0,345

		1770		1960		1570(AISI)	
Diameter	kg/100M	kN	Kg	kN	Kg	kN	Kg
1,0	0,35	0,59	60	0,65	66	0,52	53
1,5	0,78	1,32	135	1,46	149	1,17	120
2,0	1,38	2,35	240	2,60	265	2,08	213
2,5	2,16	3,67	374	4,07	415	3,26	332
3,0	3,11	5,29	539	5,86	597	4,69	478
4,0	5,52	9,40	958	10,41	1.061	8,34	850
5,0	8,63	14,69	1.498	16,27	1.658	13,03	1.328
6,0	12,42	21,20	2.156	23,40	2.388	18,80	1.913
8,0	22,08	37,60	3.834	41,60	4.245	33,40	3.401
10,0	34,50	58,80	5.99	65,10	6.633	52,10	5.313
12,0	49,68	84,60	8.626	93,70	9.552	75,10	7.651
14,0	67,62	115,20	11.741	127,50	13.001	102,20	10.414
16,0	88,32	150,40	15.335	166,60	16.981	133,40	13.602



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DEALERS IN LIFTING EQUIPMENTS

Pundol Apartments, Shop No. 5 & 6,160 M.G. Road, Pune - 411001. (India)

Tel. : +91 - 20 - 6708 8100 **Fax** : +91 - 20 - 6708 8101

Email : sales@safelifters.com **Website** : www.safelifters.com

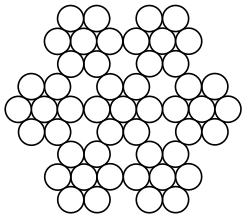
Wire Ropes

Minimum Breaking Force Factor K = 0,388

Nominal Length Mass Factor W = 0,384

7x7

		1770		1960		1570(AISI)	
Diameter	kg/100M	kN	Kg	kN	Kg	kN	Kg
1,0	0,38	0,69	70	0,76	78	0,61	62
1,2	0,55	0,99	101	1,10	112	0,88	89
1,5	0,86	1,55	158	1,71	174	1,37	140
1,8	1,24	2,23	227	2,46	251	1,97	201
2,0	1,54	2,75	280	3,04	310	2,44	248
2,3	2,03	3,63	370	4,02	410	3,22	328
2,5	2,40	4,29	438	4,75	485	3,81	388
3,0	3,46	6,18	630	6,84	698	5,48	559
4,0	6,14	10,99	1.12	12,17	1.24	9,75	994
4,5	7,78	13,91	1.418	15,40	1.57	12,34	1.257
5,0	9,60	17,17	1.75	19,01	1.938	15,23	1.552
6,0	13,82	24,70	2.52	27,40	2.791	21,90	2.235
7,0	18,82	33,70	3.43	37,30	3.799	29,80	3.043
8,0	24,58	44,00	4.48	48,70	4.961	39,00	3.974
9,0	31,10	55,60	5.67	61,60	6.279	49,30	5.03
10,0	38,40	68,70	7.001	76,00	7.752	60,90	6.21
12,0	55,30	98,90	10.081	109,50	11.163	87,70	8.942

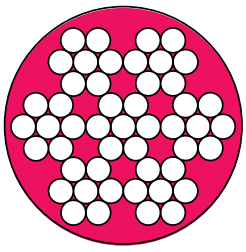


Minimum Breaking Force Factor K = 0,388

Nominal Length Mass Factor W = 0,384

7x7 Coated

		1770		1960		1570(AISI)	
Diameter	kg/100M	kN	Kg	kN	Kg	kN	Kg
1,0	0,38	0,69	70	0,76	78	0,61	62
1,2	0,55	0,99	101	1,10	112	0,88	89
1,5	0,86	1,55	158	1,71	174	1,37	140
1,8	1,24	2,23	227	2,46	251	1,97	201
2,0	1,54	2,75	280	3,04	310	2,44	248
2,3	2,03	3,63	370	4,02	410	3,22	328
2,5	2,40	4,29	438	4,75	485	3,81	388
3,0	3,46	6,18	630	6,84	698	5,48	559
4,0	6,14	10,99	1.12	12,17	1.24	9,75	994
4,5	7,78	13,91	1.418	15,40	1.57	12,34	1.257
5,0	9,60	17,17	1.75	19,01	1.938	15,23	1.552
6,0	13,82	24,70	2.52	27,40	2.791	21,90	2.235
7,0	18,82	33,70	3.43	37,30	3.799	29,80	3.043
8,0	24,58	44,00	4.48	48,70	4.961	39,00	3.974
9,0	31,10	55,60	5.67	61,60	6.279	49,30	5.03
10,0	38,40	68,70	7.001	76,00	7.752	60,90	6.21
12,0	55,30	98,90	10.081	109,50	11.163	87,70	8.942



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Email : sales@safelifters.com **Website** : www.safelifters.com

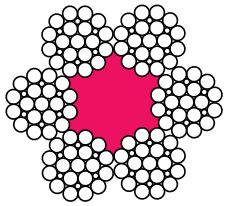
Engineering Wire Ropes

Minimum Breaking Force Factor K = 0,307

Nominal Length Mass Factor W = 0,346

		1770		1960		1570(AISI)	
Diameter	kg/100M	kN	Kg	kN	Kg	kN	Kg
3,0	3,11	4,89	499	5,42	552	4,34	442
4,0	5,54	8,69	886	9,63	981	7,71	786
5,0	8,65	13,58	1.385	15,04	1.533	12,05	1.228
6,0	12,46	19,60	1.994	21,70	2.208	17,40	1.769
6,5	14,62	23,00	2.34	25,40	2.592	20,40	2.076
7,0	16,95	26,60	2.714	29,50	3.006	23,60	2.407
8,0	22,14	34,80	3.545	38,50	3.926	30,80	3.144
9,0	28,03	44,00	4.487	48,70	4.968	39,00	3.98
10,0	34,60	54,30	5.539	60,20	6.134	48,20	4.913
11,0	41,87	65,80	6.702	72,80	7.422	58,30	5.945
12,0	49,82	78,20	7.976	86,60	8.833	69,40	7.075
13,0	58,47	91,80	9.361	101,70	10.366	81,50	8.303
14,0	67,82	106,50	10.857	117,90	12.022	94,50	9.63
16,0	88,58	139,10	14.18	154,00	15.702	123,40	12.578
18,0	112,10	176,00	17.947	195,00	19.873	156,00	15.919
20,0	138,40	217,00	22.157	241,00	24.535	193,00	19.653

6x19+FC

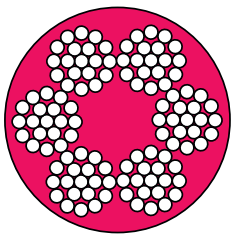


Minimum Breaking Force Factor K = 0,307

Nominal Length Mass Factor W = 0,346

		1770		1960		1570(AISI)	
Diameter	kg/100M	kN	Kg	kN	Kg	kN	Kg
3,0	3,11	4,89	499	5,42	552	4,34	442
4,0	5,54	8,69	886	9,63	981	7,71	786
5,0	8,65	13,58	1.385	15,04	1.533	12,05	1.228
6,0	12,46	19,60	1.994	21,70	2.208	17,40	1.769
6,5	14,62	23,00	2.34	25,40	2.592	20,40	2.076
7,0	16,95	26,60	2.714	29,50	3.006	23,60	2.407
8,0	22,14	34,80	3.545	38,50	3.926	30,80	3.144
9,0	28,03	44,00	4.487	48,70	4.968	39,00	3.98
10,0	34,60	54,30	5.539	60,20	6.134	48,20	4.913
11,0	41,87	65,80	6.702	72,80	7.422	58,30	5.945
12,0	49,82	78,20	7.976	86,60	8.833	69,40	7.075
13,0	58,47	91,80	9.361	101,70	10.366	81,50	8.303
14,0	67,82	106,50	10.857	117,90	12.022	94,50	9.63
16,0	88,58	139,10	14.18	154,00	15.702	123,40	12.578
18,0	112,10	176,00	17.947	195,00	19.873	156,00	15.919
20,0	138,40	217,00	22.157	241,00	24.535	193,00	19.653

6x19+FC Coated



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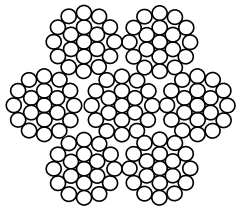
Engineering Wire Ropes

6x19+SC

Minimum Breaking Force Factor K = 0,362

Nominal Length Mass Factor W= 0,381

		1770		1960		1570(AISI)	
Diameter	kg/100M	kN	Kg	kN	Kg	kN	Kg
2,0	1,52	2,56	261	2,84	289	2,27	232
2,5	2,38	4,00	408	4,43	452	3,55	362
3,0	3,43	5,77	588	6,39	651	5,12	521
4,0	6,10	10,25	1.045	11,35	1.157	9,09	927
5,0	9,53	16,02	1.633	17,74	1.808	14,21	1.448
6,0	13,72	23,10	2.351	25,50	2.604	20,50	2.086
6,5	16,10	27,10	2.76	30,00	3.056	24,00	2.448
7,0	18,67	31,40	3.2	34,80	3.544	27,80	2.839
8,0	24,38	41,00	4.18	45,40	4.629	36,40	3.708
9,0	30,86	51,90	5.291	57,50	5.858	46,00	4.693
10,0	38,10	64,10	6.531	71,00	7.233	56,80	5.793
11,0	46,10	77,50	7.903	85,90	8.751	68,80	7.01
12,0	54,86	92,30	9.405	102,20	10.415	81,80	8.343
13,0	64,39	108,30	11.038	119,90	12.223	96,00	9.791
14,0	74,68	125,60	12.802	139,10	14.176	111,40	11.355
16,0	97,54	164,00	16.721	181,60	18.516	145,50	14.831

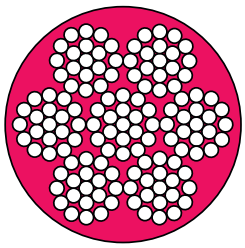


6x19+SC Coated

Minimum Breaking Force Factor K = 0,362

Nominal Length Mass Factor W= 0,381

		1770		1960		1570(AISI)	
Diameter	kg/100M	kN	Kg	kN	Kg	kN	Kg
2,0	1,52	2,56	261	2,84	289	2,27	232
2,5	2,38	4,00	408	4,43	452	3,55	362
3,0	3,43	5,77	588	6,39	651	5,12	521
4,0	6,10	10,25	1.045	11,35	1.157	9,09	927
5,0	9,53	16,02	1.633	17,74	1.808	14,21	1.448
6,0	13,72	23,10	2.351	25,50	2.604	20,50	2.086
6,5	16,10	27,10	2.76	30,00	3.056	24,00	2.448
7,0	18,67	31,40	3.2	34,80	3.544	27,80	2.839
8,0	24,38	41,00	4.18	45,40	4.629	36,40	3.708
9,0	30,86	51,90	5.291	57,50	5.858	46,00	4.693
10,0	38,10	64,10	6.531	71,00	7.233	56,80	5.793
11,0	46,10	77,50	7.903	85,90	8.751	68,80	7.01
12,0	54,86	92,30	9.405	102,20	10.415	81,80	8.343
13,0	64,39	108,30	11.038	119,90	12.223	96,00	9.791
14,0	74,68	125,60	12.802	139,10	14.176	111,40	11.355
16,0	97,54	164,00	16.721	181,60	18.516	145,50	14.831



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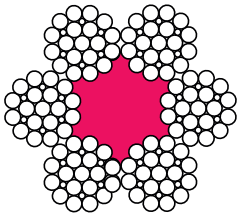
Engineering Wire Rope

Minimum Breaking Force Factor K = 0,330

Nominal Length Mass Factor W= 0,359

		1770		1960		1570(AISI)	
Diameter	kg/100M	kN	Kg	kN	Kg	kN	Kg
6,0	12,92	21,00	2.143	23,30	2.374	18,70	1.901
6,5	15,17	24,70	2.516	27,30	2.786	21,90	2.231
7,0	17,59	28,60	2.918	31,70	3.231	25,40	2.588
8,0	22,98	37,40	3.811	41,40	4.22	33,20	3.38
9,0	29,08	47,30	4.823	52,40	5.341	42,00	4.278
10,0	35,90	58,40	5.954	64,70	6.593	51,80	5.281
11,0	43,44	70,70	7.204	78,30	7.978	62,70	6.39
11,2	45,03	73,30	7.469	81,10	8.271	65,00	6.625
12,0	51,70	84,10	8.574	93,10	9.494	74,60	7.605
13,0	60,67	98,70	10.062	109,30	11.143	87,60	8.925
14,0	70,36	114,50	11.67	126,80	12.923	101,50	10.351
16,0	91,90	149,50	15.243	165,60	16.879	132,60	13.52
16,3	95,38	155,20	15.82	171,80	17.518	137,70	14.032
18,0	116,32	189,00	19.291	210,00	21.362	168,00	17.112
19,0	129,60	211,00	21.494	233,00	23.802	187,00	19.066
20,0	143,60	234,00	23.817	259,00	26.373	207,00	21.125
22,0	173,76	283,00	28.818	313,00	31.911	251,00	25.562
24,0	206,78	336,00	34.296	373,00	37.977	298,00	30.421
26,0	242,68	395,00	40.25	437,00	44.571	350,00	35.702
28,0	281,46	458,00	46.68	507,00	51.691	406,00	41.406
30,0	323,10	526,00	53.587	582,00	59.339	466,00	47.532
32,0	367,62	598,00	60.97	662,00	67.515	531,00	54.081
34,0	415,00	675,00	68.83	748,00	76.218	599,00	61.052
36,0	465,26	757,00	77.166	838,00	85.449	671,00	68.446
38,0	518,40	843,00	85.97	934,00	95.207	748,00	76.263
40,0	574,40	935,00	95.266	1.035,00	105.492	829,00	84.502
42,0	633,28	1.030,00	105.031	1.141,00	116.305	914,00	93.163
44,0	695,02	1.131,00	115.272	1.252,00	127.646	1.003,00	102.247
46,0	759,64	1.236,00	125.989	1.369,00	139.514	1.096,00	111.753
48,0	827,14	1.346,00	137.183	1.490,00	151.909	1.194,00	121.682
50,0	897,50	1.460,00	148.853	1.617,00	164.832	1.295,00	132.034
52,0	970,74	1.579,00	161	1.749,00	178.282	1.401,00	142.808

6x19F+FC



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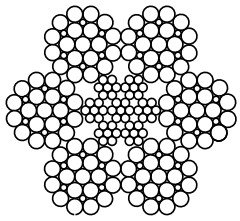
Engineering Wire Rope

Minimum Breaking Force Factor K = 0,356

Nominal Length Mass Factor W= 0,400

		1770		1960		1570(AISI)	
Diameter	kg/100M	kN	Kg	kN	Kg	kN	Kg
6,0	14,40	22,70	2.312	25,10	2.561	20,10	2.051
6,5	16,90	26,60	2.714	29,50	3.005	23,60	2.407
7,0	19,60	30,90	3.147	34,20	3.485	27,40	2.792
8,0	25,60	40,30	4.111	44,70	4.552	35,80	3.646
9,0	32,40	51,00	5.203	56,50	5.761	45,30	4.615
10,0	40,00	63,00	6.423	69,80	7.113	55,90	5.697
11,0	48,40	76,20	7.772	84,40	8.606	67,60	6.894
11,2	50,18	79,00	8.057	87,50	8.922	70,10	7.147
12,0	57,60	90,70	9.249	100,50	10.242	80,50	8.204
13,0	67,60	106,50	10.855	117,90	12.021	94,50	9.629
14,0	78,40	123,50	12.59	136,80	13.941	109,50	11.167
16,0	102,40	161,30	16.443	178,60	18.209	143,10	14.585
16,3	106,28	167,40	17.066	185,40	18.898	148,50	15.138
18,0	129,60	204,00	20.811	226,00	23.045	181,00	18.46
19,0	144,40	227,00	23.188	252,00	25.677	202,00	20.568
20,0	160,00	252,00	25.693	279,00	28.451	224,00	22.79
22,0	193,60	305,00	31.088	338,00	34.426	271,00	27.576
24,0	230,40	363,00	36.998	402,00	40.969	322,00	32.817
26,0	270,40	426,00	43.421	472,00	48.082	378,00	38.515
28,0	313,60	494,00	50.358	547,00	55.764	438,00	44.668
30,0	360,00	567,00	57.809	628,00	64.015	503,00	51.277
32,0	409,60	645,00	65.774	715,00	72.834	572,00	58.342
34,0	462,40	728,00	74.253	807,00	82.223	646,00	65.863
36,0	518,40	817,00	83.245	904,00	92.181	724,00	73.839
38,0	577,60	910,00	92.752	1.008,00	102.708	807,00	82.271
40,0	640,00	1.008,00	102.772	1.116,00	113.804	894,00	91.159
42,0	705,60	1.112,00	113.306	1.231,00	125.469	986,00	100.503
44,0	774,40	1.220,00	124.354	1.351,00	137.703	1.082,00	110.303
46,0	846,40	1.333,00	135.916	1.476,00	150.506	1.183,00	120.558
48,0	921,60	1.452,00	147.991	1.608,00	163.878	1.288,00	131.269
50,0	1.000,00	1.575,00	160.581	1.744,00	177.819	1.397,00	142.436
52,0	1.081,60	1.704,00	173.684	1.887,00	192.329	1.511,00	154.059

6x19F +IWRC



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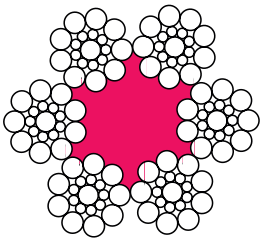
Engineering Wire Rope

6x19S+FC



Minimum Breaking Force Factor
K = 0,330

Nominal Length Mass Factor
W= 0,359

		1770		1960		1570 (AISI)	
Diameter	kg/100M	kN	Kg	kN	Kg	kN	Kg
6,0	12,92	21,00	2.143	23,30	2.374	18,70	1.901
6,5	15,17	24,70	2.516	27,30	2.786	21,90	2.231
7,0	17,59	28,60	2.918	31,70	3.231	25,40	2.588
8,0	22,98	37,40	3.811	41,40	4.22	33,20	3.38
9,0	29,08	47,30	4.823	52,40	5.341	42,00	4.278
10,0	35,90	58,40	5.954	64,70	6.593	51,80	5.281
11,0	43,44	70,70	7.204	78,30	7.978	62,70	6.39
11,2	45,03	73,30	7.469	81,10	8.271	65,00	6.625
12,0	51,70	84,10	8.574	93,10	9.494	74,60	7.605
13,0	60,67	98,70	10.062	109,30	11.143	87,60	8.925
14,0	70,36	114,50	11.67	126,80	12.923	101,50	10.351
16,0	91,90	149,50	15.243	165,60	16.879	132,60	13.52
16,3	95,38	155,20	15.82	171,80	17.518	137,70	14.032
18,0	116,32	189,00	19.291	210,00	21.362	168,00	17.112
19,0	129,60	211,00	21.494	233,00	23.802	187,00	19.066
20,0	143,60	234,00	23.817	259,00	26.373	207,00	21.125
22,0	173,76	283,00	28.818	313,00	31.911	251,00	25.562
24,0	206,78	336,00	34.296	373,00	37.977	298,00	30.421
26,0	242,68	395,00	40.25	437,00	44.571	350,00	35.702
28,0	281,46	458,00	46.68	507,00	51.691	406,00	41.406
30,0	323,10	526,00	53.587	582,00	59.339	466,00	47.532
32,0	367,62	598,00	60.97	662,00	67.515	531,00	54.081
34,0	415,00	675,00	68.83	748,00	76.218	599,00	61.052
36,0	465,26	757,00	77.166	838,00	85.449	671,00	68.446
38,0	518,40	843,00	85.978	934,00	95.207	748,00	76.263
40,0	574,40	935,00	95.266	1.035,00	105.492	829,00	84.502
42,0	633,28	1.030,00	105.031	1.141,00	116.305	914,00	93.163
44,0	695,02	1.131,00	115.272	1.252,00	127.646	1.003,00	102.247
46,0	759,64	1.236,00	125.989	1.369,00	139.514	1.096,00	111.753
48,0	827,14	1.346,00	137.183	1.490,00	151.909	1.194,00	121.682
50,0	897,50	1.460,00	148.853	1.617,00	164.832	1.295,00	132.034
52,0	970,74	1.579,00	161	1.749,00	178.282	1.401,00	142.808

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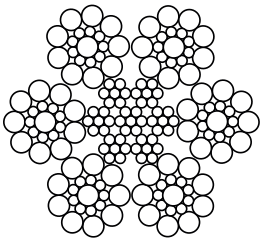
Engineering Wire Rope

6x19S+IWRC



Minimum Breaking Force Factor	Nominal Length Mass Factor
K = 0,356	W= 0,400

		1770		1960		1570 (AISI)	
Diameter	kg/100M	kN	Kg	kN	Kg	kN	Kg
6,0	14,40	22,70	2.312	25,10	2.561	20,10	2.051
6,5	16,90	26,60	2.714	29,50	3.005	23,60	2.407
7,0	19,60	30,90	3.147	34,20	3.485	27,40	2.792
8,0	25,60	40,30	4.111	44,70	4.552	35,80	3.646
9,0	32,40	51,00	5.203	56,50	5.761	45,30	4.615
10,0	40,00	63,00	6.423	69,80	7.113	55,90	5.697
11,0	48,40	76,20	7.772	84,40	8.606	67,60	6.894
11,2	50,18	79,00	8.057	87,50	8.922	70,10	7.147
12,0	57,60	90,70	9.249	100,50	10.242	80,50	8.204
13,0	67,60	106,50	10.855	117,90	12.021	94,50	9.629
14,0	78,40	123,50	12.59	136,80	13.941	109,50	11.167
16,0	102,40	161,30	16.443	178,60	18.209	143,10	14.585
16,3	106,28	167,40	17.066	185,40	18.898	148,50	15.138
18,0	129,60	204,00	20.811	226,00	23.045	181,00	18.46
19,0	144,40	227,00	23.188	252,00	25.677	202,00	20.568
20,0	160,00	252,00	25.693	279,00	28.451	224,00	22.79
22,0	193,60	305,00	31.088	338,00	34.426	271,00	27.576
24,0	230,40	363,00	36.998	402,00	40.969	322,00	32.817
26,0	270,40	426,00	43.421	472,00	48.082	378,00	38.515
28,0	313,60	494,00	50.358	547,00	55.764	438,00	44.668
30,0	360,00	567,00	57.809	628,00	64.015	503,00	51.277
32,0	409,60	645,00	65.774	715,00	72.834	572,00	58.342
34,0	462,40	728,00	74.253	807,00	82.223	646,00	65.863
36,0	518,40	817,00	83.245	904,00	92.181	724,00	73.839
38,0	577,60	910,00	92.752	1.008,00	102.708	807,00	82.271
40,0	640,00	1.008,00	102.772	1.116,00	113.804	894,00	91.159
42,0	705,60	1.112,00	113.306	1.231,00	125.469	986,00	100.503
44,0	774,40	1.220,00	124.354	1.351,00	137.703	1.082,00	110.303
46,0	846,40	1.333,00	135.916	1.476,00	150.506	1.183,00	120.558
48,0	921,60	1.452,00	147.991	1.608,00	163.878	1.288,00	131.269
50,0	1.000,00	1.575,00	160.581	1.744,00	177.819	1.397,00	142.436
52,0	1.081,60	1.704,00	173.684	1.887,00	192.329	1.511,00	154.059

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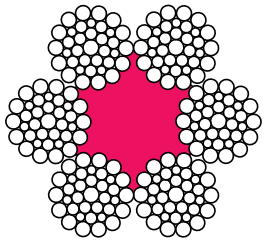
Engineering Wire Rope

6x36+FC



Minimum Breaking Force Factor
K = 0,330

Nominal Length Mass Factor
W= 0,367

		1770		1960		1570 (AISI)	
Diameter	kg/100M	kN	Kg	kN	Kg	kN	Kg
6,0	13,21	21,00	2.143	23,30	2.374	18,70	1.901
8,0	23,49	37,40	3.811	41,40	4.22	33,20	3.38
9,0	29,73	47,30	4.823	52,40	5.341	42,00	4.278
10,0	36,70	58,40	5.954	64,70	6.593	51,80	5.281
11,0	44,41	70,70	7.204	78,30	7.978	62,70	6.39
12,0	52,85	84,10	8.574	93,10	9.494	74,60	7.605
13,0	62,02	98,70	10.062	109,30	11.143	87,60	8.925
14,0	71,93	114,50	11.67	126,80	12.923	101,50	10.351
16,0	93,95	149,50	15.243	165,60	16.879	132,60	13.52
18,0	118,91	189,00	19.291	210,00	21.362	168,00	17.112
19,0	132,49	211,00	21.494	233,00	23.802	187,00	19.066
20,0	146,80	234,00	23.817	259,00	26.373	207,00	21.125
22,0	177,63	283,00	28.818	313,00	31.911	251,00	25.562
24,0	211,39	336,00	34.296	373,00	37.977	298,00	30.421
26,0	248,09	395,00	40.25	437,00	44.571	350,00	35.702
28,0	287,73	458,00	46.68	507,00	51.691	406,00	41.406
30,0	330,30	526,00	53.587	582,00	59.339	466,00	47.532
32,0	375,81	598,00	60.97	662,00	67.515	531,00	54.081
34,0	424,25	675,00	68.83	748,00	76.218	599,00	61.052
36,0	475,63	757,00	77.166	838,00	85.449	671,00	68.446
38,0	529,95	843,00	85.978	934,00	95.207	748,00	76.263
40,0	587,20	935,00	95.266	1.035,00	105.492	829,00	84.502
42,0	647,39	1.030,00	105.031	1.141,00	116.305	914,00	93.163
44,0	710,51	1.131,00	115.272	1.252,00	127.646	1.003,00	102.247
46,0	776,57	1.236,00	125.989	1.369,00	139.514	1.096,00	111.753
48,0	845,57	1.346,00	137.183	1.490,00	151.909	1.194,00	121.682
50,0	917,50	1.460,00	148.853	1.617,00	164.832	1.295,00	132.034
52,0	992,37	1.579,00	161.000	1.749,00	178.282	1.401,00	142.808

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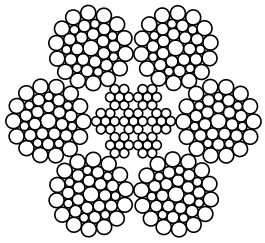
Engineering Wire Rope

6x36+IWRC



Minimum Breaking Force Factor
K = 0,356

Nominal Length Mass Factor
W= 0,409

		1770		1960		1570 (AISI)	
Diameter	kg/100M	kN	Kg	kN	Kg	kN	Kg
6,0	14,72	22,70	2.312	25,10	2.561	20,10	2.051
8,0	26,18	40,30	4.111	44,70	4.552	35,80	3.646
9,0	33,13	51,00	5.203	56,50	5.761	45,30	4.615
10,0	40,90	63,00	6.423	69,80	7.113	55,90	5.697
11,0	49,49	76,20	7.772	84,40	8.606	67,60	6.894
12,0	58,90	90,70	9.249	100,50	10.242	80,50	8.204
13,0	69,12	106,50	10.855	117,90	12.021	94,50	9.629
14,0	80,16	123,50	12.59	136,80	13.941	109,50	11.167
16,0	104,70	161,30	16.443	178,60	18.209	143,10	14.585
18,0	132,52	204,00	20.811	226,00	23.045	181,00	18.46
19,0	147,65	227,00	23.188	252,00	25.677	202,00	20.568
20,0	163,60	252,00	25.693	279,00	28.451	224,00	22.79
22,0	197,96	305,00	31.088	338,00	34.426	271,00	27.576
24,0	235,58	363,00	36.998	402,00	40.969	322,00	32.817
26,0	276,48	426,00	43.421	472,00	48.082	378,00	38.515
28,0	320,66	494,00	50.358	547,00	55.764	438,00	44.668
30,0	368,10	567,00	57.809	628,00	64.015	503,00	51.277
32,0	418,82	645,00	65.774	715,00	72.834	572,00	58.342
34,0	472,80	728,00	74.253	807,00	82.223	646,00	65.863
36,0	530,06	817,00	83.245	904,00	92.181	724,00	73.839
38,0	590,60	910,00	92.752	1.008,00	102.708	807,00	82.271
40,0	654,40	1.008,00	102.772	1.116,00	113.804	894,00	91.159
42,0	721,48	1.112,00	113.306	1.231,00	125.469	986,00	100.503
44,0	791,82	1.220,00	124.354	1.351,00	137.703	1.082,00	110.303
46,0	865,44	1.333,00	135.916	1.476,00	150.506	1.183,00	120.558
48,0	942,34	1.452,00	147.991	1.608,00	163.878	1.288,00	131.269
50,0	1.022,50	1.575,00	160.581	1.744,00	177.819	1.397,00	142.436
52,0	1.105,94	1.704,00	173.684	1.887,00	192.329	1.511,00	154.059

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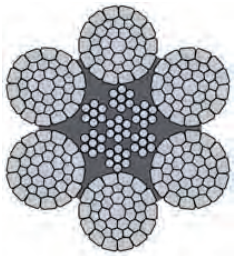
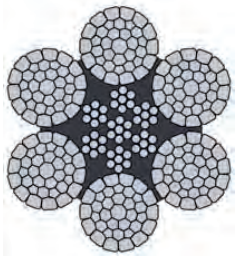
PowerForm® 6/6P

- Powerform 6 is a high strength rugged six strand rope ideal for situations where longer service life is required
- A sample of rope from each production batch is tested to destruction in order to confirm' compliance with catalogue breaking force values .
- Powerform" 6 can be substituted for any six strand construction to improve service life e and reduce total cost.
- High fatigue life resulting from the unique compaction process.
- Maximum resistance to crushing Recommended for multi-layer spooling operations.
- Increased abrasion resistance resulting from the unique compaction process.
- Fully lubricated in manufacturing.
- Optional plastic impregnation (P) signifies full plastic impregnation of the steel core Standard



PowerForm® 6



PowerForm® 6P

Standard Characteristics Powerform® 6/6P		
Construction	6xK36SW(14-7+7-7-1)-CWR 6xK41SW(16+8+8-8-1)-CWR	
Compacted	Yes	No
	◆	
Tensile Grade N/mm²	1770	1960
	◆	◆
Finish	Bright	Galvanised
	◆	◆
Lay Direction	Right Hand	Left Hand
	◆	◆
Lay Type	Ordinary	Langs
	◆	
Average Fill Factor (%)	67.5	
Turn value at 20% of breaking force degrees/rope lay	58	
Nominal rope lay length (NRD = Nominal Rope Diameter)	6.5 x NRD	
Discard Criteria	Refer to ISO 4309:1990	

Warning : Powerform® 6/6P in Langs lay must only be used in applications where both ends are secured and are unable to rotate.

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PowerForm® 6/6P

NOM ROPE DIA. mm	.NOM. ROPE DIA. in	APPROX.* MASS kg/100m	MINIMUM BREAKING FORCE GALVANISED & UNGALVANISED ROPE GRADE			
			1960 N/mm2		2160 N/mm2	
			kN	tonnes	kN	tonnes
10		46.4	69.5	7.1	85.7	8.7
11		56.1	83.8	8.5	98.6	10.1
12		66.8	100.0	10.2	114.0	11.6
	½	74.8	113.0	11.5	140.0	14.3
13		78.4	118.0	12.0	147.0	15.0
14		90.9	137.0	14.0	170.0	17.3
15		104.0	157.0	16.0	195.0	19.9
16	5/8	119.0	178.0	18.1	218.0	22.2
17		134.0	201.0	20.5	246.0	25.1
18		150.0	225.0	22.9	276.0	28.1
19	3/4	168.0	251.0	25.6	304.0	31.0
20		186.0	278.0	28.3	335.0.	34.1
22		225.0	336.0	34.3	400.0	40.8
	7/8	229.0	343.0	35.0	408.0	41.6
24		267.0	400.0	40.8	489.0	49.8
	1	299.0	449.0	45.8	552.0	56.3
26		314.0	470.0	47.9	578.0	58.9
28		364.0	545.0	55.6	657.0	67.0
30		418.0	626.0	63.8	757.0	77.2
32	1-1/4	475.0	712.0	72.6	846.0	86.2
34		518.0	804.0	82.0	916.0	93.4
36		581.0	901.0	91.8	1065.0	109.0
38	11/2	647.0	1004.0	102.0	1165.0	119.0
40		717.0	1112.0	113.0	1295.0	132.0
42		790.0	1226.0	125.0	1425.0	145.0
44		867.0	1246.0	127.0	1505.0	153.0
46		948.0	1362.0	139.0	1665.0	170.0
48		1032.0	1483.0	151.0	1885.0	192.0
50		1120.0	1609.0	164.0	1975.0	201.0
52		1211.0	1741.0	177.0	2135.0	218.0
54		1306.0	1877.0	191.0	2325.0	237.0
56		1405.0	2019.0	206.0	2475.0	252.0
58		1507.0	2166.0	221.0	2650.0	270.0
60		1613.0	2317.0	236.0	2810.0	286.0

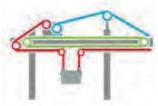
* Mass per unit length of POWERFORM 6P increases by approx. 3%

Note: Rope Sizes and Breaking Force not shown in the standard table, may be available on request and prior confirmation.

POWERFORM 6P is available only for 16 mm and above on special request and prior confirmation.

Typical Applications

CONTAINER



MAIN HOIST
BOOM HOIST
TROLLEY

LATTICE BOOM

MAIN HOIST *
BOOM HOIST

DOCKSIDE

BOOM HOIST

STEELWORKS LADLE

MAIN HOIST

OFFSHORE PEDESTAL

BOOM HOIST

UNLOADER

MAIN HOIST
BOOM HOIST
RACKING

BOOM HOIST
MAIN HOIST
RACKING/
TROLLEY

* For higher lifting heights a rotation resistant rope should be selected

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DEALERS IN LIFTING EQUIPMENTS

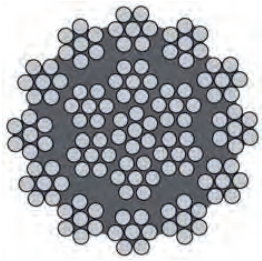
Pundol Apartments, Shop No. 5 & 6,160 M.G. Road, Pune - 411001. (India)

Tel. : +91 - 20 - 6708 8100 **Fax** : +91 - 20 - 6708 8101

Email : sales@safelifters.com **Website** : www.safelifters.com

HYFLEX 18

- Hyflex 18 is a high quality rotation resistant hoist rope.
- Good resistance to rotation verified by testing on the in-house torque/turn machine.
- Consistent performance.
- Fully lubricated in manufacturing.
- Also available in fibre core construction.
- A sample of rope from each production batch is tested to destruction in order to confirm compliance with catalogue breaking force values.



Hyflex 18

Standard Characteristics Hyflex 18		
Construction	18x7(12x7:6x7-1x7)	
Compacted	Yes	No
		◆
Tensile Grade N/mm^2	1960	2160
	◆	◆
Finish	Bright	Galvanised
		◆
Lay Direction	Right Hand	Left Hand
	◆	
Lay Type	Ordinary	Langs
		◆
Average Fill Factor (%)	61.5	
Turn value at 20% of breaking force degrees/rope lay	5	
Nominal rope lay length (NRD = Nominal Rope Diameter)	6.25 x NRD	
Discard Criteria	Refer to ISO 4309:1990	

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HYFLEX 18

NOM. ROPE DIA. mm	NOM. ROPE DIA. in	APPROX. MASS kg/100m	MINIMUM BREAKING FORCE GALVANISED & UNGALVANISED ROPE GRADE			
			1960 N/mm²		2160 N/mm²	
			kN	tonnes	kN	tonnes
6		14.6	25.0	2.5	27.0	2.8
7		19.9	34.0	3.5	36.7	3.7
8		26.0	45.0	4.6	48.6	5.0
9		32.9	56.5	5.8	61.0	6.2
10		40.6	70.0	7.1	75.6	7.7
11		49.1	84.0	8.6	90.7	9.2
12		58.5	101	10.3	109	11.1
	1/2	65.5	113	11.5	121	12.3
13		68.6	118	12.0	127	12.9
14		79.6	137	14.0	148	15.1
15		91.4	157	16.0	169	17.2
16	5/8	104	180	18.3	194	19.8
17		117	203	20.7	219	22.3
18		132	226	23.0	244	24.9
	3/4	147	253	25.8	273	27.8
20		162	279	28.4	301	30.7
22		197	339	34.6	366	37.3
	7/8	201	346	35.3	374	38.1

Note: Rope Sizes and Breaking Force not shown in the standard table, may be available on request and prior confirmation.

Typical Applications

MAIN HOIST ■

Note : For higher lifting heights, consideration should be given to using a 35x7 construction with improved rotational characteristics.

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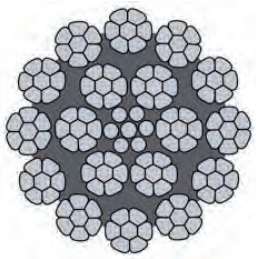
POWERFORM®18

- Powerform® 18 is a high strength rotation resistant hoist rope.
- A sample of rope from each production batch is tested to destruction in order to confirm compliance with catalogue breaking force values.
- Good resistance to rotation verified by testing on the in-house torque/turn machine.
- Suitable for use on single part and multi-part hoist reeving systems.
- High fatigue life resulting from the unique compaction process.
- Increased resistance to crushing. Recommended for multi-layer spooling operations.
- Increased abrasion resistance resulting from the unique compaction process.
- Fully lubricated in manufacturing.



Powerform® 18

Standard Characteristics Powerform® 18			
Construction	6mm-19mm	18xK7(12xK7:6xK7-1x7)	
	20mm-32mm	18xK19S(12xK19S:6xK19S -1x19S)	
Compacted		Yes	No
		◆	
Tensile Grade N/mm²		1960	2160
		◆	
Finish		Bright	Galvanised
			◆
Lay Direction		Right Hand	Left Hand
		◆	
Lay Type		Ordinary	Langs
			◆
Average Fill Factor (%)		66.3	
Turn value at 20% of breaking force degrees/rope lay		4	
Nominal rope lay length (NRD = Nominal Rope Diameter)		6.25 x NRD	
Discard Criteria		Refer to ISO 4309:1990	

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POWERFORM®18

NOM. ROPE DIA. mm	NOM. ROPE DIA. in	APPROX. MASS kg/100m	MINIMUM BREAKING FORCE GALVANISED & UNGALVANISED ROPE GRADE			
			1960 N/mm²		2160 N/mm²	
			kN	tonnes	kN	tonnes
6		17.5	29.4	3.0		
7		23.8	38.0	3.9		
8		31.0	51.8	5.3		
9		39.3	64.6	6.6		
10		48.5	80.8	8.2		
11		58.7	101.0	10.3	111	11.3
12		69.8	116.0	11.8	127	12.9
	1/2	78.2	135.0	13.8	148	15.1
13		82.0	141.0	14.4	155	15.8
14		95.1	160.0	16.3	177	18.0
15		109.0	182.0	18.6	201	20.5
16	5/8	124.0	209.0	21.3	232	23.6
17		140.0	237.0	24.2	262	26.7
18		157.0	266.0	27.1	295	30.1
	3/4	175.0	291.0	29.7	322	32.8
20		194.0	320.0	32.6	359	36.6
22		235.0	379.0	38.6	424	43.2
	7/8	240.0	387.0	39.4	433	44.1
24		279.0	462.0	47.1	523	53.3
	1	313.0	517.0	52.7	585	59.6
26		328.0	542.0	55.2	613	62.5
28		380.0	632.0	64.4	710	72.4
30		437.0	721.0	73.5	809	82.5
32	1-1/4	497.0	820.0	83.6	920	93.8

Note: Rope Sizes and Breaking Force not shown in the standard table, may be available on request and prior confirmation.

Typical Applications

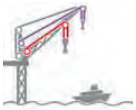
MOBILE

MAIN HOIST

DOCKSIDE

MAIN HOIST

OFFSHORE PEDESTAL



MAIN HOIST
WHIP HOIST

MAIN HOIST ■
WHIP HOIST ■

Note : For higher lifting heights consideration should be given to using a 35x7 construction with improved rotational characteristics.

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DEALERS IN LIFTING EQUIPMENTS

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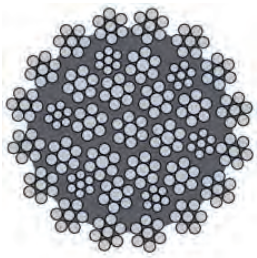
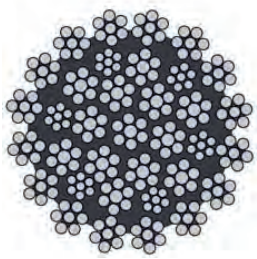
Email : sales@safelifters.com **Website** : www.safelifters.com

HYFLEX 35/35P

- Hyflex 35 is a high strength flexible hoist rope.
- Maximum resistance to rotation verified by testing on the in-house torque/turn machine.
- Suitable for use on single part and multi-part hoist reeving systems.
- Langs lay construction offers maximum resistance to wear.
- A sample of rope from each production batch is tested to destruction in order to confirm
- compliance with catalogue breaking force values.
- Optional plastic impregnation (P) signifies full plastic impregnation of the steel core.
- Fully lubricated in manufacturing.



Hyflex 35



Hyflex 35P

Standard Characteristics Hyflex 35		
Construction	35x7(16x7:6x7+6x7-6x7-1x7)	
Compacted	Yes	No
		◆
Tensile Grade N/mm²	1960	2160
		◆
Finish	Bright	Galvanised
		◆
Lay Direction	Right Hand	Left Hand
	◆	
Lay Type	Ordinary	Langs
	◆	◆
Average Fill Factor (%)	63.5	
Turn value at 20% of breaking force degrees/rope lay	0.2	
Nominal rope lay length (NRD = Nominal Rope Diameter)	6.0 x NRD	
Discard Criteria	Refer to ISO 4309:1990	

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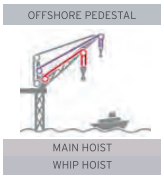
HYFLEX 35/35P

NOM. ROPE DIA. mm	NOM. ROPE DIA. in	APPROX.* MASS kg/100m	MINIMUM BREAKING FORCE GALVANISED & UNGALVANISED ROPE GRADE			
			1960 N/mm²		2160 N/mm²	
			kN	tonnes	kN	tonnes
10		44.8	76	7.7	86.5	8.8
11		54.2	91	9.3	104.0	10.6
12		64.5	107	10.9	125.0	12.7
	1/2	72.0	123	12.5	137.0	14.0
13		76.0	128	13.0	146.0	14.9
14		88.0	148	15.1	168.0	17.1
16	5/8	115.0	194	19.8	221.0	22.5
18		145.0	242	24.7	277.0	28.2
19	3/4	162.0	277	28.2	312.0	31.8
20		179.0	301	30.7	337.0	34.4
21		198.0	335	34.1	370.0	37.7
22		217.0	370	37.7	412.0	42.0
	7/8	221.0	376	38.3	418.0	42.6
24		258.0	441	45.0	498.0	50.8
	1	289.0	491	50.1	546.0	55.7
26		303.0	517	52.7	581.0	59.2
28		351.0	599	61.1	681.0	69.4
	1-1/8	366.0	621	63.3	704.0	71.8
30		403.0	679	69.2	775.0	79.0
32	1-1/4	459.0	769	78.4	865.0	88.2
35	1-3/8	549.0	945	96.3	1044.0	106.0
36		581.0	983	100.0	1085.0	111.0
38	1-1/2	647.0	1078	110.0	1205.0	123.0
40		717.0	1202	123.0	1335.0	136.0
42		790.0	1227	125.0		
44		867.0	1347	137.0		
	1-3/4	885.0	1375	140.0		
46		948.0	1472	150.0		
48		1032.0	1603	163.0		
50		1120.0	1740	177.0		
	2	1156.0	1796	183.0		
52		1211.0	1881	192.0		

* Mass per unit length of HYFLEX 35P increases by approx. 3%

Note:
- HYFLEX 35P is available on special request and prior confirmation.
- Rope Sizes and Breaking Force not shown in the standard table, may be available on request and prior confirmation.

Typical Applications



MAIN HOIST ■
WHIP HOIST ■

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DEALERS IN LIFTING EQUIPMENTS

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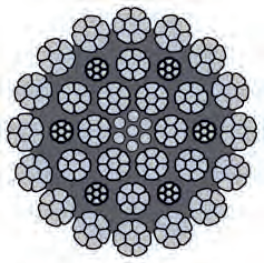
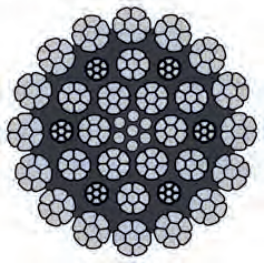
Email : sales@safelifters.com **Website** : www.safelifters.com

POWERFORM®35/35P

- Powerform® 35/35P has the highest strength of all low rotation hoist ropes.
- A sample of rope from each production batch is tested to destruction in order to confirm compliance with catalogue breaking force values.
- Maximum resistance to rotation.
- Suitable for use on single part and multi-part hoist reeving systems.
- High fatigue life resulting from the unique compaction process.
- Increased resistance to crushing. Recommended for multi-layer spooling operations.
- Increased abrasion resistance resulting from the unique compaction process.
- Optional plastic impregnation. (P) signifies full plastic impregnation of the Steel Core.
- Fully lubricated in manufacturing.



Powerform® 35



Powerform® 35P

Standard Characteristics Powerform® 35/35P			
Construction	10mm-40mm	35xK7(16xK7:6xK7+6xK7-6xK7-1x7)	
	42mm-60mm	35xK19S(16xK19S:6xK19S+6xK19S-6xK19S-1x19S)	
Compacted		Yes	No
		◆	
Tensile Grade N/mm2		1960	2160
		◆	◆
Finish		Bright	Galvanised
		◆	◆
Lay Direction		Right Hand	Left Hand
		◆	
Lay Type		Ordinary	Langs
			◆
Average Fill Factor (%)		74.5	
Turn value at 20% of breaking force degrees/rope lay		0.2	
Nominal rope lay length (NRD = Nominal Rope Diameter)		6.0 x NRD	
Discard Criteria		Refer to ISO 4309:1990	

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POWERFORM 35/35P

NOM. ROPE DIA. mm	NOM. ROPE DIA. in	APPROX.* MASS kg/100m	MINIMUM BREAKING FORCE GALVANISED & UNGALVANISED ROPE GRADE			
			1960 N/mm²		2160 N/mm²	
			kN	tonnes	kN	tonnes
	1/2	81.1	148	15.1	160	16.3
13		85.0	155	15.8	167	17.0
14		98.6	180	18.3	192	19.6
16	5/8	129	233	23.8	252	25.7
18		163	300	30.6	321	32.7
19	3/4	182	331	33.7	358	36.
20		201	372	37.9	399	40.7
21		222	402	41.0	434	44.2
22		243	444	45.3	484	49.3
	7/8	249	453	46.2	490	49.9
24		290	531	54.1	572	58.3
	1	325	591	60.2	640	65.2
26		340	621	63.3	661	67.4
28		394	720	73.4	788	80.3
	1-1/8	411	748	76.2	810	82.6
30		453	827	84.3	904	92.2
32	1-1/4	515	944	96.2	1035	106.0
35	1-3/8	616	1125	115.0	1216	124.0
36		652	1185	121.0	1286	131.0
38	1-1/2	726	1326	135.0	1437	146.0
40		805	1477	151.0	1588	162.0
42		887	1485	151.0		
44		974	1618	165.0		
	1-3/4	994	1646	168.0		
46		1064	1765	180.0		
48		1159	1935	197.0		
50		1258	2078	212.0		
	2	1298	2150	219.0		
52		1360	2256	230.0		

* Mass per unit length of POWERFORM 35P increases by approx. 3%

Note:
- POWERFORM 35P is available on special request and prior confirmation.
- Rope Sizes and Breaking Force not shown in the standard table, may be available on request and prior confirmation.

Typical Applications

MOBILE

MAIN HOIST

TOWER

MAIN HOIST

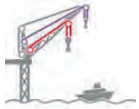
LATTICE BOOM

MAIN HOIST

DOCKSIDE

MAIN HOIST

OFFSHORE PEDESTAL



MAIN HOIST
WHIP HOIST

MAIN HOIST ■
WHIP HOIST ■