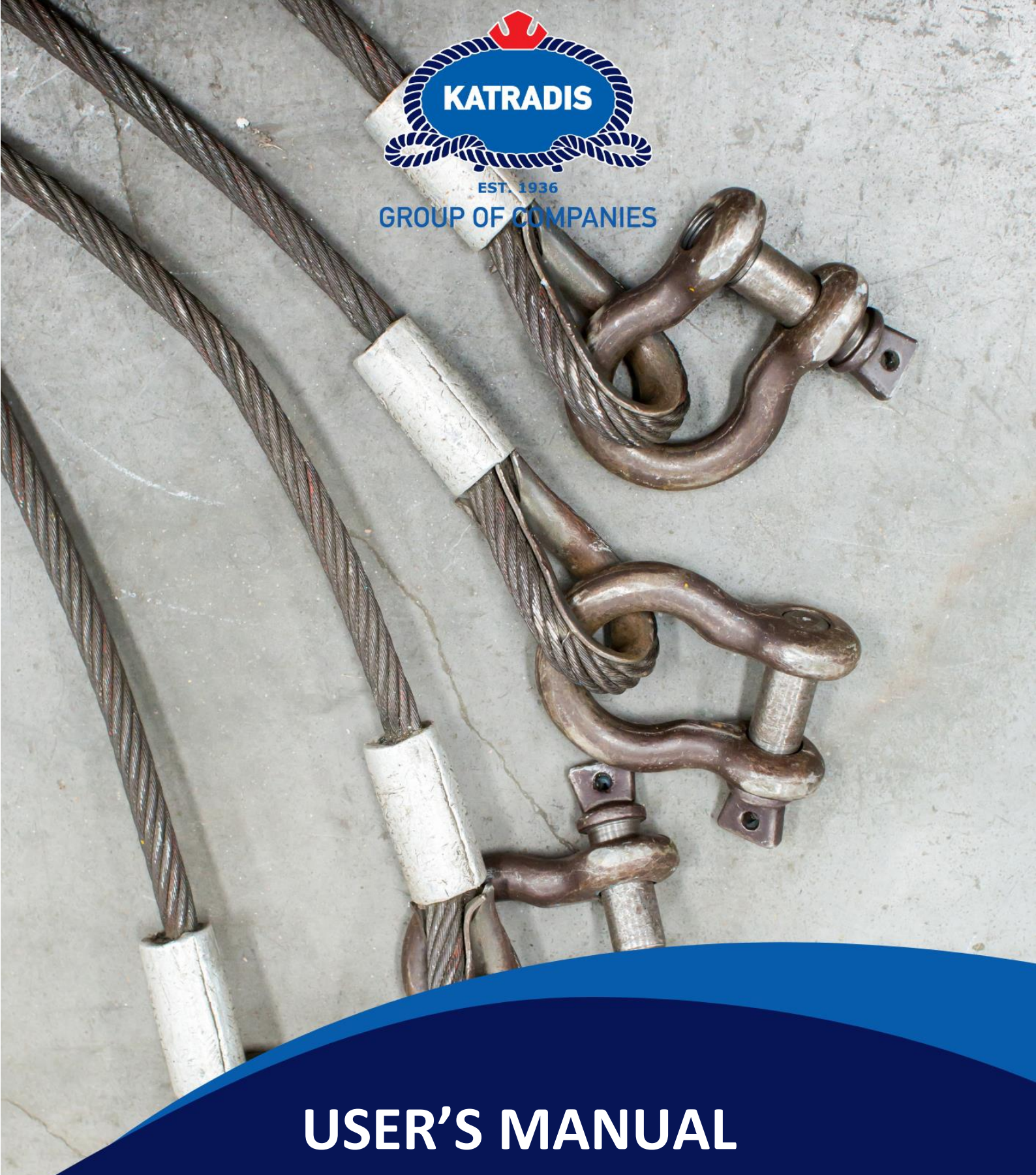

KATRADIS

EST. 1936

GROUP OF COMPANIES

USER'S MANUAL

Steel Wire Rope Sling

KATRADIS GROUP OF COMPANIES

MANUFACTURER OF SYNTHETIC, HMPE ROPES & SACRIFICIAL ANODES

PROVIDER OF WIRE ROPES, ANCHORS & CHAINS, VESSEL DECK EQUIPMENT, PORT EQUIPMENT

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PLANT : Athinon - Lamias National Rd (69.2 km, Schimatari 320 09 Tel. (+30) 2262 071279, Mail: info@katradis.com

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Steel Wire Rope Sling use and maintenance information

Steel wire rope slings are essential tools for general lifting applications. As with all tools, they require a minimum level of knowledge from the user in order to effectively complete the tasks required by them. Maintenance and storage are equally vital for safe operations until their discard.

Factors to take into consideration:

Temperatures affect the working load limit of any wire rope slings as per the table below which must be taken into consideration when a sling is called to operate at elevated temperatures:

Percentage of WLL reduction compared to normal temperature operation:

Termination type	Ferrule material	Rope core	Reduction of working load limit expressed as % of the WLL of the sling					
			Temperature, t, ^{0}c					
			40<t<100	100<t<150	150<t<200	200<t<300	300<t<400	T>400
Turn back eye	Aluminium	Fiber	100	Do not use	Do not use	Do not use	Do not use	Do not use
Turn back eye	Aluminium	Steel	100	100	Do not use	Do not use	Do not use	Do not use
Flemish eye	Steel	Fiber	100	Do not use	Do not use	Do not use	Do not use	Do not use
Flemish eye	Steel	Steel	100	100	90	75	65	Do not use
Hand splice	-	Fiber	100	Do not use	Do not use	Do not use	Do not use	Do not use
Hand splice	-	Steel	100	100	90	75	65	Do not use

The above reductions in the WLL of the wire rope slings are not permanent. Once the slings return to ambient temperature the WLL's are restored. Wire rope slings are not adversely affected by temperatures down to -40^0 C and no reduction to the WLL is necessary. For temperatures below -40^0 c please consult with us.

Wire rope slings should not be used either immersed in acidic solutions or exposed to acid fumes. Attention must be paid to the fact that certain production processes involve acidic solutions, fumes and sprays in which case expert consultation is needed.

Advice must also be sought in the case of slings exposed to chemicals combined with high temperatures.

Slings for general lifting applications exclude hazardous conditions including offshore activities, lifting of persons and lifting of potentially dangerous loads such as molten metals, corrosive materials or fissile materials. In such cases the degree of hazard must be assessed by a competent person and the working load limit adjusted accordingly.

Before taken into use:
Before first use of the wire rope sling, please ensure that:

1) The sling is precisely as ordered
2) The manufacturer's certificate is available at hand
3) The identification and WLL marking on the sling correspond to the information in the certificate
4) Full details of the slings are recorded in a register of slings
5) The actual use is to be as intended

Safe use for the wire rope sling:

Before starting the lift, please ensure that the load is free to move and not bolted down or obstructed in any way.

Special packing may be required where a rope may be come into contact with a load in order to protect either the rope or the load or both, since sharp corners of hard material may bend or damage the rope or the rope damages the load due to the high contact pressure. Corner protection must be used to prevent such damage.

A tag line is recommended in order to prevent dangerous swaying of the load.

Special note: when loads are accelerated or decelerated, dynamic forces (shock loading) occur which increase the stresses in the rope. Such situations (which must definitely be avoided), arise from snatch or shock loading, ie when not taking up the slack rope before starting to lift or sudden stop during unloading etc.

Very essential is to know the exact mass of the load to be lifted before the lifting starts.

Stability of the load:
It is assumed that the attachment point of the hook is directly above the center of gravity of the load. The following conditions must be met for loads with attachment points:

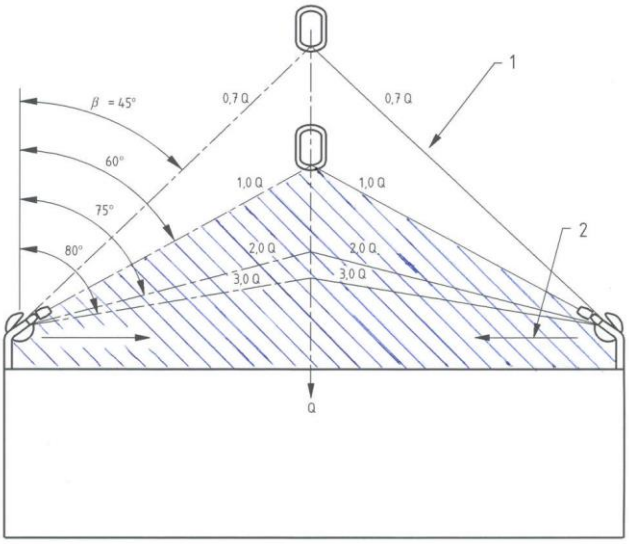
1) For single leg and single endless wire rope slings the attachment point should be vertically above the center of gravity
2) For two leg wire rope slings the attachment points should be in either side of and above the center of gravity
3) For three and four leg wire rope slings the attachment points should be distributed in plan around the center of gravity. It is preferable that the distribution should be equal (see symmetry in loading below) and that the attachment points are above the center of gravity

If the attachment points in 1) or 2) above are at or below the center of gravity, other lifting arrangements must be used.

Angles for multi leg slings:

When using two, three and four leg wire rope slings the attachment points and sling configuration must be selected to achieve angles between the sling legs and the vertical within the range marked on the sling. Preferably all the angles to the vertical (β in the figure below) should be equal (see also below "symmetry"). Angles to the vertical less than 15^0 must be avoided, if possible, as they present a significantly greater risk of load imbalance.

All multi leg slings exert a horizontal component of force (see figure below) which increases as the angle between the legs increases. Care must be taken so that it is ensued that the load to be moved can resist this horizontal component of force ("squeeze" or "pressure" effect) without being damaged.



1. LOADING OF LEG
2. HORIZONTAL COMPONENT OF FORCE

HATCHED AREA: NOT COVERED BY TAG

THE HATCHED AREA INDICATES ANGLES GREATER THAN 60^0 TO THE VERTICAL FOR WHICH WIRE ROPE SLINGS ARE NOT INTENDED TO BE USED.

VARIATION OF WIRE ROPE SLING LEG LOADING WITH LEG ANGLE FOR A LOAD OF Q

Connection method:
A wire rope sling is usually attached to the load and the lifting machine by means of terminal fittings. Sling legs must not be twisted or knotted. The lifting point must be seated well down in a hook, never on the point or wedged in the opening the sling hook must be free to incline in any direction so as to avoid bending. For the same reason, the terminal fitting must be free to incline in any direction on the hook to which it is fitted.

The rope may be passed under or through the load to form a choke hitch or basket hitch (see figures below). When using basket hitch method and where it is necessary, due to the danger of the load tilting, to use more than one sling, this should preferably be done in conjunction with a lifting beam having two upper connections to the crane hook.

When a wire rope sling is used in a choke hitch, the rope must be allowed to assume its natural angle and must not be hammered down.

When attaching the sling to the lifting hook, please make sure that there is adequate clearance to permit articulation and to prevent damage to the sling. Slings must never be hammered, wedged or forced into position. If there is not sufficient clearance, please fit a shackle between the sling and the hook.

In order to prevent the formation of kinks and subsequent weakening of the rope of slings having soft eye terminations, please make sure that the effective diameter of the shackle pin/hook is at least twice the diameter of the rope.

In the case of a multi-leg sling, the tip of a sling hook should be directed outwards. No rope should be wrapped around a crane hook.

Sling legs may be attached to the load in several ways:

1) straight leg:
In this case lower terminals are connected directly to the attachment points. Selection of hooks and attachment points must be such that the load is carried in the seat of the hook and tip loading of the hook is avoided.

2) choke hitch:
In this case sling legs are passed through or under the load and the lower terminal back hooked or reeved onto the rope (see figure below). A single leg sling may also be used in a double choke hitch (see figure below). This method can, therefore, be used where no suitable attachment points are available and has the additional advantage that the wire rope sling legs tend to bind the load together.
Where choke hitch is employed, the working load limit of the sling should be no more than 80% of that marked on it.

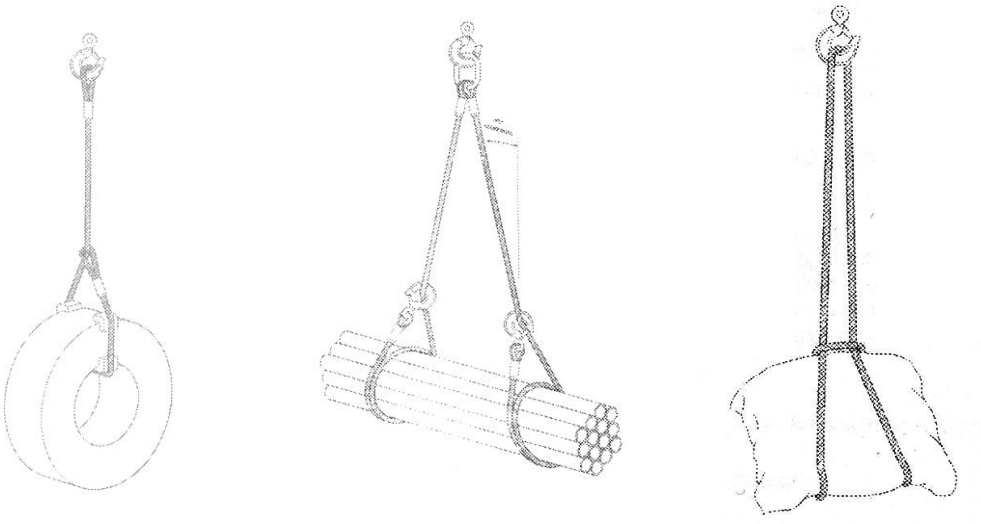
If two or more wire rope sling legs are used in a choke hitch or a double choke hitch, special care should be exerted so that:

A. If it is important, to avoid imparting a torque to the load, to align the chokes or
B. If it is important, to avoid the load rolling or moving laterally when first lifted, to ensure that (at least) one leg passes either side of the load.

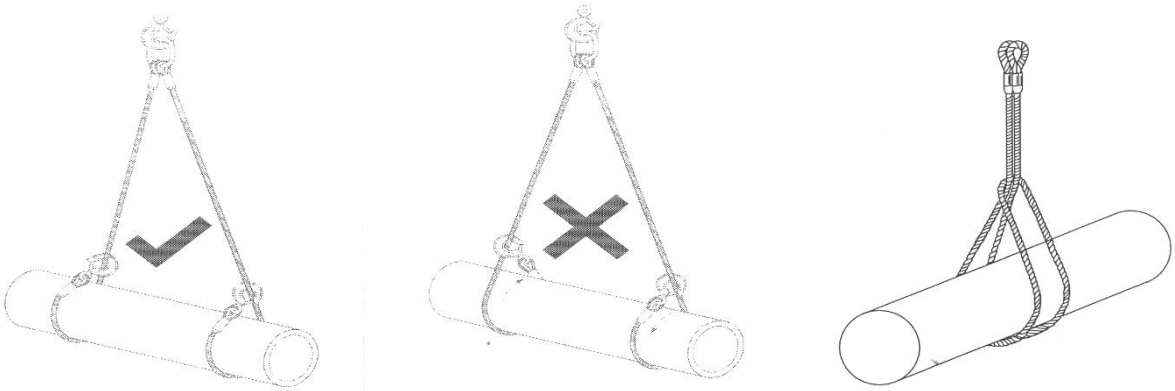
When endless slings are used, they must be placed in such a way that any joining ferrules or splices are in the free length of the sling.

3) basket hitch:
There are two methods of forming a basket hitch; passing a single sling through a load or wrapping two slings around the load. The second method is not suitable where the slings are able to move towards each other when the load is lifted or when lifting loads which are not held together such as loose bundles; a choke hitch is preferred. Examples as shown in the figures below.

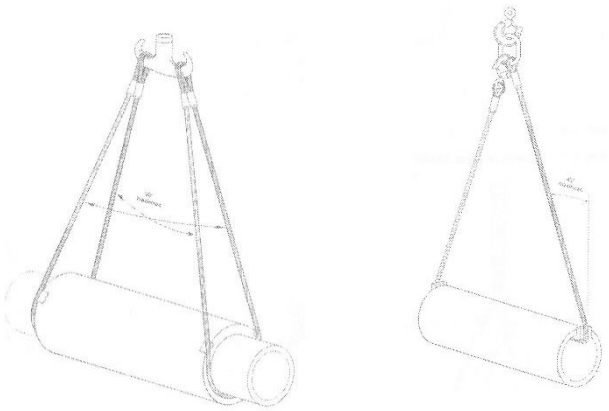
Choke hitches (single and double)



Choke hitches (single and double) (cont'd)



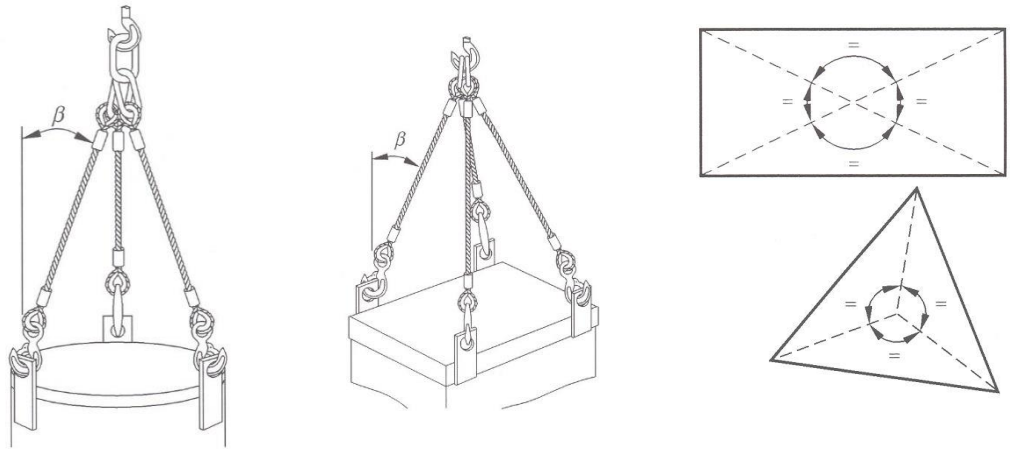
Basket hitches:



Symmetry of loading:

The working load limits given in EN 13414-1 for the wire rope slings have been determined on the basis that the loading of the slings is symmetrical. This means that when the load is lifted, the wire rope sling legs are symmetrically arranged in plan and subtend the same angles to the vertical (see figure below).

In the case of three wire rope leg slings, if the legs are not symmetrically arranged in plan, the greatest tension will be in the leg where the sum of the plan angles to the adjacent legs is greatest. The same effect will occur in 4 leg wire rope slings except that the rigidity of the load should also be taken into account. With a rigid load the majority of the mass must be assumed to be taken by only three or even two legs with the remaining leg or legs serving only to balance the load (see figure below)



In the case of two, three and four-leg wire rope slings, if the legs subtend different angles to the vertical, the greatest tension will be in the leg with the smallest angle to the vertical. In the extreme case, if one leg is vertical, it will carry all the load

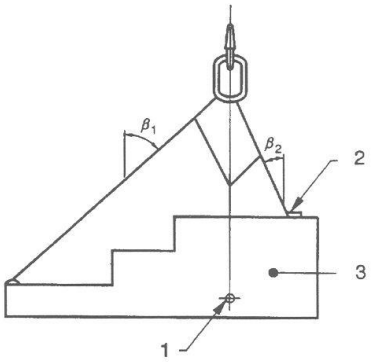
If there is a lack of symmetry in plan and unequal angles to the vertical, the two effects will combine and may either be cumulative or tend to negate each other; but if the following is satisfied, the loading can be assumed to be symmetric providing the load to be lifted does not exceed 80% of the marked WLL:

A) Wire rope sling leg angles to the vertical are all not less than 15^0; and
B) Wire rope sling leg angles to the vertical are all within 15^0 to each other; and
C) In the case of three and four wire rope slings, the sum of the plan angles to the adjacent legs is within 15^0 of each other.

If not all of the above parameters are satisfied then the loading should be considered as asymmetric and the lift referred to a competent person to establish the safe working load for the wire rope sling. Alternatively, in the case of asymmetric loading, the wire rope sling should be rated at half the marked WLL.

If during a test lift the load is unstable, it should be lowered and the slinging arrangement changed.

Asymmetric loading:



1. CENTER OF GRAVITY
2. HIGH LOAD IN THIS LEG
3. LOAD *P*

Safety of lift:
Hands and other parts of the body should be kept away from the sling to prevent injury as the slack is taken up. When ready to lift, the slack should be taken up until the rope is taut. The load should be raised slightly and a check made that it is secure and assumes the position intended. Persons undertaking the lift should be aware of the potential hazards associated with the load tilting or swaying. This is especially important with basket or other loose hitches where friction retains the load.

Multi leg wire rope slings with less than the full number of legs in use:

As a general principle, wire rope slings must only be used for the purpose for which they have been designed. In practice, however, occasions may arise when a lift needs to be made using a smaller number of legs than the number of legs in the sling. In such cases the WLL must be reduced from that marked on the sling by applying the relevant factor given in the following table.

Legs that are not in use must be hooked back in order to reduce the risk of such legs swinging freely, or snagging when the load is moved.

Working load limit (WLL) factors

Types of sling	Number of legs used	Factor to apply to the marked WLL
Two leg	1	½
Three and four leg	2	2/3
Three and four leg	1	1/3

Taking into consideration all the above and the cumulative effects of de-rating, the method of slinging must be decided and a suitable wire rope sling(s) selected so that the mass to be lifted does not exceed the WLL.

Landing the load:

The landing site should be prepared. It must be ensured that the ground or floor is of adequate strength to take the load taking account of any voids, ducts, pipes etc which may be damaged or collapse. It must also be ensured that there is adequate access to the site and that it is clear of any unnecessary obstacles and people. It is preferable to use timber bearers or similar material to avoid trapping the sling or to protect the floor or load or to ensure the stability of the load when landed.

The load should be landed carefully ensuring that hands and feet are kept clear. Care should be taken to avoid trapping the wire rope sling beneath the load as this may damage it. Before allowing the rope to become slack, the load should be checked to ensure that it is properly supported and stable. This is especially important when several loose objects are in a basket hitch and choke hitch. When the load is safely landed, the wire rope sling should be carefully removed to avoid damage or snagging or cause the load to topple over. The load should not be rolled off the sling as this may damage the sling.

Storage of wire rope slings:

When not in use, wire rope slings should normally be kept on a properly designed rack. They should not be left lying on the ground where they may be damaged.

If the wire rope slings are to be left suspended from a crane hook, the sling hooks should be engaged in an upper link to reduce the risk of sling legs swinging freely or snagging.

If it is likely that wire rope slings will be out of use for some time they should be cleaned, dried and protected from corrosion, ie lightly oiled.

Inspection, thorough examination and maintenance:

General data:
During service, wire rope slings are subjected to conditions that affect their safety. It is therefore necessary to ensure, as far as is reasonably practicable, that the sling is safe for continued use.

The sling must be inspected for any obvious signs of deterioration before each use. If at any time there is reason to doubt the safe condition of the sling, it must be withdrawn from service and subjected to a thorough examination. If the tag or label identifying the sling and its working load limit becomes detached and the necessary information is not marked on the master link, or by some other means, the sling must be withdrawn from service.

Inspection before each use:
An inspection is a visual examination on the condition of the sling to identify any obvious damage or deterioration that might affect its fitness for use. The sling must be withdrawn from service and referred to a competent person for thorough examination if any of the following is observed before each use:

A) Illegible sling markings, ie sling identification and/or working load limit
B) Wear, distortion and/or cracking of the upper or lower terminals and or ferrules
C) Concentration(s) of broken wires
D) Severe rope distortion, such as kinks or protrusion of the core
E) Significant rope wear
F) Corrosion
G) Heat damage

Thorough examination and discard criteria:

General
A thorough examination must be carried out at intervals not exceeding 12 months. These intervals must be less where deemed necessary in the light of service conditions.

In order to facilitate examination, slings may need to be cleaned so as to be free from oil, dirt and rust prior to examination. This can usually be accomplished by using a wire brush. Other methods may be used providing that the parent metal is not damaged. Methods to avoid are those using acids, overheating or removal of metal.

Records of such examinations must be maintained.

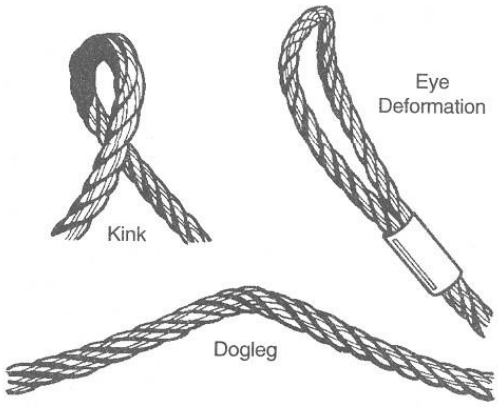
The sling must be ***withdrawn from service*** if any of the following are present, reached or exceeded:

1) The sling markings (such as information on the sling identification and/or the WLL) are illegible
2) Wear, distortion or cracking of the upper or lower terminals. Particular attention should be paid to signs of opening up, distortion or cracking of the hook, distortion and wear of links or the closing of the thimble, indications that the sling may have been overloaded
3) Wear, distortion or cracking of ferrules or the pulling out of a splice
4) Broken wires: this is a detrimental condition, because of the possibility of injury to the user's hands and of the loss of strength in the rope. Broken wires are usually caused by mechanical damage, although corrosion may also be a factor. The appearance of well distributed broken wires may have no marked effect on the strength of the sling but the discard criteria (see below) must be adopted for randomly distributed broken wires and concentrated broken wires resp. In order to prevent injury to the user's hands, protruding wires can be broken off in the valleys between the strands by reverse bending the wire, with the help of pliers, until fracture occurs. Such actions must be recorded.
5) Randomly distributed broken wires: 6 randomly distributed broken outer wires in a length of 6d but no more than 14 randomly distributed broken wires in a length of 30d, where d is the nominal rope diameter
6) Concentrated broken wires: 3 adjacent broken outer wires in one strand
7) Rope distortion: kinking, crushing, birdcaging or core protrusion or other damage which distorts the rope structure. The main thing to look for is wires or strands that are pushed out of their original positions in the rope. Slight bends in a rope where wires or strands are still relatively in their original positions would not be considered serious damage.
8) Rope wear: 10% of the nominal rope diameter (d)
9) Corrosion: pitting of the wires or loss of flexibility of the rope due to severe internal corrosion. Corrosion may occur where slings have been improperly stored or have been used in particularly corrosive conditions, such as moving loads in and out of acid/alkali baths. The effect is readily identified through the loss of flexibility and roughness to the touch. While light surface rusting is unlikely to affect the rope strength, it may be indicative of internal corrosion, the effect of which is not predictable.
10) Heat damage as evidenced by discoloration of the wires, loss of lubrication or pitting of the wires caused by electric arcing.

Any replacement component or part of the wire rope sling must be in accordance with the appropriate European standard for that component or part. Components that are cracked, visibly distorted or twisted, severely corroded or have deposits that cannot be removed must be discarded and replaced. Minor damage such as nicks and gouges to terminal fittings may be removed by careful grinding or filing. The surface must blend smoothly into adjacent material without abrupt change of section. The complete removal of the damage must not reduce the thickness of the section at that point to

Less than the manufacturer's specified minimum dimensions or by more than 10% of nominal thickness of the section.

Various warnings & tips for a safer lifting



Attention must be paid in the condition of the sling so that it doesn't show a deformation as shown. When a loop is "pulled through" it forms a kink which permanently deforms a wire rope by freezing or locking wires and strands. This prevents them from sliding and adjusting, and reduces rope strength. A "dogleg" is a "set" which occurs when a wire rope sling is pulled down snug against a load. A dogleg usually can be "rolled back" or turned inside out, and usefulness of the sling restored, since strands can still adjust.
Eye deformation is ordinarily not detrimental to sling strength as long as there are no broken wires or gross distortion of the lay of the strands. An eye has two legs, so has adequate strength for the load the body can carry. A sling must be retired when distortion locks the strands or flattens the rope in the eye so strands cannot move and adjust.

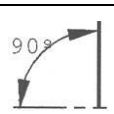
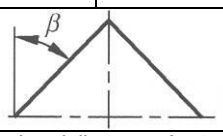
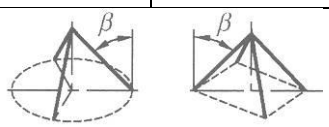
Warning: Hand spliced slings must not be used in lifts where the sling may rotate and cause the wire rope to unlay. Use a tag line to keep the load in balance upon lifting.

In Annex A there is a table of the Working Load Limits (WLL's) for single leg, double leg and there & four leg slings and choke hitch for 1960 grade wire ropes.

For WLL's for 1770 grade multiply the values by 0,903.

ANNEX A

WLL FOR STEEL WIRE ROPE SLINGS 1960 GRADE

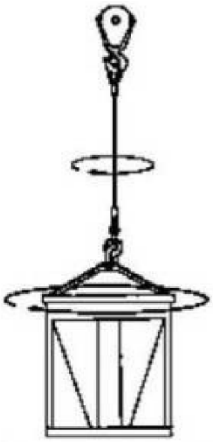
	Single leg	Two leg		Three and four leg		Endless ferrule secured sling (Choke hitch)
Angle to the vertical, β	0^0	0^0 to 45^0	Over 45^0 to 60^0	0^0 to 45^0	Over 45^0 to 60^0	0^0
Nominal rope diameter, d						
	Working Load Limits, kgs (Fiber core for 6x19 & 6x36 class | IWRC core for 6x19IWRC, 6x36IWRC & 8x36IWRC class)					
mm	Kgs	Kgs	Kgs	Kgs	Kgs	Kgs
8	770 | 830	1050 | 1160	770 | 830	1660 | 1700	1160 | 1220	1200 | 1330
9	940 | 1050	1300 | 1440	940 | 1050	2000 | 2200	1440 | 1550	1550 | 1660
10	1160 | 1270	1600 | 1770	1160 | 1270	2500 | 2650	1770 | 1880	1880 | 2050
11	1440 | 1550	2000 | 2200	1440 | 1550	3000 | 3300	2150 | 2350	2350 | 2500
12	1700 | 1900	2350 | 2550	1700 | 1900	3700 | 4000	2500 | 2770	2750 | 3000
13	1990 | 2200	2800 | 3100	1990 | 2200	4300 | 4600	3000 | 3300	3200 | 3500
14	2340 | 2500	3300 | 3500	2340 | 2500	4800 | 5300	3500 | 3800	3650 | 4100
16	3000 | 3300	4200 | 4600	3000 | 3300	6300 | 7000	4600 | 5000	4800 | 5300
18	3800 | 4100	5300 | 5800	3800 | 4100	8000 | 8600	5750 | 6300	6250 | 6700
20	4800 | 5100	6600 | 7200	4800 | 5100	10000 | 10800	7200 | 7600	7600 | 8200
22	5800 | 6300	8000 | 8600	5800 | 6300	12200 | 13100	8500 | 9300	9300 | 10000
24	7000 | 7400	9750 | 10400	7000 | 7400	15000 | 15500	10500 | 11100	11000 | 12000
26	8000 | 8600	11000 | 12200	8000 | 8600	16600 | 18300	12000 | 13000	13000 | 14000
28	9300 | 10000	13000 | 13800	9300 | 10000	20000 | 21000	14000 | 14900	15000 | 16000
30	10700 | 11500	14800 | 16100	10700 | 11500	23000 | 24400	16000 | 17200	17500 | 18600
32	12000 | 13100	16600 | 18300	12000 | 13100	26000 | 27700	18000 | 19400	20000 | 21000
34	14000 | 14800	18800 | 20800	14000 | 14800	29000 | 31300	21000 | 22100	22500 | 23500
36	15500 | 16600	21000 | 23200	15500 | 16600	32000 | 34900	23000 | 24900	25000 | 26000
38	17000 | 18500	23500 | 26000	17000 | 18500	36000 | 39000	26000 | 28000	28000 | 29600
40	19000 | 20500	26000 | 28800	19000 | 20500	40000 | 43200	29000 | 31000	31000 | 33250
42	21000 | 22700	29000 | 31800	21000 | 22700	44000 | 47600	32000 | 34000	34000 | 37000
44	23500 | 24900	32000 | 34900	23500 | 24900	49000 | 52000	35000 | 37100	37000 | 40000
46	25500 | 26800	35400 | 37900	25500 | 26800	53000 | 56500	38000 | 40700	41000 | 43000
48	27700 | 28800	38700 | 41000	27700 | 28800	57500 | 60900	41000 | 44300	44000 | 46500
50	30000 | 31800	41500 | 44800	30000 | 31800	63000 | 67000	45000 | 48200	48000 | 51000
52	32000 | 34900	44300 | 48700	32000 | 34900	68500 | 73100	49000 | 52000	52000 | 55500
54	34600 | 37400	48000 | 52000	34600 | 37400	73500 | 78600	52000 | 55900	56000 | 60000
56	37000 | 39900	52000 | 55400	37000 | 39900	78500 | 84100	55500 | 59800	60000 | 64000
58	40000 | 43200	56000 | 59800	40000 | 43200	84000 | 90800	60000 | 64800	65000 | 69000
60	43000 | 46500	60000 | 64200	43000 | 46500	90000 | 97400	64000 | 69700	70000 | 74500
Leg factor, K_1	1	1,4	1	2,1	1,5	1,6

NOTE 1: The WLL of a 4 leg sling is calculated assuming that one leg is redundant.

NOTE 2: Lifting an irregularly shaped load with a thee legged sling, may develop unequal loads in the sling legs. To be safe, please use the formula for a two legged sling under these or similar circumstances.

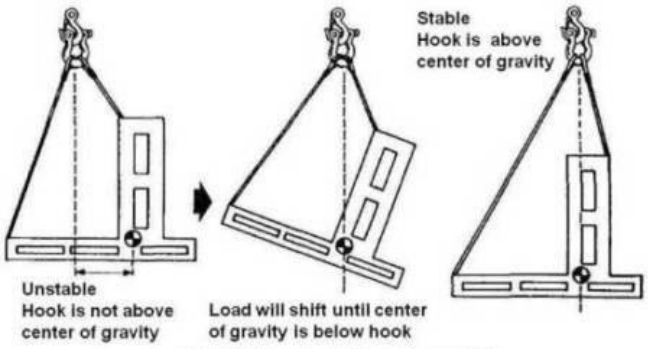
CAUTIONS:

Single vertical lifting



In single vertical lifting, a sling is used to connect a lifting hook or other device to a load. In this configuration the total weight of the load is carried by a single leg, the sling horizontal angle is 90º (angle between horizontal line and sling), and the weight of the load can equal the maximum working load limit of the sling. This configuration provides absolutely no control over the load because it permits rotation. A tagline should be attached to prevent rotation which may damage the sling.

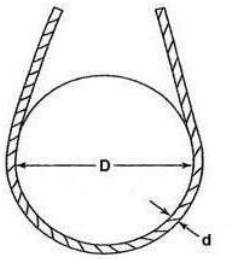
For load stability, it is equally important to ensure that the support points of a load (i.e. where the slings are attached to the load) lie above its centre of gravity. Under suspension, an object's centre of gravity will always seek the lowest level below the point of support. This knowledge is especially important for lifting pallets, skids, or the base of any object since they all have a tendency to topple. This type of load will be stable if the attachments are above the centre of gravity as shown.

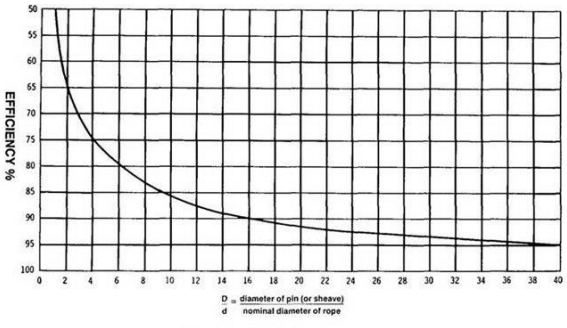


Effect of Center of Gravity on Lift

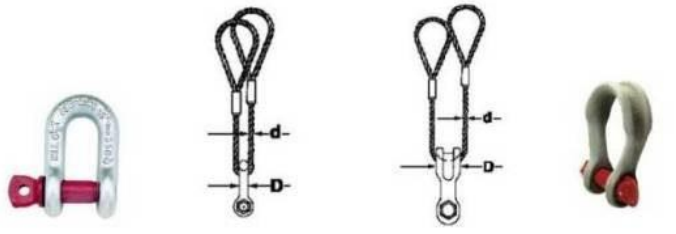
D/d Ratio

The capacity of a wire rope sling can be greatly affected by being bent sharply around pins, hooks, or parts of a load. The term "D/d ratio" is used to express the severity of bend. "D" is diameter of curvature that the rope or sling is subjected to and "d" is the diameter of the rope. The minimum D/d ratio is usually taken as 20 which correspond to 92 % efficiency. As wire ropes are usually stronger than the catalogue strength, the bent sling at D/d = 20 is considered 100 % efficient. In case wire rope slings are used for smaller D/d ratio, sling capacity shall be decreased based on wire rope efficiency as per following graph (static load lifting).





STRENGTH EFFICIENCY OF WIRE ROPE
WHEN BENT OVER PINS OR SHEAVES OF VARIOUS SIZES

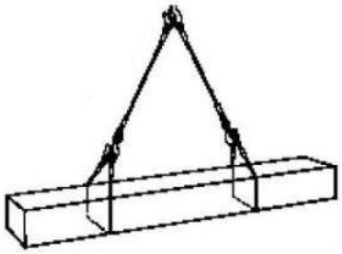


Normal Shackle | Normal Shackle D/d = 2 | Wide Body Shackle, D/d = 5 | Wide Body Shackle

Examples – Small D/d Ratios

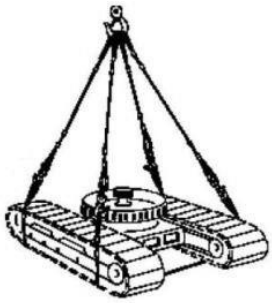
Preventing Sling Damage

Make sure loads are not bolted to the floor. In winter, make sure that the load is not frozen to the ground. If slings are used above spreader, select their size based on weight of load to be lifted plus weight of spreader.
Use additional single leg slings to wrap around the load as shown below. If they get damaged, they are less costly to replace.



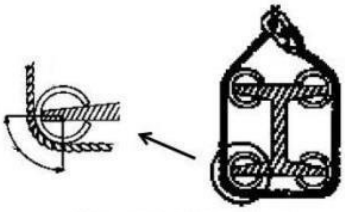
Use of Additional Slings to Wrap The Load

For large loads, a 4-leg sling can be made into a double basket sling by adding 2 single leg slings. These single leg slings can be made of larger diameter rope to better withstand load conditions as shown below. They are less expensive to replace than the entire 4-leg sling if they get damaged.



Lifting of Large Loads

Use proper corner protection. A sharp steel edge may cut through wire rope sling; at least it will permanently damage the sling. As shown below, sliced steel pipes have proven to an effective corner protector. For square and round objects proper wooden padding will be sufficient. Before making the final lift, do a trial lift. Check that the padding is strong enough and does not crack under the load weight.



Corner Protection

Do not place the splice ferrules, rope thimbles, or sling hooks around corners as shown here. A ferrule failure will result in the failure of the sling.

Damage to Sleeve

DISCLAIMER

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Visual Illustrations

The images of damages and deformations included in this manual are intended solely for illustrative purposes, serving as general guidelines to help users recognize common forms of wear, tear, and damage. Actual damages or deterioration in equipment may differ substantially in appearance, extent, and causation.

These images are not intended to be the sole basis for assessing the safety or condition of any equipment. For a thorough evaluation and recommendations regarding repair or replacement, users are advised to consult a qualified professional or contact Katradis Marine Ropes Industry S.A.

KATRADIS
EST. 1936

11, Psaron Street, Piraeus 186 48, Greece

Tel.: +30 210 4060300 Fax: +30 210 4626268

Email: info@katradis.com
www.katradis.com