

Hendrik Veder Group Eemhavenweg 131, 3089KE Rotterdam, Netherlands	Instruction safe use of Wire Rope Slings	Document no.	HVG-4-001
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Instruction Safe use of Wire Rope Slings

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The information in this leaflet must be passed to the user of the equipment, who must be suitably trained in the use of this equipment

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1 Introduction

This document is issued in accordance with the requirements of Section 6 of the Health and Safety at Work etc. Act 1974 and the Supply of Machinery (safety) Regulations 2008. It provides instruction to the user with regards to the care and safe use of general-purpose wire rope slings.

The information is based on Section 15 of the LEEA Code of Practice for the Safe Use of Lifting Equipment. It should be read in conjunction with the requirements for general purpose slinging practice, given overleaf, which form an integral part of these instructions.

Always	Never
<ul style="list-style-type: none"> • Ensure the operator is properly trained to use wire rope slings. • Store and handle wire rope slings correctly. • Inspect wire rope slings and accessories before use and before placing into storage. • Follow safe slinging practices, as given overleaf. • Fit slings carefully, protect them from sharp edges and position hooks to face outward from the load. • Apply the correct mode factor for the slinging arrangement. • Back hook free legs onto the master link. 	<ul style="list-style-type: none"> • Attempt to shorten, knot or tie wire rope slings. • Force, hammer or wedge wire rope slings or their fittings into position. • Lift on the point of a hook. • Expose wire rope slings to acidic conditions without consulting the supplier. • Use wire rope slings at temperatures above 400 °C or below minus 40 °C without consulting the supplier. • Shock load wire rope slings.

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2 Inspection, thorough examination, and maintenance

2.1 Pre-Use Inspection

An inspection is a visual check on the condition of the sling to identify any obvious damage or deterioration that might affect its fitness for use.

Withdraw the sling from service and refer it to a competent person for thorough examination if any of the following is observed:

- Illegible sling markings, i.e. sling identification and/or working load limit;
- Wear, distortion and/or cracking of the upper or lower terminals and/or ferrules;
- Concentration(s) of broken wires;
- Severe rope distortion, such as kinks or protrusion of the core;
- Significant rope wear;
- Corrosion;
- Heat damage.

2.2 Thorough examination

Lifting products are required by law to have inspections at least once a year by a competent person.

2.3 Maintenance and storage

Any replacement component or part of the wire rope sling should 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, should be discarded and replaced.

Minor damage such as nicks and gouges to terminal fittings may be removed by careful grinding or filing. The surface should blend smoothly into adjacent material without abrupt change of section. The complete removal of the damage should reduce the thickness of the section at that point to less than the manufacturer's specified minimum dimensions or by more than 10% of the nominal thickness of the section.

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

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

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3 Selecting the Correct Sling

Wire rope slings are available in a range of sizes and assemblies. Select the slings to be used and plan the lift taking the following into account:

- Type of sling to be used – endless, single two, three or four leg.
- Capacity – the sling must be both long enough and strong enough for the load and the slinging.
- Apply the mode factor for the slinging method.
- For use at temperatures exceeding 400°C or below minus 40 °C refer to the supplier's instructions.
- Where slings may come into contact with chemicals, particularly acids or acidic fumes, consult the supplier.
- In the case of multi-leg slings the angle between the legs should not be less than 30° to prevent load imbalance or exceed the maximum marked.
- Multi-leg slings exert a gripping force on the load which increases as the angle between the legs increase and this must be taken into account.
- Due to the possibility of sparking, the use of aluminum is restricted in certain classified atmospheres, so ensure the ferrule is suitable for such conditions.

4 Storing and Handling Wire Rope Slings

When manually handling wire rope slings always wear gloves and protective footwear. It is recommended that heavy wire rope slings are moved by means of handling aid, such as a forklift.

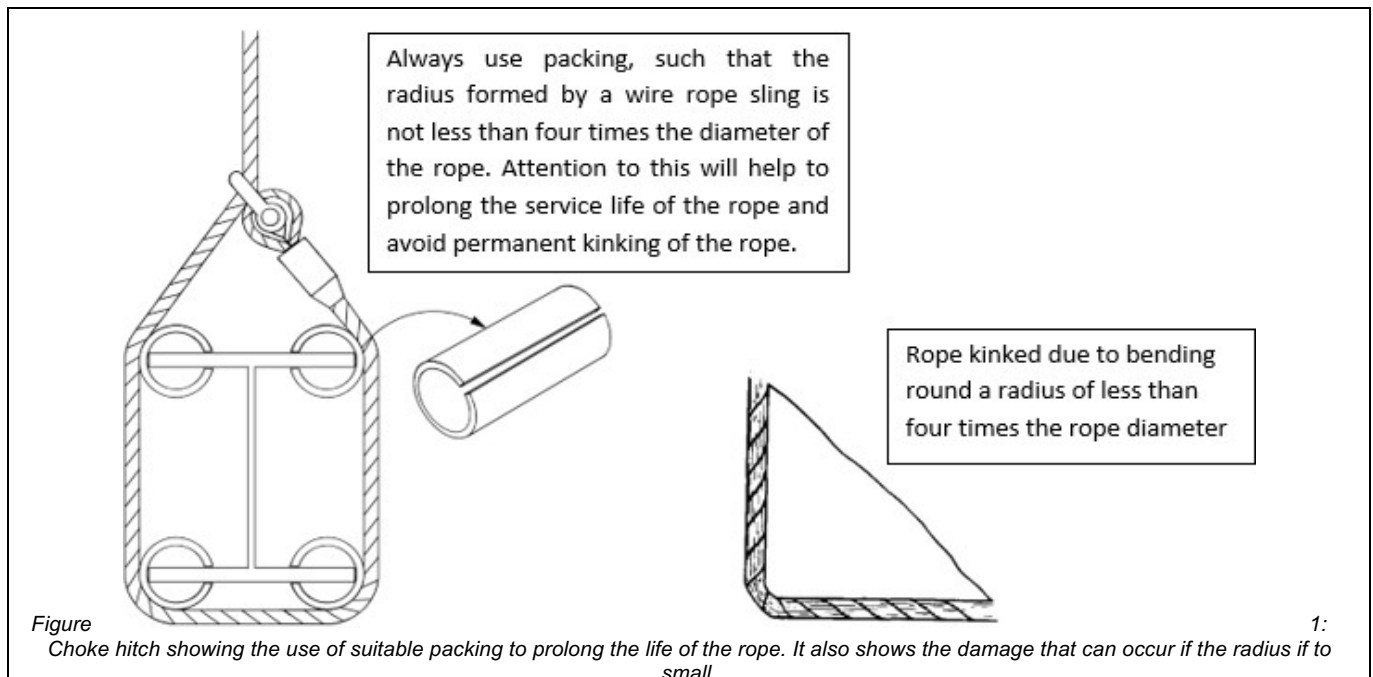
Never return damaged contaminated slings to storage. They should be dry, clean, and protected from corrosion.

Store wire rope slings on a rack and not lying on the ground. The storage area should be dry, clean, and free of any contaminants which may harm the sling.

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5 Using Wire Rope Safely

- Do not attempt lifting operations unless you understand the use of the equipment, the slinging procedures, and the mode factors to be applied.
- Do not use defective slings or accessories.
- Do not force, hammer, or wedge wire rope slings or fittings into position; they must fit freely. Check the correct engagement of fittings and appliances.
- Position hooks of multi-leg slings facing outward from the load. Do not lift on the point of the hook and ensure that the wire is not twisted or knotted.
- Ensure the effective diameter of pins, hooks etc. upon which soft eyes fit is at least 2 x wire rope diameter.
- Position the splices of endless slings in the standing part of the sling away from hooks and fittings.
- Never join wire rope slings made of different lays of rope together as this will cause them to un-lay thus seriously affecting their capacity.
- Back hook free legs to the master link to avoid lashing legs which might accidentally become engaged or otherwise become a hazard.
- Take the load steadily and avoid shock loads.
- Do not leave suspended loads unattended. In an emergency cordon of the area.



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6 In-service Inspection and Maintenance

Maintenance requirements are minimal. Keep wire rope slings clean and protect from corrosion. Use non-acids lubricants.

Regularly inspect wire rope slings, particularly before putting into service and before each use, and in the event of the following defects, refer the sling to a competent person for thorough examination: illegible markings; distorted, worn or damaged fittings; broken or cut wires ; kinks; protrusion or core; corrosion; heat damage or discoloration; signs of movement at splices and ferrules; any other visible defect to the wire rope, thimbles or fittings.

Only repair wire rope slings with manufacturer's approved components.





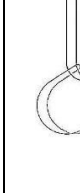
7 General Purpose Slings Practice

The following information is based on section 1 – Appendix 1.5 of the LEEA Code of Practice for the Safe Use of Lifting Equipment. It should be read in conjunction with the instructions for the safe use, given overleaf, of which it forms an integral part with any specific instructions issued by the supplier.

Always	Never
<ul style="list-style-type: none"> • Plan the lift, establish the weight of the load, and prepare the landing area ensuring that it will take the weight. • Check slings and equipment are free of damage, use slings/sliding methods suitable for the load and protect slings from sharp edges and corners. • Attach the sling securely to the load and appliance and position hooks to face outwards. • Ensure the load is balanced and will not tilt or fall. • Keep fingers, toes etc. clear when tensioning slings and when landing loads. • Ensure that the load is free to be lifted. • Make a trial lift and trial lower. 	<ul style="list-style-type: none"> • Use damaged slings or accessories. • Twist, knot or tie slings. • Hammer slings into position. • Overload slings due to the weight of the load or the mode of use. • Trap slings when landing the load. • Drag slings over floors etc. or attempt to pull trapped slings from under loads. • Allow personnel to ride on loads.

8 Sling Configuration and Rating

Slings are available in single, two, three and four leg or endless form. In practice it will be found that wire ropes are available any of these configurations. The maximum load that a sling may lift in use will be governed by the slinging arrangement (mode of use) and many vary form marked SWL, refer to table 1 below. It is necessary to multiply the marked SWL by a mode factor relevant to sling arrangement, see table 1.

Mode Factors				
Maximum Load to be lifted = mode factor x WLL marked on the sling				
Single leg in line	Single leg choked	Single leg basket	Single leg back hooked	Endless Choked
				
1	0.8	1.4	1	1

*Table 1: Mode factors to be applied to different slinging arrangements,
NOTE: WLL in accordance with EN 13414-1.*

The following three simple rules will ensure that the sling is not overload. In some cases, this will mean that the sling will be underutilized although this is unlikely to hinder the user unduly. Where the maximum utilization is required, reference should be made to a competent person who understands the factors involved and who can perform the necessary calculations.

- (1) For straight lift never exceed the marked SWL and in the case of multi-leg slings the specified angle or range of angles.
- (2) When using slings in choke hitch multiply the marked SWL by 0.8 to obtain the reduced maximum load the sling may lift i.e., reduce the safe working load by 20%.
- (3) With multi-leg slings, when using less than the full number of legs, reduce the maximum load in proportion to the number of legs in use. Simply multiply the marked SWL by the number of legs in use expressed as a fraction of the total thus: one leg of a two-leg sling = $\frac{1}{2}$ marked SWL, three legs of a four-leg sling = $\frac{3}{4}$ marked SWL and so on.

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9 Operative Training

Sling should only be used by trained operative who understand the methods of rating and application of mode factors.

10 Safe use of slings

- Good slinging practice must ensure that the load is as safe and secure in the air it was in the ground and that no harm is done to the load, lifting equipment, other property, or persons.
- Establish the weight of the load, ensure the lifting method is suitable and inspect the sling and attachment for obvious defects. Prepare the landing area making sure the floor is strong enough to take the load. Follow any specific instructions from supplier.
- Ensure the lifting point is over the center of gravity. Any loose parts of the load should be removed or secured. Secure the sling firmly to the load by hooks onto lifting points or shackles etc. The sling must not be twisted, knotted, or kinked in any way.
- Use packing to prevent damage to the sling from corners or edges and to protect the load.
- Do not exceed the SWL or rated angle. Any choke angle must not exceed 60° and any basket 45° from the vertical.
- Do not hammer, force, or wedge the slings or accessories into position; they must fit freely.
- When attaching more than one sling on the hook of the appliance use a shackle to join the sling and avoid overcrowding the hook.
- Use an established code of signals to instruct the crane driver.
- Ensure the load is free to be lifted and not, for example, bolted down.
- Check that there are no overhead obstacles such as power lines.
- Keep fingers, toes etc. clear ensuring they do not become trapped when lifting, lowering, or controlling loads.
- Make a trial lift by raising the load a little to ensure it is balanced, stable and secure and if not lower it and adjust the sling arrangement.
- Where appropriate use a tag line to control the load.
- Except where special provision is made
- Do not allow to anyone to pass under the ride upon the load. The area should be kept clear.
- Make a trial set down, ensure that the sling will not become trapped, and the load will not tip when the slings are released. Use support which are strong enough to sustain the load without crushing.
- Never drag slings over floors etc. or attempt to drag a trapped sling from under the load.
- Never use a sling to drag a load.
- Place the hooks of free legs back onto the master link and take care to ensure that empty hooks do not become accidentally engaged.
- Never use slings in contact with chemicals or heat without the manufacturer's approval.
- Never use damaged or contaminated slings.
- On completion of the lift return all equipment to proper storage.