

WIRE ROPE SLING

SAFETY USE AND MAINTENANCE INSTRUCTION

Introduction

This document is issued in accordance with the requirements of UNI EN 13414-2 “Steel wire rope slings - Safety - Part 2: Specification for information for use and maintenance to be provided by the manufacturer” . It should be read in conjunction with the requirements for general purpose slinging practice, given overleaf, which form an integral part of these instructions. This information is of a general nature only covering the main points for the safe use of wire rope slings. It may be necessary to supplement this information for specific applications.

Terms and definitions

1. **A DAILY VISUAL INSPECTION** The person handling the sling must do this each day and should check for major damage or deterioration that would weaken the sling and for obvious signs such as broken wires, kinks, crushing, broken attachments and severe corrosion.
2. **ADDITIONAL INSPECTIONS AT REGULAR INTERVALS** These are based on frequency of sling use, severity of service conditions, the nature of the lifts and prior experience based on service life of slings used in similar circumstances. A designated person who has a working knowledge of wire rope must conduct these inspections.

Inspection shall be made at least annually (or according with local regulation) and shall include a record of the inspection or of apparent conditions to provide the basis for a continuing evaluation. Inspection shall be conducted on the entire length of the sling, including splices, end attachments

Hazards

The release of a load due to the improper use or maintenance of a wire rope sling puts at risk either directly or indirectly the safety or health of those persons within the danger zone of lifting equipment.

ALWAYS:	NEVER:
<ul style="list-style-type: none"> • 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 to the master link. 	<ul style="list-style-type: none"> • Attempt to shorten, knot or tie wire rope slings. • Force, hammer or wedge slings or their fittings into position. • Lift on the point of the hook. • Use wire rope slings in acidic conditions without consulting the supplier. • Use wire rope slings at temperatures above 100°C or below minus 40°C without consulting the supplier. • Shock load wire rope slings.

Actions to be taken before putting the wire rope sling into first use

Before first use of the wire rope sling it should be ensured that :

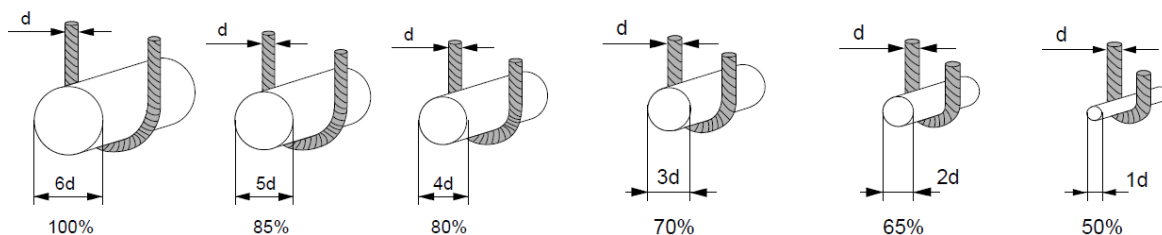
- the sling is precisely as ordered;
- the manufacturer's certificate is to hand;
- the identification and WLL marking to the information on the certificate;
- full details of the sling are recorded in a register of sling
- the actual use is to be as intended.

Information regarding safe use of the wire rope sling

- Good slinging practice must ensure that the load is as safe and secure in the air as it was on 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 attachments for obvious defects. Prepare the landing area making sure the floor is strong enough to take the load. Follow any specific instructions from the supplier.
- Ensure the lifting point is over the centre 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 120° and any basket 90°.
- Do not hammer, force or wedge slings or accessories into position; they must fit freely.
- When attaching more than one sling to the hook of the appliance use a shackle to join the slings 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 slinging arrangement.
- Where appropriate use tag lines to control the load.
- Except where special provision is made, do not allow anyone to pass under or ride upon the load. The area should be kept clear.
- Make a trial set down, ensure the sling will not become trapped and the load will not tip when the slings are released. Use supports 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 a 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 manufacturers approval.
- Never use the red marked area to connect the grommet sling to the hook or other lifting accessory
- Never use damaged or contaminated slings.
- On completion of the lift return all equipment to proper storage.



WARNING



Bending diameters effect on the working load limit (WLL): consideration will be taken to that the slings capacity will be lower when the bending diameter decreasing. If, for example the rope bends around a bearing point which have the same diameter as the rope itself the capacity will decrease to the half, see figure.

Thorough examination and maintenance

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

The sling should 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 should 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 should be withdrawn from service.

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.

The sling should 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, i.e. sling identification and/or working load limit..	e) significant rope wear
b) wear, distortion and/or cracking of the upper or lower terminals and/or ferrules.	f) corrosion.
c) concentration(s) of broken wires.	g) heat damage
d) severe rope distortion, such as kinks or protrusion of the core.	

Broken wires Wire breaks are usually caused by mechanical damage or corrosion. They reduce the strength of the rope and can cause hand injury to the The sling must be rejected and replaced if any strands are totally broken, wire breaks occur very close to each other or the number of wire breaks exceeds 5% of the total number of wires along a length equal to six times the diameter of the rope. The sling must be rejected if the nominal diameter of the rope has worn by more than 10% at any point.

Rusting and corrosion Corrosion may occur if the sling is incorrectly stored or used in corrosive conditions. Surface rusting may also be a sign of internal corrosion, the extent of which is difficult to estimate. In this case the rope must be opened up to assess its internal condition. The sling must be rejected if a significant degree of internal corrosion is found, or corrosion is found in the splice.

Deformation The sling must be rejected if it contains deformation caused by kinks, bird caging, crushing, core failure or knots.

Heat damage Colour changes of steel ropes can be a sign of overheating. Overheating damages the fibre core and weakens the rope's lubrication. The manufacturer's instructions must be observed regarding the permissible operating temperatures.



W A R N I N G



Thorough examination and discard criteria: A thorough examination is a visual check, performed by an expert and, when required, complemented with other methods, e.g. measurement and/or tests with intent o identify any damage or deterioration that might affect the slings fitness for use.

A thorough examination should be carried out at intervals not exceeding twelve months. This interval should be less where deemed necessary in the light of service conditions. 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.

How to dispose of a rejected wire rope sling

Once the qualified person has determined a sling is no longer usable, he should tag it immediately, "Do Not Use." The sling should then be destroyed as soon as possible by cutting the eye and fittings from the rope. This will prevent accidental reuse of the sling.

ANNEX

- De-rated working load limit of slings due to temperature

Termination type	Ferrule material	Rope core	De-rated working load limit expressed as % of WLL of the sling					
			Temperature, T, °C					
			40 < T ≤ 100	100 < T ≤ 150	150 < T ≤ 200	200 < T ≤ 300	300 < T ≤ 400	400 < T
Turn-back eye	Aluminium	Fibre	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	Fibre	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	-	Fibre	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 use of wire rope slings within the permissible temperature ranges given in table A.1 does not require any permanent reduction in working load limit when the rope is returned to ambient temperature.

Wire rope slings will not be adversely affected by temperatures down to -40 °C and no reduction from the working load limit is necessary, therefore, on this account. Where wire rope slings are to be used at temperatures below -40 °C the manufacturer should be consulted.

- Variation of wire rope sling leg loading with leg angle for a load of Q

How the load in a part of the wire rope sling changes according to the vertical angle for a 10 ton load.

The red area indicates angles greater than 60° for which wire rope slings are not intended to be used.

