

User Information

Synthetic and Natural Fiber Slings

The following information does not claim to be exhaustive. Further information on the use of slings and load suspension equipment should be taken from the relevant employers' insurance association regulations and state regulations.

Intended use:
for anchoring and lifting loads only

www.carlstahl.com

This user information presents a general overview regarding the application of textile lifting slings and does not substitute the existing operating instructions for specific products! Lifting operations with textile slings may be carried out by competent users (trained in theory and practice) only.

When operated correctly, our textile slings offer the highest degree of safety in line with long life expectancy and avoid damage to products and people.

Instructions For use for Lifting Round and Flat Webbing Slings

Material Resistance

Slings are made from materials with selective chemical resistance. Polyester (PES) resists most mineral acids but can be damaged by alkalis.

Loading

Do not overload textile lifting slings. The identity label indicates the capacities for key lifting and slinging methods. Always adhere to the maximum angle from the vertical (angle β).

Temperature

Polyester textile lifting slings are suitable for use in temperatures ranging from -40°C to $+100^{\circ}\text{C}$. In chemical environments, this range may vary. Below 0°C , the woven structure of wet textiles can be damaged by ice formation, which reduces sling flexibility. Only use dry lifting equipment below 0°C . In dry conditions, polyester has high electrical resistance and acts as an insulator between the load and crane hook, which is important during welding.

Shock Loading

Avoid subjecting textile lifting and lashing equipment to sudden jerks or jolts, as these can generate forces much greater than the load weight.

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

- ⊙ The sling corresponds precisely to that specified on the order;
- ⊙ The manufacturer's certificate is to hand;
- ⊙ The identification and WLL marked on the sling correspond with the Information on the certificate.

Before each use, the sling should be inspected for defects and to ensure that the identification and specification are correct. A sling that is unidentified or defective should never be used but should be referred to a competent person for examination. (Carl Stahl provided this service)

Before every use

- ⊙ Inspect slings for any damage before use. discard any slings that show signs of damage.
 - Confirm that slings are free from any defects.
 - Make sure that slings are properly identified and meet the required specifications.

The product must not be used in the event of:

- ⊙ Mechanical damage due to crushing, indentations, crack formation or breakage.
- ⊙ Deformation caused by bending, twisting, or impressions.
- ⊙ Extension of the entire chain or a chain link interior by 5% or more.
- ⊙ Reduction of the nominal thickness at any point by more than 10%.
- ⊙ Damage to securing devices and cross-section reductions of 5% or more in the case of eyelets, bolts and brackets on shackles and hooks.
- ⊙ Bluish discolouration of the grade 8 chain due to heat (welding).
- ⊙ Expansion of the hook by more than 10%.
- ⊙ Faulty hook locking mechanism.

During the period of use

Regular inspections should be conducted to identify defects or damage, including any hidden by dirt, that could compromise the sling's safe use. These inspections should also cover any fittings and lifting accessories used with the sling. If there is any uncertainty about the sling's condition or if required markings are missing or unreadable, the sling should be taken out of service for assessment by a qualified person. Visible damage to the cover suggests possible damage to the load-bearing core.

Selection and use of textile rope slings

- ⊙ Determination of the mass of the load, its central of gravity, attachment points and proposed method of attachment.
- ⊙ Observance of the marked WLL and mode factors. In the case of multi-leg slings, this will include restrictions on the angle of sling legs.
- ⊙ Attachment of sling to hook of lifting machine.
- ⊙ Attachment of sling to load; direct attachment, choke hitch, basket hitch, special fittings, and other lifting accessories.
- ⊙ Protection of sling and load.
- ⊙ Controlling rotation of the load
- ⊙ Ensuring an even balance of the load, avoidance of shortening sling legs, e.g., by twisting, knotting etc.
- ⊙ Shock loading.
- ⊙ Safety of personnel
- ⊙ Clamping force
- ⊙ Preparation of landing site
- ⊙ Detachment of sling
- ⊙ Correct storage of sling.

Correct selection and use of round slings and webbing slings

Sling Selection Considerations

Ensure slings possess the necessary working load limit, considering both the lifting method and the characteristics of the load. Choosing the right sling depends on factors such as load size, shape, weight, intended use method, working conditions, and load nature. The selected sling should be sufficiently strong and of appropriate length for the intended use. Ideally, slings should be of uniform length or extended using suitable fittings. Avoid using slings with knots or loops (*Refer to Picture 01*).

When employing multiple slings to lift a load, ensure they are identical. The sling material should withstand environmental conditions and load factors without adverse effects.

Picture 01



Ensuring Balanced Lifting

Prioritize planning before initiating any lifting operation. Ensure the hook aligns directly above the load's center of gravity. Slings should be chosen and utilized to maintain this alignment throughout the lifting and lowering process, preventing potential tilting or slipping of the load. Keep in mind that endless slings can shift within the hook if the load isn't balanced.

Basket Hitch

Secure the load against both sliding and tilting when employing a basket hitch. When using slings in pairs, such as when lifting boats, consider utilizing a lifting frame for added security.

Choked Hitch

When using a choked hitch, ensure the angle between parts forms naturally without force. Employing a double choke hitch (two turns around the load) can help prevent sliding and enhance security.

Multi-leg Slings






The Working Load Limit (WLL) of multi-leg slings is based on symmetrical loading. However, in some scenarios, a stiff load may only be supported by two legs, with the potential for nearly all the loading to be borne by just one leg in extreme cases. It's crucial to dimension slings carefully according to the specific lifting conditions encountered.

Working load limits for various modes of use






When choosing the type of sling to use, you need to consider its Working Load Limit (WLL) according to both the load configuration chart and the type of load to lift.

Slings should not be overloaded: the correct mode factor should be used (see table).

ROUND SLINGS LOAD CONFIGURATION CHART

		Load in %				
		100 %	200 %	140 % from 7° to 45°	80 %	100 % from 45° to 60°
Factors		1	2	1,4	0,8	1
WLL in kg						
PURPLE	1 000	1 000	2 000	1 400	800	1 000
GREEN	2 000	2 000	4 000	2 800	1 600	2 000
YELLOW	3 000	3 000	6 000	4 200	2 400	3 000
GREY	4 000	4 000	8 000	5 600	3 200	4 000
RED	5 000	5 000	10 000	7 000	4 000	5 000
BROWN	6 000	6 000	12 000	8 400	4 800	6 000
BLUE	8 000	8 000	16 000	11 200	6 400	8 000
ORANGE	10 000	10 000	20 000	14 000	8 000	10 000
ORANGE	15 000	15 000	30 000	21 000	12 000	15 000
ORANGE	25 000	25 000	50 000	35 000	20 000	25 000
ORANGE	30 000	30 000	60 000	42 000	24 000	30 000
ORANGE	40 000	40 000	80 000	56 000	32 000	40 000

WEBBING SLINGS LOAD CONFIGURATION CHART

			Load in %				
			100 %	200 %	140 % from 7° to 45°	80 %	100 % from 45° to 60°
		Factors	1	2	1,4	0,8	1
	WLL in kg	Width in mm					
PURPLE	1 000	30	1 000	2 000	1 400	800	1 000
OLIVE	1 500	50	1 500	3 000	2 100	1 200	1 500
GREEN	2 000	60	2 000	4 000	2 800	1 600	2 000
WHITE	2 500	75	2 500	5 000	3 500	2 000	2 500
YELLOW	3 000	90	3 000	6 000	4 200	2 400	3 000
GREY	4 000	120	4 000	8 000	5 600	3 200	4 000
RED	5 000	150	5 000	10 000	7 000	4 000	5 000
BROWN	6 000	180	6 000	12 000	8 400	4 800	6 000
BLUE	8 000	240	8 000	16 000	11 200	6 400	8 000
ORANGE	10 000	300	10 000	20 000	14 000	8 000	10 000
ORANGE	16 000	240	16 000	32 000	22 800	12 800	16 000
ORANGE	20 000	300	20 000	40 000	28 000	16 000	20 000

Maintenance, Repair, Reform

- ⊙ Repairs must be performed either by the manufacturer or a third party authorized by the manufacturer. Only slings with identifiable labels can be repaired.
- ⊙ Any damage to the coupling elements or accessories, such as deformation or cracks, requires the immediate scrapping of the affected slings.
- ⊙ Damage to the sleeve indicates potential deterioration of the load-bearing core, making the sling possibly unfit for use.
- ⊙ If the sleeve is damaged to the point where the core is exposed, the sling must be taken out of service and examined by a qualified person.

Guidelines for Using Slings

When using slings with soft eyes and hooks, ensure the eye length is at least 3.5 times the maximum thickness of the hook, with the angle in the sling eye not exceeding 20°.

When connecting slings with soft eyes to lifting appliances, ensure the part of the appliance bearing on the sling is mostly straight. If the sling's bearing width is ≤ 75 mm, the lifting appliance attachment's radius of curvature should be at least 0.75 times the bearing width of the sling.

Curvature in hook interiors can affect wide webbings, leading to uneven loading across the webbing width.

Follow good slinging practices: plan slinging, lifting, and lowering operations beforehand.

Position and attach slings securely and correctly to the load, ensuring they can flatten and distribute load uniformly across their width. Avoid knotting or twisting slings.

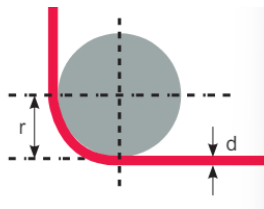
Prevent damage to labels by keeping them away from the load, hook, and choke angle.

For multi-leg slings, Working Load Limits (WLL) are based on symmetrical loading. In asymmetric configurations, the leg with the greatest plan angles to adjacent legs bears the highest tension. Rigidity of the load should also be considered, with rigid loads possibly being supported by fewer legs while others balance the load.

Slings should be protected from edges, friction and abrasion, whether from the load or the lifting appliance. Where protection against damage from edges and/or abrasion is supplied as part of the sling, this should be correctly positioned. It may be necessary to supplement this with additional protection.

Definition of a sharp edge:

Radius r (edge) < thickness d of the lifting gear.

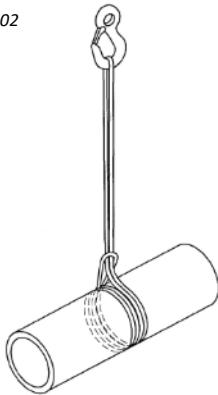


Secure the load with slings to prevent toppling or falling during lifting operations. Arrange slings so the lift point aligns directly above the load's center of gravity, ensuring balance and stability. Movement of the sling over the lifting point is possible if the load's center of gravity isn't beneath the lifting point.

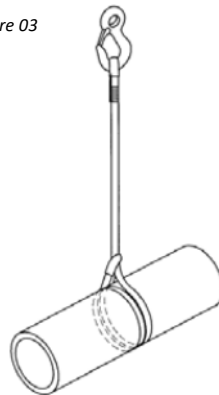
When using a basket hitch, ensure load security as there's no gripping action like with a choke hitch, potentially allowing the sling to roll through the lifting point. For paired slings, consider using a spreader to hang sling legs as vertically as possible and evenly divide the load between them.

In a choke hitch, position the sling to naturally form a 120° angle, avoiding friction-generated heat. Never force a sling into position or attempt to tighten the bite. Illustrations in *Picture 02* (Round sling) and *Picture 03* (Webbing sling) depict the correct method for securing loads in a double choke hitch, providing enhanced security and preventing load slippage through the sling.

Picture 02



Picture 03



Prioritize personnel safety during lifting operations. Warn individuals in the vicinity of the danger area about the impending lift and evacuate them if necessary. Keep hands and other body parts clear of the sling to prevent injuries as slack is taken up.

Plan, organize, and execute lifting tasks meticulously to mitigate potential hazards. Adhere to national regulations concerning the use of lifting devices and equipment, ensuring that only trained individuals with theoretical and practical knowledge operate them. Consult both instruction manuals and relevant national regulations for each workplace.

Conduct a trial lift, gradually taking up slack until the sling is taut. Lift the load slightly to verify its security and intended position, particularly crucial with basket or loose hitches where friction holds the load.

If the load starts to tilt, lower it and adjust attachments accordingly. Repeat the trial lift process until load stability is confirmed.

Exercise caution during the lift to maintain control over the load and prevent accidental rotation or collisions with other objects. Avoid snatch or shock loading, as these actions increase forces acting on the sling.

NOTE :A load in the sling or the sling itself should not be dragged over the ground or rough surfaces.

Ensure that when lowering the load, it's done with equal control as during the lifting process. Avoid trapping the sling while lowering the load and refrain from allowing the load to rest on the sling, as this could lead to damage. Never attempt to pull the sling from beneath a load resting on it.

After completing the lifting operation, return the sling to its designated storage area. Store slings in a clean, dry, and well-ventilated environment at ambient temperature, preferably on a rack. Keep them away from heat sources, chemicals, fumes, corrosive surfaces, direct sunlight, and other sources of UV radiation.

Before storing, inspect slings for any damage incurred during use. Damaged slings should never be returned to storage.

If slings have come into contact with acids or alkalis, dilute with water or neutralize with appropriate substances before storage. Depending on the material of the sling and the chemicals involved, seek additional cleaning recommendations from the supplier.

Wet slings, whether from use or cleaning, should be hung up and allowed to air dry naturally, away from heat sources.

Examination and repair

Examination periods should be determined by a competent person, taking into account the application, environment, frequency of use and similar matters, but in any event, slings should be visually examined at least annually by a competent person to establish their fitness for continued use.

Records of such examinations should be maintained.

Damaged slings should be withdrawn from service. Never attempt to carry out repairs to slings yourself.

Important Information

Maximum Lifespan: We recommend a maximum lifespan of 10 years from the date of production for lifting slings. Extension beyond this period is possible but subject to detailed examination.

Marking for First Use: Before initial use, mark the date of first use clearly by year and month.

End of Use/Disposal: Discontinue use of lifting slings when their service life ends. Dispose of them as polyester scrap.

Material Composition: lifting slings primarily consist of polyester. We offer assistance with disposal if needed.

Disclaimer: We reserve the right to alter product design, materials, specifications, or instructions without prior notice or obligation. We do not assume responsibility for safety consequences if the product is modified or combined with incompatible components.

Manila Rope User Guide for Lifting Activity

Manila Rope is designed for various lifting activities, ensuring safety, efficiency, and durability. This user guide provides comprehensive instructions on the proper use, maintenance, and safety precautions for lifting with Manila Rope.

Using Manila Rope for lifting activities requires careful attention to safety, proper usage techniques, and regular maintenance. By following this guide, users can ensure the longevity and reliability of the rope while maintaining a safe working environment. Always refer to the manufacturer's instructions for specific details and updates regarding the rope's use and care.

Inspection Before Use:

- ⊙ Inspect the rope for any signs of damage such as fraying, cuts, or excessive wear.
- ⊙ Check for discoloration, which may indicate exposure to harmful chemicals or UV degradation.
- ⊙ Ensure the rope is clean and free from debris.

Weight Limits:

- ⊙ Always adhere to the manufacturer's specified load limits.
- ⊙ Do not exceed the maximum working load limit (WLL) of the rope.

Proper Storage:

- ⊙ Store the rope in a cool, dry place away from direct sunlight and chemicals.
- ⊙ Avoid sharp bends or knots that could weaken the rope fibers over time.

Environmental Conditions:

- ⊙ Be cautious when using the rope in extreme temperatures or wet conditions as they can affect the rope's performance.
- ⊙ Do not use the rope near chemicals or solvents that could degrade the material.

Usage Instructions

1. Preparation

- ⊙ Selecting the Right Rope: Ensure the rope is suitable for the specific lifting task based on its diameter, length, and load capacity.
- ⊙ Equipment Check: Verify that all lifting equipment, such as pulleys, hooks, and anchors, are in good condition and compatible with the rope.

2. Tying Knots /Common Knots for Lifting

- ⊙ Bowline Knot: Creates a fixed loop at the end of the rope.
- ⊙ Figure Eight Knot: Used to prevent the rope from slipping through a device or to create a secure stopper knot.
- ⊙ Clove Hitch: Useful for securing the rope to a post or object.

3. Attaching the Load

- ⊙ Secure Attachment: Ensure the load is securely attached to the rope using appropriate knots and lifting gear.
- ⊙ Balancing the Load: Distribute the weight evenly to avoid uneven stress on the rope and lifting equipment.

4. Lifting Procedure

- ⊙ Positioning: Stand clear of the load and ensure the path is free from obstructions.
- ⊙ Controlled Lifting: Lift the load steadily without jerking to prevent shock loading.
- ⊙ Monitoring: Continuously monitor the rope and load for any signs of slippage or strain.

5. Lowering the Load

- ⊙ Smooth Descent: Lower the load slowly and steadily, maintaining control at all times.
- ⊙ Positioning the Load: Ensure the load is placed securely on a stable surface before detaching the rope.

Maintenance

Cleaning:

- ⊙ Clean the rope with mild soap and water.
- ⊙ Avoid using harsh chemicals that could damage the fibers.

Drying:

- ⊙ Allow the rope to dry completely before storage.
- ⊙ Avoid direct sunlight or high heat sources during the drying process.

Inspection and Replacement:

- ⊙ Regularly inspect the rope for any signs of wear or damage.
- ⊙ Replace the rope if any significant damage is found or if it fails an inspection.

Shelf Life and Service Life

- ⊙ Storage Conditions: Proper storage conditions are crucial to maximizing the shelf life of Manila Rope.
- ⊙ Store in a cool, dry place away from direct sunlight.
- ⊙ Avoid exposure to chemicals, oils, and other contaminants.
- ⊙ Estimated Shelf Life: Under optimal storage conditions, the shelf life of Manila Rope is typically 5 to 7 years. However, this can vary based on environmental factors during storage.
- ⊙ Service life is based on the frequency of use and environmental conditions.
- ⊙ Signs of Expiration: Even if the rope has not been used extensively, it should be inspected for signs of degradation such as stiffness, discoloration, or brittleness. If any of these signs are present, the rope should be replaced regardless of its age.