

Operating instructions



Round slings

- DoForce 1 round slings
- DoForce 2 round slings
- DoWeb round slings
- DoStabil round slings
- DoPremium round slings
- DoMega heavy-duty round slings
- DoLeicht round sling suspensions
- Special designs



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Imprint

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1 Foreword

1.1 About these instructions

These operating instructions are part of the scope of delivery.

Always keep the operating instructions ready to hand.

Read the operating instructions carefully before first use and observe the information when using the product.

Observe the safety instructions in the operating manual to avoid personal injury and damage to property.

1.2 Symbols in the instructions

Warnings of personal injury



This safety warning symbol and the associated signal word indicate important information for avoiding hazards that can lead to injuries or even death. The meaning of this signal word is explained in more detail below.

DANGER!	Extremely dangerous situation. Non-observance of the safety instruction will result in death or serious injury.
WARNING!	Dangerous situation. Non-observance of the safety instruction may result in death or serious injury.
CAUTION!	Dangerous situation. Non-observance of the safety instructions may result in minor injuries.

Warnings of property or environmental damage



This symbol indicates important instructions to avoid damage to the product or other objects as well as the surroundings (environment).

Other information



This symbol indicates other helpful information. This information is additionally marked with a frame.

1.3 Limitation of liability

Dolezych GmbH assumes no liability for damages caused by:

- Failure to observe these operating instructions
- Non-intended use
- Use of the product by untrained personnel
- Use of non-approved accessories / fitting parts
- Unauthorized modifications

1.4 Special regulations and guidelines

For safe handling of the product, special reference is made to the following applicable regulations and technical rules:

- EN 1492-2 – Textile slings – Safety – Part 2: Round slings made of man-made fibres for general purpose use
- EN 818-6 – Short link chain for lifting purposes – Safety
- EN 1677-1 - 4 – Components for slings – Safety
- DGUV 109-017 – Operation of load handling attachments and slings in hoisting operations
- DGUV Information 209-061 – Use of lifting slings and round slings made of man-made fibres
- DGUV Information 209-013 – Slings

If necessary, additional special regulations must be observed, e.g. for the transport of hazardous goods.

2 Safety instructions

2.1 Intended use

The product is used for slinging and lifting loads and may only be used:

- for loads that are suitable for this purpose due to their nature.
- by authorised and instructed persons.
- in compliance with the applicable regulations.

This is a professional product intended for commercial users.



According to DGUV 109-017 (formerly DGUV 100-500), round slings are lifting equipment and fulfil the requirements of EN 1492 Part 2.

It is expressly forbidden to:

- modify the product.
- repair the product by non-specialist personnel.
- lengthen the product by knotting or interlocking it with other lifting devices.

2.2 General safety instructions

When lifting loads with slings, the persons under or next to the load are particularly at risk. There are residual dangers when handling slings. These are in particular:

- insufficiently secure connection from the sling to the load,
- swinging load when lifting and
- falling loads.

For safe handling of the product, the following instructions must be observed.

- Observe the working load limit (WLL)! The product must never be loaded beyond the specified load capacity.
- In the case of multi-leg suspensions, the maximum total load-bearing capacity of the legs used must not be exceeded.
- Observe temperature ranges.
- Avoid contact with chemicals.
- Do not load the product if it is knotted.
- Do not load the product if it is twisted.

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- Edge protectors must be used for sharp-edged loads or the product may only be used with a suitable coating (e.g. PU, minimum thickness 5 mm).



A sharp edge is already present if the edge radius of the load is smaller than the thickness of the product (see also p. 16).

- The sewn area on the round sling cover must always be in the straight part of the round sling.
- To prevent damage to the labelling, it must not be positioned in the lacing point or the load application point.
- Reposition the round sling regularly between lifting operations to avoid overloading at certain points.
- Avoid tearing or jerky loads.
- Do not place loads on the product if this may damage the product.
- Never drag the load over the product.
- Do not pull the product out from under the load when the load is still on.
- Do not drag the product over floors or rough surfaces.
- Never leave the load in the sling if damage can result.
- Load the lifting hooks in the bowl of the hook. Lifting hooks must not be loaded on the tip.
- Fitting components must not be subjected to bending stresses.
- Suspension links/assemblies or shackles must be freely movable in the crane hook.
- Protect the product against flying sparks during cutting, grinding or welding work.
- If more than one sling is used to lift the load, they must be made of the same material (due to e.g., the same elongation values).
- The product must not be crushed or stacked.

2.3 Safety instructions for multi-leg suspensions

In addition to the general safety instructions, the following specifications apply to multi-leg suspensions:

- If not all legs are used in a load-bearing manner, the unused legs must be hung up in the suspension head. This prevents:
 - The legs from being damaged.
 - The then lower hanging hooks of the non-load bearing legs to cause:
 - Injuries to personnel or
 - Damages due to unintentional hanging
- If not all legs are used in a load-bearing manner, the labelled working load limit must be reduced by applying the corresponding utilization factor (see Table 1). In this case, two strands from different B-members must always be used.

Table 1: utilization factor for multi-leg suspensions

Type of suspension	Number of legs used	Utilization factor for marked working load limit
2-legged	1	1/2
3- and 4-legged	2	2/3
3- and 4-legged	1	1/3

Example:

A four-legged suspension has a marked Working Load Limit of 6.300 kg at an inclination of 0° - 45°.

If only two legs are used at an inclination of 0° - 45°, the Working Load Limit is reduced to 4.200 kg.

$$6.300 \text{ kg} * 2/3 = \underline{4.200 \text{ kg}}$$



For round sling suspensions, the load capacity of the entire suspension is indicated on the working load limit tag on the suspension link.
In accordance with EN 1492-2, the working load limit is either omitted from the labels of the individual round sling strands or is labelled as 0 kg.

3 Product description



NOTE! Woven belt material is coloured. Colour pigments can be transferred from the belt material to the surface of the load through direct contact with surfaces.

- Avoid possible discolouration or marks by using suitable intermediate layers.

3.1 Product identification

The label prescribed by EN 1492-2 is sewn into all Dolezych round slings. The information on the label is as follows:

- WLL = Working Load Limit = load-bearing capacity in the slinging type direct, stated in tons (exception for multi leg suspensions, see p. 8)
- Material of the round sling core:
 - PES = polyester, blue label
 - PA = polyamide, green label
 - PP = polypropylene, brown label
- Nominal length in metres
- Year of manufacture
- Manufacturer's label
- Traceability code
- GS mark and test centre (optional)
- CE mark
- Specification of the applicable standards



All Dolezych round slings manufactured in accordance with EN 1492-2 are colour-coded for easy differentiation.

Same sling colour = same load capacity.

This is only a guide! Always check the information on the labelling before use!

Load capacity	Colour	Load capacity	Colour
500 kg	Pink*	4 t	Grey
1 t	Violet	5 t	Red
1,5 t	Dark green*	6 t	Brown
2 t	Green	8 t	Blue
3 t	Yellow	10 tons and more	Orange

* These colours are not specified in EN 1492-2. These lifting slings are therefore manufactured "in the style of" EN 1492-2.

3.2 Labelling on the product

The markings on the product have the following meaning.

	Carry out a visual inspection before use.
	Read the operating instructions.
	Carry out inspection according to checklist.
	WLL = Working Load Limit = Load capacity Never exceed the working load limit.
	Observe the specified operating temperatures.
	Do not use if there are cuts or knots.
	Observe the "sharp edge rule"
	Be careful with chemical contamination. Consult the manufacturer.

3.3 Application-orientated product selection

The following points must be observed in order to select a suitable product for the application:

- Mass of the load,
- Position of the load's centre of gravity,
- Position of the attachment points,
- intended type of hitch.

The product must be selected so that it can support the load in such a way that it does not make any unwanted movements.

The criteria for the correct product selection are

- the type of product,
- the length of the product and
- the method of attachment to the load.

The product must be selected so that it is suitable for the environmental conditions at the place of use. Special environmental conditions can have a negative impact on the performance and stability of the product, meaning that the product may fail.

Special environmental conditions are:

- extreme temperatures,
- radiation,
- influence of chemical substances, especially acids, alkalis and solvents.

Operating temperatures

Depending on the material of which the product is made, the product may only be used and stored in the following temperature ranges.

Material	Suitable temperature range
Polyester (PES)	-40 °C to +100 °C
Polyamide (PA)	-40 °C to +100 °C
Polypropylene (PP)	-40 °C to + 80 °C



NOTE! If moisture is present, ice can form at low temperatures. Ice crystals in the fabric can damage it. This damage can also occur invisibly inside the product. This damage can reduce the load-bearing capacity. Ice can restrict the flexibility of the product and make it unusable.

- Only use the product when it is completely dry!

Radiation

The product is made of man-made fibres whose properties deteriorate when exposed to ultraviolet light.

The product should not be exposed to direct sunlight or other sources of ultraviolet radiation more than necessary.

The product must always be stored away from such sources of UV radiation.

Chemical resistance

The material from which the product is made has a selective resistance to chemicals. The material-dependent resistances are described below.

Material	Resistance at room temperature
polyester (PES)	Very resistant to mineral acids. Very sensitive to alkalis (lyes).
polyamide (PA)	Very resistant to alkalis (lyes). Very sensitive to mineral acids.
Polypropylene (PP)	Resistant to acids. Resistant to alkalis (lyes). Sensitive to solvents.



NOTE! Harmless alkaline or acid solutions can become so concentrated through evaporation that they can cause damage to the product. This damage can significantly reduce the load-bearing capacity of the product.

If the product has been contaminated, then:

- Take contaminated product out of service immediately
- Clean contaminated product with cold water
- Allow the product to air dry afterwards
- Do not artificially accelerate drying (e.g. by heating).
- Before using the product again, have it inspected by an expert.



NOTE! The chemical influence of aggressive substances must be carefully analysed, especially in the case of round slings. It is not sufficient to check the cover, as the twine fabric inside may be damaged even though the cover is intact.



If it is very likely that the product will come into contact with chemicals during use, additional information should be obtained from the Dolezych service team before use.

4 Testing and maintenance

4.1 Initial commissioning

Before using the round slings for the first time, it must be ensured that:

- Identification and dimensions of the product correspond to the specifications,
- the certificate issued by the manufacturer is available,
- the labelling and working load limit (WLL) attached to the sling correspond to the specifications of the certificate

If one of these criteria is not met, the product must not be used.

4.2 Before each use

Before any further use of the round sling, it must be ensured that:

- the labelling on the product is present and legible,
- the product shows no damage or defects,
- the product is not ready to be discarded (see page 14)

If one of these criteria is not met, the product must not be used.

4.3 Regular inspection

In accordance with DGUV 109-017, the product is a sling. The product must therefore be inspected at intervals of no more than one year. The inspection must be carried out by a competent person.



Dolezych GmbH offers a testing service for lifting gear.

The slings can be tested either at the test centre in Dortmund, at the company or directly on site.

Depending on the operating conditions of the product, tests may be required at shorter intervals than one year.

This applies, for example, to:

- particularly frequent use,
- increased wear,
- Corrosion or exposure to heat or
- if operating experience indicates an increased risk of damage.

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Carry out regular visual inspections during the period of use. This is the only way to detect any damage that may affect the safe use of the product at an early stage.

To be inspected are:

- Round sling cover
- Fittings
- Connecting elements
- Labelling

The product must be taken out of service immediately for examination by a competent person if:

- there are doubts about the usability,
- the required labelling is missing (label or tag),
- damage or special events have occurred that could influence the load-bearing capacity.

Examples of faults and damage that impair permanent and safe use are

- Scuff marks on the surface,
- Longitudinal or cross-sectional cuts in the cover,
- Damage to the seam of the cover,
- Visible core,
- Chemical influence,
- Damage due to heat or friction,
- Damage to or deformation of fittings,
- Damage to abrasion or edge protection hoses.

Dolezych repair service

If the product is faulty, it can be repaired by an expert Dolezych specialist. This helps to save costs.



Never repair the product yourself!
Improper repairs can lead to product failure.

4.4 Discard maturity

The product must not be used once it has reached discard maturity.

Discard maturity is reached at:

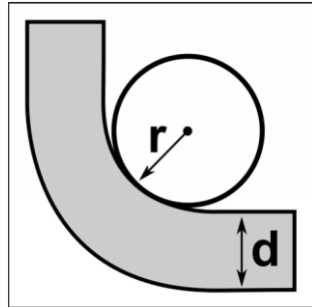
- Missing or illegible labelling
- Damage to the cover so that the load bearing core of the round sling is visible.
- Damage to the load-bearing core (repair is not possible in this case)
- Damage due to the influence of heat (friction, radiation).
This damage can be recognised by:
 - glossy appearance of the fibres of the cover
 - fused fibres
- Damage caused by the effects of aggressive substances.
This damage can be recognised by:
 - the flaking of fibres
 - Fibres that can be pulled out or rubbed off
- Deformations, cracks, fractures or other damage to components, such as:
 - Hook opening increased by more than 10 % of the nominal width
 - Wear in the hook bowl exceeding 5 %
 - Wear of suspension or end links exceeding 15 %

5 Application notes

5.1 Protection from sharp edges



NOTE! Sharp-edged loads and lifting equipment can damage the product and lead to failure! A sharp edge already exists if the edge radius **r** of the load is smaller than the thickness **d** of the product.



The following measures can be used to protect the product from sharp edges:

- Use edge protection tubes.
- Use products with integrated edge cut protection. When using these products, the edge cut protection must always be positioned between the product and the load or lifting device.



Dolezych cut protection tubes and *DoLex* tubes protect round slings from sharp edges.



NOTE! Round slings with edge protection tubes are only suitable for lifting and not for turning. Too much heat is generated in the edge area during the turning process.

5.2 Load factors and working load limit (WLL)

The working load limit (WLL) specified on each product applies to the "direct" type of hitch. The working load limit of the product depends on the type of hitch used. The label shown in Figure 1 is located on each Dolezych product. This label shows the load factors for the common hitch types.

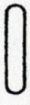
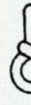
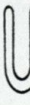
direkt	ge-schnürt	umgelegt	
LA = 1	LA = 0,8	LA = 2 ($\beta \leq 7^\circ$)	LA = 1,4 ($\beta \leq 45^\circ$) LA = 1 ($\beta \leq 60^\circ$)
			 ($\beta \leq 45^\circ$)  ($\beta \leq 60^\circ$)
			 ($\beta \leq 45^\circ$)  ($\beta \leq 60^\circ$)

Figure 1: Load-bearing capacity with common hitch types

β = angle of inclination (angle between the vertical and the sling)

LA = Load attachment factor (ratio of the possible working load limit to the working load limit in the "direct" hitch type)

Example:

Working load limit in direct hitch type
(LA = 1) = 10 tons

Working load limit in the choker hitch
(LA = 0.8) = 10 tons * 0.8 = 8 tons



Not every type of hitch shown is suitable for every load.

5.3 Lifting configuration

Choker hitch

When using the product in a choker hitch, the working load limit (WLL) of the product is only **80 %!**



NOTE! A jerky tightening may occur when the load is picked up. The resulting friction can damage the product.

- Manually tighten the unloaded round sling as far as possible before lifting the load.



NOTE! To prevent damage to the labelling, it must not be located in the choking point.

Basket hitch



WARNING!

Risk of injury from falling load!

The slings can slip together when using the basket hitch. The load can shift and fall out of the slings.

- Only attach large loads in the basket hitch if the slings cannot slip together and the load cannot shift.
- Use spacers to prevent the slings from slipping together.



WARNING!

Risk of injury from falling load!

When slinging long, rod-shaped loads under lifting beams in the basket hitch, the load or parts of the load can shoot out to the side or bend in such a way that they slip out of the slings.

- Support the load so that it cannot bend.
- Forcibly prevent the crossbar from tilting.

OR

- Use the nature and surface of the load for slinging in such a way that the load or parts of it cannot shoot out.



Due to the existing hazards with the "basket hitch", this type of hitch should only be used in exceptional cases!
Instead, it is recommended to use the choker hitch.

5.4 Attachment to crane hooks

When using round slings with stitched eyes, the eye length must be at least 3.5 times the maximum hook thickness.

When attaching to a hook, the angle formed by the eye of the sling must not be greater than 20° (Figure 2).

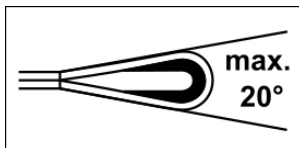


Figure 2: maximum opening angle of the eye

5.5 Attachment to the load

When attaching the product to the load, arrange it in such a way that:

- a uniform load is applied across the entire width of the product,
- there are no seams above the hook area or other lifting equipment,
- the seams are always in the straight part of the product,
- damage to the label is avoided by keeping it away from the load, hooks and lacing.
- it does not overlap itself or other round slings.



WARNING!

Risk of injury from falling load!

Strapping is not a suitable anchor point

- Never reach under the strapping!

5.6 Balancing the load

To lift the load without it twisting or turning over, the following conditions must be observed:

- For single-leg suspensions, the anchor point must be vertically above the load's centre of gravity.
- For 2-leg suspensions, the attachment points must be evenly spaced on both sides and above the load's centre of gravity.
- For 3- and 4-leg suspensions, the attachment points must be equally distributed in a plane around the load's centre of gravity and must be above the load's centre of gravity.



NOTE! It is essential to observe the angle of inclination β : The greater the angle of inclination, the lower the working load limit.

➤ Angles of inclination exceeding 60° are not permitted!

- In the case of 3- and 4-leg suspensions and uneven loading, only the working load limit of a 2-leg suspension may be assumed on the largest angle of inclination.
- If different angles of inclination occur with 2-leg suspensions (Figure 3), only the working load limit of a single leg may be taken as a basis.

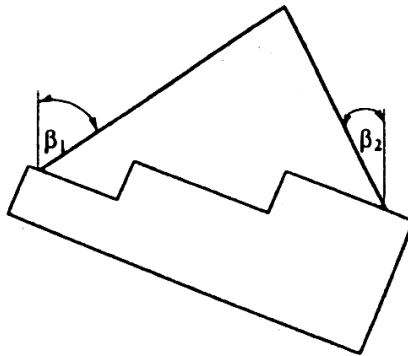


Figure 3: Example for unequal inclination angles β

Uneven load distribution is always to be expected when:

- the load is inelastic (e.g., concrete parts, castings, short beams).
- the position of the centre of gravity is not known.
- the load is unevenly shaped.
- different angles of inclination occur.

5.7 Setting down the load

The following guidelines must be observed when setting down the load.

- Prepare the set-down location so that the product is not trapped under the load (e.g. use wooden supports).
- Ensure that the load is secure!
- Do not remove the product until the load has been secured against tipping over and slipping.

6 Storage and care

6.1 Storage

Before storing the product, inspect it for damage that may have occurred during use.

Do not store damaged products.

Store the product on a shelf

- in a clean, dry and well-ventilated environment,
- away from heat sources.

During storage, contact must be avoided with

- Chemicals,
- flue gases,
- corroding surfaces,
- direct sunlight,
- other sources of ultraviolet radiation.

6.2 Cleaning

Clean the product with clean water only.

Do not use any chemical additives.

If the product has become wet due to cleaning or use, hang it up to dry.

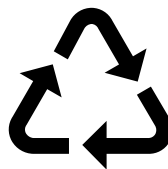
Do not artificially accelerate the drying of the product (e.g. by heating).

7 Disposal instructions

Dolezych round slings are made from recyclable materials.

Once they have reached the end of their useful life, these round slings must be disposed of properly and in accordance with the local legal requirements.

Contamination of the round slings during use can impair their recyclability.



8 EC Declaration of Conformity

In accordance with the EC Machinery Directive 2006/42/EC



We hereby declare,

Dolezych GmbH & Co. KG
Hartmannstraße 8
44147 Dortmund

that the round slings designed for lifting loads comply with the following relevant regulations in the standard version:

EC Machinery Directive 2006/42/EC

EN ISO 12100 Safety of machinery - General principles for design

EN 1492-2 – Textile slings - Safety – Part 2: Round slings made of man-made fibres for general purpose use

Dortmund; 30.10.2017

A handwritten signature in black ink, appearing to read 'Th. Schade', is written over a dotted line.

Dipl. Ing. Thomas Schade
(Authorised representative)