

PRODUCT INFORMATION

USER INFORMATION

Textile ropes in service

Usage guidelines

Storage and maintenance

To avoid negative effects on material properties of natural fibre and synthetic ropes the following should be observed:

- The storage environment should be well ventilated and at normal temperature and humidity.
- Excessive heat, moisture and contact with acids and alkalis or other aggressive substances should be avoided to prevent sudden and significant loss of strength.
- Natural fibre rope having come into contact with aggressive substances must be discarded.
- Synthetic ropes having come into brief contact with aggressive substances can retain their usage properties if rinsed immediately with water. However, the rope must be carefully examined for possible changes and its safety confirmed.
- Soiled ropes should be cleansed (with water) and dried (in fresh air) before being stored.

Inspection

Textile ropes should be inspected before and during service to establish their safe usage condition. Check for:

- Broken yarns
- Broken strands
- Compacted or crushed areas
- Kinks in twisted rope
- Loosening of rope structure
- Condition of end fittings
- Damage caused by aggressive substances
- Evidence of rot in natural fibre ropes (excessive fibre dust)

Removal from service

Discard in the event of:

- Broken strands
- Absent or inadequate marking or identification
- More than 10% of all yarns broken or split
- Kink formation
- Heavy mechanical wear (over 10% loss of cross-section), applies to surface as well as inside of rope
- Melt marks in synthetic ropes (over 10% loss of cross-section), applies to surface as well as inside of rope
- Excessive fibre dust in natural fibre ropes
- Deformation due to overload, or shock load (over 10% loss of cross-section)
- Working temperature range exceeds permitted limits, even temporarily (For maximum temperatures at continuous operation see 'Characteristics of textile ropes by material')
- Evidence of rotting in natural fibre ropes (discoloration, fungal infection, musty smell, loose rope construction)
- Loose, irreparable splices

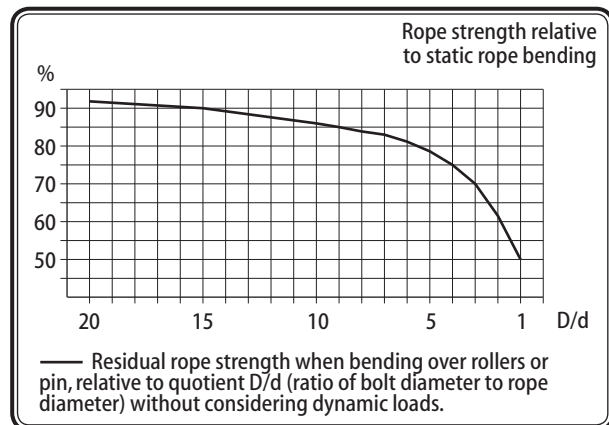
Damage and risks

When assessing the condition of textile ropes the following must be taken into consideration:

- Increased wear reduces working load.
- A slightly roughened surface on synthetic ropes (furring) only slightly lowers breaking strength and reduces further surface wear.
- Under normal service conditions the inner frictional resistance in synthetic ropes is high, therefore inner wear low.
- Outer frictional resistance of synthetic materials when in

contact with harder materials, however, is low, at least far lower than that of natural fibre materials. The consequence, depending on material, is relatively low wear resistance. Ropes should therefore never be pulled over coarse or dirty surfaces, whether under load or not. This means that any rope pulleys, moving rollers or wheels, stationary bollards or chocks must have clean, corrosion-free and smooth surfaces. If this is not the case, chafe protectors should be used to reduce abrasion.

- Textile ropes are flexible but have low cut resistance. There are, however, limits to pliability: Depending on the bend diameter, static bending reduces breaking strength (for coefficient see approximates in graph) whilst dynamic bending causes material fatigue and destruction (excessive wear through yarn and strands rubbing together). The higher the number and intensity of repeat bends, the greater the wear.



The bend diameter should, depending on material and construction, be adequately large, certainly no less than 5d for fibre ropes made from polypropylene, polyamide and polyester; 8d for wire ropes made from polyamide (d=nominal rope diameter). In ropes made from high modular polyethylene or aramid the bend radius primarily depends on the rope construction, therefore the manufacturer or supplier should be consulted. Sharp edges must at all times be avoided, if necessary by using edge protection.

- The high elasticity of most synthetic rope materials leads to considerable energy build-up when stretched under load, which may cause a snap back effect if the rope breaks. This can be absolutely lethal to people located near the breakpoint, especially if linear to the rope gradient.
- UV radiation damages chemical fibres, especially polypropylene, less for polyester. UV resistance can be significantly increased by treating with UV stabilisers and is particularly recommended for polypropylene ropes. The resistance of natural fibres and synthetic wire ropes to UV radiation is far higher than that of chemical fibre ropes.
- Textile ropes are generally heat sensitive. Either they burn (natural fibres) or melt (synthetic materials: see also table 'Textile ropes in comparison' elsewhere in this chapter). Textile ropes must therefore be protected from heat and never be dried using fan heaters or other direct heat sources.
- Even without other harmful influences, aging causes a reduction in breaking strength, more so for natural fibres than synthetic materials. It is recommended to test the breaking strength of ropes stored for more than five years.

Handling

Improper winding or unwinding of twisted textile ropes can render them inadequate for service. Winding from a drum or reel should be done tangentially from the inside of rings (coils), i.e. in the winding direction.

Braided ropes are flexible and can be pulled off in both directions. Twisting and untwisting should be avoided to prevent permanent deformation under load and therefore damage, even rendering them unsuitable for service. Kinks in twisted ropes bearing no strain can be removed by turning if one end of the rope can turn freely.

It is best to place ropes on the ground as they fall. In most cases this will be in a figure eight.

General

These usage guidelines are based on existing European recommendations and standards. Further to these, consideration should also be taken of applicable local, national and international legislation, standards, directives and regulations from official societies (professional organisations, classification bodies, etc.) with regard to equipment safety (personal protection, industrial safety, accident prevention), as well as recommendations and operating instructions from manufacturers and/or operators of the equipment being used (lifting gear, conveyor systems, etc.).

You are advised to consult the manufacturer or supplier if in

Typical

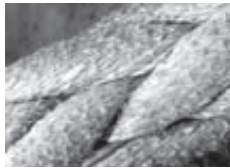
Views of areas with more or less heavy irreparable damages, or areas just slightly affected, thus repairable or without consequences.



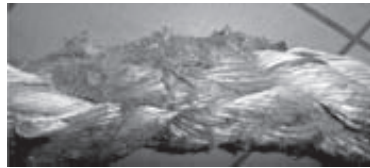
Complete strand pulled out.



Several yarns cut.



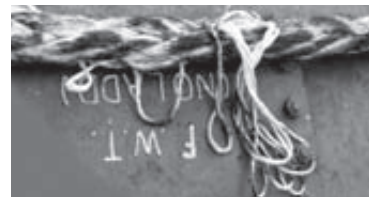
Used rope. Furry surface. No damage.



Cut and abraded yarns.



No damage. Single pulled out yarn. Repairable.



Large amount of pulled out yarns.



Six-strand laid rope with kinks.



Six-strand laid rope with birdcages.



Knotted yarn (inevitable during production of strands). No damage.



Rope compressed upon heavy load on winch drum. No damage.



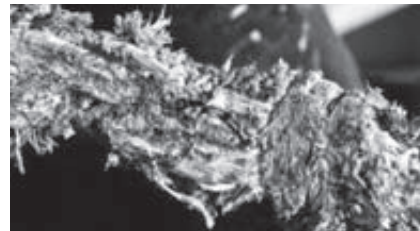
More than 50% of all yarns in one strand cut.



Damaged braided jacket. Repairable if core undamaged.



Damaged splice. Irreparable without cutting short.



Melted areas caused by friction (under load).