Draka CSR d.6,5 mm PU Coated Rope User Manual

Version 1022

Draka EHC

A Brand of Prysmian Group

Important! Please read first!

WARRANTY AND SAFETY INFORMATION

This user manual is meant to serve as a general guideline for use of DRAKA CSR d.6,5 mm Elevator Rope.

Please contact your rope supplier for technical assistance.

Customers are encouraged to adapt these guidelines to the specific requirements of their elevator models. Elevator manufacturers and installers are fully responsible for design, testing, and usage of elevators.

All conditions of the conformity or type certificates issued by the notified body and local laws and regulations must be fulfilled to ensure safe operation of the elevator.

Certification documents are available from your rope supplier upon request.

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Product description

SPECIFICATIONS AND TRACEABILITY

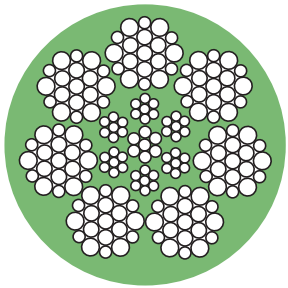
Draka EHC's Coated Steel Rope (CSR) is a unique product that offers several advantages in elevator operation. It is smaller in diameter and offers better traction than comparable uncoated steel ropes.

SAP Code: CITEBK065P143A

Description: DRAKA CSR d.6,5 mm 7x7+7x19W sZ 2450 N/mm^2

Every Draka CSR d. 6,5 mm rope is uniquely marked to be traceable to its point and time of manufacture. This number must be reported in the working certificate to ensure a match between the rope and the document.

SPECIFICATIONS FOR DRAKA CSR D.6,5 mm	
Specification	
Diameter (nominal)	6,5 mm
Wire rope diameter	5,0 mm
Wire rope construction	Warrington 7x7+7x19 with IWRC
Wire tensile (nominal) strength	2.450 N/mm^2
Minimum Breaking Load	28 kN
Weight (kg/m)	0,12
Metallic cross-section	12,6 mm^2



Special handling instructions

KEEP AWAY FROM SPECIFIC CHEMICALS

Exposure to certain chemicals may damage PU-coated ropes. The extent of damage depends upon the substance and the concentration, temperature and duration of exposure.

Exposure will cause a gradual degradation of the rope. In extreme cases, it can cause disintegration of the coating.

Chemical substances to avoid include, but are not limited to:

- Aromatic hydrocarbons such as benzene and toluene
- Concentrated acid and alkaline solutions
- Solvents such as ethanol, aliphatic esters, propanol, acetone, and ketones. Some organic solvents such as dimethyl sulfoxide, dimethylformamide and tetrahydrofuran can dissolve the coating
- Extended contact with hot water can cause slow degradation of the coating
- Lubricants such as oils and greases can cause severe reduction of the rope's traction capabilities.

Special handling instructions

PROTECTION FROM THE ELEMENTS

The rope must be stored in a protected environment that is dry, clean and temperature-controlled. Most importantly, the rope must not be exposed to the environment (e.g. rain, direct sun exposure, dust, dirt, etc.).

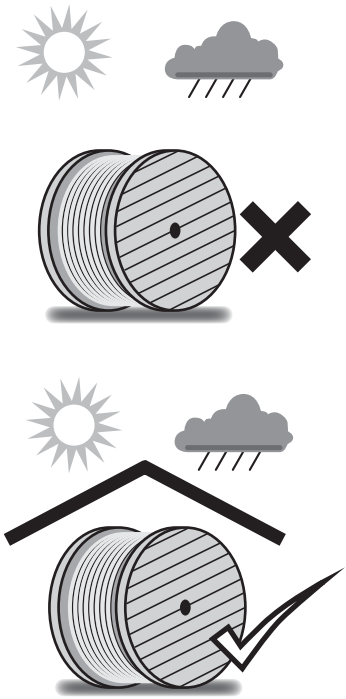
When storing, find a location where the rope will not be exposed to direct sunlight. For instance, if a window permits direct sunlight to shine on the cable, the window should be blocked or shaded.

Long-term storage temperature must be kept within a range of -10°C to +50°C.

During short-term exposure, such as transportation, temperatures between -25°C and 80°C can be tolerated. Note that temperatures above 80°C can cause a slow degradation of the coating.

Avoid contact with heat sources, as high temperatures can melt the coating and cause irreversible damage.

DO NOT perform welding or grinding work in proximity of the product as sparks will cause damage to the coating.



Special handling instructions

AVOID ALL CONTACT WITH DIRT AND LUBRICANTS

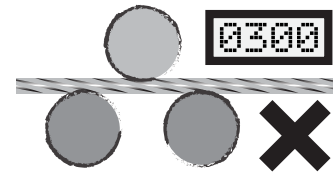
Coated ropes are very sensitive to lubricants and oil substances in general.

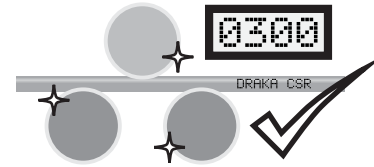
Therefore, it is essential that the rollers in the cutting machine counter are free of lubricants and debris that they have picked up from cutting standard wire ropes.

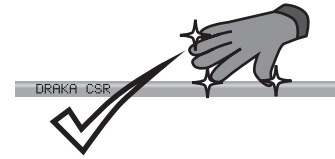
Additionally, the operator's gloves must be clean and clear of grease or lubricants. Dirty rollers and gloves will transfer contaminants to the coating that may damage the rope.

If the rope becomes contaminated, use these steps to clean the rope:

- Remove dirt by rubbing the coating with a dry, clean cloth.
- If this is ineffective, use a clean cloth to apply pure water or a solution of mild soap in water. Remove any soap residue with pure water.
- If contamination is still present, pour isopropanol (isopropyl alcohol) onto a clean cloth and use the cloth to remove the dirt/lubricant. Use a minimal amount of solvent. Heavy or long-term contact with isopropanol will damage the coating.







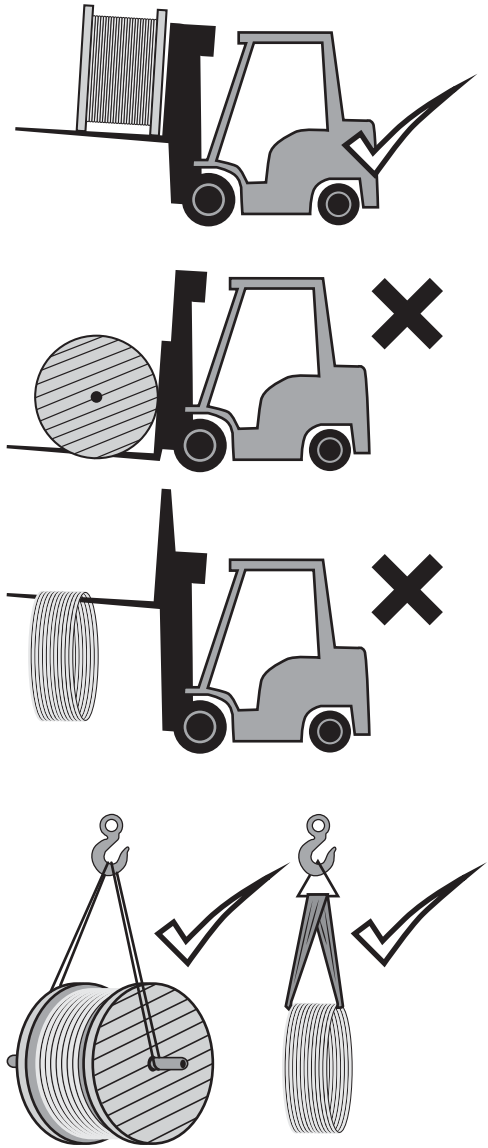
Transporting and moving reels

TAKE SPECIAL CARE WHEN USING FORKLIFTS

Maximum care must be paid in the operation of movement and handling of the rope coils due to the delicate nature of the rope surface.

All sharp edges must be avoided and suitable hanging points must be used to move the reels properly in the warehouse.

Forklift forks can seriously damage the surface of the rope. DO NOT let the forks touch the exposed rope in any way. The preferred method of movement is to place a rod through the hub of the reel and use the forks to lift the rod.



Handling rope on a reel

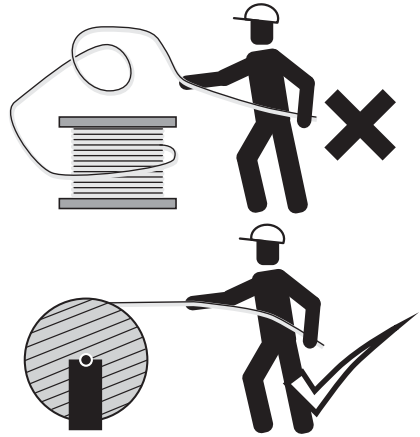
AVOID KINKING, LOOPING AND PLACING TORSION INTO THE ROPE

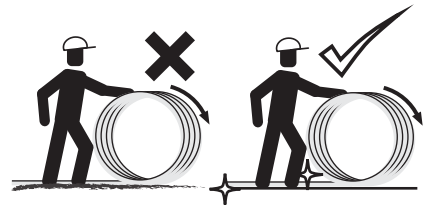
When uncoiling the rope:

DO NOT let the rope loop or kink.

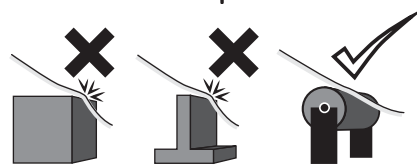
DO NOT uncoil the rope on dirty or rough surfaces, as this can irreparably damage the rope coating.

DO NOT introduce torsion into the rope. Torsion can be avoided by allowing the reel to rotate as the rope is payed off. Do not drag the rope from a standing reel.

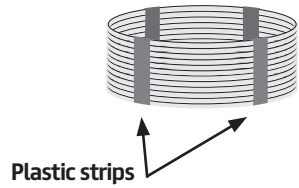




DO NOT drag the rope over sharp edges or rough surfaces. Use a smooth rotating drum to prevent damaging the rope.



DO NOT use metallic strips to secure coiled ropes. The sharp edges will damage the surface of the rope. The use of plastic strips is mandatory.

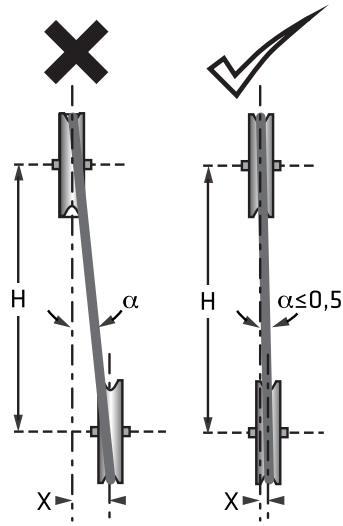


Usage and maintenance

DEFLECTION SHEAVE ALIGNMENT AND SHEAVE GROOVE INFORMATION

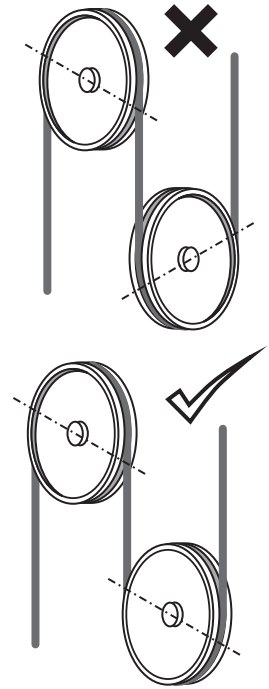
Elevators must be designed with the properties of DRAKA CSR d.6,5 mm elevator rope in mind to obtain all its benefits. The following recommendations are general guidelines. Please contact your supplier of DRAKA CSR d.6,5 mm ropes for further support.

During elevator design, reduce deflection angles of the ropes entering sheaves to the absolute minimum. It is recommended to carefully check alignment of all elevator components during installation with appropriate tools such as laser gauges.



Additionally, all sheaves must be in the same plane. The rope cannot be rotated during travel.

Both traction and deflection sheaves must have semi-circular grooves. Worn or otherwise unsuitable sheaves can damage the rope.



Usage and maintenance

FRICTION FACTORS

Prysmian Group recommends using the following values for the friction factor f as a guideline for elevator design. Please note that these are friction factor values f and not friction coefficient μ.

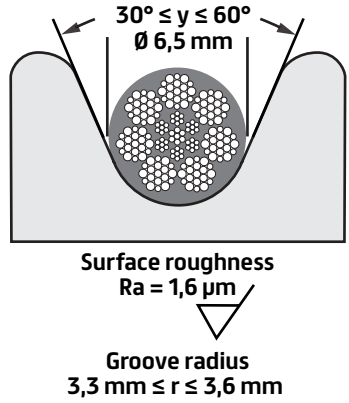
- Car loading condition (EN81-50 art. 5.11.2.2.1): $f = 0.25$
- Emergency braking condition (EN81-50 art. 5.11.2.2.2): $f = 0.25$
- Car stalled condition (EN81-50 art. 5.11.2.2.3): $f = 0.75$

The values for f given above are based on laboratory test results. It is mandatory to perform traction tests during prototyping of elevator models and for each individual installation before putting it into operation. Note that traction of new ropes tends to increase during the first elevator movements.

Please note that the main concern of the EN81-20 art. 5.5.3.b condition for emergency stops is to ensure sufficient deceleration. Elastomer coated elevator ropes have significantly higher friction factors compared to bare steel wire ropes. In some cases, this can lead to very high decelerations during emergency stops.

We recommend to use a wrapping angle of at least 120° for the traction sheave. Please contact your rope supplier in case your elevator design requires wrapping angles less than 120°.

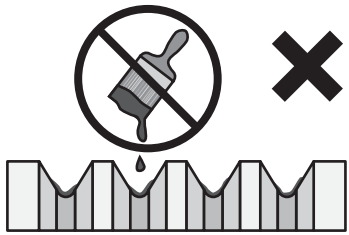
The electrically-isolating nature of the coating can cause electrostatic charging during elevator usage. Electrical grounding of the steel rope core is recommended, particularly if plastic deflection sheaves are used.



Usage and maintenance

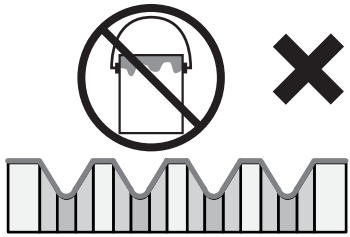
INSTALLATION

During rope installation, do not pull the rope over sharp objects or edges. Avoid twisting/ rotating the rope around its axis. Twisting can lead to a build-up of excess strand or wire length inside the rope. This can cause reduced rope life.



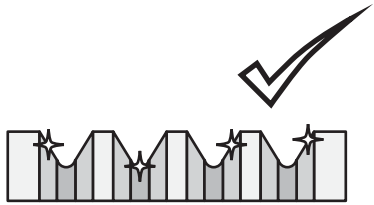
Remove all greases and oils (such as corrosion protection) from the traction sheave before rope installation. Contamination of the rope with lubricants such as greases and oils can cause severe reduction of traction capabilities and rope slip over the traction sheave.

The sheaves should not be painted.



Avoid rope contact with lubricated elevator parts such as guide rails.

DO NOT use contaminated gear (such as greasy gloves) during rope handling.

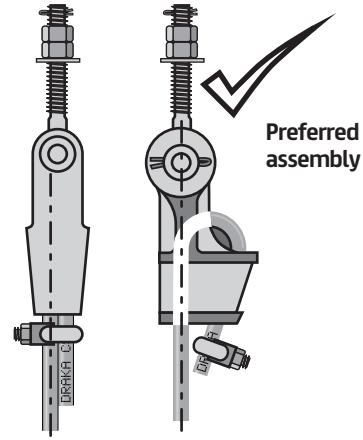


Usage and maintenance

TENSIONING AND CHECKING FOR TORSION

Rope terminations should be compliant with DRAKA CSR d.6,5 mm elevator ropes and fulfill all relevant safety regulations.

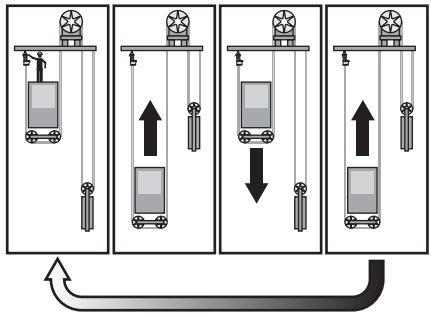
Ropes must be installed with equal tensions (±10%). Tensions must be re-checked after a few trips and corrected if necessary.



After initial tensioning, run the elevator up and down to allow for the tension to be spread along the complete length of the rope. Check the rope tensions again, adjust as necessary, and make another complete trip of the elevator. Repeat until tensions fall with the 10% difference.

Immediately after installation, rope torsions should be checked during inspection mode. Rope torsion can be best observed by attaching to the ropes small “flags” made from sticky tape. During elevator movement, ropes should not rotate for more than one full turn for a moving distance of 20 metres of rope. Excessive rope torsions/rotation during movement is usually caused by misalignments and will reduce the life of the rope.

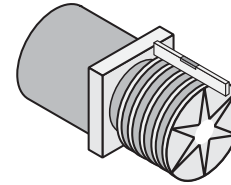
Rope tensioning is an iterative process - Repeat until all ropes have equal tension



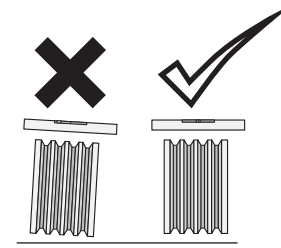
Usage and maintenance

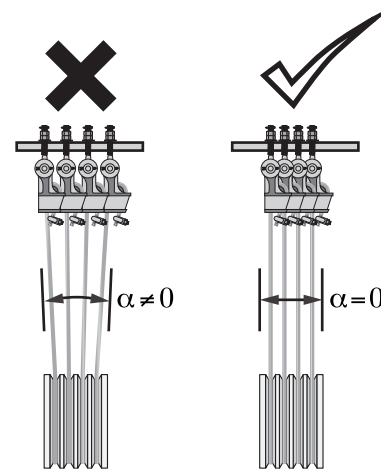
LISTEN FOR NOISE DURING OPERATION

Ropes should be silent while running over sheaves. Noise can be a sign of excessive deflection angles as the rope enters the sheave and could indicate dirt inside the sheave grooves.



Carefully check for misalignment to see if all ropes are running through the grooves correctly and if terminations are properly positioned.



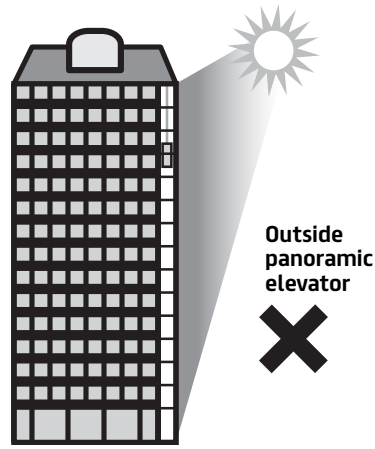


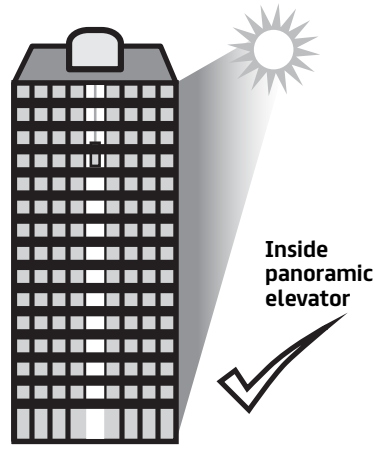
Usage and maintenance

OPERATING TEMPERATURES AND EXPOSURE TO SUNLIGHT

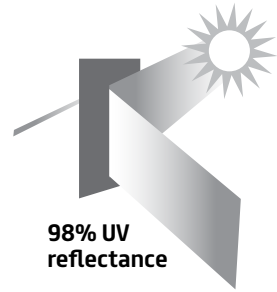
The recommended temperature range during elevator operation is 0°C to 40°C. However, the rope may withstand temperatures that are above or below the threshold for a short period of time, such as when they are being shipped.

The rope should not be used in environments with temperatures higher than 60 °C or below -10°C. Using the rope outside of the recommended temperature range may lead to a reduction in the life of the ropes.





When used in external panoramic elevators, the glass should be surface laminated with a PVB film interlayer to protect the rope against UV rays. As an alternative, apply an adhesive anti-UV film to the glass. It is necessary that at least 98% of UV radiation be blocked.



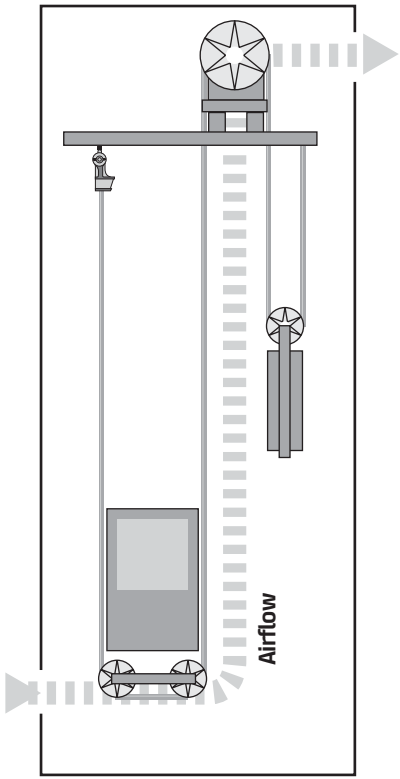
Usage and maintenance

HUMIDITY AND CONDENSATION

DRAKA CSR d.6,5 mm elevator ropes operate best in environments that do not permit condensation (the formation of moisture) on the ropes.

Avoid placement in areas where there are wide differences in ambient temperatures, such as sunlit areas that rapidly cool in the evening).

Adequate airflow in the hoistway (creating a chimney effect with lower and upper venting) is a good way of decreasing condensation. The best way is to make sure that the hoistway is climate-controlled.



Discard criteria

REPLACE ALL ROPES IF DISCARD CRITERIA IS REACHED FOR ONE

DRAKA CSR d.6,5 mm elevator ropes are almost maintenance-free and must not be lubricated. Check for discard criteria at regular inspection intervals specified by the elevator manufacturer. The discard criteria are part of the conformity examination certificates issued by the notified body. During elevator inspection, check also for surface contamination of ropes, confirm or adjust rope tensions for equality, and verify traction capability.

If one or more of the discard criteria is reached, ALL ropes in the installation must be replaced. It is forbidden to exchange individual ropes.

Discard criteria

DEPENDS ON NUMBER OF TRIPS, NUMBER OF YEARS OR VISIBLE DAMAGE

Coated steel ropes have to be replaced when the maximum number of trips or lifetime in years (from TÜV SÜD examination of conformity certificate CA561) is reached OR when one of the other discard criteria described below occurs.

DISCARD CRITERION				
Suspension	1:1	1:1	2:1	2:1
With extra pulley	No	Yes	No	Yes
Maximum number of trips (millions)	3	1,5	1	0,75
Number of bends of rope parts with the highest level of wear	1	2	3	4
Maximum number of years until replacement of the ropes	10	10	10	10

The ropes have to be discarded after reaching a determined value of time or trips (it depends which case occurs first). Every change of direction shall be counted as one complete trip.

Discard criteria

INSPECTION

In addition, the ropes must be regularly inspected over the whole length and discarded:

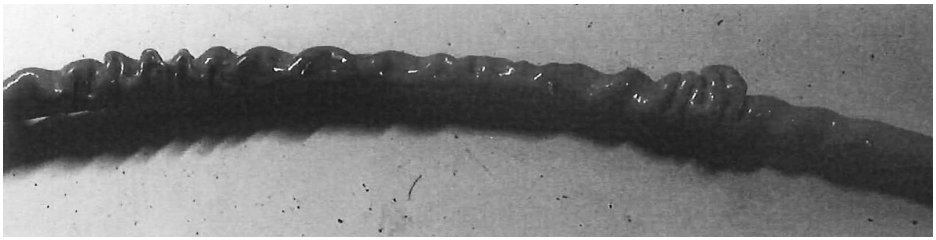
- in case of positional displacement of the steel rope inside the plastic sheathing
- in case of recognizable ingress of moisture into the plastic sheathing,
- in case of deformation of the plastic sheathing (e.g., blistering, crease, necking),
- in case of deformations caused by persistent torsions of the ropes,
- in case of coating cracks clearly visible at straight rope sections under tension that extend to the inner steel rope with a number greater than 3 over a length of 10 cm,
- in case of plastic sheathing damage with large separation of the coating from the rope of a length greater than 1,5 cm,
- in case of escaping steel wire through the plastic sheathing with a number greater than three over a length of 100 cm, and
- in case of wire rope strand breakage.

All ropes in the elevator installation have to be exchanged at the same time even when above discard criteria are reached only for one or more individual ropes. It is not allowed to exchange individual ropes.

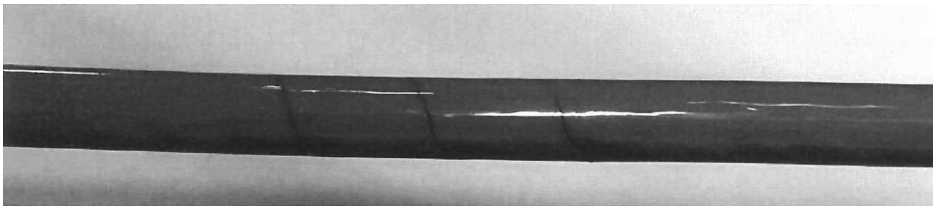
Discard criteria

EXAMPLES

Ropes have to be discarded in case of deformation of the plastic sheathing.



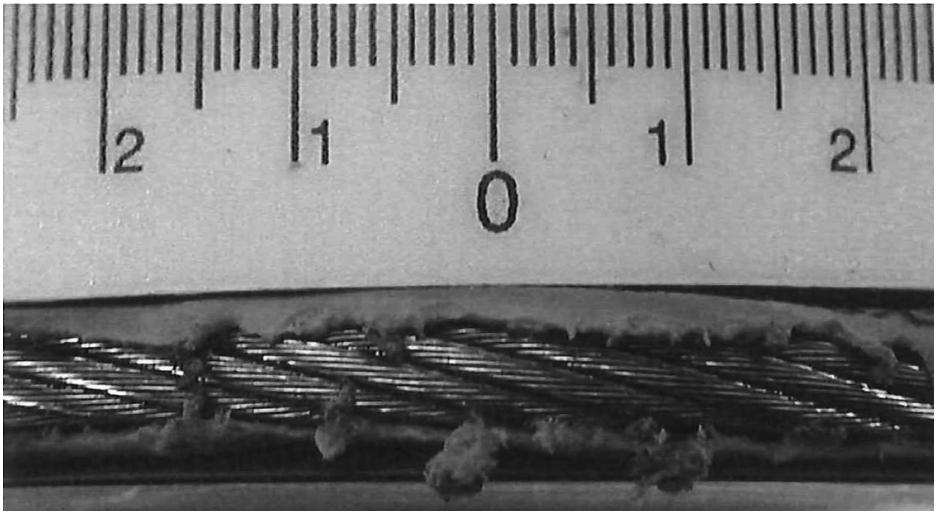
Ropes have to be discarded in case of coating cracks clearly visible at straight rope sections under tension that extend to the inner steel rope with a number greater than three over a length of 10 cm.



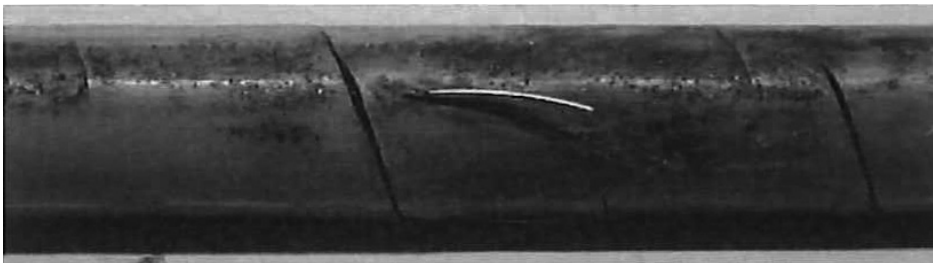
Discard criteria

EXAMPLES

Ropes have to be discarded in case of plastic sheathing damage with large separation of the coating from the rope of a length greater than 1,5 cm.



Ropes have to be discarded in case of steel wires escaping through the coating with a number greater than three over a length of 100 cm.



Warranty

DRAKA EHC warrants that the DRAKA CSR d.6,5 mm elevator ropes conform to the specifications agreed upon with its clients.

Except as provided in DRAKA EHC terms and conditions of sale, DRAKA EHC neither makes nor assumes any warranty of merchantability, any warranty of fitness for any particular purpose, any warranty that the goods shall be delivered free of the rightful claim of any third person by way of infringement of any patent, copyright, or other intellectual property or the like, or any other warranty of any kind, express, implied or statutory. DRAKA EHC neither assumes nor authorizes any person or entity to assume for it any other liability or obligation in connection with the sale or use of DRAKA CSR d.6,5 mm elevator ropes, and there are no oral agreements or warranties collateral to or affecting the sale of DRAKA CSR d.6,5 mm elevator ropes. DRAKA EHC cannot be considered to accept any of the liabilities for providing advice with regard to the maintenance of the products.

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