

## Installation and maintenance instructions for wire and mooring ropes

(05.12.2011)

### 1. Goods inwards check

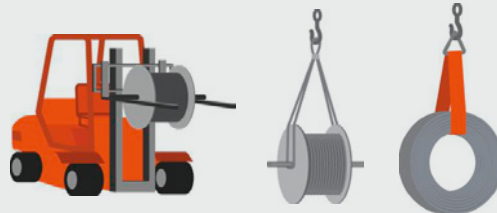
When the goods are delivered, you must check the condition of the ropes and the condition of the packaging on the delivery truck. Mechanical damage to the ropes or visible transport damage must be correspondingly documented and presented.

### 2. Transportation

The lifting equipment must not come into direct contact with the rope.

The use of lifting straps is recommended for lifting rolled up sections of rope.

When lifting coils, insert an auxiliary bar through the axle hole of the coil.



### 3. Storage

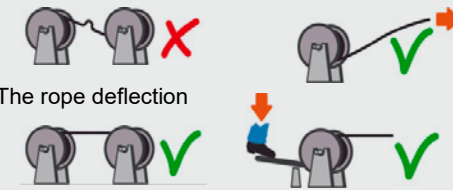
Ropes must be kept clean, dry, protected from strong solar radiation and must not make contact with the floor.

If temporarily stored outside, they must be covered and regularly checked for condensation and penetrating moisture.



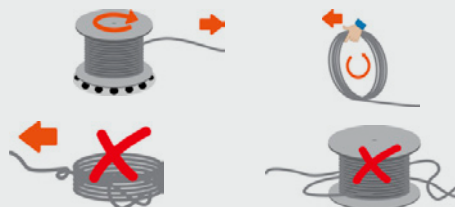
### 4. Spooling

Wire ropes must be wound up and rewound with initial tension. This is particularly important for multiple layer winding. The rope deflection must not be more than 10°. The winding direction must be retained to prevent the rope from twisting. You must also avoid floor contact, squashing or pulling the rope over sharp edges to prevent soiling and mechanical damage.



### 5. Unwinding

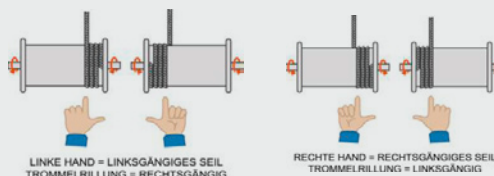
Avoid looping when unwinding wire ropes and fasteners. When unwinding, ensure that the rope is not stopped by torsion or dirt.



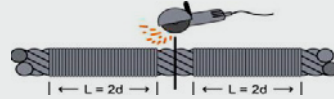
### 6. Positioning and commissioning

The following rules apply when driving rope:  
Right lay rope requires a left hand grooved drum.  
Left lay rope requires a right hand grooved drum.  
When positioned or inserted, ropes must be protected from dirt and mechanical damage. When inserted, there

must be no torsion in the rope. Threading aids such as welded eyelets, nuts etc. do not carry the breaking forces specified for the rope and must be removed after rope has been inserted. The diameter and wear and tear of the rope pulleys and drums must be checked before laying ropes for the first time and when replacing ropes.



End connections of newly laid ropes must be repeatedly checked at the beginning of commissioning and screw connections must be repeatedly tightened.



## 7. Cutting

Ropes must be carefully set on both sides next to the cutting point to prevent an end of the rope from springing up. The rope is tied off with iron wire as insulating tape cannot prevent the wire ropes from structurally changing.

## 8. Greasing / lubrication

Greased ropes must be regreased to reduce inner and outer friction. The ropes can be greased manually or using automatic greasing equipment.

When regreasing, ensure that the types of grease used are compatible. Drahtseilwerk Bremerhaven will be happy to provide information about the types of grease used during production.

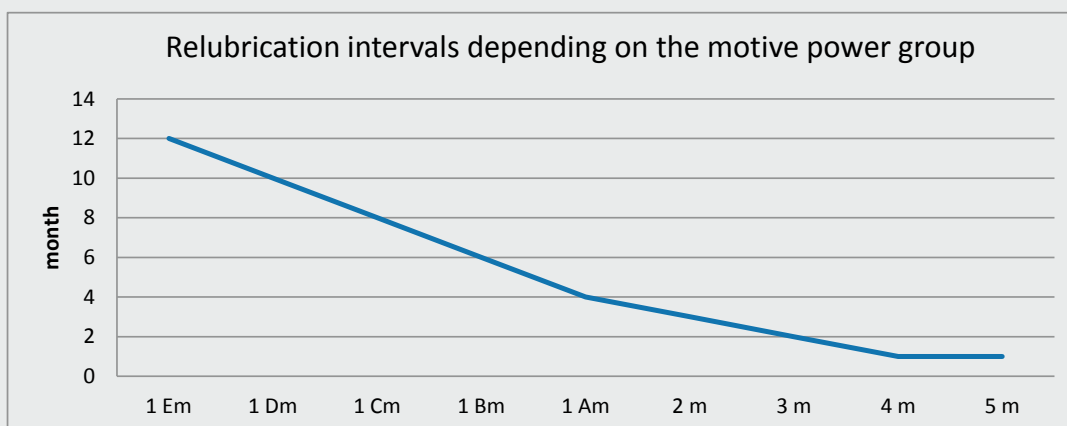
Before regreasing the ropes, they must be cleaned to ensure that the new grease is not blocked by dirt or residual grease.

The regreasing intervals are determined by the situation and the classification associated with the appropriate motive power group.

Motive power groups in accordance with DIN 15020, page 1

Operating class	Abbreviation			V006	V012	V025	V05	V1	V2	V3	V4	V5
	Average operation time per day in hrs, in relation to a year			Up to 0.125	Over 0.125, up to 0.25	Over 0.25, up to 0.5	Over 0.5, up to 1	Over 1, up to 2	Over 2, up to 4	Over 4, up to 8	Over 8, up to 16	Over 16
Collective load	No.	Description	Explanation	Motive power group								
	1	Light	Low frequency with heaviest load	1 Em	1 Em	1 Dm	1 Cm	1 Bm	1 Am	2 m	3 m	4 m
	2	Medium	Approx. same frequency with small, medium and heavy loads	1 Em	1 Dm	1 Cm	1 Bm	1 Am	2 m	3 m	4 m	5 m
	3	Heavy	Nearly always heaviest loads	1 Dm	1 Cm	1 Bm	1 Am	2m	3 m	4 m	5 m	5 m
During a work cycle of 12 minutes or more, the rope drive can be classified 1 motive power class lower than the motive power group, which is determined by the operating class and collective load.												

Recommended relubricating intervals from Drahtseilwerk GmbH



## 9. Maintenance and inspection

Rope drives require regular maintenance and inspection. In many cases, the type of inspection is regulated by standards and guidelines (e.g. DIN 15020 etc.).  
The maintenance includes checking the ropes, greasing, end connections, pulleys, rollers and drums.

Checking the rope for wire breaks, wear and tear and corrosion

The entire length of the ropes must be checked at specific intervals for wire breaks, wear and tear, corrosion and deformation particularly the parts of ropes running over rollers and at the end connections. As soon as the number of wire breaks permitted or the permitted wear and tear, corrosion and runtime values are reached as per the operating regulations or as determined on an individual basis, the wire must be replaced.

Spliced ropes must also be inspected for potential slippage of the insert strands.

Sealed rope ends must be inspected at specific intervals for corrosion as well as wire breaks.

Pressed connections must also be checked for cracks, wear and tear in and on the ferrules and possible rope slippage.

Wire ropes discarded due to wire breaks as per DIN 15020, page 2

Number of load-bearing wires in the outer stands of the rope	Number of visible wire breaks when ropes discarded at a length of							
	Motive power group 1 Em / 1 Dm / 1 Cm / 1 Bm / 1 Am				Motive power group 2 m / 3 m / 4 m / 5 m			
	Ordinary lay on a length of		Lang lay on a length of		Ordinary lay on a length of		Lang lay on a length of	
	6d	30d	6d	30d	6d	30d	6d	30d
Up to 50	2	4	1	2	4	8	2	4
51 - 75	3	6	2	3	6	12	3	6
76 - 100	4	8	2	4	8	16	4	8
101 - 120	5	10	2	5	10	19	5	10
121 - 140	6	11	3	6	11	22	6	11
141 - 160	6	13	3	6	13	26	6	13
161 - 180	7	14	4	7	14	29	7	14
181 - 200	8	16	4	8	16	32	8	16
201 - 220	9	18	4	9	18	35	9	18
221 - 240	10	19	5	10	19	38	10	19
241 - 260	10	21	5	10	21	42	10	21
261 - 280	11	22	6	11	22	45	11	22
281 - 300	12	24	6	12	24	48	12	24
Over 300	0.04 x n	0.08 x n	0.02 x n	0.04 x n	0.08 x n	0.16 x n	0.04 x n	0.08 x n

For rope constructions with particularly thick wires on the outside of the outer strands, e.g. round stranded ropes 6x19 Seale as per DIN 3058 or round stranded ropes 8x19 Seale as per DIN 3062, the number of visible wire breaks 2 lines below the table values must be used for ropes discarded.  
Motive power groups as per DIN 15020, page 1  
d = Wire diameter

Flux-cored wires are not used as load-bearing.  
For wire ropes with several strands, only the strands on the outside are considered "outer strands".  
For wire ropes with a steel insert, the insert is considered as an internal strand.

The figures reached must be rounded up.

## Rope deformations

In addition to the number of wire breaks, the deformation of ropes is also a factor for discarding wire ropes. They must also be replaced in the event of bird caging, looping of wires in the rope, formation of a strong knot, strong constriction, flattening, or formation of kinks in the wire rope.