

# WHITE PAPER

**REELING CABLES FOR  
INDUSTRIAL APPLICATIONS**

## » REELING CABLES FOR INDUSTRIAL APPLICATIONS

Reeling cables are an indispensable part of numerous industrial applications including lifts, industrial trucks, transport and mining equipment, and construction and agricultural machinery. The high loads associated with winding and unwinding, as well as the often harsh

operating conditions, demand a lot from these cable types - and require very special materials and designs. In this white paper, we give you an overview of the different types of reeling cables and their respective areas of application.



## » How are reeling cables constructed?

The construction of reeling cables differs greatly depending on the application. One of the most important factors in the design is what forces and mechanical loads the cable is exposed to in practice - for example abrasion, tension or torsion. All components used, from copper strands and optical fibres to core insulation and sheathing materials, are specially selected for a particular application.

Abrasion is a frequent stress that reeling cables are confronted with in practice. The sheath materials must therefore be extremely robust so that they do not wear out prematurely. Plastics such as polyurethane or special rubber compounds such as neoprene are par-

ticularly suitable for this purpose. These are also resistant to various oils, greases, acids, solvents and chemicals as well as weathering.

To cope with extremely high tensile forces, especially in vertical applications, special construction elements such as internal strain relief made of aramid or textile fibres or external strain relief with flexible steel cables are often used with reeling cables. If the cable is particularly stressed by torsion, torsion protection braids offer a remedy: These can be braids made of textile or plastic threads that are embedded between the inner and outer sheath.

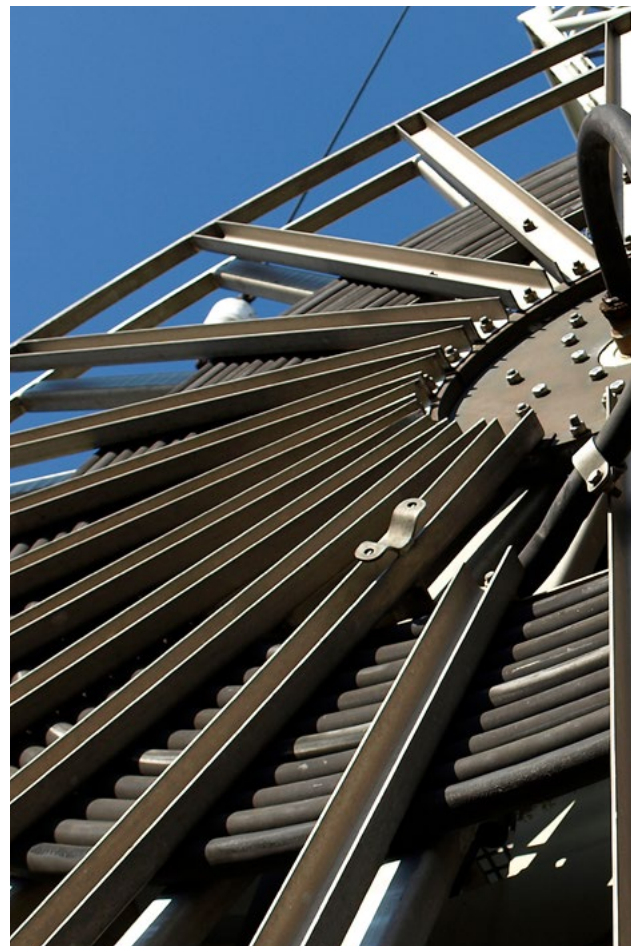
## » What types of reeling cables are there?

Reeling cables are available in a variety of designs. A distinction is generally made between five different areas of application:

### » Reeling Cables

This designates all cables that are wound and unwound with the help of a drum. The drum can be driven by spring tension or a motor. The cables are used, for example, in crane and conveyor technology. Another - often better known - application are charging cables for electric mobility, which are rolled up inside the charging case when not in use.

When coiled up, the cable is very well protected from external influences and damage by the drum. However, the constant winding and unwinding is accompanied by high loads due to tension, torsion as well as abrasion. Correspondingly robust materials and designs are therefore essential. Due to the size of the drums, the bending radius of the cable is usually not decisive. However, it should still be taken into account to ensure that the cable is not be overly bent and the strands are damaged as a result. Furthermore, depending on the stranding direction, it is important to choose the exact stop on the drum to avoid corkscrewing in the cable.





## » Festoon Cables

Festoon cables are round or flat flexible cables attached to one or more rail-mounted cable trolleys. These allow the cable to bundle into loops when moving along the rail or when space is limited. Festoon cables are used in cranes, hoists, lifts, conveyor systems, stacker cranes and other applications.

As with many moving applications, festoon cables are made from flexible copper conductors that are stranded together. They are usually equipped with PVC or neoprene insulation and a PVC, neoprene or PUR outer jacket. Normally, festoon cables are manufactured without a torsion protection braid, as torsion usually does not play a special role in these applications.



## » Spreader Cables

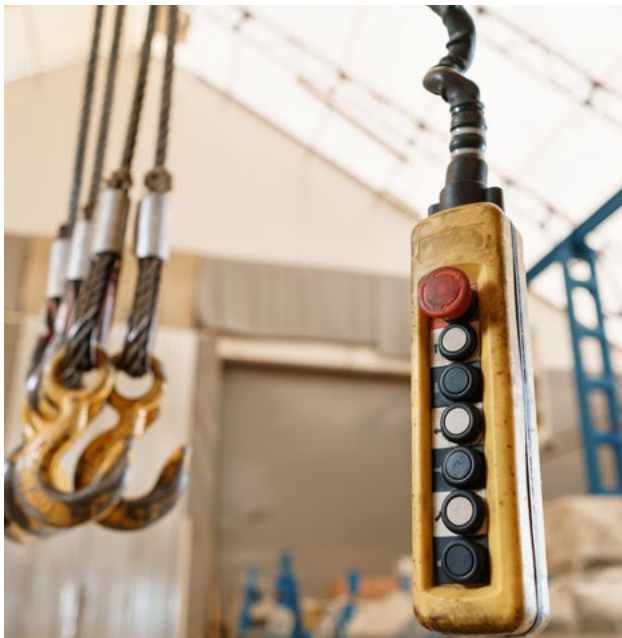
Spreader cables are specially developed for use in harbour crane systems. The spreader is the load handling device connected to the crane for handling shipping containers. The unused cable length is taken up on a drum or in a basket during vertical movement. This protects it from potential weather damage. The spreader drum is typically found in Europe, while the variant with a basket is found in Asia.

Spreader cables can be extended without support for over very long vertical lengths. In some applications, extra weight is added to the cables to optimise their take-up in the basket and to prevent wind from blowing them around. To make this possible, the cables are reinforced with aramid or textile fibre elements. During installation, care must be taken to ensure that the cable is inserted into the basket in an anti-clockwise direction and without twisting. In addition to high mechanical load capacity, resistance to moisture, and weathering in particular, is a central requirement for the cables.

## » Mining Cables

Cables from this category are used in large material transport machines such as excavators, cranes and dumpers in mining and tunnel construction. In this adverse environment, the requirements are very specific: the cables must not only be resistant to mechanical stress, but also to dust, dirt, moisture, oil or UV radiation. Even impacts from falling debris must not damage them. Therefore, they usually have a very thick and resistant outer jacket.

A common application in the mining sector is trailing cables. These are specially designed to be pulled along with mobile equipment (for example, a drag crane in a coal mine or mineral sands processing plant). To prevent damage when the cables get caught in the guide rail of the mobile equipment, they have to be very robust.



## » Lift Cables

Reeling cables are also frequently used in lifts, crane systems, storage and retrieval machines and floor conveyor systems. One example of this is suspension cables, which are used, for example, in overhead cranes to connect suspended control and operating elements, the so-called control pads. In applications such as these, the focus is particularly on the tensile load caused by the cable's own weight, the load attached to it and the differences in height that must be overcome.

Lift cables therefore have special insulation, for example made of PVC or neoprene, and are additionally reinforced with a textile braid, depending on the length of the cable. The cables also need internal or external strain relief to support their own weight and that of the suspended equipment.

## » Summary

Abrasion, tension, torsion, plus adverse environmental conditions such as dust, humidity, temperature fluctuations and UV radiation: the challenges for reeling cables are extreme. However, they also vary greatly depending on the application - which makes it all the more important to know the exact application in order to be able to select the right cable solution. However, reeling cables tend to be particularly robust. Special materials and construction elements ensure that the cables fulfil their function reliably and safely.

HELUKABEL has combined its portfolio of reeling cables under the term REELABILITY. In this segment, users will find a wide range of cables and conductors that are particularly well suited for the above-mentioned areas of application. In addition to numerous standard articles, the company also offers targeted support in the implementation of individual special designs. Thanks to a large number of international approvals, the leading supplier of cables, wires and accessories can offer exactly the solution that reliably withstands the special environmental conditions and mechanical stresses anywhere in the world.

## » CONTACT

For further information, please do not hesitate to contact us.



### Your contact person

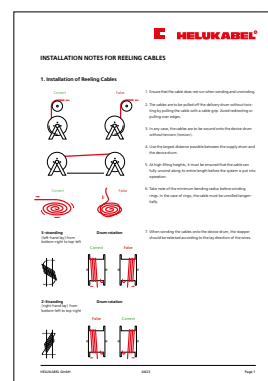
#### Oliver Schmitz

Global Segment Manager

Custom & Reeling Cables

Tel.: +49 7150 9209 786

[oliver.schmitz@helukabel.de](mailto:oliver.schmitz@helukabel.de)



More information can be found in the [installation notes](#)