

# world of rope

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WORLD CRANE AND TRANSPORT  
SUMMIT AMSTERDAM

## The Gelmer Funicular: Renewal of a 90 year old gem

This past summer, the Swiss Gelmer Funicular was extensively renovated. This is a 90 year old funicular that began operation in 1926 in the valley known as Haslital in the canton of Bern. Originally, the work line was constructed to transport material to build the wall of the Lake Gelmer dam and the water supply line for the Handeck power plant. Since opening for tourism in 2001, it has enjoyed growing popularity among young and elderly alike. As a result, the Gelmer Funicular is used by up to 45,000 passengers a year. Since the funicular continues to serve as a work line, part of the logistics infrastructure of the Grimsel power plant, it was decided that the system should undergo a complete renewal. After converting the electric drive in 2001, the intensified usage of the line was seen to justify more comprehensive work. And so it was that at the start of the season, on 3 June of this year, both the open winch drive and the machine foundation

in the building of the summit station were renewed. As part of this renewal, the winch drive, including the gearbox and the service and safety brakes, the towrope was also changed. The consensus was that the towrope used should feature interior copper cores so that the line guide along the track could be removed. Together with our partner of many years, the Swiss Jakob AG, we have agreed to deliver a 10 strand winch rope with the requisite internal copper cores. This is a modified CASAR Superplast8 with a nominal diameter of 38 mm and a total length of 1,100 m.

The term "modified" in this case means that the core strand was replaced by the electric lead while the intermediate strands, that is the outer strand layer of the core rope, have been retained. This brings with it two decisive advantages for the line operator:

For one, the demands made on the rope's breaking load are directed entirely to the



**Andreas Schmeiss**  
WireCo WorldGroup  
VP Global Cranes

Dear readers of our newsletter,

I don't know what you think, but I always find something new in this industry that grabs my attention. As ever, ropes are a basic element in construction when it comes to the safe and efficient lifting of loads and machines. We work constantly to improve our products and as a loyal reader of our newsletter, you will always have the latest information, straight from the source. In this edition, you will find an article

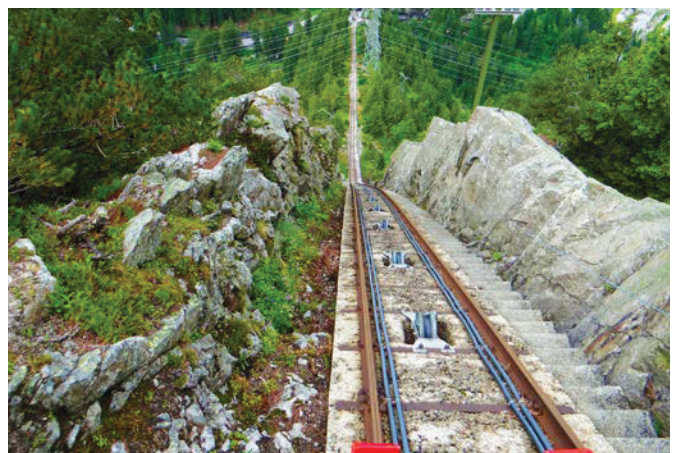
on the current state of synthetic rope development for crane applications. WireCo is also working intensely on the relevant products, though also on the necessary standards, as this is the only way to safely bring a new technology to market.

I hope you enjoy reading our newsletter.

Yours sincerely,

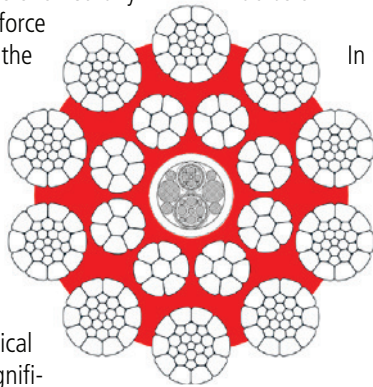
*Andreas Schmeiss*

VP Global Cranes



outer strands. This means that the required minimum breaking load of 850 kN has already been achieved through the outer strands alone and the intermediate strand layer offers additional breaking load, or in other words safety, for the operator. In internal testing, the entire rope achieved a breaking result of 45% above the required minimum breaking load. During the breakage testing, the conductivity of the electrical line was continuously monitored and none of the electrical lines showed any impact from the tensile force whatsoever right up to the point of breakage.

The second advantage has to do with the fact that in applications such as this in which the rope is wound in multiple layers around the drum, the electrical lead is subjected to significant transverse pressures.



The additional strand layers protect the lead and provide the entire rope with the necessary transverse stability. The rope also receives additional protection by virtue of the fact that both the lead in the core as well as, afterwards, the core rope itself were both sheathed with plastic. 10 compacted outer strands in lang lay round out the entire package and provide even the cross-over points of the rope on the drum with the necessary smoothness and minimum abrasion.

In fact, inclined lifts in Switzerland are also funiculars, which is why this line is referred to by its operator as the steepest funicular in Europe.

#### BASIC INFORMATION ON THE GELMER FUNICULAR:

- Around 45,000 passengers per year
- Built in 1926 (first renovation 2001; second renovation 2017)
- Maximal slope 106%
- Speed 2 m/s (7.2 km/h)
- Travel time 10 minutes
- Altitude difference 468 m (altitude of valley station 1,412 m above sea level/altitude of summit station 1,860 m above sea level)
- Winch rope 1,100 m 38 mm CASAR Superplast8 with electrical line

## WireCo supports new mobile crane standard for synthetic hoist ropes

Synthetic hoist ropes for crane applications have already been successfully in use at WireCo for many years, e.g. in ship cranes and various lifting devices. Their use in mobile cranes, however, represents a special challenge. As mobile load lifting devices, these vehicles are subject to special norms and regulations. Their widely varied use in nearly every climate zone on Earth, as well as their frequent assembly and disassembly on site, constitute an enormous strain on the components. Of course this is particularly true for that safety-relevant component, the rope.

A further special demand levelled by crane manufacturers is to be able to use a rope with an optimal balance between breaking load and weight. Both the limited axle load of road-approved vehicular cranes as

well as the limitation on transport weight for caterpillar cranes has led to a steadily increasing breaking load combined with a constant rope diameter. Replacing these high-performance steel ropes with ones made of synthetic materials requires special fibre materials with a tensile strength similar to that of steel. Ropes made of such special fibres are already available and WireCo already offers the rotation-free hoist rope Lanko®Lift S under the brand name Lankhorst Ropes.

Steel ropes have been successfully used in these applications for many years and there are numerous norms which set out their selection, calculation, handling, assembly, maintenance and necessary

replacement schedules. Through use, every rope eventually wears out with time and must be regularly checked according to set criteria and, when necessary, discarded.

In order to set the use of synthetic ropes on a broad foundation, the area "mobile cranes", a sub-group of the FEM manufacturer's association "Cranes and Lifting

Devices", has created a working group comprised of manufacturers of

mobile cranes as well as producers of synthetic hoisting ropes. After 2 years of intensive work, last summer it was possible to publish the requisite guidelines. This is available through the publishing house VDMA Verlag.

