

# POWER

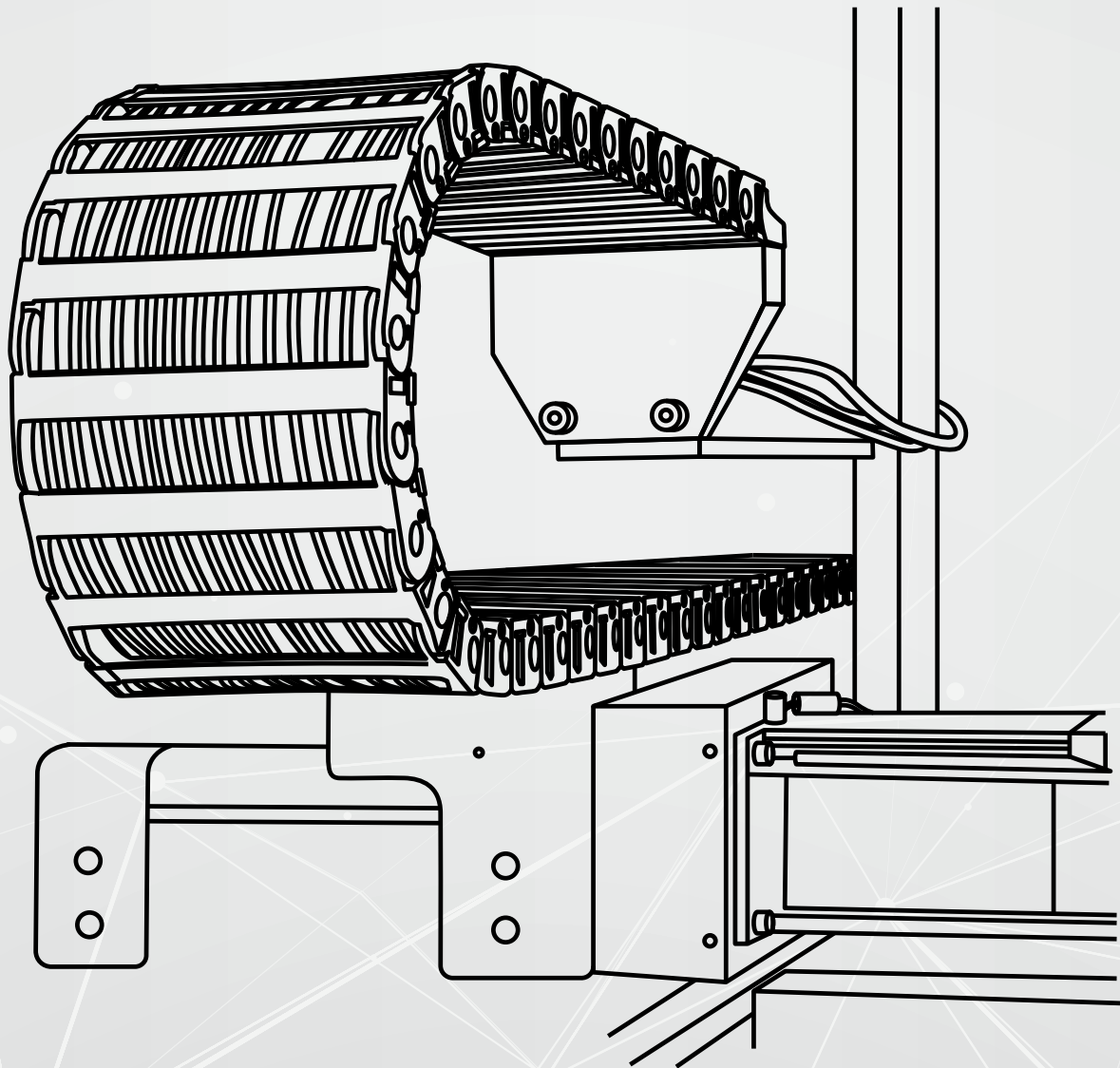
#14



## Trenchless Pipelines

Herrenknecht's electrical horizontal drilling machines  
rely on products from the HELUKABEL Group page 14

# Optimum Protection for Moving Applications



**Energy chains – also called drag chains – serve as guides for electrical cables or hydraulic and pneumatic hoses in moving applications. Among other things, they ensure that the smallest permissible bending radius of the cables is maintained. In this way, they prevent damage that can occur due to the continuous stress. On the last page, you can see which cable types HELUKABEL has in its portfolio for this dynamic field of application. Take a look right now!**



## *Dear Reader,*

Recent reports about business activities and economic trends often contain phrases such as “dark clouds, “bleak prospects” or “slack period”. It would appear that these economists have a penchant for meteorological metaphors. But how serious are things really?

Probably nobody can say for sure. But it is true: political and armed conflicts, inflation, a shortage of raw materials and supply chain problems are causing uncertainty in many sectors. New ideas and concepts are often key to solving these challenges and strengthening future growth.

We at HELUKABEL are trying to be optimally prepared for this future. On the one hand, we benefit from the fact that we supply virtually all branches of industry with our products. On the other hand, we have continued to develop over the 45 years of our existence and are now not only a supplier, but also a solution provider for electrical connection technology from a single source. As a long-term thinking family business with around 2,200 experienced employees, we are a reliable partner even in challenging times.

In this issue, the tunnel boring pioneers Herrenknecht, the intralogistics system provider BEUMER Group, and the testing systems manufacturer KARL DEUTSCH serve as examples of how our customers benefit from this. We have been able to support them with tailor-made solutions for the broadest diversity of applications – also in partnership with our subsidiary EKD Systems who specialise in high-quality energy chains.

Our expert panel discussion this time is dedicated to mechanical engineering. This key industry sector plays a particularly important role for us. And of course, lots of other news from the HELUKABEL world also await you.

I hope you enjoy reading and exploring this issue of POWER!

*Kind regards,*  
Marc Luksch, *Managing Director, HELUKABEL GmbH*



# Sturdy Guidance for Accurate Measurements

page 20



24



28

---

# POWER # 14

## **8 LET'S TALK ABOUT... MECHANICAL ENGINEERING**

In an expert discussion, we examine the trends and challenges companies are facing

## **14 TRENCHLESS PIPELINES**

Herrenknecht's electrical horizontal drilling machines rely on products from the HELUKABEL Group

## **18 ON CALL-OUT WITH ELECTRIC POWER**

Connection cables supply Ambulanz Mobile rescue vehicles with energy

## **20 STURDY GUIDANCE FOR ACCURATE MEASUREMENTS**

EKD Systems delivers customised energy chains for KARL DEUTSCH ultrasonic testing systems

## **24 NO SUITCASE GOES ASTRAY**

HELUKABEL cables for BEUMER Group baggage handling systems

## **28 INTERVIEW**

Pascal Schwindhammer,  
Sales Manager of KABELMAT Wickeltechnik GmbH

## **32 PUT TO THE ULTIMATE TEST**

Part 3: Drag chain tests

|    |  |
|----|--|
| 06 | In Brief   |
| 27 | Training with HELUKABEL                            |
| 34 | Worldwide: Welcome to Portugal!                    |
| 35 | FAQ: How do I choose the right conductor material? |
| 36 | Service/Imprint                                    |

# In Brief

## New Services & Resources

### FIRST-HAND, EXPERT KNOWLEDGE

In the "Newsroom" section on the HELUKABEL website, you will not only find all the latest news from the HELUKABEL world, but also a selection of informative white papers on various topics. The library is constantly being expanded – for example, you can now find papers on the optimal cabling of photovoltaic systems or instrumentation cables in the oil and gas industry. Be sure to take a look!

### QUICK AND EASY CABLE STRIPPING

HELUKABEL expands its accessory portfolio with the HELUTOOL HAM 29, an innovative outer sheath cutter. This universally applicable tool is designed for cable diameters ranging from 4.5 to 29 millimetres, the cutting depth can be precisely adjusted up to three millimetres. Electricians and installers can save time and effort during cable laying and connection without risk of injury.

### ALWAYS UP TO DATE

HELUKABEL has given its newsletter a completely new look: Once a month you will receive everything worthwhile from the world of the fastening technology specialists in a clearly structured summary. This means you'll always be up to date with everything that's happening at HELUKABEL – whether it's new additions to the portfolio or developments within the company. Subscribe now!



## Family Summer Party in Hemmingen



HELUKABEL GmbH celebrated its summer party at its headquarters in Hemmingen, Germany on 24 June under a bright blue sky and high summer tem-

peratures. In addition to employees from all German locations, their families were also invited. In total, around 1,200 people were on the guest list – the largest celebration to date in the 45-year history of the company.



Visitors could enjoy themselves with a wide range of food and drinks as well as live music on stage. A colourful animation programme awaited the younger guests. Another highlight was the tour of HELUKABEL's state-of-the-art logistics centre.

Company founder Helmut Luksch handed over a symbolic "baton" – of course in the form of a cable – to his son Marc. With him, the next generation at HELUKABEL is already taking over responsibility for the company management. ◀

# 1.084 billion euros

was the turnover of the HELUKABEL Group in the 2022 financial year – around 36 per cent more than in the previous year and more than ever before in the history of the company! ▶

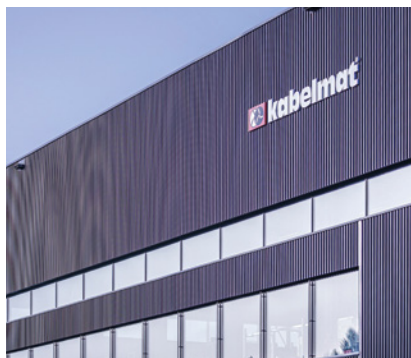
# KABELMAT Wickeltechnik Celebrates Anniversary

A milestone birthday for KABELMAT Wickeltechnik GmbH: the subsidiary of the HELUKABEL Group, based in Glatten, Germany, is celebrating its 60th anniversary this year. Since its foundation in 1963, the company has specialised in devices and machines for storage, winding and hanging of cables and wires, steel cables, pipes, hoses and profiles. However, solutions for handling other products – for example chains, candle wicks, sausage casings, strings for tennis rackets or even cigarettes – have also been developed time and again.

KABELMAT became part of the HELUKABEL Group in 2009 and the current head office was inaugurated in 2019. Since then, the areas of cable handling and automation have been further strengthened – with the aim of offering customers tailor-made complete solutions

from a single source. As an experienced and globally established specialist in winding technology, KABELMAT is an important part of the HELUKABEL portfolio and an integral part of the company.

HELUKABEL congratulates colleagues on their 60th anniversary and looks forward to continuing successful cooperation – at least over the next 60 years! ◀



# Blood Donation Campaign at HELUKABEL



Together with the German Red Cross, HELUKABEL organised a large blood donation campaign at its headquarters in Hemmingen in May. Employees had the opportunity to donate blood conveniently during working hours and could thus actively contribute to saving lives. A neighbouring company and the Hemmingen town hall also took part in the campaign. A total of 50 participants donated 23 litres of blood to the German Red Cross. The high number of first-time donors was particularly pleasing. HELUKABEL would like to thank all those who took part for their commitment! ◀

# New Subsidiary in Ireland

The HELUKABEL Group has founded a subsidiary in Ireland and is now represented in 39 countries around the globe. With this new office and logistics location in the capital, Dublin, the company will be able to supply its customers throughout the country with cables, wires and accessories even faster and more reliable.

“Our goal is to establish the world-renowned HELUKABEL brand in Ireland and to sustainably expand our position in this exciting market,” says Geoff Byrne, managing director of the new subsidiary. “We still see great potential here in many industrial sectors and especially in renewable energies.” Cables and wires for wind power and photovoltaic systems have been a great strength of the company for many years.

“Our customers here in the country can look forward to an even more comprehensive service as well as shorter response and

delivery times in the future,” adds Geoff. “Especially when it comes to special requirements or customer-specific solutions, the local presence is a decisive advantage.” ◀



# Engineering

# Quality

# Innovation



# “Driven by Innovation and Fit for the Future”

Mechanical engineering is one of the most important pillars of the global economy – and it is currently facing enormous challenges: New technologies, increasing customer expectations, but also economical and political uncertainties are changing the industry from scratch and are demanding innovative ideas and products. We therefore discussed the trends and developments in mechanical engineering with a panel of experts who also ventured a look into the future of the sector.

**Werner von Siemens, Gottlieb Daimler and Robert Bosch: Industry, and particularly mechanical engineering, is a long-living and special tradition in Germany. What do you associate with the sector?**

**Andreas Muckes:** For me, mechanical engineering, particularly here in Germany, has always been inspired by a certain spirit. There have always been things that were claimed to be impossible – and then a Mr. Siemens or Daimler or Bosch came along and said “It is possible!” and made it so. In my opinion, it’s this ambition, the creativity to think in new dimensions and the ability to adapt to ever-changing circumstances which are the essential attributes and virtues that have kept mechanical engineering alive and kicking in Germany to the present day – and will do so in the future too, I hope.

**Holger Wennrich:** It’s also why German machine builders have a very good reputation abroad, particularly with respect to quality. When talking to colleagues and clients abroad, I often hear that machin-

ery is made in Germany according to the “as good as possible” principle, whereas in the rest of the world the “good enough” principle usually applies. This can be a problem, but it can also be seen as an opportunity.

**Muckes:** There are an amazing number of “hidden champions” in mechanical engineering who are absolutely best-in-class in their specialist area. It’s very seldom though that the public have heard of these companies – after all, when people buy cars, sports shoes or other goods they’re not usually interested in the machines that produced them.

**Dr. Sebastian Eisele:** By contrast, people buying and using machinery have definitely heard of these companies. For them, of course, quality and reliability are among the most important purchase criteria. But other factors also play a role. For example: how much space does the machine need in my factory? Can it be connected to other machines? Is it easy to operate? These are questions that manufacturers need to think about early on in the development process.



Energy chains are often used to securely connect cables and wires to moving machine parts.

**Alongside the traditional creative spirit, it is mainly topics such as productivity, efficiency and flexibility that influence the development of mechanical engineering. What, in your opinion, are the most important drivers of innovation in the sector?**

**Wennrich:** For me, flexibility is the most important trend. The size of production runs is declining in almost every sector. Manufacturers are being forced to produce more cost-effectively with bigger variances. They need the appropriate machinery as well as new manufacturing concepts with features such as networking and digitalisation to do this.

**Eisele:** This demand for more flexibility is also driven by increasing personalisation – not only for consumer goods but also in mechanical engineering itself. In the past, machine builders developed and sold standard products. These times are now over. Today customers know exactly what they want and are demanding more and more individual modifications – even for machinery. This means suppliers also have to be much more flexible.

**Muckes:** At the same time though, the quality must be just as high, if not higher. For example, a machine tool must manufacture every part with the same precision – regardless of whether it's making one or 50,000 parts. That adds another layer of complexity to the requirement profile.

**Digitalisation and networking are changing mechanical engineering from the bottom up. Which challenges and opportunities do they bring machine builders and their customers?**

**Thomas Ameis:** I see this trend as an opportunity for mechanical engineering to prove its innovative power. If you want to be successful in this sector in the future, you have to stand out from the competition as an innovator in areas such as digitalisation, networking and predictive maintenance. This is technically challenging, of course, but it also holds a lot of potential – particularly when it comes to economically viable manufacturing processes with batch sizes as small as one. New technologies such as additive manufacturing or 3D printing are offering possibilities previously undreamed of.

**Eisele:** It must be said here though that digitalisation and networking are not exactly core competencies here in Germany. The major innovations are mostly taking place abroad. This is partly due to the high level of data protection we have here – which is undeniably important as it's certainly advisable to handle sensitive company data carefully. On the other hand, we have to make sure we don't miss the boat or dillydally around too much. Take AI for example: Instead of looking at the unbelievable potential of

this new technology, public discussion is mostly about restricting its possibilities. I don't think this is necessarily the right approach.

**“The next development stage in mechanical engineering will be more cost-effective production in batch sizes down to one, but in the same quality as series production.”**

*Andreas Muckes, Global Segment Manager  
Drag Chain Systems, HELUKABEL GmbH*

**Digitalisation in mechanical engineering also means installing even more sensors, controllers and other electronic components together with the relevant cabling. Which cables are mainly used for this?**

**Wennrich:** They range from motor and servo cables for electric drives to connection and sensor cables and bus and Ethernet cables for data transmission: generally speaking, the more digitalised and automated a machine is, the greater the variety

of cables. An important aspect here is the space available for installing more sensors and electrical components in the machine. As this usually remains the same, solutions that save space are becoming more and more sought-after – that means small outer diameters and bending radii.

**Energy chains are often used to securely connect cables and wires to moving machine parts. What needs to be thought about during their construction and use?**

**Eisele:** These days machinery needs to be faster and more dynamic. Increasing travel distances and speeds are putting more stress on the energy chains, something which also needs to be planned for. During this planning though, you face a dilemma between the space available and the number of cables needed. On the one hand, the machine should have lots of functions and extensive electrical fittings, on the other hand it should be as compact as possible.

**Ameis:** We've noticed this too: The number of cables is increasing due to more networking and sensor technology, but the space available for installing the energy chain is the same. It's becoming more and more difficult to lay the cables in separate chambers in the chain. It's important here to use the space intelligently by ensuring the cables are optimally arranged. With this internal arrangement, taking into account the installation guidelines, the maximum service life of the cables can be guaranteed.

**Muckes:** In addition, customers assume that the cables, connectors and chain in energy chain systems are all compatible with one another, which is certainly not always the case. Here we're talking about mechanical and electrical components for a machine which are usually designed by different departments. Often these departments don't communicate enough with each other and have different requirements, for example, with respect to space. As a system supplier, we are in a position to bring these departments together to solve these challenges. Customer proximity is a must for this though.

**Talking about customer proximity: for many machine builders, the focus is increasingly on service concepts. What does good customer relations mean and what does a successful strategy look like in your opinion?**

**Eisele:** One promising approach in mechanical engineering involves turnkey concepts, i.e. the provision of ready-to-use products. Companies in all sectors are complaining about the skills shortage. They don't have enough qualified staff to commission or even operate their machines. So, anyone able to offer complete ready-to-use production lines which ideally no longer need operating staff but just technicians to service them has a clear-cut advantage. Customers are also prepared to pay extra for this. Machine builders don't always know in advance though who's buying their machines and exactly how they'll be used which makes designing them difficult.

**Ameis:** That's true. It's often difficult to plan for their ambient conditions. What counts here is experience with the machines in everyday use. Geographical differences shouldn't be underestimated. A machine in Thailand, for example, is subject to completely different temperature and humidity stresses than one in Germany. Hence, it's a good idea to test them in various conditions beforehand.

**Wennrich:** Expert technical advice is and will always be extremely valuable. When it comes to cables, for example, it's true to say that standard products are purchased where the price-performance-ratio is best. However, customers prefer to purchase sophisticated products from reliable partners who know their challenges and application well. Ideally, they'll buy everything from this partner to simplify the procurement process.

**Muckes:** The purchasing department is often forced to buy according to the motto "we've always done it like this", either because they've been integrated into the procurement process too late or the project is very urgent – and this despite there perhaps being significantly better components available on the market in the



The experts agreed: Flexibility and proximity to the customer are becoming increasingly important in mechanical engineering.

**"Innovative power has always been the distinguishing feature of machine construction and it will continue to ensure its success in the future too."**

*Thomas Ameis, Chief Technology Officer,  
EKD Systems GmbH*



**"Customers are demanding more and more individual modifications for machinery. Suppliers have to be much more flexible."**

*Dr. Sebastian Eisele, Managing Director,  
Eisele Elektronik GmbH*

meantime. It's also the supplier's job to point out potential optimisations, to actively offer alternative solutions and to clearly explain their added value.

**Ameis:** If the customer needs a product that perhaps doesn't exist, one possibility is for the supplier and customer to develop it together until it's ready for serial production. This creates a long-term and stable relationship with the customer.

**Another trend is the move towards more sustainable production methods and renewable energy sources. What obstacles are associated with this and how can machine builders benefit from it in the long term?**

**Eisele:** The move to renewable energy is definitely necessary. However, the current high energy costs are proving to be a real challenge for many manufacturing industries. I think politicians have to create a better general framework to ensure Germany remains a competitive location in the future as well – other countries are making the move more successfully at the moment. A slight unravelling of the complex global supply chains is another approach which offers more sustainability. After all, the Covid pandemic made it drastically clear how little it takes to bring production to a halt. It also had a vast knock-on effect with suppliers whose upstream products were no longer needed. Many of them now find themselves in a precarious situation. And lastly, a question which also needs to be

asked is: Is it really necessary to buy a product from the other side of the world rather than from around the corner just because it's a few cents cheaper?

**The turbulences in global supply chains discussed here, but also political crises and inflation mean many machine builders are facing an uncertain future. How can they best deal with these uncertainties?**

**Muckes:** A knock-on effect of these uncertainties is more short-termism. Mechanical engineering, however, lives from the planning phase during which not only new products but also new ideas emerge. As this is contrary to the trend, I can imagine it becoming the norm in future to work closely with suppliers as early on as the planning stage and to view the various processes through their eyes. This will make it easier to decide whether a particular process is really sensible in terms of feasibility, functionality and sustainability, and will increase the tempo of development.

**Eisele:** I also think long-term cooperations could be key to coping with uncertainties – for example, a partnership where the focus is on a particular type of machine. Good communication between manufacturer and supplier is particularly important here and will definitely become more so in the future.

**Muckes:** Another benefit of Germany as a business location is the high concentration of companies in a small area, includ-

**"Customers prefer to purchase sophisticated products from reliable partners who know their challenges and application well."**

*Holger Wennrich, Global Segment Manager  
Custom & Drag Chain Cables,  
HELUKABEL GmbH*

ing the so-called hidden champions. This proximity makes it easier to work in flexible partnerships. If suppliers allow customers to work with them on the required product, they also can bring creativity to the fore front.

***Bearing in mind all these challenges as well new opportunities, how do you see mechanical engineering developing in the coming years?***

**Muckes:** I think the next development stage in mechanical engineering will be one that enables even more cost-effective production and in smaller quantities, i.e. down to batch sizes of one, but in the same high quality as series production. Digitalisation, networking and new technologies such as additive manufacturing will make this possible. It's just a question now of making best use of this opportunity.

**Eisele:** I see a great need for improvements in Germany, as far as the general political framework is concerned – for example, by speeding up the approval process. Many companies have reservations about new developments because of the complications in obtaining the relevant approvals. This must be simplified, but not at the expense of quality. It's also a fact that more and more production activities will be carried out by machines in future which will boost demand for them. That's why I see a rosy future for mechanical engineering. It's important now to consolidate resources, to know what you're good at, to watch the market and perhaps to be more adventurous. In my opinion, there's nothing then standing in the way of success.

**Ameis:** I can only agree with you there. Innovative power has always been the distinguishing feature of mechanical engineering and it will continue to ensure its success in the future too. I am convinced about that. ◀

---

## ABOUT THE PEOPLE



**Thomas Ameis** joined the HELUKABEL subsidiary EKD Systems as Chief Technology Officer (CTO) in October 2022. The graduate mechanical engineer started specialising in energy chains as early on as the mid-1990s and has been able to gather plenty of experience in both sales and engineering from his previous jobs.



**Dr. Sebastian Eisele** is managing director of Eisele Elektronik GmbH. As a machine construction subcontractor, the company with headquarters in Glatten, Germany focuses on the construction of energy chains, switching cabinets and cable assemblies. One of its key strengths is providing customers with complete systems which save them time, energy money and space.



**Andreas Muckes** has been working at HELUKABEL since August 2023. As Global Segment Manager Drag Chain Systems, his remit is energy chain systems – a topic in which he has already acquired considerable expertise from previous positions.



**Holger Wennrich** joined HELUKABEL in 2007 and has held a variety of positions, including subsidiary manager in Italy and China. Since 2019 he is in charge of the expansion of the department for special cables. He is also Global Segment Manager for the specialty area of drag chain cables.

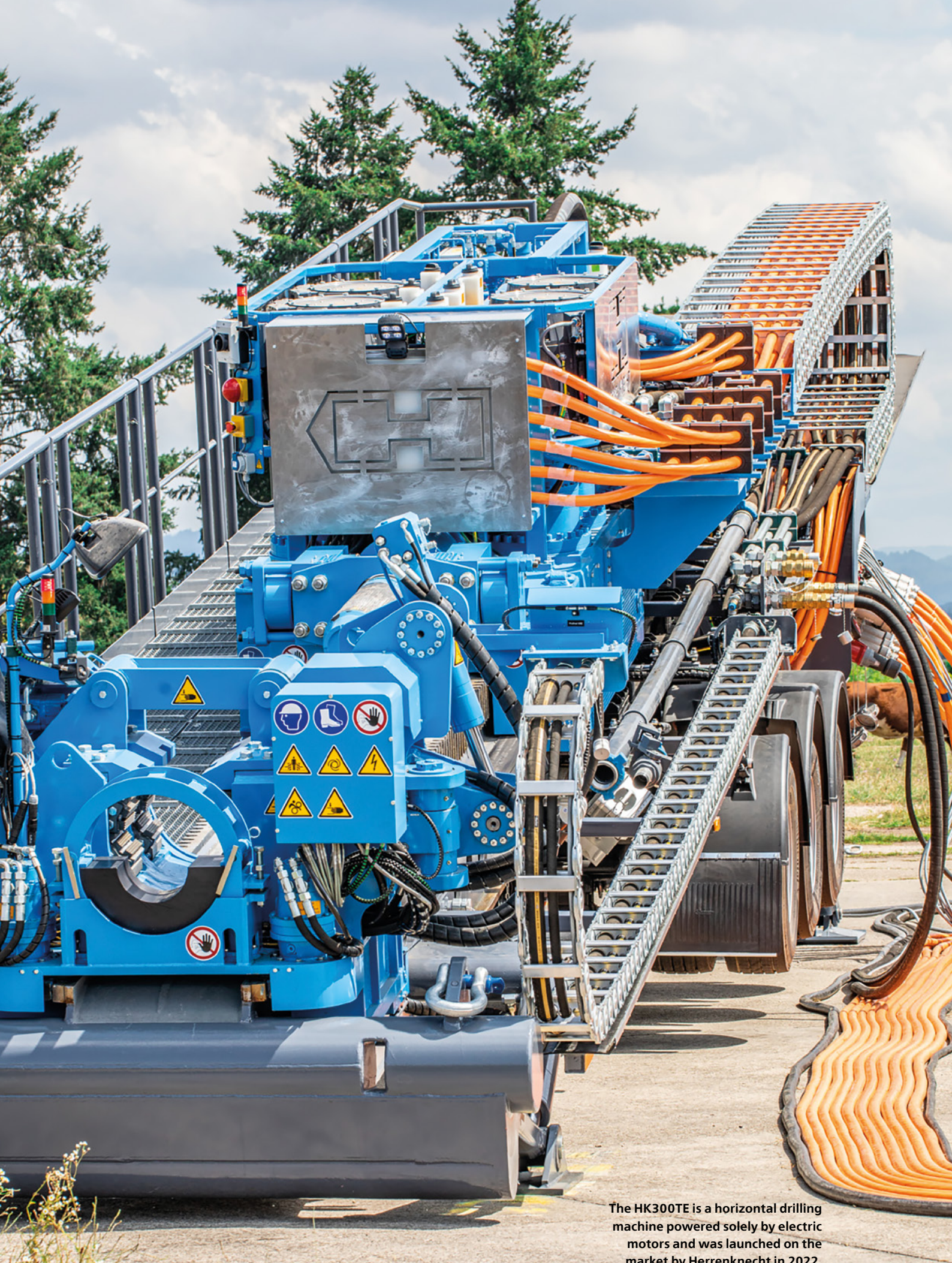
# Trenchless Pipelines

Herrenknecht's electrical horizontal drilling machines rely on products from the HELUKABEL Group

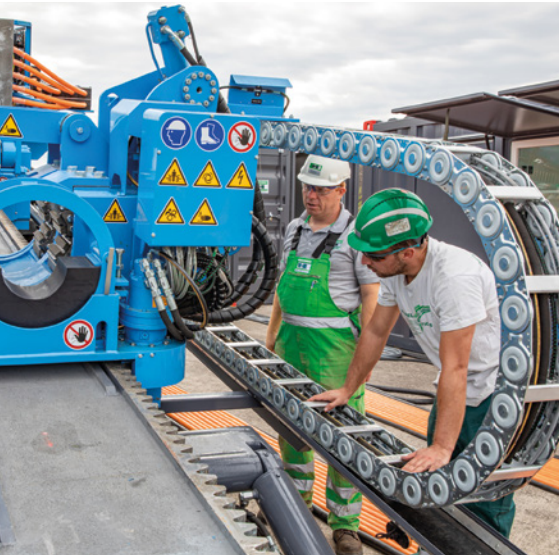
**T**he horizontal drilling machines from Herrenknecht AG pave the way for quick and easy installation of pipelines and conduits. And now electrically powered versions are available as well. Inside the machines, the company relies on HELUKABEL for the hard-wearing cables with extended current-carrying capabilities – and EKD Systems for the tailor-made energy chain.

The world's population continues to grow – and with it, the need for higher performing infrastructures. Distribution networks for water, power and communications that function reliably are particularly important in cities. A large number of these networks run underground through tunnels and pipelines. Their installation is becoming costlier and taking longer – especially in densely populated areas where planned sections run underneath buildings or other obstacles.





The HK300TE is a horizontal drilling machine powered solely by electric motors and was launched on the market by Herrenknecht in 2022.



The rig's carriage is able to move back and forth several metres.

Such challenges are nothing new to Herrenknecht AG. The company with headquarters in Schwanau, Germany, is a global technology leader in the field of tunnel boring engineering and is currently participating in a number of construction projects around the world. The company's portfolio covers several types of boring methods. For example, the so-called Horizontal Directional Drilling (HDD) facilitates fast, cost-effective and environmentally friendly installation of pipelines and conduits for oil, gas, waste water, district heating or internet cables underneath rivers and infrastructures.

The HDD method uses a controllable drilling head which starts by making a pilot hole from the launch to the reception point. This hole is then enlarged in several steps until it reaches the required size. During the last step the prefabricated pipeline is inserted. The key benefits here are the elimination of the need to dig a trench and hence the minimal impact on the environment.

### **ELECTRIC DRIVES REPLACE DIESEL HYDRAULICS**

Previously, the horizontal drilling machines (also known as rigs) were started using diesel-driven hydraulic power units. These had several drawbacks as Stefan Pabst, head of process engineering at Herrenknecht, explains: "Diesel engines are very energy-intensive, with low efficiency and relatively loud. The latter is a particular problem in residential areas." This is why – as in many other areas – the trend is towards electric drives.



**"In order to achieve the required performance, we need large currents."**

*Jens Holzwarth,  
Electrical Engineer for Process Engineering,  
Herrenknecht AG*

The HK300TE is an HDD rig powered solely by electric motors and was launched on the market by Herrenknecht in 2022. With a tensile force of 300 tonnes and a torque of 120,000 newtons, it is equal in every way to diesel-driven versions, but is significantly more energy-efficient, zero-emission and quieter. "This means, for example, it can be operated over longer periods of time because it doesn't disturb the residents so much. Subsequently, tunnels can be completed more quickly and efficiently," points out Pabst. "Moreover, the speed, forward thrust and torque of the rigs

can be set much more precisely." And there's another benefit: "The different emission standards for diesel engines which exist in many countries are irrelevant with these machines which means they can be used more flexibly."

The environment in which tunnel boring takes place is a tough one with adverse weather conditions, humidity, dust, rubble and dirt. High quality cabling is essential to ensure the electric motors work reliably and at full power. "In order to achieve the required performance, we need large currents," explains Jens Holzwarth, electrical engineer for process engineering at Herrenknecht. "The cables must have a suitable current rating. Electromagnetic compatibility (EMC) must also be guaranteed to avoid disruptions to operations." Weight and space requirements were also important factors during design as the rigs are transported on trucks and hence need to be as compact and lightweight as possible.

### **LONG-STANDING PARTNER WITH SOLUTION COMPETENCE**

With these requirements in mind, Herrenknecht turned to HELUKABEL. The expert for electric connection technology has been a reliable supplier to the company and a partner in the development of new machinery for about 15 years now. The TOPFLEX series of drive cables which connect frequency converters to electric motors was one of several cables chosen for the HK300TE. "They have the required current rating and are shielded to avoid electromagnetic interference," explains Michael Huser, head of



regional sales at HELUKABEL. Also used is the HELUTHERM series of single cores which are fitted between the junction box and motor. The HELUKABEL experts developed a special shielded cable with a customised sheathing material for outside installation. The delivery package also includes data cables for measuring the temperature of the motor.

The HDD rig's main drive unit is the carriage which supplies the torque and forward thrust required for drilling. The carriage is able to move back and forth several metres thereby forcing the rotating drill string into the stone or soil. Every cable connecting this part to the rest of machine must be fitted into a flexible energy chain to ensure reliable protection against damage from the moving carriage. The chain is a bespoke development from EKD Systems GmbH, a subsidiary of HELUKABEL. "An off-the-shelf plastic chain wouldn't be tough enough for this demanding type of application so the construction department decided to make one from steel," explains Stefan Pabst. Thanks to the high level

of expertise in the development of bespoke constructions at EKD Systems, it was no problem to optimally adapt the energy supply for use in the HDD machine.

### **SINGLE SOURCE SUPPLIER**

Cables and energy chains that come from a single company are of considerable benefit to Herrenknecht. As Holzwarth points out: "We can be confident that all components optimally complement each another.

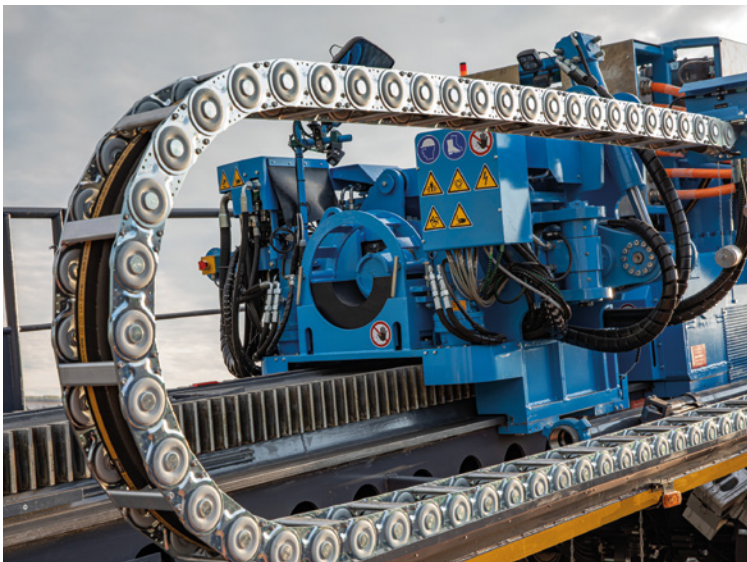
And if we get stuck, we have an expert who knows what they're taking about and can answer our questions about electric connection technology. Over the years, HELUKABEL has become more of a partner than a supplier. And we're confident this successful collaboration will continue into the future".



**"Together with Herrenknecht, we developed a shielded special cable suitable for outside installation."**

*Michael Huser,  
Head of Regional Sales, HELUKABEL GmbH*

**Cables and energy chains from a single source – this is of considerable benefit to Herrenknecht.**



**"HELUKABEL has become more of a partner than a supplier."**

*Stefan Pabst,  
Head of Process Engineering, Herrenknecht AG*





## ON CALL-OUT WITH ELECTRIC POWER

The future of mobility is electric – this also applies to the emergency vehicles from Ambulanz Mobile GmbH & Co. KG. The family company with headquarters in Schönebeck, Germany develops ambulances, rescue vehicles, doctor's emergency cars and vehicles for people with reduced mobility – and recently with electric motors as well. The vehicles are equipped with a secondary energy storage system comprising of two 48-volt batteries. The manufacturer purchases the connection cables from HELUKABEL. This guarantees that the entire vehicle body, which contains the medical equipment among other things, is independent of the base vehicle and its range is not restricted.

The medical equipment on board the emergency vehicles is also fitted with cables from HELUKABEL. This facilitates a reliable power supply in all emergency call-outs.



# Sturdy Guidance for Accurate Measurements

EKD Systems supplies customised energy chains for  
KARL DEUTSCH ultrasonic testing systems

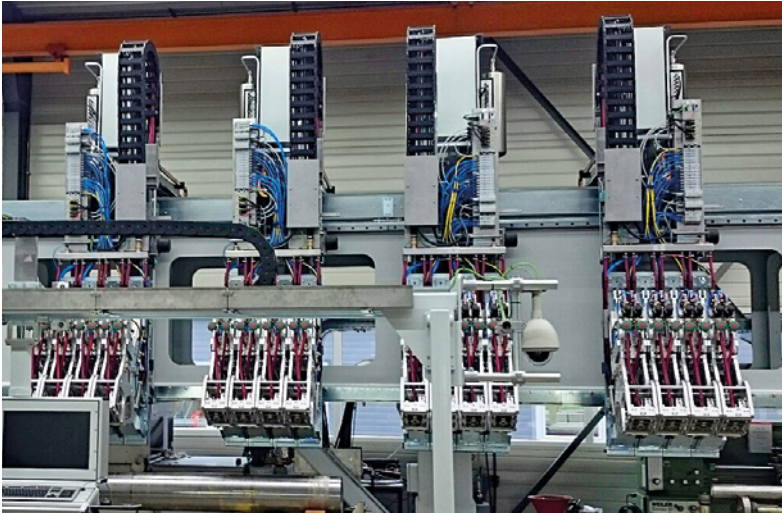
Ultrasonic testing systems such as the Echograph SNHF can be used to test HF-welded pipes for production faults.



The ultrasonic testing systems from KARL DEUTSCH Prüf- und Messgerätebau GmbH + Co KG (KARL DEUTSCH Testing and Measuring Equipment Manufacturers) detect the smallest of welding defects generated during the manufacturing of steel pipes. The measuring equipment used to do this is extremely sensitive and must deliver accurate results despite the long travel distances and high speeds of the system. Each vibration can corrupt the measurement results and impair production quality. The HELUKABEL subsidiary EKD Systems supplied customised energy chains for this demanding application. Their high stability guarantees accurate measurements with fewer errors and reliable functionality over the entire lifetime.

One of the oldest methods for producing steel pipes is welding. Rolled steel sheets are formed into circular cross-sectional lengths whose ends are then joined together. Although other sheet metal forming processes exist these days for making seamless pipes, two thirds of the steel pipes manufactured in the world are still welded. The technologies for doing this have steadily evolved over the years. The High Frequency (HF) method, for example, has been around since the 1960s. This method uses particularly high-frequency currents which are particularly good at generating heat. Fast welding speeds and good efficiency are the distinguishing features of this method.

To guarantee the quality of the welded pipes, the weld seams are controlled during production by a non-destructive test procedure such as ultrasonic testing. Here, a test head sends sound waves through the material and record their reflections. The ultrasonic device creates an image which reveals the smallest of weld seam defects. The method is exceptionally precise, but equally sensitive.



The moving parts of the system are fitted with energy chains from EKD Systems.

### SENSITIVE MEASUREMENTS AT HIGH SPEED

An expert in this specialty field is KARL DEUTSCH Prüf- und Messgerätebau GmbH + Co KG. The company with headquarters in Wuppertal, Germany has dedicated itself to the development and production of equipment for non-destructive testing of materials since it was founded in 1949. Its portfolio includes ultrasonic testing systems such as the Echograph SNHF which can be used to test HF-welded pipes for production faults. “Our machines must be able to carry out sensitive measurements, even over long travel distances at high speeds,” points out Holger Harmuth, Machine Tool Manufacturing Designer at KARL DEUTSCH. “A low-vibration environment is extremely important here to avoid distorted measurement results.”

The moving parts of the system are fitted with energy chains. These contain the cables which supply the individual components with power, data and control signals. The cable carriers protect the cables from

getting tangled or trapped during operation or from becoming damaged as a result of abrasion and tensile loading. “Many off-the-shelf energy chains cause vibrations when they move which can corrupt the results of our measurements,” explains Harmuth. When KARL DEUTSCH started planning a new version of the Echograph series, they therefore commissioned the experts at EKD Systems, a HELUKABEL Group subsidiary, to supply bespoke energy chain systems for this sophisticated application.

Challenges such as these are nothing out of the ordinary for EKD Systems: The company has been specialising in the development and production of customised steel, stainless steel and plastic energy chains for more than 50 years. Their focus is on user-specific system solutions designed to customer requirements, in small to middle-sized quantities. For this, EKD Systems has a number of machining centres, its own tool and die making facilities, as well as a broad-based fully automated plastic injection moulder.

“We have a vast array of diverse energy chain systems in our assortment which can be modularly adapted to the individual requirements of our customers,” explains Karsten Göbel from Technical Sales at EKD Systems.

The energy chains used in the KARL DEUTSCH ultrasonic testing system need to be particularly sturdy. The experts from EKD Systems therefore opted for the PLE plastic link energy chain. This is a plastic hybrid chain with rugged aluminium dividers and a multiple locking system in the joints to ensure high stability and safe guidance of the cables. The chains are also suitable for long travel distances and high travel speeds and therefore optimally support the dynamic performance of the testing system. EKD Systems has also fitted sliding elements into the inner radius of the chain in order to reduce the driving forces. The result is a version of the chain which guarantees smooth and precise transmission of forces and movements, and hence reliable measurement operations.

### BESPOKE CARRIER FOR TIGHT INSTALLATION SPACES

A cable carrier optimised for installation in tight spaces was an additional requirement alongside extremely smooth operation. The testing system has a travel distance of 27 metres and a travel speed of two metres per second, all well in a very confined space. In order to make optimal use of this space, EKD Systems created a customised energy chain system which comprises a trough made to customer specifications and fitting perfectly into the existing design. The special construction of the chain uses dividers to facilitate a highly variable design of the inner space. This optimises the cable carrier and hence contributes to the reliable functionality of the testing system.

After setting up the machine at the KARL DEUTSCH factory, it was dismantled into its components in preparation for transport to the end customer. The cables were inserted in the energy chain from EKD Systems and then wound on to a special assembly drum included in the scope of delivery. "This facilitates fast and efficient on-site installation of the chain and hence saves a lot of time and money during the assembly of the system," recalls Harmuth.

### **TAILORED EXACTLY TO THE APPLICATION**

Thanks to the cooperation with EKD Systems, KARL DEUTSCH received a customised pre-manufactured energy chain system tailored exactly to the specific requirements of this sophisticated application. "The rugged and low-oscillating energy chain facilitates the precise transmission of force and movement and hence accurate measurements with fewer errors and reliable functionality of the testing system over the entire lifetime," praises Harmuth, who is completely satisfied with the partnership: "Together with the experts from EKD Systems we were able to build a first-class product which saves both us and the system operator considerable time and money." ◀



The customised energy chain system facilitates accurate measurements and reliable functionality of the testing system.

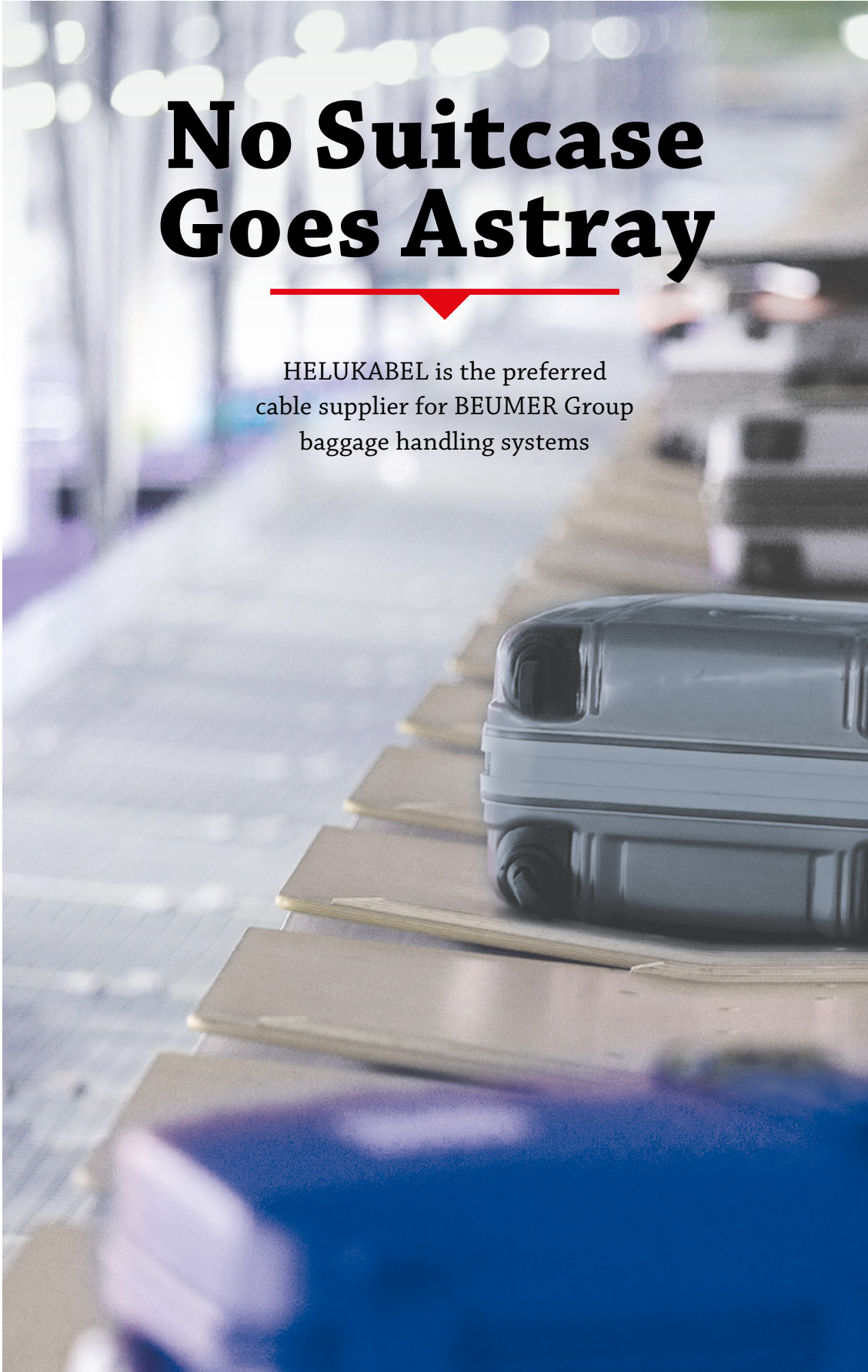


**"We have a vast array of diverse energy chain systems in our assortment which can be modularly adapted to the individual requirements of our customers."**

*Karsten Göbel,  
Technical Sales, EKD Systems GmbH*

# No Suitcase Goes Astray

HELUKABEL is the preferred  
cable supplier for BEUMER Group  
baggage handling systems





**T**he Danish-based BEUMER Group A/S – part of the German BEUMER Group, specialises in modern baggage handling systems for airports. The system specialist relies on HELUKABEL for the transmission of power, signals and data in these mega-systems: more than 100 different cables and wires help guide suitcases, bags and sports equipment safely and quickly to their destination anywhere in the world.

International aviation is posting positive numbers again after being hit badly during the Covid pandemic: 32 million flights took off in 2022, significantly more than in the previous year. Experts expect further recovery in the future with air traffic soon exceeding pre-pandemic levels.

To cope with the growing number of passengers, airports are being converted into more efficient transport hubs. New and more efficient baggage handling systems play an important role here as passengers should arrive at their destination together with their luggage. Sorting and transport systems at airports have thus become technically sophisticated end-to-end systems capable of performing a diversity of auto-

nous and computer-controlled tasks that handle bags from check-in and security checks to baggage claim.

### **HIGH-TECH AUTOMATED SOLUTIONS**

One of the most renowned specialists in this demanding sector is the BEUMER Group. The product portfolio of this intralogistics system supplier with headquarters in Beckum, Germany contains a variety of solutions in the fields of transport, loading, palletising, sorting and distribution. Its Danish group company, BEUMER Group A/S, is the centre of competence for baggage handling systems and has installed its high-tech systems in several of the world's largest airports. In doing so, the company has been able to draw on around 40 years of experience in the sector.

“Depending on the airport's operational requirements, we specify different solutions such as a tilt-tray loop system, or larger independent carrier systems such as the BEUMER autover cart-based system or the CrisBag tote-based carrier system,” explains BEUMER Group Procurement Manager, Sebastian Vester Sørensen. “All these systems have one thing in common:

They are highly automated and contain a diversity of electrical and electronic circuitry.” Cables and wires are thus key components in these huge systems as they guarantee the correct and reliable transmission of power, control signals and data.

### **COMPREHENSIVE SERVICE WITH COMPETENT PARTNERS**

The BEUMER Group has relied on HELUKABEL for many years now. The company acquires its cables and wires from cable harness manufacturers as well as directly from the connection technology specialists who also have a subsidiary in Denmark. With Holger Weeber (Regional Sales Manager Nordic Countries), Hartmut Kellner von Bergen (Senior Manager International Business) and Markus Kienzle (International Accounts Manager), the intralogistics system supplier has three experienced and competent partners at the HELUKABEL headquarters in Hemmingen, Germany, who provide BEUMER project sites with reliable support regardless of where they are in the world. The BEUMER Group has been assigned Global Accounts status at HELUKABEL which means it benefits from an especially transparent,

**Baggage handling systems are highly automated and contain a diversity of electrical and electronic circuitry.**





Airports are exceptionally sensitive areas with high safety standards, as is reflected in the requirements for cables and wires.

efficient and reliable supply chain. In addition, Managing Director Brian Lyngholm's Danish colleagues offer responsive and comprehensive on-site service – a constellation which, in the opinion of Sebastian Sørensen, “leaves nothing to be desired.”

Airports are exceptionally sensitive areas with high safety standards, as is reflected in the requirements for the used cables and wires. “For fire prevention reasons, for example, they must be halogen-free, and in the event of fire, only cause low smoke development,” describes Sørensen. “Moreover, they must withstand vibrations, be particularly flexible and because of the long service life of our systems, be extremely resilient.” Depending on where the BEUMER Group baggage handling systems are installed, they must fulfil the EN or UL standards and regulations applicable to each location.

### ENORMOUS ASSORTMENT AND HIGH PRODUCT AVAILABILITY

In collaboration with the HELUKABEL experts, the BEUMER Group engineers have been able to specify the perfect cable type for each application. The systems use, for example, the JZ-500 HMH and JZ-600 HMH range of halogen-free control and connection cables, PROFInet cables for data transmission and the MULTISPEED series of highly flexible drag chain cables specially designed for extreme mechanical stresses. “All in all, we procure more than 100 different cables from HELUKABEL,” reports Sørensen. “The product assortment is so extensive that we always find an appropriate solution for our complex tasks.”

Another plus point for the BEUMER experts is the high product availability: “The required cables can usually be deliv-



**“With its Global Accounts status, the BEUMER Group benefits from a transparent, efficient and reliable supply chain.”**

*Hartmut Kellner von Bergen,  
Senior Manager International Business,  
HELUKABEL GmbH*

ered in the fastest time, either from Germany or directly from Denmark. This saves us valuable time during procurement and allows us to react flexibly to customer needs.” Sørensen particularly commends the technical collaboration between the two companies: “We don't just buy products from HELUKABEL. We also obtain the corresponding know-how. This is a great advantage when it comes to developing new systems. If we have any questions about the electrical connection technology, we always know who to turn to.”



For the apprentices and dual students of the class of 2019/20, the motto this summer was: Congratulations on your successful graduation! We are pleased that all of you will continue to stay with the HELUKABEL family!



Visit us on Instagram!

helukabel\_youngsters  
Helukabel GmbH

**BAM 2023**

"Your profession is looking for you!" – this was the motto of the vocational training fair bam in Ludwigsburg in March. HELUKABEL was on site as an exhibitor and informed interested young people on both days of the fair about the various career opportunities in the company.

helukabel\_youngsters  
Helukabel GmbH

**Channeling PURE**

**VISITORS AT HELUKABEL**

"SCHOOL AND PRACTICAL EXPERIENCE GO HAND IN HAND"

In June we were visited by the teachers from the Glemstalschule, one of our partner schools in the region. Their conclusion: school and training go hand in hand at HELUKABEL – as it should be!

helukabel\_youngsters  
Helukabel GmbH

**MELANIE NEEF**

since 01.09.2023  
Training Referee for the location Hemmingen  
#TRANSFER

Since September 2023, Melanie Neef has been taking care of the needs of the approximately 50 apprentices and dual students at the Hemmingen site as the new Training Officer at HELUKABEL. She thus strengthens the team of Training Manager Alexandra Wellinger. A warm welcome!

helukabel\_youngsters  
Helukabel GmbH

HELUKABEL®

**CLASS OF 2023**

Welcome!

Record-Breaking Start to Apprenticeships

At the start of apprenticeships at HELUKABEL's German sites in Hemmingen and Windsbach, we had the pleasure of welcoming a particularly large number of new apprentices and dual students this time: with 23 young individuals, the training cohort 2023 marks the largest in the company's history!

# “Sales Benefits from Trustful Interaction”

In August 2022, when Pascal Schwindhammer started his job as head of sales at KABELMAT Wickeltechnik, a subsidiary of the HELUKABEL Group, he became an important contact for both his customers and team members. In this interview he explains what he finds particularly exciting about his job, how he goes about building successful relationships with customers – and why selling KABELMAT products is different from selling jelly babies.

**Mr. Schwindhammer, before joining the HELUKABEL Group, you worked for many years at a worldwide leading mechanical engineering company. Tell us about your career and what attracted you to your new job.**

My career began with a degree apprenticeship in business computer science. When I'd finished that, I started working in industrial engineering where my job was to plan and set up factories abroad. For example, I spent one year in India and two in China and was responsible for promoting business activities in these regions. On returning to Germany, I became involved with the overall strategy of the group. The move into sales has been an inspiring one for me because now I not only look at ways of optimising our own processes, but also those of our customers. I very much enjoy collaborating with users over long periods in order to help them find the right solution. KABELMAT was and is for me an exciting

place to work because it has big growth potential. We are suppliers of powerful and innovative products which our customers will use for decades to come. But many potential customers have never heard of us and that's where I see big opportunities in the future.

**What do you particularly like about your job as head of sales?**

For me, both sales and human leadership depend on personal and trustful interaction. Everyday I look forward to discussing and elaborating on upcoming topics with colleagues. Open and ongoing communication is very important to me.

**What's your typical working day look like?**

I don't really have a typical working day as I have a variety of tasks to tackle. A big part of my job consists of meeting customers on-site or via Teams. And then





there are office days when I'm very busy writing emails or making phone calls. On top of this, there are lots of exciting workshops at KABELMAT either with our engineering partners or organised by the HELUKABEL Group. They might be on sales training, product placements or marketing, for example. Then there are strategic topics such as new products, cooperations or the expansion of our sales network which we hope will boost growth at KABELMAT. So, it's never boring.

**And how do you relax after a tiring day?**

I like going to a good restaurant with delicious food, and combining that with a short walk – and I don't mean just from the car to the restaurant. This allows me to recharge my batteries quickly. My hobbies play an important role here too – for example, I'm a member of the voluntary fire brigade. For longer periods of rest, I like going on holiday and travelling around the world.

**KABELMAT manufactures handling equipment for cables, wires, pipes, steel cables, hoses and profiles. What's the difference between selling such specialty equipment and selling, for example, jelly babies or sports shoes?**

Consumer goods such as jelly babies are standardised and sold in large quantities to private individuals and the main aim is to satisfy personal preferences. Appearance, taste and well-being are key factors here – all things that users in mechanical engineering are usually less interested in. The sale of our products is substantially different: We are suppliers of machines that are used to wind di-

verse materials with extremely different properties. This means we have customers in different sectors, each with their own processes and requirements. The exciting thing about sales is getting involved and finding solutions that can be perfectly integrated into existing environments so that users can achieve their goals – be it through increased capacity, more flexibility or shorter delivery times. In sales, we also attach great importance to other topics such as efficiency and work safety. And another difference: when someone buys jelly babies or a pair of sports shoes, it's that individual person's decision whereas in industry, several people are involved in the process. We're talking about much bigger sums of money here for long-term investments and these aren't normally easy decisions for customers. It's part of our job to accompany them through the process and provide them with support

**KABELMAT joined the HELUKABEL Group in 2009. How has KABELMAT profited from being part of the group and what are the benefits for your customers?**

Being part of the HELUKABEL Group has various benefits for our customers. The first one is the HELUKABEL sales network which covers most of the world and which we have access to. HELUKABEL sales representatives regularly attend product training workshops at our company. This means our customers always have a qualified contact nearby, be it in Germany, the USA or Brazil. We have also installed our machines in HELUKABEL distribution centres around the world which gives customers the opportunity to see our products in action.

As a result of this long-standing collaboration and HELUKABEL's high level of automation, we have been able to continually extend our portfolio which also benefits our customers. Our relationship with other subsidiaries in the group allows customers to purchase complete tailor-made solutions from a single supplier.

**How has working in sales changed over the years?**

One of the biggest and most obvious changes is the technological change. In the past, a sales rep used to drive from one place to the next visiting customers – not only to get to know them but also to discuss technical solutions or quotes. Today a large part of this work is done digitally. This brings a lot of opportunities but also risks. For a start, we can generate quotes much more quickly as lots of things can be discussed via

**"In sales, we also attach great importance to topics such as efficiency and work safety."**

Teams, and pictures or videos can be viewed online. Remote access to machinery and equipment by the service department, for example, also saves a lot of time. But this might be at the risk of forfeiting personal contact with customers and failing



to get a feel for where the machinery is installed. In my opinion, a combination of both is best, i.e. using the benefits of modern technology while at the same time visiting customers on site.

I've already mentioned the decision making process. In the past, it was the managing director and nobody else who decided about investments. These days, various people are involved, including the machine operator, and I think that's very good and the right way to go about things. Input from different stakeholders puts us in a better position to properly understand the relevant challenges and to focus on providing appropriate solutions.

***Looking into the future, where do you see big opportunities for KABELMAT?***

From a technological perspective, I see big opportunities in cable drum man-

agement – for example, through the mapping and digital management of traditional floor storage on the basis of shelves. Another major goal is to increase the level of automation by connecting our cutting systems to warehouse and materials handling equipment. HELUKABEL in Hemmingen has been a real innovator here. More and more customers are approaching us these days with similar inquiries. From a geographic perspective, the USA and Canada are particularly exciting areas as lots of work is still done by hand in these countries but this is likely to change in the future. We are in the process of extending our sales network in North American in order to focus on discussions with potential customers. Another megatrend which is creating very promising demand is electric mobility – after all, electric cars need charging cables which are made and cut by machines. But we are also extremely optimistic about sectors such as renewable ener-

gy and artificial intelligence. By working together with different partners, our solutions are becoming even smarter and more interconnected which further enhances the added value given to customers. ◀



---

**PASCAL SCHWINDHAMMER HAS TO DECIDE!**

***Tea or coffee?***

→ I don't function without coffee!

***A suit or jeans?***

→ Preferably comfortable jeans.

***What do you like best: a savoury or sweet snack?***

→ Unfortunately I love everything that's bad for you. But if I had to decide, then savoury

***Active or passive sport?***

→ It depends on the type of sport. My favourite sport – football – saw me relegated very quickly to the spectator's bench due to lack of talent.

***Camping or all-inclusive?***

→ Depends: with just one person, an all-inclusive, with the family, camping's fun.

***Mountains or the sea?***

→ Oh, definitely the sea.

***Cat or dog?***

→ I've always been a big cat fan.

***Music or podcast?***

→ Music – and across the board, from 80s rock to modern. The mix is important.

***City or village?***

→ I get very impatient looking for somewhere to park – but this isn't the only reason I prefer village life.

***TV or book?***

→ I'd go for TV.



THE SERIES AT A GLANCE:

TORSION TESTS // BENDING TESTS // **DRAG CHAIN TESTS** // KINK AND ABRASION TESTS //  
FIRE TESTS // AGEING TESTS // EMC TESTS

# Drag Chain Tests

During the development of our cables and wires, we vigorously test each product in our testing laboratories. In the third part of our series “Put to the Ultimate Test”, we introduce you to drag chain tests.



In its testing laboratory, HELUKABEL has a variety of drag chain test facilities with traverse paths ranging from 0.9 to 40 metres.



**E**nergy chains – also known as drag chains – are ideal for guiding and protecting electrical, hydraulic and pneumatic cables in moving machinery and equipment. They are used in situations where machine components are moving back and forth – for example in lifts, machine tools and in the control stations of high-bay warehouses. The guide ensures that the smallest permissible bending radius for the cables is not exceeded, thereby avoiding damage.

Drag chain cables are constantly moving – often non-stop around the clock – making fast accelerations, tight bending radii and continuous abrasion ongoing challenges. There are many applications where drag chains have to withstand millions of bending cycles undamaged, and at the same time be resilient to oil, heat and chemicals. Core insulation and sheathing materials of high quality are essential here to reduce the risk of abrasive wear which might damage the cables and lead to expensive machine outages.

The HELUKABEL portfolio contains special drag chain cables for moving applications in energy chains. To ensure that they meet the stringent demands of day-to-day use, we subject them to extensive testing in our testing laboratory in Windsbach, Germany. We have a variety of drag chain test facilities with traverse paths ranging from 0.9 to 40 metres. With accelerations of up to  $50 \text{ m/s}^2$ , velocities of up to 10 m/s and different chain radii, we can realistically simulate diverse operating conditions. The aim of these tests is to prove that the copper wires, core insulations, stranding and outer sheathing withstand constantly changing bending stresses undamaged and therefore meet our high quality standards.

Only cables that fulfil every one of our strict requirements find their way into our product portfolio. Hence, our drag chain cables are HELUKABEL's contribution to ensuring that plant and machinery are able to operate both cost-effectively and efficiently over the long term, even in harsh conditions. ◀

© Andreas Riedel

## Ask the Expert

### ***What do you have to pay particular attention to when choosing a drag chain cable?***

There are several criteria: firstly, the copper wires should be finely stranded, i.e., are conductor class 5. The individual conductors should be stranded with the smallest possible lay length to optimise flexibility. The design of the sheathing and insulating materials must take into account the required movements as well as the relevant ambient conditions. It is also recommended keeping the number of cores to a minimum: if the number of cores increases, a special stranding process is required. This increases the diameter of the cable which might lead to space problems in the chain. Furthermore, drag chain cables must be designed to be as light as possible. The energy chain has to carry its own weight as well as that of the cables inside it. The lower the overall weight, the greater the dynamic performance and hence the less the energy needed to get the system moving.

### ***How are the cables aligned in a drag chain?***

For optimal alignment, it is important to define beforehand precisely which cables and other components such as pneumatic and hydraulic hoses will be used and to select the energy chain accordingly. Cables and hoses should be loosely placed beside each other in the chambers of the drag chain and, ideally, kept apart from one other using dividers. Maintaining a specified clearance between the cable and divider ensures that the cables can move freely. Symmetrical weight distribution in the chain helps to ensure smooth operation. In addition, the cables in each section should all have the same sheathing material to avoid unnecessary abrasion.

### **ABOUT THE AUTHOR**

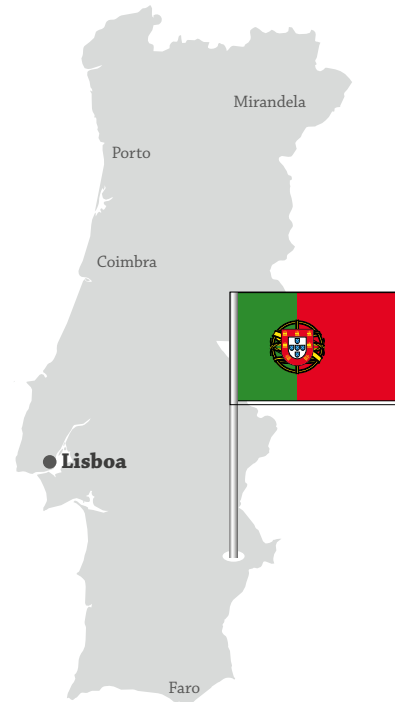
Günter Meyer is Head of Dynamic Testing at the HELUKABEL plant in Windsbach



# Welcome to Portugal!

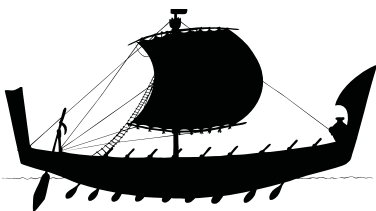
Interesting facts about the HELUKABEL subsidiary and the country

- ▶ HELUKABEL has been represented in Portugal as a subsidiary since 2016. Its headquarters are located in Coimbra, with additional offices in Lisbon and Porto.
- ▶ For Managing Director Eduardo Soares and his 30-member team, customer needs come first: in order to fulfil them promptly, HELUKABEL Portugal has a logistics centre of around 1,000 m<sup>2</sup> with 760 pallet places, which can store cable drums up to 4.5 tonnes.
- ▶ Portugal is a global pioneer in renewable energies – correspondingly, the demand for cables and wires from the solar and wind power industry is high. But the paper and automation technology industries are also important customers.
- ▶ In addition to the local market, HELUKABEL Portugal supplies various African countries such as Algeria, Tunisia, Angola, Mozambique and was also involved in setting up the HELUKABEL subsidiary in Morocco.



- ▶ To be prepared for future growth, HELUKABEL Portugal is currently planning on moving its headquarters to a new location within Coimbra. More details to follow shortly!

## FUN FACTS



Portugal is old – very old: due to its advantageous location, the Phoenicians settled in Lisbon as early as 1200 BC to trade. The city is thus estimated to be **400 YEARS** older than Rome.

Portugal holds the record for the longest and shortest reigning **KING** of all time: King Henrique was the incumbent for an incredible 73 years, while Luis Filipe only made it to the throne for 20 minutes.



More than 250 million people speak Portuguese, making it one of the ten most spoken languages in the world. Besides Portugal, Portuguese is an **OFFICIAL LANGUAGE IN EIGHT OTHER COUNTRIES**, such as Brazil, Angola and the Cape Verde Islands.



The University of Coimbra – the city where HELUKABEL Portugal's headquarters are located – was founded in 1290, making it one of the oldest universities in the world. It has been a **WORLD HERITAGE SITE** since 2013.

The Portuguese fishing village of Nazaré on the Atlantic coast is an Eldorado for surfers and is known for its huge waves. In 2020, Germany's Sebastian Steudtner set the current world record in big wave surfing here: The wave he conquered was a whopping **26 METRES** high.



Football star Cristiano Ronaldo is undoubtedly the most famous person of Portuguese decent today. Over **600 MILLION** people follow him on the social media platform Instagram – more than any other celebrity.



## FAQ

## How do I choose the right conductor material for cables and wires?

**V**arious materials can be used as electric conductors for transmitting energy, signals or data in cables and wires. The most well-known and commonly used one is copper (Cu) which is a very ductile metal with high conductivity. It is also flexible, high-tensile and comparatively cheap, making it the first choice for many applications. The conductor comprises either a single wire or multiple wires twisted together to form a so-called strand. Copper can be tin-plated, for example, to make it more corrosion-resistant, or nickel-plated to improve its temperature range.

Aluminium (Al) is another potential conductor material. Its major benefit over copper is a much lower density. But it has poorer conductivity which means a greater cross section is required to transmit the same current. In addition, aluminium wires are less flexible and hence more likely to break. This makes them unsuitable for moving applications. As a result, aluminium is mainly used for energy distribution cables and medium-voltage cables where weight plays an important role.

The material with the best conductivity is silver (Ag) but it is many times more expensive than copper. For this reason, silver is normally only used in special applications where exceptional performance and efficiency is required – for example in high-end audio. Another possible conductor for audio cables is silver-plated copper wire which stands out for high conductivity and resistance to corrosion. The high price and poorer conductivity of gold (Au) compared to silver and copper rules this out as a conductor.

Another material which, at first glance, would also appear to be an unsuitable conductor is steel with a conductivity significantly worse than that of copper or aluminium. On the other hand, it is extremely strong and highly tensile. For this reason, steel is used in military applications as well as in aerospace, often in combination with other materials such as aluminium.

Alongside all these metal conductors are optical fibres, or so-called optical waveguides. These are ideal for transmitting signals at high speed using light. They consist of a quartz glass or plastic fibre core. The latter is more flexible and hence can be bent more easily. The core is surrounded by an optical jacket, known as the cladding. The light signals are reflected between the core and cladding and hence transmitted through the waveguide at high speed. Optical waveguides are used in a variety of applications, such as in telecommunications, medicine and aerospace. They cannot transmit current though. The best conductor material thus depends heavily on the application in question and the prevailing conditions. These must be known precisely in order to be able to carefully consider the pros and cons of each material. Of course other characteristics of a cable such as stranding, cross section, insulation and sheathing material also play an important role. For this reason, it is always best to seek expert advice when choosing cables and wires to ensure compliance with all the requirements of everyday use. ◀

**About the author:**  
Christian Dettmer is  
Head of Technical  
Department at  
HELUKABEL



## OUR TRADE FAIR DATES

HELUKABEL will be exhibiting at various trade fairs around the world over the next few months. Please check our website [helukabel.com/trade-fairs](https://www.helukabel.com/trade-fairs) for an up-to-date overview of the dates and locations. We look forward to your visit!



## HELUKABEL ON SOCIAL MEDIA

We use our social media accounts to share all the latest news from the HELUKABEL world with you: from product innovations and successful customer projects to delving deep and sharing knowledge on technical topics concerning electrical connection technology. Would you also like to stay up to date? Then follow us! We can be found on the platforms listed below:

 [helukabel gmbh](https://www.helukabel.com)

 [@helukabel-gmbh](https://www.linkedin.com/company/helukabel-gmbh)

 [@helukabelgroup](https://twitter.com/helukabelgroup)

 [@helukabelgroup](https://www.facebook.com/helukabelgroup)

 [@helukabelgroup](https://www.instagram.com/helukabelgroup)

## Imprint

### PUBLISHER:

HELUKABEL® GmbH  
Schloßhaldenstraße 10  
71282 Hemmingen  
info@helukabel.de  
www.helukabel.com

### RESPONSIBLE FOR CONTENT:

Dr. Petra Luksch

### CHIEF EDITOR:

Dr. Petra Luksch

### EDITING:

Matthias Reiser

### DESIGN:

Kerstin Maaß, Elisa Mongiovi

### PRINTING AND PROOFING:

W. Kohlhammer Druckerei GmbH

Published semi-annually.

All rights reserved. Publication, reprinting and reproduction, even excerpts, require the permission of HELUKABEL® GmbH.

### CONTACT THE EDITOR:

HELUKABEL GmbH  
Corporate Communications  
Schloßhaldenstraße 10  
71282 Hemmingen

Mail: [presse@helukabel.de](mailto:presse@helukabel.de)  
Telephone: +49 7150 9209-0

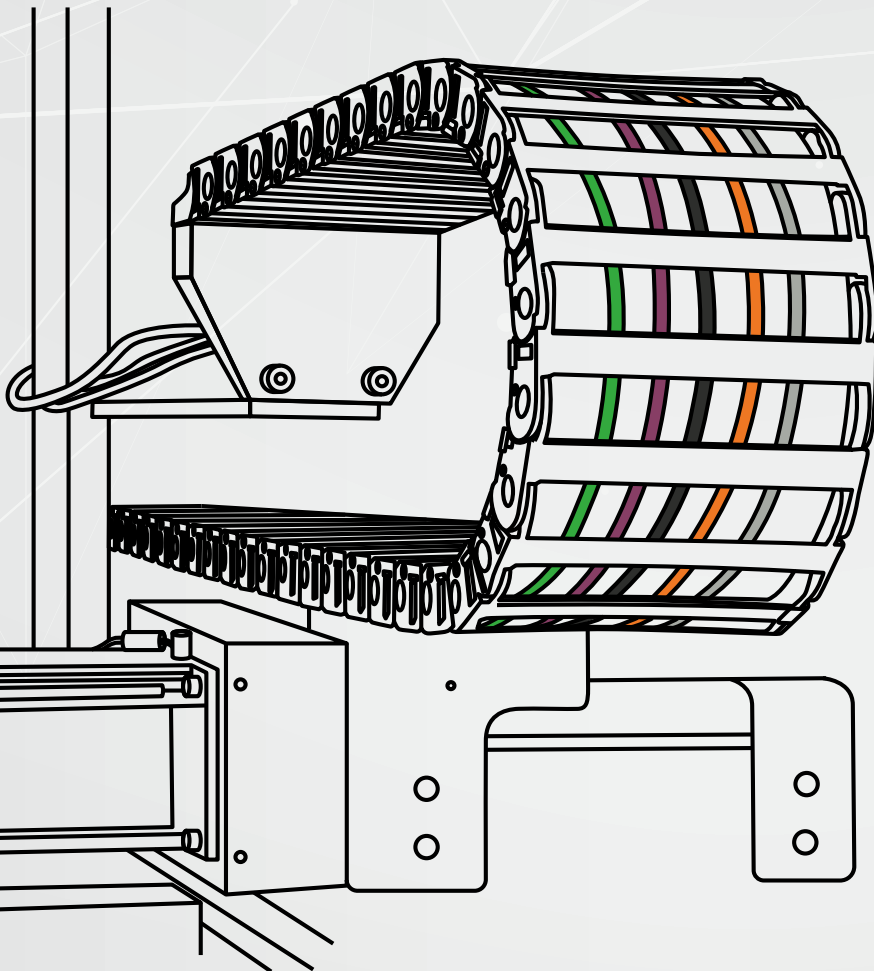
As a long-standing partner to the mechanical and plant engineering industry, HELUKABEL has a comprehensive range of cables specially designed for highly dynamic use in drag chains. Together with its subsidiaries, the company even supplies its customers with completely pre-assembled and ready-to-install drag chains – and thus electrical connection technology from a single source!



**Feedback cables** such as the TOPGEBER 512 PUR transmit the data of a servo motor to a frequency inverter so that the drive can position and move as desired.



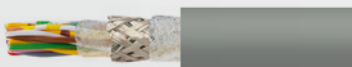
**Industrial Ethernet and bus cables** such as the Profibus L2 PUR CHAIN ensure reliable data transmission in moving applications thanks to their flexibility.



**Control cables** such as the MULTISPEED 500-C-PUR UL/CSA are specially designed for applications with high mechanical stress. The highly flexible cables ensure permanently reliable operation even with tight bending radii, tension and abrasion.

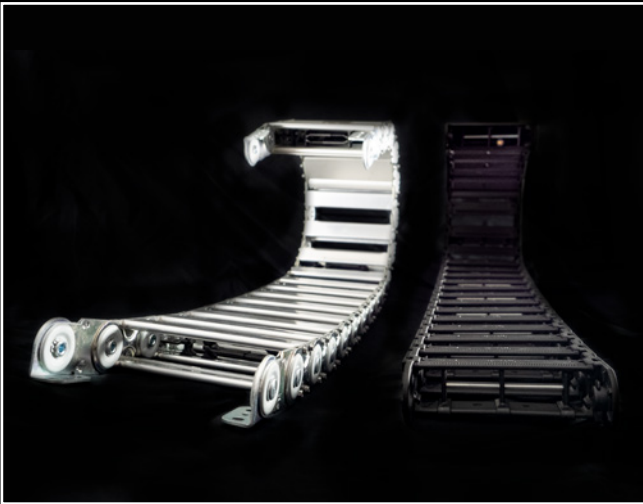
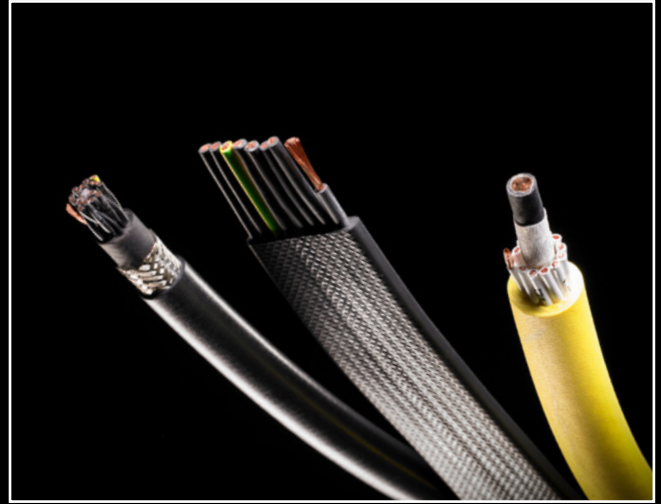


**Servo cables** such as the TOPSERV 113 PUR are manufactured according to the specifications of well-known servo drive and control manufacturers and are used to supply power and control signals.



**Pair-stranded cables** such as SUPER-PAAR-TRONIC-340-C-PUR enable reliable pulse transmission even under high-frequency external influences. The individual cores are twisted into pairs with optimally matched lay lengths and the entire cable is shielded.

# Electrical Connection Technology from a Single Source



From individual cables to ready-to-install complete systems, from standard products to special constructions: For more than 40 years, HELUKABEL solutions have been ensuring that energy and data arrive where they are needed – anywhere in the world. Trust the expert!  
[helukabel.com](http://helukabel.com)

