

## Always faster and more Fibre optic cables at wire 2018

The digitalised data volumes required for e-mails, e-commerce, telephone calls and TV are rising rapidly. The demand for ever greater volumes at ever faster speeds is one met particularly well by fibre optic cables. For this the cable industry has to deliver production machinery, cable sheathing and measuring technology at the highest level.

Developments in fibre optic cable manufacturing to ensure the required performance are similarly rapid. And this challenge is taken up by Kurre Spezialmaschinenbau, to name but one producer. "In addition to low-cost implementation it is imperative to go along with customers' new, specific requirements time and again. We want to understand our customers' product-specific requirements so we can conceive optimum production lines," says Thorsten Wilde, Head of Sales and Project Management at Kurre Spezialmaschinenbau GmbH, and explains that this flexibility helps to generate the matching solutions needed in e-mobility, data transmission or for sensors in automotive manufacturing.

### Predictability through Production Depth

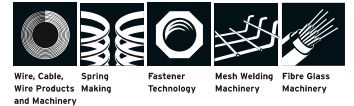
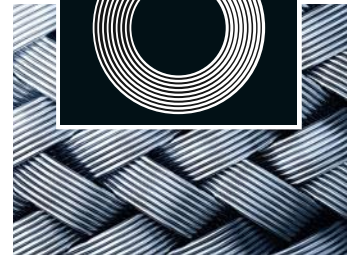
Predictability is key for the fibre optic cable industry. This is why Kurre Spezialmaschinenbau focuses on nearly "100% production depth". Machinery is "designed on the basis of detailed customer specifications in a state-of-the-art 3D-engineering environment, then manufactured in house, assembled and shipped to customers all over the world after detailed commissioning." This production depth makes it possible to re-manufacture any "spare and wear part lifelong making them available at any time," stresses Thorsten Wilde.

Fibre optic production requires not only the machines for the production process proper in a drawing tower, but also extruders, winding, unwinding machines, storage reels, pullers, cooling channels as well as various measuring systems.

### Sheathing of Fibres

One decisive factor impacting the quality of fibre optic cables is the extrusion process. Approx. a dozen optical fibres are bundled in loose

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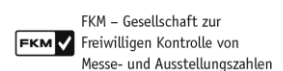
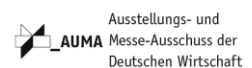
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tubes “and loosely sheathed with a high-rigidity and stabilising polybutylenterephthalate (PBT) tube in an extrusion process,” explains Dr. Simon Kniesel from the Product Development Department for Industrial Plastics at BASF. Sheathing takes place in one consistent, automated extrusion process. “During this extrusion process the individual optical fibres coming from various reels are pulled into the little, inline-manufactured tube at speeds of up to 500 metres per minute.”

### **Cables Becoming Ever Thinner**

But which material should be used for the sheathing? The melt should solidify fast during the extrusion process and the finished loose tubes should be very stiff. Another challenge in Simon Kniesel’s opinion is the growing demand for fibre optic cables worldwide while the space available for transmission lines and in cable ducts but also for in-house wiring and in opto-electronic assemblies is limited. “This means cables need to become thinner and thinner despite constant information density.” To fulfil these stricter requirements BASF has developed a new Ultradur® type especially for thin fibre-optic sheathing. Other companies are expected to follow suit with their own developments.

### **Measuring Devices for Monitoring**

The industry is also pushing stranding developments. Rosendahl Nextrom has improved its SZ stranding for fibre optic cables. Speed, say the company, is a key factor for stranding machine performance. Here the loose tubes are stranded at 2,500 rpm with a line speed of up to 200 m/min.

Speed, however, is not everything. “Integrated components also have to respond precisely at high speeds,” stresses Rosendahl Nextrom. The company’s new “crosstie” keeps pace with the speed, he adds, but also makes for low tension in the strand. “Our active tension control ensures that tubes or bundles are not damaged by tension.”

### **Fibre Protection**

Key for manufacturing fibre optic cables is fibre protection inside the cable. Furthermore, these cables have to withstand such stresses as moisture and tensile forces for extended periods. “Fibre optic cables

are typically equipped with an insulation layer made of polyethylene (PE) as an outer protective jacket,” explains fibre optic firm Sikora and goes on to say that for this type of cable the thickness of the insulation layer must be measured. A measurement of the diameter is also important but generally not sufficient by its own.

Sikora has developed devices that detect diameter, minimum wall thickness, eccentricity and quality by means of X-ray. These values are measured, they say, with the help of an X-ray sensitive image sensor within fractions of a second. “This measuring technique is also particularly attractive for fibre optic cables in view of the savings potential it brings,” adds Sikora.

### **Companies are Investing**

Companies are investing in view of required innovations and the rising demand for optic fibres. 2016 saw Kurre Spezialmaschinenbau occupy another assembly hall thereby expanding its production area by 800 square metres. Furthermore, the headcount has now been increased to a staff of approx. 170 over the past years. “We have strongly invested and added to our team, especially in programming and commissioning so as to further develop this core competence,” explains Thorsten Wilde, Head of Sales and Project Management at Kurre Spezialmaschinenbau GmbH. And they are thinking very hard about further investment and/or strategic partnerships.

Earlier this year the Kurre group of companies took over extruder specialist Siebe Engineering in Rhineland Palatinate. With this move Kurre Spezialmaschinenbau GmbH has extended its core business to also include extrusion lines and now also offers complete manufacturing lines.

### **High Demand due to Digitalisation**

Companies like Kurre Spezialmaschinenbau are gearing up for the future: after all, digitalisation will continue generating high demand from the metal and fibre optic cable industries. “At the same time, end users’ higher demands will make the demands made on the transmission speeds of the cables / technologies used rise as a whole,” predicts Thorsten Wilde. And since properties directly correlate with the quality

of manufacturing equipment, he adds, the demands made on drive controls, will also rise.

“Customers’ rising quality demands will also ensure that over the coming years substantially more machinery and production parameters will have to be collected, transmitted, saved and processed for statistical and quality purposes,” says Thorsten Wilde, Head of Sales and Project Management at Kurre Spezialmaschinenbau GmbH. This means that alongside machine technology proper smart software applications will be decisive to stand out from your competitors and to live up to customers’ expectations.

### **Joint Development of Manufacturing Concepts**

The market is also in motion from a geographical perspective. Labour-intensive manufacturing steps have been sourced out to Asia while manufacturing capacities have moved closer to customers, as was the case on the US automotive market. Machinery deliveries to these regions have developed accordingly: “Often manufacturing concepts are developed together with European contacts but the finished plant is finally delivered to a group site anywhere in the world,” explains Thorsten Wilde.

The forecasts for producers of fibre optic cables and their up-stream suppliers are promising. “Even today, there is a demand for high-performance connections with symmetrical bandwidth and a dedicated Quality of Service in some sectors such as financial services and insurance, in the automotive industry, in the medical sector and wherever big data volumes have to be transmitted fast and safely from A to B,” sums up Wolfgang Heer, General Manager Bundesverband Glasfaseranschluss e.V. (BUGLAS).

### **Fibre Optic Network Expanding More Rapidly**

BUGLAS, the German Association for Fibre Optic Connection, expects that all countries across the board will (have to) invest further in fibre optic networks, especially in the fields of machine-to-machine communication (IoT) and energy supplies. Due to the energy transition more and more energy is fed into grids from decentralised generation

entailing an increased demand for control and adjustment of the transmission grids.

Germany's importance as a market for fibre optics will rise. "We expect the expansion of fibre optic grids to gain even further momentum over the coming years," underscores BUGLAS General Manager Wolfgang Heer. On the one hand, because the "hunger for bandwidth" will continue to grow making further self-sustaining expansion projects possible, and, on the other, because the Federal grant scheme "Breitband" was filled up with state subsidies and Euros three to six billion will go into the expansion of hitherto underserved regions – the so-called white spots – by the end of 2018.

### **Healthy Economy**

"Our country is Europe's strongest economy despite its broadband coverage rather than because of it. To ensure things continue to stay that way further, substantial investment will be needed especially in Germany," says BUGLAS General Manager Heer. So the production and installation of fibre optic cable is about nothing less than a healthy economy. And this should be incentive enough for all parties involved.

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