

## PLANT MANUFACTURER INTEGRATES LASER MEASUREMENT TECHNOLOGY



Production systems for the luxury food and tobacco industries are complex, achieve very high throughput rates and often run 24/7. In order to ensure the products' high quality, the Körber Business Area Technologies counts on seamless monitoring of the entire manufacturing process in the plant. This expectation also applies to the laser-based perforation systems that the company integrates into its lines. Based on Körber's specifications, MKS developed a customized Ophir® OEM sensor to measure the laser power, which can be integrated directly into the equipment. For maintenance tasks, the plant manufacturer also uses and recommends another Ophir OEM quad sensor to measure the position and power of the laser beam.

### Sophisticated machines

In automated production plants, every process step must be implemented optimally. When designing the system, it's important to consider all contingencies, to eliminate potential interference factors, and to continuously monitor the manufacturing quality at numerous points within the process. This is where the core competencies of the Körber Business Area Technologies, part of the international Körber Technology Group, come to the fore: The company specializes in developing tailor-made systems – including software, measuring instruments and flavorings – for the luxury food and tobacco industry. In particular, their cigarette and filter machines set standards worldwide. The company's solutions also include the Laserport laser-based perforation system, which uses a CO<sub>2</sub> laser to perforate cigarette filters at lightning speed. In order to ensure the laser's functionality and thus the correct perforation of the filters, the developers integrated power gauges into the production plant.

#### Product:

- Ophir® 150-UA-1-C-HUI OEM power sensors
- Ophir 600-BB-34-OEM QUAD sensors
- Ophir StarLite display

#### Field of application

- Plant engineering for the luxury food and tobacco industry

#### Application:

- Integrated laser measurements in production plants

#### Benefits:

- Individual, integrable OEM sensors
- Continuous testing of the laser power

**“We have full confidence in the Ophir sensors, as they work reliably and are very robust. This immediately provides our customers with advance notice if the laser power starts to drop, which gives them time to prevent wastage.”**

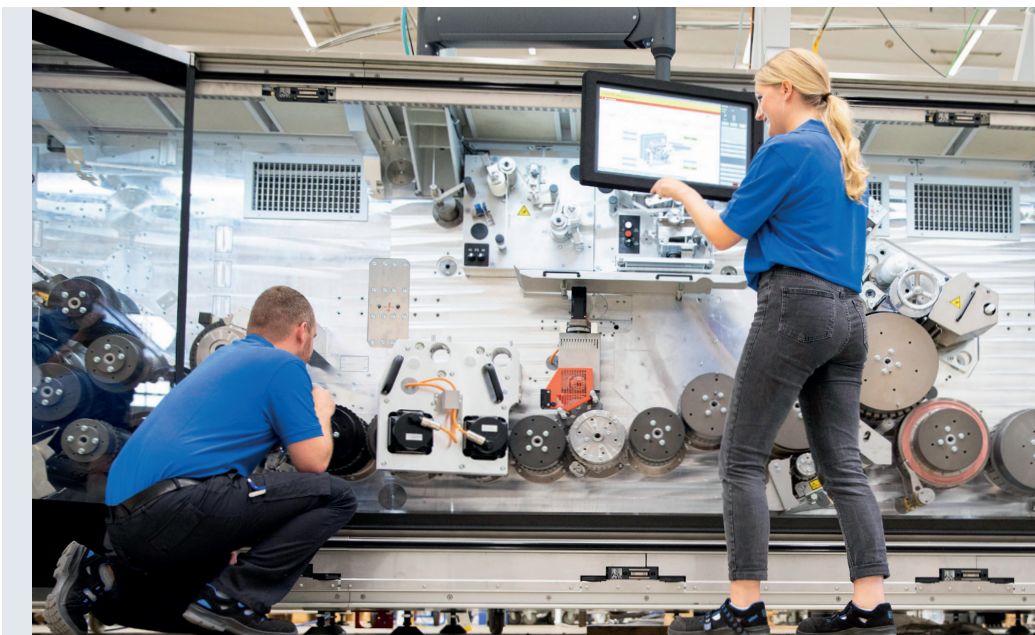
Stefan Meißner, development engineer Körber Technologies

#### **Individualized development**

It was already clear during the development of the first laser port that one of the critical parameters to record was the laser power. Initially, the company used sensors that had been developed in-house for this purpose. But to ensure the quality and maintenance of the sensors over the long term, the company decided rather to purchase the power sensors from specialized suppliers. MKS Instruments convincingly presented its Ophir sensors – which were modified into OEM sensors according to Körber’s requirements. In particular, the spatial limitations within the machine had to be taken into account: The Ophir 150-UA-1-C-HUI OEM power sensors were precisely adapted to these dimensions and given a new housing, as were the Ophir 600-BB-34-OEM QUAD sensors for measuring laser position and power.

#### **Regular power measurement**

The pure power sensors are installed directly in the machines or, if desired, they can be retrofitted. They ensure that the pulsed CO<sub>2</sub> laser (100-500 watts) is working as specified and that the filters are perforated correctly. A beam splitter (99% mirror) directs a part of the laser beam onto the sensor and determines the average power. These readings go very quickly and are displayed on a separate screen on the line. On a Körber system, it’s possible to produce up to 20,000 cigarettes per minute; up to 60 long holes with a diameter or width of 1/10 mm are shot through each filter.



*Abb. 1: Körber Business Area Technologies is specialized in developing and producing customized systems for the luxury food industry. The complex production systems, including software and measuring equipment, are individually configured for customers.*

Also: Each cigarette is checked with regard to the degree of ventilation achieved. If too little air flows through the filter, those batches have to be rejected. Stefan Meißner, development engineer at Körber Technologies, explains: “We have full confidence in the Ophir sensors, as they work reliably and are very robust. This immediately provides our customers with advance notice if the laser power starts to drop, which gives them time to prevent wastage.”

### Flexible laser maintenance

In addition to the built-in verification of the laser beam at the processing level, the Ophir 600-BB-34-OEM QUAD sensors can be used to check the overall settings of the laser unit. Maintenance is generally carried out every six months, but at a minimum, it’s done once a year outside production hours. It can be performed either by the Körber service team or, after appropriate training, by the users themselves. During maintenance, the processing optics that focus the laser beam are removed and cleaned according to the manufacturer’s instructions.

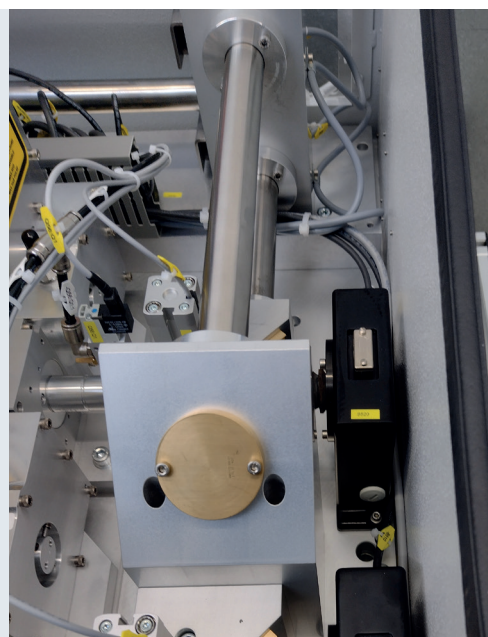
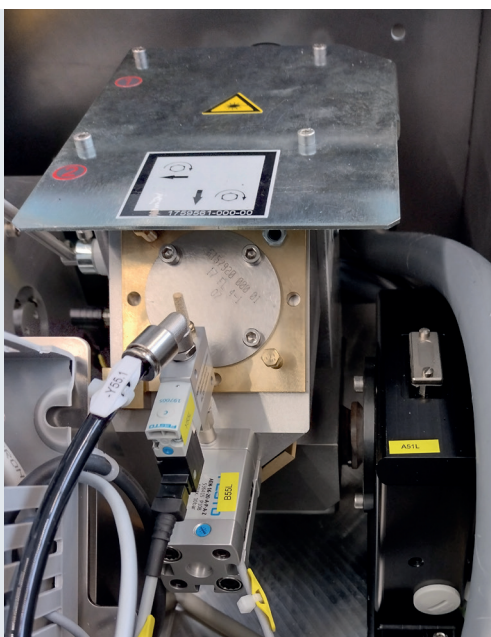
On this occasion, the positioning of the laser source and its output power are checked and adjusted using the Ophir sensor. Should there actually be any abnormalities in the production process with regard to the degree of filter ventilation, users can also quickly and easily test whether the laser unit is out of adjustment, for example.

### Positive cooperation

The Körber Business Area Technologies (formerly Hauni) also uses the Ophir laser sensors in its own laboratory for research and development. So far, any challenges that have arisen were always addressed and a solution found, thanks to the close cooperation between the two companies. According to Stefan Meißner, the development horizon already played an important role in the procurement process, and now that foresight is paying off: “Our systems are known for having a long service life. Some of our customers ask for spare parts 25 years after purchasing them! In MKS, we’ve found a partner who’ll still be able to offer us the right Ophir sensor – even many years later.”

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*Stefan Meißner, development engineer Körber Technologies*



*Abb. 1+2: The Ophir power sensor (in the photos on the right) was individually combined with the control electronics for Körber and integrated in a special housing as an OEM sensor. This allows the sensor technology to be installed directly in the respective Körber production line, as shown in the two examples above (on the left LASERPORT 1000 with two beam sources and two sensors; on the right the LASER 250S with one beam source).*



## WHY MKS?

CRITICAL TECHNOLOGIES	PROVEN PARTNER	OPERATIONAL EXCELLENCE	COMPREHENSIVE PORTFOLIO
World-class technology and development capabilities for leading-edge processes	Recognized leader delivering innovative, reliable solutions for our customers' most complex problems	Consistent execution across all aspects of our business	Extensive offering of products and services for the Semiconductor, Advanced Electronics and Specialty Industrial markets.

### MKS Photonics Solutions

MKS Instruments helps businesses solve their hardest technology challenges. A trusted partner of the world's largest electronics and industrial companies, we leverage leading-edge science and engineering capabilities to offer solutions that improve process performance and productivity for our customers. Spectra-Physics, Ophir, Newport and ESI are brands within the MKS Instruments Photonics Solutions division. Spectra-Physics combines groundbreaking laser technologies with deep application expertise to deliver industry leading lasers for precision industrial and scientific research applications. Ophir specializes in laser and LED measurement products, including laser power and energy meters and laser beam profilers. Ophir also provides high-performance IR thermal imaging lenses and optical elements as well as optics for CO<sub>2</sub> and high-power fiber laser material processing. Newport provides a full range of solutions including precision motion control, optical tables and vibration isolation systems, photonic instruments, temperature sensing, optical and opto-mechanical components. ESI systems deliver market-leading solutions for Flexible PCB laser processing, high-speed MLCC testing, and CO<sub>2</sub>-laser-based systems HDI PCB and IC substrate manufacturing. MKS Photonics Solutions enhance our customers' capabilities and productivity in the semiconductor, advanced electronics and specialty industrial markets.