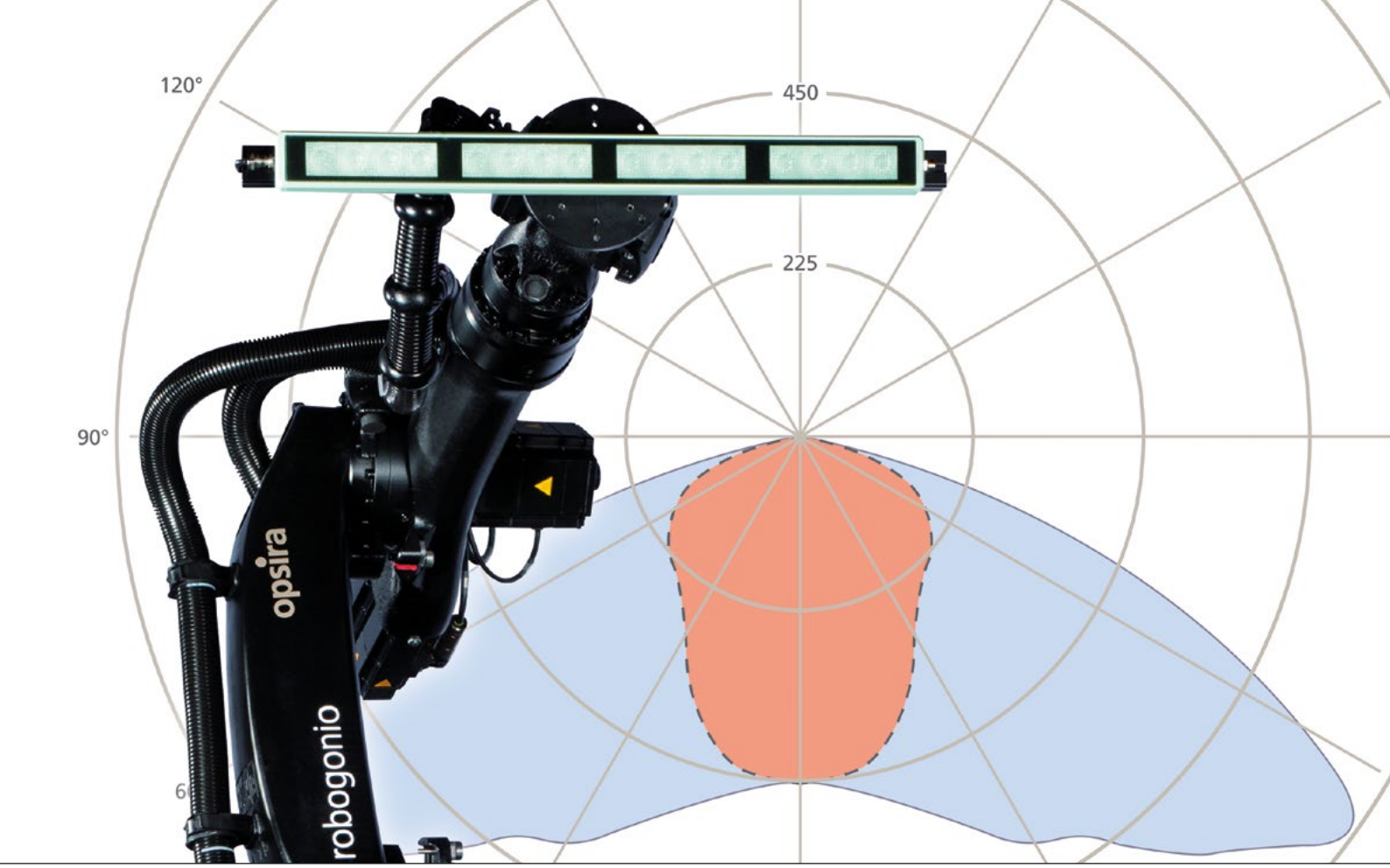

robogonio

User report
Goniophotometry with LED Linear

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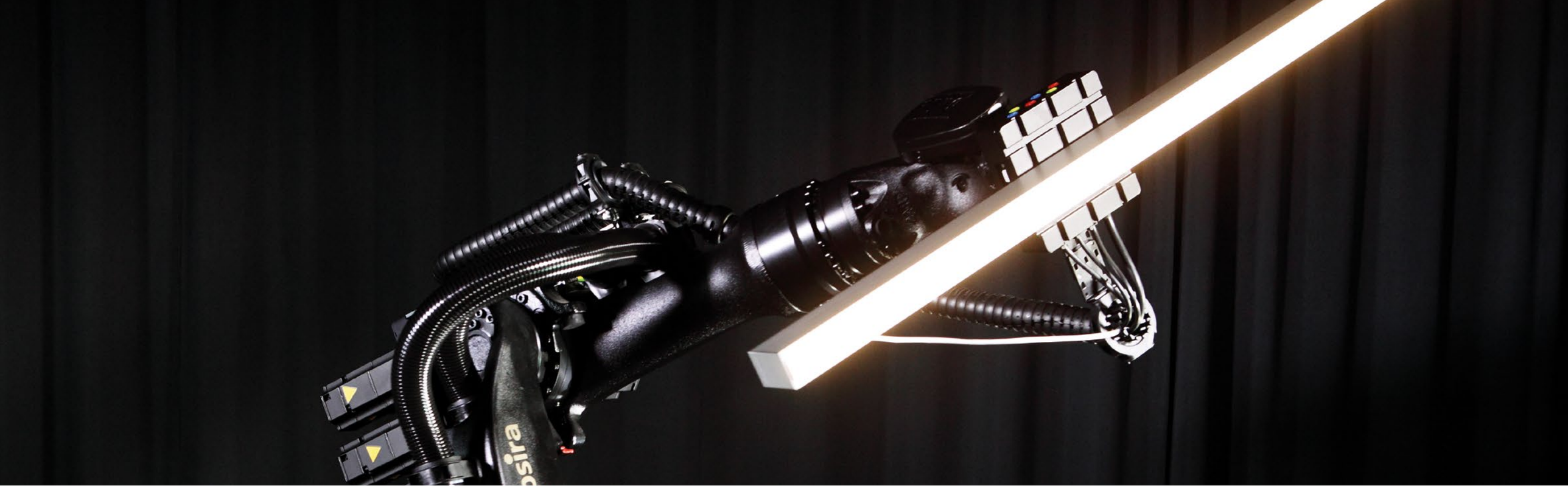

The LED market is fast-moving, and the trend goes to increasingly small luminaires with continuously improved optics. The light lab of LED Linear, the specialist for linear illumination systems, has been accredited by the DAkkS in acc. with DIN ISO/IEC 17025 since the middle of 2018 and is designed for precisely these challenges. Dino Iavarone, head of measuring technology, explains how LED Linear does it: "We use the most modern measuring technology. Also, the robogonio goniophotometer allows us to perform measurements very fast and precisely. Speed is worth real money nowadays." In addition, the colour spectrum and temperature can even be measured in the outmost angle of radiation. "Making these values quantifiable is becoming increasingly important in optics development." The product development at LED Linear profits from all these advantages just as much as smaller manufacturers without an accredited lab, because all services are also available to external customers.

Planning stress tests for luminaires and optics: anything can be measured.

The aim of expanding photometry at LED Linear was to be able to thoroughly test light sources and optics. Cold, heat air humidity and temperature changes are simulated in climatic test chambers. Long-term tests are about service life predictions. The illuminants are operated for 10,000 to 15,000 hours at increased temperatures to be able to make substantive statements. "The stress tests are mainly about whether components can be improved and to see whether foils, adhesives and polyurethanes maintain their characteristics," says Iavarone. "We perform these tests with all new developments, but we also regularly test our standard products to determine possible error sources."

The light lab, accredited in accordance with DIN ISO/IEC 17025, is also equipped with the robogonio goniophotometer by opsira and an Ulbricht sphere. The Ulbricht sphere provides the luminous flux or R_a and the spectral radiant power. The robogonio provides the light distribution curve up to gamma = 120°, the luminous flux and the angular dependent colour coordinate-specific values. The photometric results are provided as IES or EULUMDAT files. "That's all a light lab has to be able to do," notes Iavarone. "What's exciting on the one hand is that the robogonio works completely different than a mirror goniometer and allows significantly faster precise measurements. On the other hand, we have a measuring option for the coffee spots problem that paves the way to the perfect optic."

Compact, fast, nonconformist: What a goniophotometer can do.

Mirror goniometers are still frequently used, but since the market introduction of the robogonio in 2012, different photometry manufacturers have developed robot solutions. "We have been working with opsira for the past five years," says Iavarone. "The measuring technology is often comparable, but the companies differ. opsira's support is fast and competent and we pursue a reasonable exchange. Besides the good product, this is a huge benefit." For this reason, LED Linear relied on the certification for measurements in accordance with DIN EN 13032-4 being possible with the goniophotometer by opsira, and this trust has paid off.
Since then, the company has been profiting from various advantages that are interesting for internal development and external customers. While a mirror goniometer requires a very large, very high room and moves around the luminaire, the robogonio moves the luminaire. "So we only need a long, narrow room at whose end the detector records the measuring values." The consequence: the light distribution curve is measured at a speed that cannot be realised with a mirror goniometer. Valid results are thus available faster and the development process speeds up. "With the rapid developments nowadays, this is a giant advantage," says Iavarone.
Another central aspect is a measurement that is designed to remove coffee spots. In combination with a spectral measuring head, luminaires can also be tested in the outmost angle of radiation. "The trend goes towards increasingly smaller luminaire dimensions, which is why it becomes increasingly challenging to achieve a homogeneous light distribution." Measurements of the colour spectrum and temperature allow us to quantify errors and compare these with the target value. "We use a lot of computer simulations in optics development. These become significantly more accurate when fed with precise values," notes Iavarone. "As this will become increasingly important in the future, it is important for us to make sure that our lab is ready for this trend."

The robogonio:
One system for many applications

The robogonio offers highest precision because it unites goniophotometry in the near and far field together with various detector systems in one device. The class L photometer reduces measuring time and performs a half space measurement, for example, in about two minutes. The robogonio ensures maximum precision with an angular repeatability of up to 0.005°. Complicated and error-prone measurements with mirror goniophotometers are a thing of the past thanks to its intuitive handling.

The robogonio is available with various detectors and in various robot sizes (lifting capacity from 4 to 1,000 kg) for different application fields. Special models are also always an option. Three product lines already cover most applications: the alpha line with the sturdy frc'3 photometer, the pro line with the fast Class-L photometer frc-f-l, and the top line with its combination of frc-f-l photometer and spectrometer.

More about opsira

For 20 years, opsira has been supporting its customers in the field of optical system technology - from the concept to the prototype ready for serial production. Whether competent development support, measurements in the opsira labs or customised measuring systems for application on site: opsira offers exactly what users need. The company develops and optimises optical systems using the most modern and efficient simulation and measuring technology.
Opsira offers customised optical measuring systems, high-tech products for photometry, spectrometry and goniophotometry for measuring labs. These testing systems are constructed according to customer specifications. The goniophotometer robogonio, combines near field, extremely fast far field, and spectral measurement in one single, highly flexible system. Optical systems are measured precisely, fast and economically in the opsira light labs.

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More about LED Linear

LED Linear GmbH develops and produces high-quality linear LED illumination systems for technically demanding interior and exterior lighting. Its main products are linear and scalable luminaire modules and systems on LED basis with a protection class of up to IP67. More than 30 million individual solutions can be generated on the basis of a modular construction system.

The luminaire systems are applied all over, ranging from ambient and general lighting and furniture installations to facade lighting at a height of 300 metres. The use of high-quality and durable components guarantees energy-saving solutions with an extremely long service life of up to 60,000 hours. The products are distributed globally, for example in the USA and Canada, Singapore, India, Australia, France, Spain, the UK and in the Middle East. The company employs around 175 employees globally.

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