Zero tolerance for errors

User report
Test system and test concept for medical lights at Dräger

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Strict standards apply to lighting in operating theatres to ensure maximum safety during medical procedures. Quality measurements are an essential part of the end-of-line test. Dräger has developed a completely new test system for its Polaris 600 family of medical lights in cooperation with light measurement specialist opsira. "Among other things, Polaris 600 offers the possibility of adjusting the color temperature to match the tissue", explains Matthias Brauer, Industrial Engineering Medical Lights and Video at Dräger. "In order to fully test these functions, our equipment construction department has worked together with opsira to develop a test concept which we have been using successfully since the introduction of Polaris 600."

There's no such thing as impossible when the test system is being developed into a product.

When the Polaris 600 family of luminaires came out of product development at Dräger, the test engineers faced a special challenge during the end-of-line test. The new functions of the luminaire could not be verified using conventional measuring technology. „The Polaris 600 brings a number of things together, which are otherwise not available on the market", says Brauer. „The variable color temperature is an essential feature, as is the ability to set different light beam diameters." A camera is also integrated into the luminaire, with a wireless connection between camera and receiver. The manufacturer of medical and safety technology was therefore looking for a reliable testing concept that could help ensure compliance with all standards.

„We have been working with opsira for more than fifteen years", says Brauer. „Measuring light is a complex matter and we have very demanding requirements – opsira meets them all." The cooperation also ran smoothly with regard to the test system design. Dräger's equipment construction department was responsible for software development, while opsira contributed systems expertise and hardware to the project. Finally, a prototype of the test system was developed, in which all measuring processes were optimised. „The final test system was ready in time for the launch and the Polaris 600 was on the market", says Brauer.

What is important for testing: user-friendliness, functionality and the measuring sequence.

When developing the test system, the two companies had three main aspects in mind – the user, the focus on the features of the new luminaire and the development of a reliable measuring sequence. "With other luminaires, we use separate assembly tables for individual test steps, so the luminaires have to be transported from table to table", says Brauer. For the Polaris 600, the team designed an assembly trolley which the user pushes into a test chamber where all measurements take place – which is much easier and more ergonomic to handle.

New approaches also had to be taken with regard to measurement technology in order to meet all requirements. "To guarantee the necessary parameters, we work with sensors and a high-quality class L photometer in combination with a white section and defined radii", explains Brauer. Furthermore, a spectrometer checks whether the luminaire's color temperature can be set correctly.

The measuring sequence is designed to quickly and accurately test all relevant parameters, which are guaranteed to the customer. „The whole thing is a semi-automated measuring sequence that protects against user errors", says Brauer. Upon successful completion, the user receives a calibration protocol and approval.

The measuring time is very short thanks to a test system that is optimally adapted to the requirements. „The faster our processes are, the sooner we get our product to the customer – but we make no compromises in terms of quality", asserts Brauer. „We carry out the final examination with 100% accuracy before it goes into the operating theatre. There is zero tolerance for errors." As the test concept has been a complete success, it will continue to contribute to the timely delivery of high-quality Dräger luminaires in the future.

Precision as a commitment: test systems for medical lighting.

Based on a photometrically corrected measuring camera, the medical lighting test system (mlts) from opsira enables fast and high-resolution measurement and testing of illuminance distributions. Within seconds, the illuminated area is photometrically and geometrically measured and tested against the relevant standards (e.g. DIN EN 60601-2-41). Where, in addition to testing, luminaires need to be adjusted or calibrated, the medical lighting calibration system (mlcs) offers a whole range of options for adjusting various operating points or different illuminated areas. Both systems can be supplemented by a spectrometer component. This allows all relevant colorimetric parameters such as color temperature, chromaticity coordinates or color rendering index to be checked and adjusted.

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 our light 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 examination and testing systems are constructed according to customer specifications.

Photometric final inspection systems are designed according to the testing requirements and are installed ready-to-use in the customer's production facilities. opsira also takes over the annual maintenance and calibration on request.

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More about Dräger

Dräger is a leading international company in the medical and safety technology sector. Its products protect, support and save lives. Founded in 1889, Dräger generated worldwide sales of around EUR 2.8 billion in 2019. The Lübeck-based company is represented in more than 190 countries and has some 14,500 employees around the world. For further information, visit www.draeger.com.

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