

How the printing industry is ready for the new RoHS regulation

# Retrofitting of color proof lighting

**Color and print matcher are preparing for the phase-out of the mercury-containing fluorescent tubes. From August 2023, the RoHS Directive bans the sale of all mercury-containing fluorescent lamps for D65 and D50 standard light luminaires, also for color and print matching. Users of proof lighting are now switching to LED-based alternatives.**

There are less than 10 months left until the European Union's new Restriction of Hazardous Substances (RoHS) regulation takes effect. From August 2023, the directive will ban the sale of mercury-containing fluorescent lamps for D65 and D50, including ISO 3668 and ISO 3664 standard light luminaires, press control consoles and all color matching installations.

The purpose of these directives is the environmental aspect, especially the disposal and recycling of fluorescent tubes containing mercury, as well as the health risks associated with contact to hazardous substances. Companies that rely on proofing and quality testing using luminaires are now looking for suitable mercury-free alternatives. Manufacturers of color matching systems have long been offering alternative LED-based luminaires and stations that enable mercury-free proofing.

The technology shift from fluorescent tubes to LED lighting has already reached users, whether for general or standardized lighting. Stations and luminaires that are completely LED-based can be purchased directly from manufacturers of standardized color matching systems. However, it is not so easy to change existing stations with fluorescent tubes



*The Karl Grammlich offset printing company retrofit the luminaires in its existing press control console to the patented LED-based solution from JUST Normlicht.*

to LED. This is because LED replacement tubes cannot be inserted into existing luminaires by „plug-and-play“. In this case, the complete luminaire must be replaced.

## **WHY LED TUBES REPLACEMENT DO NOT WORK IN EXISTING LUMINAIRES**

Replacing a fluorescent tube with an LED tube creates many problems. Existing fluorescent booths rely on the 360° light output from a fluorescent tube. LED tubes in contrast have a very narrow beam angle: if LED tubes are used, they do not fit the reflectors for fluorescent lamps. Among other things, the ISO requirements can only be met with difficulty and the requirements for brightness and homogeneity are not fulfilled. The illumination becomes scattered and creates light and dark artefacts on the proofing surface. Additionally, LED replacement tubes are not calibrated after production, so the same problems occur as with fluorescent tubes: no consistency between batches and at different locations. LED tubes cannot be calibrated during their lifetime and an expensive LED tube

replacement would be necessary. In addition, the installed ballasts do not match the LED tubes. This means that the luminaire must be rewired at great expense, which expires the manufacturer's warranty as well as the operating permission. JUST Normlicht, manufacturer of standardized color viewing systems, has been looking for a technological solution to the problem and found it. The company offers its own patented, LED-based standard light solution - the Digital Light Systems. JUST's Digital Light Systems (DLS) can simulate the spectral distribution of standard light CIE D50 and D65 so perfectly that they far exceed the specifications for visual color assessment according to ISO 3664 and ISO 3668. The DLS solutions use JUST's patented LED technology coupled with special reflectors, lenses, and controllers to exceed the lighting quality of JUST's ISO-certified fluorescent tubes.

## **SIMPLY UPGRADE OR RETROFIT**

Users who already have a color matching station are given the option by JUST Normlicht to keep the station and only replace the luminaire. This saves

resources and costs because a complete replacement investment in a new station with LED-based luminaires is very costly. The DLS Upgrade Systems are significantly less expensive to purchase and can be replaced by “plug-and-play”, unlike the individual tubes. The old luminaire with built-in fluorescent tubes is replaced by a DLS luminaire with LED modules. For this, the station itself does not necessarily have to be from JUST Normlicht. The company offers to retrofit stations from third-party suppliers with the DLS Retrofit solutions. This makes it possible to equip press control consoles and color matching installations of any manufacturer easily and to benefit from all LED-based features and added values.

An important advantage of LED-based luminaires is that they do not contain mercury and thus meet the main criterion of the RoHS Directive. They are environmentally friendly and at the same time also economical, as there is no need to replace tubes, which is essential with fluorescent tubes. Furthermore, due to the low power consumption, the DLS solution contributes to the reduction of the CO2 footprint at companies and protects the environment.

The offset printing company Karl Grammlich GmbH from Pliezhausen near Stuttgart, Germany, changed the lights in its existing press control console on its large format offset printing press KBA Rapida 164 with the patented JUST Normlicht solution. Recently, the company had been using fluorescent tubes in its proofing stations for offset printing and initially decided to switch to a manufacturer that promised LED luminaires suitable for the requirements of the printing industry. In use, however, it became apparent that the installed solution did not meet the requirements. An analysis of the light showed that the UV components for detecting optical brighteners were missing. In standardized and color-compliant paper and print matching, the detection and evaluation of optical brighteners is essential. Optical brighteners are fluorescent substances that absorb light in the UV wavelength range of 300-390 nm and emit light in the subsequent spectral range of

400-460 nm. Enriched materials with optical brighteners appear whiter or brighter. To observe fluorescent surfaces, a UV radiation source is needed to determine the visual impression of the number of brighteners used and the emitted UV content of the light source.

The installed LED lights had no UV components and were unusable for the industry, although they otherwise reproduced a good light spectrum. This inconspicuous difference had a huge impact on the entire matching and proofing process. The printing house was again faced with a problem, which was solved with DLS upgrade systems from JUST Normlicht. The existing station was upgraded with DLS ModuLight 3-1700. „We are excited. Finally, we have a consistent and uniform standard light, which meets our requirements. We have quality with the lights from JUST, which also reflects our quality standards to our customer. I know that with the upgrade from JUST we have made the best decision for standard-compliant proofing, and I am already looking forward to the upcoming Retrofit in digital printing, where books for our Internet portal will be printed,” says Daniel Grammlich, Managing Director of Karl Grammlich GmbH. „Now we have a standard ISO-conform light again, which has a suitable spectrum and again achieves an optimal reproduction of the OBA (Optical Brightening Agent) in the paper due to the very small MI-UV index. All proofs fit again to the various papers which are used in daily life. Now we have been able to replace our old fluorescent tubes with a very consistent LED solution over the long term.”

With the upcoming ban on fluorescent tubes in the EU and the innovative further development of LED technology, more and more companies are deciding to consistently switch to JUST’s LED-based standardized

lighting solution. The German color proofing expert continues to prepare for the change in visual color and print matching as well as the increasing demand for LED-based standardized light. „More and more products from our portfolio will be offered LED-based and designed for existing JUST or third-party installations DLS Upgrade or DLS Retrofit solutions,” said Abdel H. Naji, sales and marketing manager at JUST Normlicht.

## THE TECHNOLOGY BEHIND THE DLS SOLUTION

The Digital Light Systems have a consistently high light quality, combining the high illuminance of the diodes with special Fresnel lenses for better homogeneity in the illumination. The mix of multiple-colored LEDs produces an even more harmonious and complete light spectrum than conventional fluorescent lamps, resulting in a natural and reproducible for years to come color representation with standardized light D50 and D65. DLS technology is far removed from environmentally harmful mercury, obstructive warm-up periods, changes in light color or batch quality variations. The DLS luminaires are equipped with D50 and D65 light types and comply with ISO 3664 and ISO 3668. Depending on the application and requirements, the UV content in both light types can be switched on and off. With the UV-ONLY function, optical brighteners or fluorescent materials can be made visible on papers and other substrates. The D50 and D65 light types can be dimmed, have no color shift and are also ideally suited for softproof applications. With the Digital Light Systems, JUST Normlicht enables LED-based proofing for a wide range of users. No matter if new acquisition, Upgrade or Retrofit - JUST Normlicht promises reliable color proofing and matching of almost all substrates with its innovative LED technology.

**LED tubes have a very narrow beam angle compared with existing fluorescent tubes.**

