RETROFIT WITH LED

The new LED tubes in the practice test

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In the two light strands at left in the approx. 15-ft high refrigeration hall the higher luminous intensity can be seen clearly. Marco Egli explains a further advantage: "Conventional fluorescent tubes need up to fifteen minutes before they reach their full light capacity - with LED tubes I press the switch and the light is 100% there!" (Photo: Marco Egli, ZSHAG)

Everyone is talking about LEDs. But when it comes to performance, especially when installed in extreme conditions such as in refrigerating plants or outdoors, one has to separate the "wheat from the chaff". With these LEDs, there are no compromises when it comes to safety and efficiency; they even fulfil the stringent ESTI standards. Another central aspect is the pleasant and homogeneous light quality. The following interview with the technical director of the slaughterhouse Zentralschlachthof Hinwil AG (ZSHAG) gives evidence of the satisfaction of plant operators with the new "Ecoline" LED tubes made by Elbro.

The ZSHAG slaughterhouse was established in 1962 by the master butcher of the Zurich Oberland under the name Zentralschlachtof-Genossenschaft Zürcher Oberland. The slaughterhouse was founded as a self-help organization for the region. Since Autumn 2010, about 30 energy-saving LED tubes have been installed at the ZSHAG; technical director and board member Marco Egli wants to gradually replace all of the existing fluorescent tubes with the new LED tubes from Elbro. Since there are about 450 fluorescent tubes installed throughout the plant, there is a great potential here. We conducted the following interview with Egli to find out how this came about and why Egli is absolutely convinced of this concept:

Mr. Egli, you produce sensitive, highly perishable foods; how does this affect the requirements for the lighting?
"The authentic colour of the meat was not as important to us (since there is no production in these rooms) as longer maintenance intervals and longer-lasting lighting elements, which can better illuminate the work areas. Otherwise, there would have been other special lights for this purpose. These new lights are functional, and that is also an important aspect for us. Our meat products are much easier to distinguish and therefore seem "more real" than with conventional fluorescent tubes. Some employees even thought that a door in the hallway was open; actually, it was a new LED tube, which illuminated that area much more brightly than they were used to!"

"In my opinion, LED technology is the most logical alternative to conventional fluorescent tubes. But not all LED tubes are created equal!"

How did it come about that LED tubes were retrofitted to replace the conventional fluorescent tubes? Were there any alternatives?
"We read an article about the LED tubes. That aroused our curiosity. In my opinion, LED technology is the most logical alternative to conventional fluorescent tubes. But not all LED tubes are created equal!"

What, specifically, led you to consider longer-lasting, but also "more expensive" LED tubes? How much energy is saved?
"We considered using these new lighting elements because we have rooms with ceilings up to twelve to fifteen feet high, in which the lights are on continuously for 12 hours and more. Even if the investment was relatively high, the payback period of 2-1/2 years is absolutely justifiable. Also, we have large refrigeration chambers, where the use of conventional fluorescent tubes made it necessary to dissipate the heat through the cooling system. The heat generated by LED tubes is substantially lower; therefore, the energy savings are considerable as

The LED tubes which are new and saving energy up to 80% have 396 LED at the 150 cm LED tubes. This guarantees an even, balanced luminance. (Photo: Markus Frutig, elFORUM)

compared with the use of twenty 58 W fluorescent tubes. That all adds up significantly - and cooling energy is the most "precious" form of energy from electricity, and therefore very expensive."

Which Elbro lighting elements do you have installed?
"We have installed only cold white T8 LED tubes of the "Ecoline" series, which we purchased from EM Elektro-Material AG."

Where did you start with the retrofitting solution?
"We started retrofitting the lighting in the refrigeration hall (with temperatures from 0-2°C); there are three strands of lights, two of which have already been retrofitted. In addition to several transport hallways, one LED tube is also installed at the outdoor washing area, which especially in winter has to be very well illuminated for up to seven hours at a time. Here one can see the difference between conventional lights and LED tubes very clearly, and the light quality is extremely good!"

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With a life of five years in continuous operation, these lights are very long-lasting; what particular advantages do you see here?
"Switching conventional fluorescent tubes on and off at temperatures around 0°C is already relatively problematic. Over time, they begin to flicker, the luminous efficiency declines and they often stop working. I expect that the longer life of the LED tubes will be a significant advantage in this respect, as well. I also want to test the

The luminous effect of the newly installed LED tube at the outdoor washing area can be seen clearly (left rear). Marco Egli explains: "Here one can see the difference between conventional lights and LED tubes very clearly, and the light quality is extremely good!" (Photo: Marco Egli, ZSHAG)

"Some employees even thought that a door in the hallway was open; actually, it was a new LED tube, which illuminated that area much more brightly than they were used to!"

LED tubes in our freezer compartments at -40°C, because so far it is impossible to illuminate areas at these temperatures with normal fluorescent tubes. Conventional fluorescent tubes need up to fifteen minutes before they reach their full light capacity - with LED tubes I press the switch and the light is 100% there!"

Satisfied with the new LED tubes: Marco Egli, technical director and board member of the ZSHAG with Gerhard Engelbracht, Sales for Contact Systems/Telematics of Elbro AG. (Photo: Markus Frutig, elFORUM)

Technical background information

The new "ECOLINE" LED tubes, with energy savings of up to 80 % have been tested and classified as safe by the Swiss Federal Inspectorate for Heavy Current Installations (ESTI). Replacement of the starter does not affect the approval of the light. The LEDs are currently available in the following colour temperatures: daylight white, 4500 K (± 100 K), cold white, 6000 K (± 500 K) and warm white, 3400 K (± 200 K). They are designed for up to 50,000 lighting hours, which is equivalent to more than five years of continuous operation - regardless of the frequency of switching on and off. A voltage range of 100 - 250 V can be selected.

Further features:
- No hazardous waste
- No IR or UV radiation
- Full brightness right after switching on; no flickering
- High density with a total of 312 LEDs in the 120 cm LED tubes (or 396 LEDs in the 150 cm LED tubes) guarantees homogeneous and balanced luminance
- Easy replacement in existing installations
- The LED tubes are KEMA EUR, for 230 V CE and RoHs certified

Is there more work involved in replacing LED tubes as compared with conventional fluorescent tubes?
"No. If I calculate the cost of replacing a conventional fluorescent tube - the electrician needs about 45 minutes to replace a defective ballast (about 60 CHF), plus the light, starter and travel costs - it is clear to me that LED tubes are economical."

Who installed the LED tubes at your facilities? Were there any particular difficulties?
"The first five LED tubes I installed myself, so that I know what one has to watch out for. Detailed installation instructions are included with the starter and there were no difficulties whatsoever; everything went well on the first try. The other lights are being replaced by our external electrical fitter."

Will you soon be considering a further retrofitting project in other areas, such as production facilities?
"In the production facilities I have to comply with stringent regulations for the luminous intensity. That will certainly be interesting for me, but currently it is not in the planning and I am somewhat wary about this. I imagine the next areas to be retrofitted would be other refrigeration areas and transport hallways. In general, however, we want to think this over."

"Conventional fluorescent tubes need up to fifteen minutes before they reach their full light capacity - with LED tubes I press the switch and the light is 100% there!"

What is your bottom line? Would you recommend this product to others?
"I am surprised how well the installation went. I am absolutely convinced of the quality and everything works perfectly. I also expect energy savings, although the share of the total is relatively small - but it adds up. The new LED tubes have very good luminous power already without a reflector; also, the constancy at low temperatures and the immediate full luminous intensity and the long life are advantages which clearly speak for these LEDs. In other words, I am very satisfied with these LED tubes!"

Thank you for the interview.

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