

Press release  
Dornbirn, August 2010

## **The positive impact of dynamic light** Research project examines influences during shift work



B1 | The Tecton continuous-row luminaires used for the study at the Flextronics company are perfectly suited for lighting industrial and production bays. They can easily be controlled using a lighting management system.

What is the influence of a dynamically controlled lighting solution on the well-being of employees working in shifts? To answer this question, a scientific study has tested the effects of dynamic lighting sequences during the early shift of an Austrian production plant. The result: dynamic room lighting has a positive impact on the well-being of shift workers. Apart from a sounder sleep, relaxation of the autonomic nervous system was proven. Explains Philippe Rettenbacher, Zumtobel Product Manager for Industry and Engineering: „The results of the study allow us to highlight the benefits of the added value of and the investment into high-quality lighting solutions, and to offer our industrial customers even better advice.“

In the EU, some 20% of all people work in shifts – a highly demanding mode of working. It is a proven fact that an increasing number of shift workers are suffering from the so-called shift workers' syndrome, which is characterised

by increased diurnal fatigue and poor sleeping quality. Moreover, the applicable lighting standard EN 12464-1 only considers visual requirements. Non-visual, biological effects of lighting are not taken into account, e.g. improving sleeping quality through light. Therefore the aim of the interdisciplinary study was to measure the biological effects of dynamic room lighting on shift workers. Being part of the research team, Zumtobel installed 500 Tecton 2/54W (4000K) continuous-row luminaires and the Luxmate Emotion lighting management system in the new production bay of the Carinthian electronics company Flextronics.

For ambient lighting, two dynamic lighting scenes were chosen. In order to create any biological effect, the lighting sequences run ranged from basic standard illuminance (1000 lux) to high illuminance levels (2000 lux). On the one hand, there was a perceptible variation of brightness to influence workers' alertness at

the beginning and fatigue towards the end of the shift, through light. To achieve this, the intervals of the dynamic scenarios were deliberately extended. On the other hand, dynamic brightness variations were tested which, due to short continuous intervals, were not perceptible to the shift workers.

It was finally proven, by checking numerous critical variables, that both dynamic settings had a positive impact on the well-being of workers during shift work as well as on nocturnal sleeping quality. Accordingly, dynamic lighting

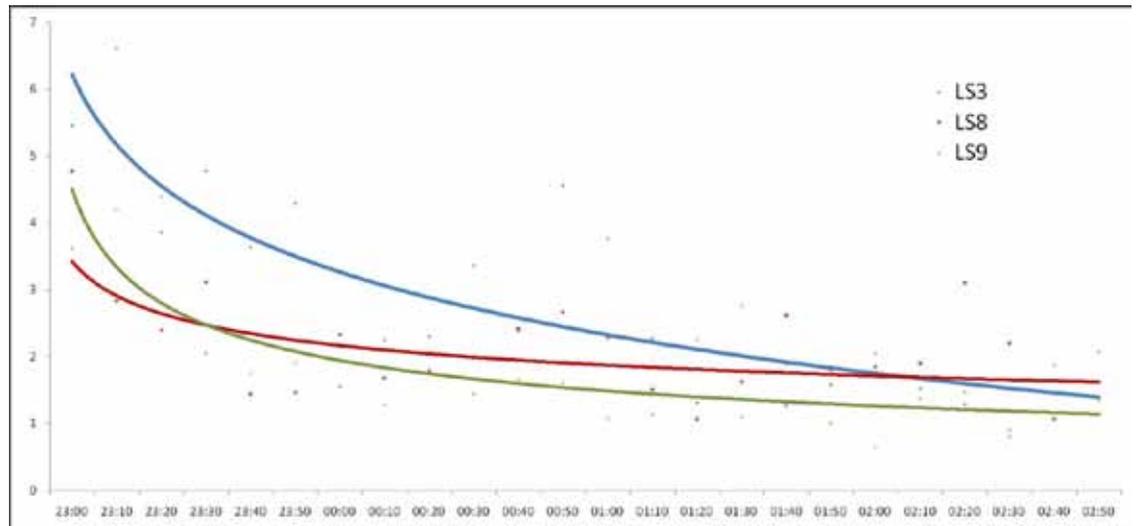
during shift work was shown to be closely associated with the psychological and physiological state of the workers. Based on the study, further scientific research projects in the laboratory may follow to investigate light as a driver of productivity.

Companies involved in the study:  
Bartenbach Lichtlabor  
Ergonomiezentrum Tirol  
Team Prevent  
Zumtobel Lighting GmbH



B2 | Dynamically controlled lighting sequences increase the well-being of employees working in shifts, e.g. at the Zumtobel plant in Lemgo. This was now shown within the scope of a joint study.

### Detailed analysis/nocturnal activity:



B3 | The current study showed that static background lighting during shift work results in significantly poorer sleeping quality (blue line). The dynamic lighting scenarios tested show greatly reduced nocturnal activity (red + green lines).



B4 | For the lighting of workstations during shifts, not only visual requirements should be considered. The biological effects of light are also very important. Thus, changes of brightness have a positive impact on the well-being of shift workers.

More information:



Zumtobel GmbH  
 Kerstin Schitthelm, Dipl.-Ing.  
 PR Manager  
 Schweizer Straße 30  
 A - 6850 Dornbirn

Tel. +43 (0)5572 390 - 1484  
 Fax +43 (0)5572 390 - 91484  
 Mobil +43 (0)676 8920 3258  
 kerstin.schitthelm@zumtobel.com  
 www.zumtobel.com