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## Energy saving and good quality lighting for indoor applications

Artificial Lighting in indoor applications is throughout Europe in a lot of cases 20 years or older. That means there are luminaires, lamps and gear in use that are inefficient and so contributing to environmental pollution due to high energy use. These installations one can find in public buildings, offices and industry halls. In offices 75% of the existing installations are old-fashioned and consumes too much energy. A tremendous high potential for energy savings is available. In the past years more and more efficient lighting solutions for these areas were developed. An increase in efficiency but at the same time also in quality of lighting took place. This increase of efficiency can be realized in different ways. In e.g. offices, new fluorescent lamps TL5 with extremely high lamp efficacies, silver-coated aluminium lamellae optics for high luminaire efficiency, as well as highly efficient electronic gear take care that the energy consumption is decreasing up to 40%, while the light quality is improving. Latest developments in lighting controls – daylight regulation and presence detection – again reduces the energy bill by another up to 50%.



Recessed mounted office luminaire SmartForm with TL5 lamps and highly efficient silver-coated aluminium lamellae louvre with a light output ratio up to 94%.



Integrated lighting controls ActiLume for daylight depending and movement detected light regulations – energy savings up to 75% are possible compared to old lighting installations

Very popular among architects are closed luminaires with optical acrylic micro lense plates. In the meantime also these luminaires are developed towards very efficient luminaires. So it is possible to create lighting solutions with “surfaces of light”, supporting lots of interiors – normal offices but also conferencing areas, while energy is saved.

Next steps can be found by using LED technology in luminaires developed for office lighting, taking all relevant norms into consideration. Miniaturization combined with freedom of design – no straight tubular shapes – will allow to come to completely new lighting solutions, that in the future will become also very efficiently.

The existing European guidelines for energy use e.g. EPBD (Energy Performance of Building Directive) forces owners and users to renovate their lighting installation. In the European LENA or German EnEV recommendations are given for maximum annual energy usage for primary energy – lighting is a part of this.