

LED LIGHTING FOR BOARDROOMS

The Western Cape, Department of Environmental Affairs recently replaced the 50W halogen down lights in their Boardroom with 9W LED luminaries supplied by LED Lighting South Africa. The lux level on the surface of the table after installation of the LEDs showed only a 20% drop in illumination. This was considered acceptable considering the 70% drop in power utilisation. In fact, using a cooler colour white light in the region of 6000K actually makes the room appear brighter. This can be seen in the adjacent photographs. The light settings on the camera were kept the same for both pictures. The remit from the Department was for all 26 down lights above the boardroom table to be operated off a single dimmer switch. Since no suitable product was found on the world market, LED Lighting South Africa began development of a suitable dimmable down light. The first step was to determine how many LEDs would be needed to create a similar level of illumination to the halogens, while still creating large power savings. Based on the lux levels, it was decided that 26 down lights, each using 3 x 3W HB LEDs, would be sufficient. For this installation, the Edison KLC8 LED, which at a drive current of 700mA has a luminous intensity of 140lumens, was selected. With High Bright (HB) LEDs it is very important to ensure that the heat is dissipated appropriately to prevent premature lumen depreciation. LED Lighting South Africa selected a fitting with a very large cylindrical heat sink to be able to dissipate the heat effectively and ensure maximum life of the LEDs. It is important to ensure that each LED receives the correct current and that this current does not vary under input voltage variations. Furthermore, any method used to convert the incoming power from 220V to the required 700mA needs to be highly efficient to reduce losses and save power. It is for this reason that a switch mode driving power supply – the most efficient was of driving LEDs - was designed in conjunction with appropriate dimmer circuitry. Each down light was equipped with this dimmable driver unit. Each dimmable driver required a 12V DC input and a signal wire to control the dimming. A wall mounted dimmer control unit was also designed to be retrofitted into the wall. During installation it was discovered that due to building modifications no access into the ceiling was possible. This meant that the signal wire from the dimmer unit could not be wired to the down lights. It was then decided that RF functionality should be built into the unit. It was also decided that the dimmer unit should be portable so that the lights could be dimmed from anywhere in the room. An RF transmitter was added to the dimmer unit and this was redesigned to be hand held. A suitable ergonomically designed enclosure with a wall mounting bracket was selected. Finally an RF receiver module was designed and fitted into the ceiling. This innovative project has demonstrated that with LEDs, dimmable high quality light is possible at a fraction of the energy consumption of traditional luminaries. All products mentioned in this article are available from LED Lighting SA.