

*NOTE 3 It is recommended to use instead of filters 'coloured' lamps wherever possible, to improve the system efficacy.*

*NOTE 4 It is recommended to use only glass filters, if possible, interference or 'dichroic' filters instead of PVC-filters, to avoid problems caused through colour-shift (because of aging) and/or damaged filters (aging and heat absorption). Any filter technique will require more maintenance effort in comparison to coloured lamps or RGB-LED sources.*

*NOTE 5 Coloured light can never be taken as an 'efficient' light in comparison to white light. This is as well valid for LED coloured light (RGB, RGBW, RGBAW, etc.).*

## 5.7 Luminaire Efficiency

The efficiency of a luminaire is quantified by its 'Light Output Ratio' (LOR). This is the ratio of the total light output of a luminaire to the total light output of the light sources used in the luminaire when operating outside the luminaire. LOR is sometimes split into upward and downward components; this happens most of the time in the case of indoor applications. LOR measures the efficiency of the luminaire in the sense that it quantifies how much of the light emitted by the light source escapes from the luminaire. LOR does not measure the efficiency of a lighting installation. Light output ratio is defined as the ratio of luminous flux emitted by the luminaire divided by the flux emitted by the bare lamps in free air. This means that for temperature sensitive lamps the LOR is a function of the increase in temperature of a lamp within the luminaire as well as the optical efficiency of the luminaire, especially applicable to LED fixtures.

*NOTE 1 LOR (Light Output Ratio), according to DIN/EN 13032/2, the LOR is described as 'the ratio of the luminous flux of the luminaire to the lumens of the lamps used'*

$$LOR = \frac{\text{Output} - \text{Lightfixture}}{\text{Output} - \text{Lamp}}$$

*NOTE 2 In realities the light output ratio is a Figure that shows how much light gets lost inside the luminaire. It is abbreviated to LOR, and sometimes subdivided into ULOR (Upper Light Output Ratio) or DLOR (Downward Light Output Ratio) – i.e. what percent shines upwards, and what percent, down. It is calculated by dividing the total light output from the luminaire (in lumens), by the total lamp output (also in lumens) to get a percent. For the ULOR and DLOR, it is the same, but with the light that comes from the upper and lower halves of the luminaire. See Figure 95.*

$$LOR = DOLR + ULOR$$