

## Qualitative lighting design

Light plays a central and manifold role in the design of a visual environment. Work and movement are only possible when we have light to see by; architecture, people and objects are only visible if there is light. Apart from simply making our surroundings visible light determines the way we perceive an environment, influences the way we feel and the aesthetic effect and atmosphere in a space. You only have to enter a Baroque church with its bright and inspiring atmosphere to see and feel what effects light can have in architecture, or, to the other extreme, look at Piranesi's paintings of dungeons with their dark labyrinths, where the shadows conceal a never-ending source of horror.

Due to the adaptability of the eye elementary perception can take place at minimum lighting levels or under difficult visual conditions, while for optimum conditions at the workplace and for a piece of architecture to be accepted and found to be aesthetically pleasing it is necessary to create lighting whose qualities, illuminance and luminance distribution are in harmony with the particular situation.

One of the most frequent sources of error in lighting design is to separate light from its complex associations with human psychology and human activities as well as with the surrounding architecture. Simplified, unilateral lighting design can provide easily comprehensible concepts, but often leads to unsatisfactory results by overlooking essential aspects. This applies to both purely quantitative lighting design, which might produce optimum working conditions but forgets the perceiving being, and to primarily design-oriented lighting, which furnishes spaces with stylish luminaires without regard for the lighting effects these fixtures produce.

What is really required is lighting design that meets all the lighting requirements – design concepts that form an integral part of the overall architectural design and produce a visual environment that supports various activities, promotes a feeling of well-being and is in line with the architectural design. The quantitative design approach with its scientifically sound calculations and processes is actually a great help here; when designing lighting for workplaces this planning process itself may even become the primary objective. The main criterion for lighting design is never a figure displayed on measuring equipment, but the human being – the deciding factor is not the quantity of light, but the quality, the way a lighting scheme meets the visual needs of the perceiving person.

### 3.2.1 Project analysis

The basis for every lighting design concept is an analysis of the project; the tasks the lighting is expected to fulfil, the conditions and special features. A quantitative design concept can follow the standards laid down for a specific task to a large extent. Standards dictate the illuminance level, the degree of glare limitation, the luminous colour and colour rendering. When it comes to qualitative planning, it is necessary to gain as much information as possible about the environment that is to be illuminated, how it is used, who will use it, and the style of the architecture.

#### 3.2.1.1 Utilisation of space

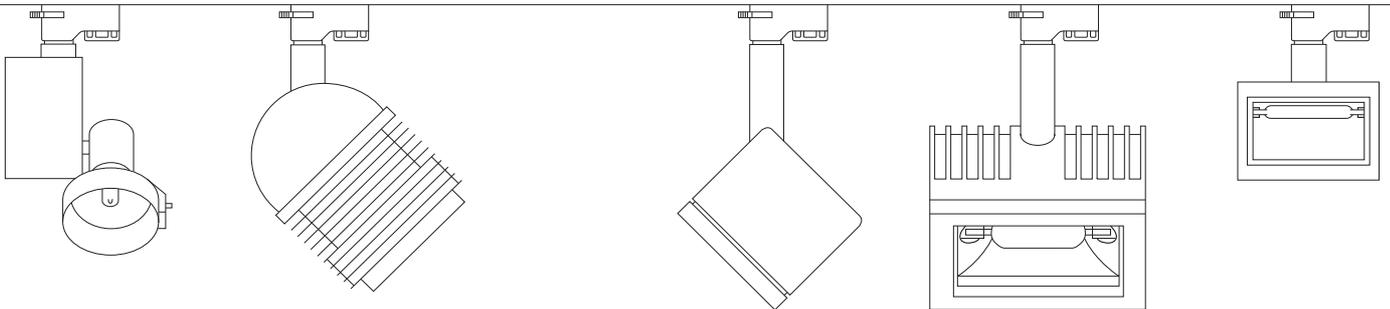
A central aspect of project analysis is the question of how the spaces that are to be illuminated are used; it is important to establish what activity or activities take place in the environment, how often and how important they are, if they are associated with specific parts of the space or specific periods of time.

This will first give rise to a series of global answers that outline the lighting task, will frequently also indicate standard stipulations, and form a framework for the lighting design concept. This comprehensive analysis of the task – e.g. the lighting of a sales space, an exhibition, an office space or the wide range of functions related to a hotel – gives rise to a series of individual visual tasks, the characteristics of which must in turn also be analysed.

Two criteria relating to a visual task are the size and contrast of the details that have to be recorded or handled; there then follows the question of whether colour or surface structure of the visual task are significant, whether movement and spatial arrangement have to be recognized or whether reflected glare is likely to be problem. The position of the visual task within the space and the predominant direction of view may also become central issues – visibility and glare limitation have to be handled differently in different environments. In a gymnasium, for example, the direction of view of people playing volleyball is upwards, or in an art gallery on the vertical, or for visual tasks in offices on the horizontal.

Apart from the qualities of the illuminated objects the visual performance of the user must also be taken into account, especially in the case of older people – the eye becomes less efficient with age, and older people are more sensitive to glare. In individual cases, the lighting of old people's homes in particular, special attention must be paid to these increased demands on illuminance and glare limitation.

Three-circuit track for mains voltage: luminaires for mains voltage and low-voltage fixtures with an integral transformer can be operated on track; three separate groups of luminaires can be switched or dimmed.



Spotlights for low-voltage halogen lamps with adjustable light heads on an electronic transformer. Compact electronic transformers allow the design of especially small luminaires.

Spotlights for low-voltage halogen lamps with integral electronic transformer.

Washlights for double-ended halogen lamps, washlight for metal halide lamps with integral control gear, wall-washer for double-ended halogen lamps.