

ver, i.e. photopic vision. Therefore, it should not come as a surprise when light sources with different spectral content do not have the same effects when used to provide mesopic vision despite being matched photometrically.

2.3 Accommodation

There are three optical components involved in the ability of the eye to focus an image on the retina, the thin film of tears on the cornea, the cornea itself, and the crystalline lens. The ciliary muscles have the ability to change the curvature of the lens and thereby adjust the power of the eye's optical system in response to changing target distances; this change in optical power is called accommodation.

Accommodation is a continuous process, even when fixating, and is always a response to an image of the target located on or near the fovea rather than in the periphery of the retina. Any condition that handicaps the fovea, such as a low light level, will adversely affect accommodative ability. As adaptation luminance decreases below 0.03 cd/m^2 (means approx. 0.6 lux)*. the range of accommodation narrows so that it becomes increasingly difficult to focus objects near and far from the observer. When there is no stimulus for accommodation, as in complete darkness or in a uniform luminance visual field such as occurs in a dense fog, the visual system typically accommodates to approximately 70 cm away.

2.4 Capabilities of the Visual System

The human visual system has a limited range of capabilities. These limits, conventionally called thresholds, are mainly of interest for determining what will not be seen rather than how well something will be seen. For the threshold measurements shown here the observers were all fully adapted, the target was presented on a field of uniform luminance and the observers' accommodation was correct.

2.5 Threshold Measures

The threshold capabilities of the human visual system can conveniently be divided into spatial, temporal and colour classes.

2.6 Factors Determining

Visual Threshold

There are three distinct groups of factors that influence the measured threshold; visual system factors, target characteristics and the background against which the target appears. Important visual system factors are the luminance to which the visual system is adapted, the position in the visual field where the target appears, and the extent to which the eye is correctly accommodated. As a general rule, the lower the luminance to which the visual system is adapted, the further the target is from the fovea, and the more mismatched the accommodation of the eye is to the viewing distance, the larger will be the threshold values.

** Conversion between cd/m^2 and Lux is indicative for understanding of the above Figures and based on typical experienced situations.