The new mesopic system describes spectral luminous efficiency, Vmes(λ), in the mesopic region as a linear combination of the photopic spectral luminous efficiency function, V(λ), and the scotopic spectral luminous efficiency function, V'(λ).

For applying the mesopic photometry, the S/P-ratio of the light source, derived from its spectral data, is needed as input value. This is the ratio of the luminous output evaluated according to the scotopic V'(λ), to the luminous output evaluated according to the photopic V(λ). The higher the S/P-ratio the higher the luminous efficacy of the light source in terms of the mesopic design.

The use of mesopic dimensioning changes the luminous output and consequently the luminous efficacy orders of lamps. Many of the 'white light' sources currently used for applications such as road lighting have S/P-ratios between about 0,65 (high pressure sodium, for example) and 2,50 (certain metal halide lamps, for example).

The S/P-ratios of warm white LEDs are around 1.15 and those of cool white LEDs around 2.15, depending on their CRI. The use of the new mesopic system to calculate the effective luminance of these white light sources results in significant changes in their apparent efficacy.

Due to their fast development, LEDs are increasingly penetrating the lighting markets. LEDs offer new solutions to various mesopic applications, too, not least because of the possibilities of producing light sources with varying spectral properties. Depending on the LED spectra, their ranking on a luminous efficiency scale may be subject to significant changes if mesopic luminous efficiency functions are used instead of the photopic.

A CIE system for mesopic photometry will give manufacturers foundations on which to develop LEDs that are optimised for low light level applications. Consequently, the coming CIE publication on mesopic photometry may also have a major impact on the evolution and adoption of LEDs as the future light sources.

As mesopic dimensioning favours 'white' light sources with high S/P-ratio, the extra benefits from using the mesopic design are good colour rendering characteristics of the lighting. This is expected to further pave way for the use of white LEDs in outdoor lighting.

The use of mesopic photometry will promote the development of mesopically optimised lighting products. It will give the manufacturers foundations on which to develop light sources that are optimised for low light level applications.