

## Facteurs d'effet mélanopique des LED

Pour la conversion de variables d'évaluation photopiques (visuelles) en variables d'évaluation mélanopiques (biologiques) (selon CIE S 026/E:2018, DIN SPEC 5031-100).

| CRI | Température de couleur* | Flux lumineux du luminaire | MNER | MDER | MEER |
|-----|-------------------------|----------------------------|------|------|------|
| >90 | 2700 K                  | 4450 lm                    | 1,03 | 0,48 | 0,53 |
|     | 3000 K                  | 4450 lm                    | 1,04 | 0,55 | 0,61 |
|     | 3500 K                  | 4450 lm                    | 1,04 | 0,65 | 0,71 |
|     | 4000 K                  | 4450 lm                    | 1,02 | 0,72 | 0,79 |
|     | 4500 K                  | 4450 lm                    | 1,00 | 0,78 | 0,86 |
|     | 5000 K                  | 4450 lm                    | 0,98 | 0,83 | 0,92 |
|     | 5700 K                  | 4450 lm                    | 0,97 | 0,89 | 0,99 |
|     | 6500 K                  | 4450 lm                    | 0,95 | 0,95 | 1,05 |

**CRI:** Indice min. de rendu des couleurs

**Température de couleur\*:** Valeurs conformes à ANSI

**Flux lumineux du luminaire:** Flux lumineux assigné du luminaire

**MNER:** Melanopic Natural Efficacy Ratio

≙ mv, mel, nat (sur la source lumineuse naturelle de référence, selon le calcul du rendu des couleurs), facteur de conversion relatif, avec la même température de couleur)

**MDER:** Melanopic Daylight Efficacy Ratio, CIE S 026/E:2018

≙ mv, mel, D65 (DIN SPEC 5031-100, facteur de conversion par rapport à l'illuminant D65 pour le calcul de l'éclairement mélanopique équivalent à la lumière du jour)

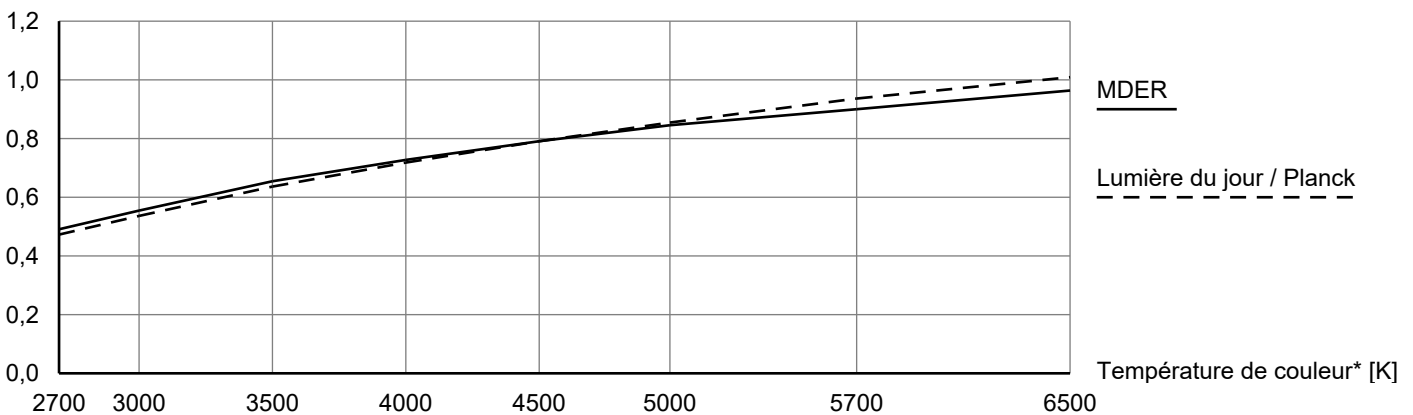
**MEER:** Melanopic Equal-energy Efficacy Ratio, CIE S 026/E:2018

≙ R (équivalent Mélanopic Lux Metric, Melanopic Ratio)

Convient pour les calculs de certification selon WELL Building Standard v2 (L03)

**Lumière du jour / Planck:** La lumière du jour est utilisée comme source de lumière naturelle de référence à partir d'une température de couleur de 5000 K, et en dessous de cette valeur, on utilise un spectre de Planck.

MDER



### Remarque pour le concepteur d'éclairage :

Voir la fiche complémentaire pour le calcul des effets de lumière mélanopiques ou contacter nos conseillers en solutions d'éclairage.

Supplément : [https://www.thornlighting.com/PDB/Teaser/EN/TLG\\_Melanopic-Datasheet-Supplement.pdf](https://www.thornlighting.com/PDB/Teaser/EN/TLG_Melanopic-Datasheet-Supplement.pdf)

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## Notes regarding the conversion of visual evaluation variables into biological evaluation variables

The conversion factors specified in the “Melanopic Data Sheet” can be used to convert the results of a photopic light calculation or measurement into melanopic evaluation variables.



Photopic (visual) evaluation



Melanopic (biological) evaluation

- 1 Reception area of the vertical illuminance at the eye of the observer, relevant for melanopic evaluation
- 2 Light from light source **photopically evaluated** with standard measuring and planning tools
- 3 Light from light source **melanopically evaluated** with formula (photopic value multiplied by factor from Zumtobel data sheet = melanopic value)

## Notes regarding melanopic light planning

The specified “melanopic action factors” enable the light planner to perform calculations to determine biological effectiveness (in accordance with CIE S 026/E:2018, DIN SPEC 5031-100, DIN SPEC 67600 and [WELL Building Standard](#)). With regard to the aspects of “Human Centric Lighting” and “Human Centred Design”, these extended planning parameters are attributed increasing importance for optimised light quality and well-being.

The luminaire and its spectrum contribute to the biological effect, but a holistic approach is required: *Integrative, holistic planning includes the application and effects of light in the planning process from the outset and, amongst other things, helps to implement energy-efficient solutions for biologically effective light through suitable use of daylight.\**

A holistic planning should take the following aspects into account: \*, \*\*, \*\*\*

- Luminous intensity (illuminance)
- Changes in the spectrum during transmission
- Changes in the spectrum during reflection
- Changes in the spectrum through absorption
- Area and room angle (geometric arrangement of the light)
- Light direction (geometric arrangement of the light)
- Daytime adapted light
- Season adapted light
- Duration of light exposure
- Spectral and spatial distribution of light over time
- Rapid light changes
- Luminous intensity (illuminance) at other times
- Correction factor for age with melanopic effects of light
- Correction factor for age-dependent reduction of transmission by the eyes
- Correction factor for age-dependent pupil constriction

Another source for planning all aspects of “Human Centric Lighting” is the [licht.wissen 21](#) Guide to Human Centric Lighting (HCL), available free of charge at licht.de.

\*DIN SPEC 67600, \*\*DIN SPEC 5031-100, \*\*\*No claim to completeness