

Melanopiska LED-åtgärdsfaktorer

Omvandla fotopiska (visuella) evalueringsparametrar till melanopiska (biologiska) evalueringsparametrar (enligt CIE S 026 / E: 2018, DIN SPEC 5031-100).

| CRI | Motsvarande färgtemperatur* | Ljusflöde från armatur | 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: Färgåtergivningsindex min.

Motsvarande färgtemperatur*: Värderna enligt ANSI

Ljusflöde från armatur: Armaturklassat ljusflöde

MNER: Melanopisk verkningsgrad (naturlig)

≅ mv, mel, nat (omvandlingsfaktor relativt till naturligt referensljus, liknar beräkning av färgåtergivning, vid samma korrelerade färgtemperatur (CCT))

MDER: Melanopisk verkningsgrad (dagsljus), CIE S 026/E:2018

≅ mv, mel, D65 (DIN SPEC 5031-100, omvandlingsfaktor relativt till D65-ljus, för beräkning av dagsljusekvivalent melanopisk belysning)

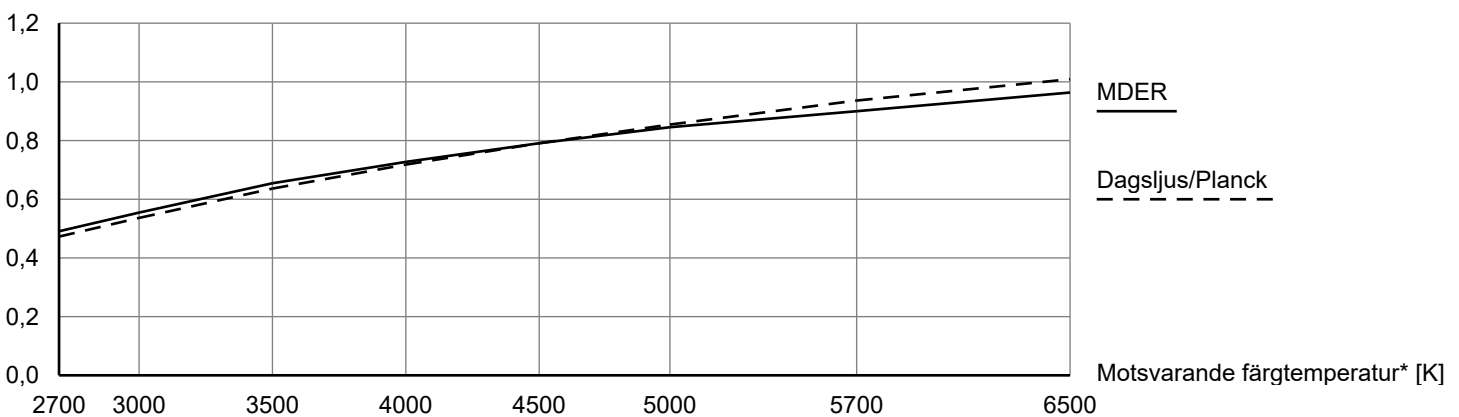
MEER: Melanopisk verkningsgrad (ekvivalent energi), CIE S 026/E:2018

≅ R (ekvivalent melanopisk luxmått, melanopisk grad)

lämpligt för beräkningar enligt WELL Building Standard v2 (L03)

Dagsljus/Planck: Dagsljusarmaturer används som naturliga referensarmaturer från 5000K och uppåt, och Planck-strålande armaturer används för lägre CCT.

MDER



Meddelande till ljusdesigner:

Läs i supplementet eller kontakta våra planerare av belysningslösningar för att få veta hur man beräknar melanopiska belysningseffekter.

Tillägg: https://www.thornlighting.com/PDB/Teaser/EN/TLG_Melanopic-Datasheet-Supplement.pdf

THORN

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