# Mitochondriak® mini infrared panel

Spectral measurement, flicker and EMF · 29 October 2026 · Protocol **ML-2026-10-MINI**

| | |
|---|---|
| Measurement date | 29 October 2026 |
| Performed by | Mitochondriak® Lab, Easy Light s.r.o., Slovakia |
| Device | Mitochondriak® mini infrared panel · 12 dual LEDs (3 W) · 6 wavelengths 630–850 nm · battery powered |
| Mode | RED and NIR on, full intensity |
| Instruments | certified OHSP-350UVF spectrometer (230–900 nm, 1 nm steps), second certified spectrometer UPRtek CV600 with calibration certificate (380–780 nm, 1 nm steps), TES 1333 solar meter (400–1,100 nm), Cornet ED88 electrosmog meter |
| Distances from the device face | 5 and 10 cm (used up close) |
| Power supply | built-in battery (USB charging) |
| Units | irradiance in mW/cm² (1 mW/cm² = 10 W/m²), spectral irradiance in mW/m²/nm |

## Summary

The Mitochondriak® mini infrared panel has 6 LED types (wavelengths) in the red and near-infrared range: 630, 670, 760, 810, 830 and 850 nm. The LEDs are distributed by biological effectiveness, not 1:1, so neighbouring bands overlap and not every wavelength has its own peak in the spectrum. At 5 cm the total irradiance is 19.9 mW/cm² (certified spectrometers, 400–1,100 nm) and the TES 1333 solar meter reads 43.2 mW/cm². Of this, 7.3 mW/cm² is red (600–700 nm) and 12.6 mW/cm² near infrared (700–1,100 nm), a ratio of 37 % to 63 %. At 10 cm the total irradiance is 11.7 mW/cm² (solar meter 21.5 mW/cm²). Below 600 nm it emits nothing – there are no blue or green LEDs. The light does not actually flicker – zero flicker (flicker index 0.00, percent flicker 1.1–2.1 %, similar to sunlight) and at 30 cm the electromagnetic field is at background level (0.1 µT, 0 V/m).

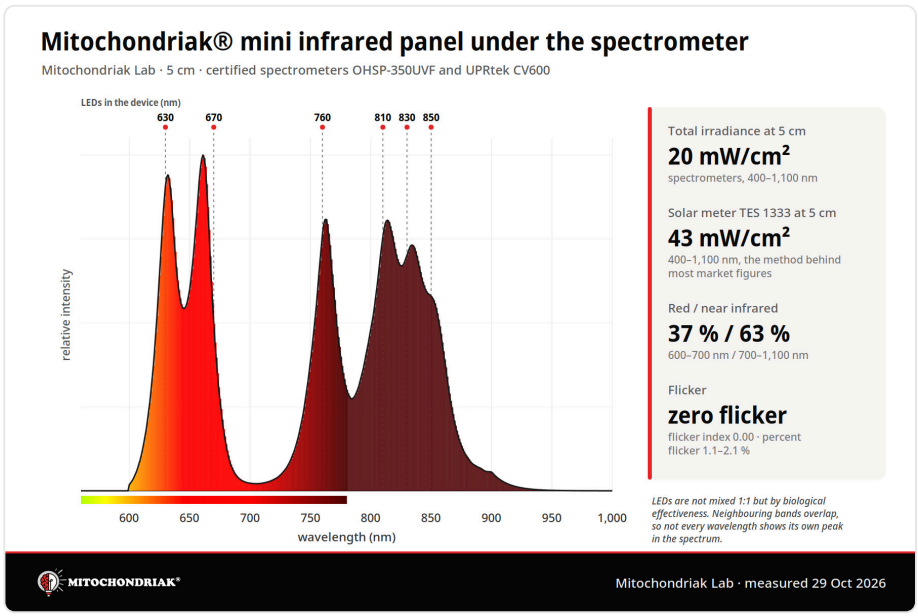
## Key results

| Parameter | 5 cm<br>up close | 10 cm<br>up close |
|---|---|---|
| Total irradiance 400–1,100 nm<br>certified spectrometers OHSP-350UVF and UPRtek CV600; the part above 900 nm calculated from the spectrum | **19.9 mW/cm²** | **11.7 mW/cm²** |
| TES 1333 solar meter, 400–1,100 nm<br>the method behind most irradiance figures on the market | **43.2 mW/cm²**<br>431.7 W/m² | **21.5 mW/cm²**<br>214.7 W/m² |
| Red 600–700 nm | **7.3 mW/cm²** | **4.1 mW/cm²** |
| Near infrared 700–1,100 nm | **12.6 mW/cm²** | **7.7 mW/cm²** |
| Ratio red : near infrared | **37 : 63 %** | **35 : 65 %** |
| Below 600 nm (blue, green)<br>no blue or green LEDs | **0 mW/cm²** | |
| Flicker<br>two independent certified spectrometers, repeated measurements – does not actually flicker | **zero flicker · flicker index 0.00 · percent flicker 1.1–2.1 %** | |
| Magnetic field (30 cm)<br>Cornet ED88, LF600 | **0.1 µT (1 mG) – background level** | |
| Electric field · radio-frequency radiation (30 cm)<br>Cornet ED88 | **0 V/m · 0.0001 mW/m² – background level** | |

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## Spectrum at 5 cm




Spectrum at 5 cm, OHSP-350UVF, 560–1,000 nm, normalised; zero below 600 nm.

## Wavelengths (LED types)

The LEDs are not distributed 1:1 but in proportion to their biological effectiveness: more LEDs where the body absorbs light best, fewer at the complementary wavelengths. Every LED is semi-monochromatic – it emits a band about 20 to 30 nm wide. Neighbouring bands therefore overlap, and the less represented wavelengths have no separate peak in the spectrum; their light is part of the shared band and fully included in the measured irradiance. The measured peaks below are a supplement, not a list of wavelengths.

| LED type | Range | In the measured spectrum (OHSP-350UVF) |
|---|---|---|
| **630 nm** | red | own peak at 632 nm |
| **670 nm** | red | own peak at 661 nm |
| **760 nm** | near infrared | own peak at 763 nm |
| **810 nm** | near infrared | own peak at 814 nm |
| **830 nm** | near infrared | own peak at 834 nm |
| **850 nm** | near infrared | overlaps with the neighbouring LED bands, no separate peak |

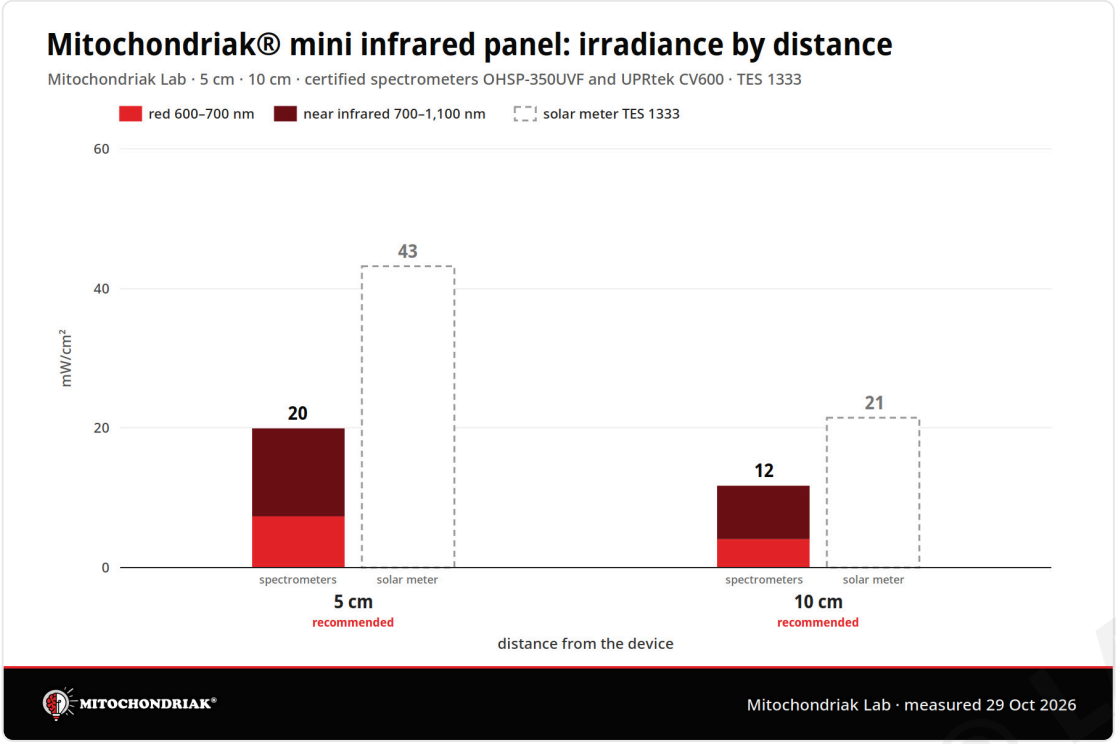
## Supplement: measured spectral peaks at 5 cm

| Band | Measured peak (OHSP-350UVF) | Full width at half maximum | Share of total irradiance |
|---|---|---|---|
| red | **632 nm** | **overlaps with the neighbouring 810–850 nm LEDs** | 17.5 % |
| red | **661 nm** | **overlaps with the neighbouring 810–850 nm LEDs** | 19.4 % |
| near infrared | **763 nm** | **25 nm** | 20.1 % |
| near infrared | **814 nm** | **overlaps with the neighbouring 810–850 nm LEDs** | 17.9 % |
| near infrared | **834 nm** | **overlaps with the neighbouring 810–850 nm LEDs** | 24.4 % |

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## Irradiance by distance




Total irradiance by distance: coloured bars = certified spectrometers (split into bands), dashed bars = TES 1333 solar meter.

| Quantity | 5 cm | 10 cm |
|---|---|---|
| UPRtek CV600 / OHSP-350UVF, 600–780 nm (mW/cm²) | **13.1 / 11.0** | **6.3 / 6.3** |

Both certified spectrometers measure the same level in the shared 600–780 nm range; the differences reflect the sensor position in front of individual LEDs.

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## Flicker and electromagnetic field

**0.00**
flicker index

**1.1–2.1 %**
percent flicker

Our devices are flicker-free – zero flicker. Repeated measurements with two independent certified spectrometers confirm it (see the display photographs in this protocol). In flicker mode the UPRtek CV600 shows a frequency of 1 Hz because it cannot display zero; the OHSP-350UVF shows 0 Hz and a flat line with a modulation depth of 0.0 % (50 kHz sampling). Percent flicker is 1.1–2.1 % – a very small fluctuation, similar to sunlight – and the flicker index is 0.00. Conclusion: our infrared panels do not actually flicker. This is the result of driver quality that we tested and selected repeatedly.

**0.1 µT**
magnetic field at 30 cm

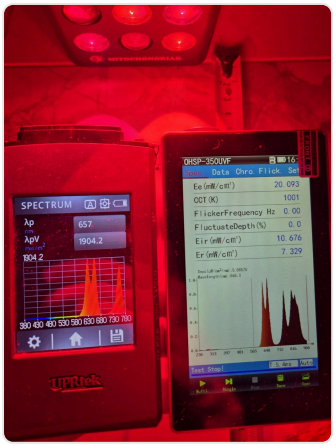
**0 V/m**
electric field

At 30 cm the Cornet ED88 electrosmog meter (LF600) showed a magnetic field of 0.1 µT (1 mG), an electric field of 0 V/m and radio-frequency radiation of 0.0001 mW/m². All values are at the normal background level of a household. The mini runs on its battery, with no mains voltage.

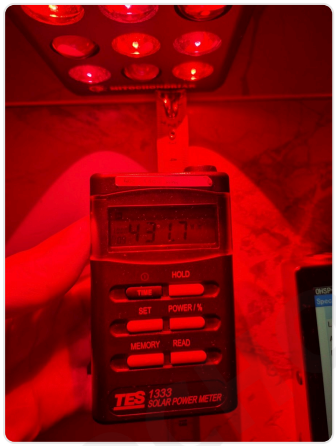
## Comparison with the sun

On 29 October 2026 at around 15:00 the same TES 1333 solar meter measured 915.6 W/m² (91.6 mW/cm², 400–1,100 nm) in direct sunlight. Based on the shape of the ASTM G173 reference solar spectrum, approx. 56.5 mW/cm² of this falls in the 600–1,100 nm range (red 16.7, near infrared 39.6 mW/cm²). The mini delivers 19.9 mW/cm² in the same range at 5 cm – 35 % of that dose, without UV and without blue light. The comparison is a calculation from the measurement.

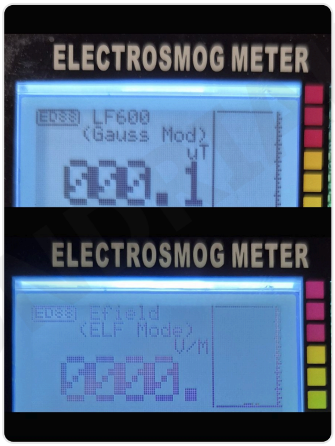
## Display photographs



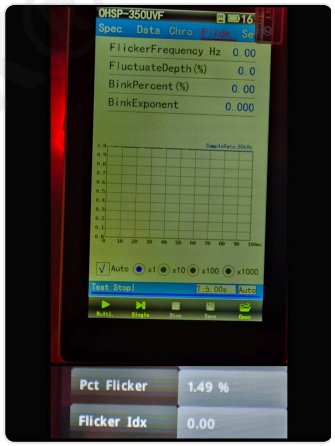
OHSP-350UVF · UPRtek CV600 at 5 cm.



TES 1333 at 5 cm: 431.7 W/m².



Cornet ED88 at 30 cm: 0.1 µT.



Flicker: OHSP-350UVF 0 Hz, modulation depth 0.0 %; UPRtek CV600 flicker index 0.00.

## Data and citation

Full data in 1 nm steps (CSV and XLSX, both spectrometers, all distances):
https://mitochondriak-media.fsn1.your-objectstorage.com/products/mini/measurements/mitochondriak-mini-spectrum-data.csv
https://mitochondriak-media.fsn1.your-objectstorage.com/products/mini/measurements/mitochondriak-mini-spectrum-data.xlsx

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## Methodology

- **Spectra:** certified OHSP-350UVF spectrometer (230–900 nm) and a second certified spectrometer, UPRtek CV600, with calibration certificate (380–780 nm), both in 1 nm steps, sensor perpendicular to the device face on its axis. Both spectrometers are equivalent.
- **Band irradiance:** $E = \Sigma\, E(\lambda) \cdot \Delta\lambda$, $\Delta\lambda = 1$ nm (red 600–700 nm, near infrared 700–1,100 nm, total irradiance 400–1,100 nm).
- **Below 600 nm:** the device has no blue or green LEDs; in the spectra, totals and data the range below 600 nm is zero.
- **Part above 900 nm:** the tail of the 850 nm LEDs from the exponential course of the spectrum between 860 and 880 nm.
- **The TES 1333 solar meter** is calibrated to the solar spectrum. With narrow LED bands it reads higher than the spectral integral of the spectrometers (1.6 to 1.8 times for devices without 940 nm); we give both values so they can be compared with market figures and with the spectral reality.
- **Flicker and pulsing:** UPRtek CV600 (flicker index and percent flicker), OHSP-350UVF in flicker mode (50 kHz sampling); flicker in continuous mode, pulsing at the 10 Hz and 100 Hz settings.
- **EMF:** Cornet ED88 electrosmog meter (LF600 magnetic field in µT/mG, electric field in V/m, radio-frequency radiation in mW/m²).

## Spectral table (5 nm steps, mW/m²/nm)

| nm | OHSP 5 cm | OHSP 10 cm | UPRtek 5 cm |
|---|---|---|---|
| **600** | 30.1 | 17.8 | 83.6 |
| **605** | 82.9 | 48.1 | 179.4 |
| **610** | 179.9 | 98.0 | 334.9 |
| **615** | 350.5 | 181.1 | 588.9 |
| **620** | 635.1 | 320.3 | 981.7 |
| **625** | 1,091.9 | 547.3 | 1,480.1 |
| **630** | 1,545.9 | 795.8 | 1,780.2 |
| **635** | 1,473.0 | 802.8 | 1,567.4 |
| **640** | 1,066.7 | 600.1 | 1,176.3 |
| **645** | 924.2 | 525.0 | 1,105.9 |
| **650** | 1,020.2 | 577.9 | 1,363.3 |
| **655** | 1,334.7 | 748.3 | 1,754.2 |
| **660** | 1,681.8 | 940.1 | 1,885.0 |
| **665** | 1,438.9 | 829.3 | 1,383.1 |
| **670** | 847.6 | 504.2 | 684.5 |
| **675** | 467.0 | 284.9 | 283.9 |
| **680** | 237.5 | 153.5 | 118.8 |
| **685** | 118.1 | 82.5 | 53.4 |
| **690** | 67.7 | 48.8 | 30.9 |
| **695** | 47.0 | 33.3 | 22.9 |
| **700** | 38.6 | 26.6 | 24.0 |
| **705** | 35.9 | 25.0 | 30.3 |
| **710** | 38.3 | 26.5 | 43.6 |
| **715** | 45.4 | 31.4 | 63.6 |
| **720** | 58.0 | 40.4 | 96.2 |
| **725** | 79.5 | 55.4 | 145.4 |
| **730** | 114.8 | 79.1 | 220.9 |
| **735** | 177.0 | 118.1 | 332.8 |
| **740** | 272.9 | 175.5 | 501.3 |
| **745** | 427.9 | 262.9 | 743.5 |
| **750** | 654.8 | 388.4 | 1,059.6 |
| **755** | 942.4 | 547.3 | 1,432.7 |
| **760** | 1,302.1 | 747.7 | 1,643.6 |
| **765** | 1,304.0 | 773.2 | 1,372.8 |
| **770** | 967.0 | 595.9 | 865.1 |
| **775** | 679.7 | 428.6 | 564.7 |
| **780** | 512.1 | 326.3 | 514.9 |
| **785** | 468.5 | 294.2 | |
| **790** | 529.6 | 321.9 | |
| **795** | 656.8 | 390.9 | |
| **800** | 820.9 | 479.5 | |
| **805** | 1,028.9 | 587.8 | |
| **810** | 1,287.6 | 727.3 | |
| **815** | 1,363.5 | 794.5 | |
| **820** | 1,227.4 | 731.3 | |
| **825** | 1,140.9 | 666.5 | |
| **830** | 1,195.4 | 672.9 | |

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| nm | OHSP 5 cm | OHSP 10 cm | UPRtek 5 cm |
|---|---|---|---|
| **835** | 1,244.2 | 704.1 | |
| **840** | 1,138.9 | 670.1 | |
| **845** | 1,023.9 | 606.9 | |
| **850** | 987.2 | 587.9 | |
| **855** | 899.6 | 571.8 | |
| **860** | 707.6 | 501.4 | |
| **865** | 493.2 | 378.5 | |
| **870** | 329.9 | 259.6 | |
| **875** | 228.4 | 172.1 | |
| **880** | 169.6 | 121.6 | |
| **885** | 133.6 | 91.0 | |
| **890** | 117.1 | 76.2 | |
| **895** | 99.1 | 68.5 | |
| **900** | 94.9 | 62.4 | |
| **905** | 65.4 | 42.9 | |
| **910** | 45.1 | 29.6 | |
| **915** | 31.1 | 20.4 | |
| **920** | 21.4 | 14.0 | |
| **925** | 14.8 | 9.7 | |
| **930** | 10.2 | 6.7 | |
| **935** | 7.0 | 4.6 | |
| **940** | 4.8 | 3.2 | |
| **945** | 3.3 | 2.2 | |
| **950** | 2.3 | 1.5 | |
| **955** | 1.6 | 1.0 | |
| **960** | 1.1 | 0.7 | |
| **965** | 0.8 | 0.5 | |
| **970** | 0.5 | 0.3 | |
| **975** | 0.4 | 0.2 | |
| **980** | 0.2 | 0.2 | |
| **985** | 0.2 | 0.1 | |
| **990** | 0.1 | 0.1 | |
| **995** | 0.1 | 0.1 | |
| **1000** | 0.1 | 0.0 | |

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