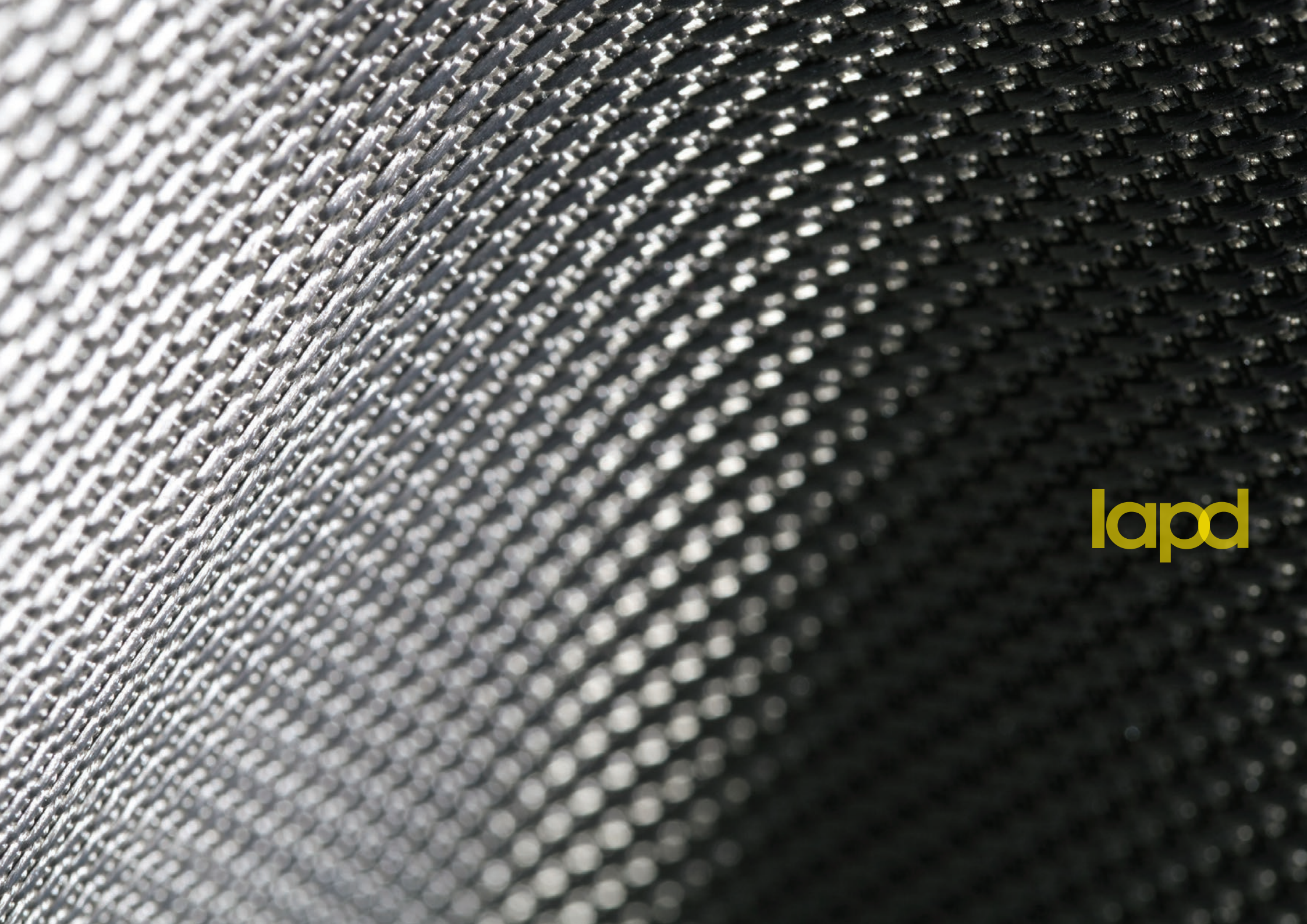
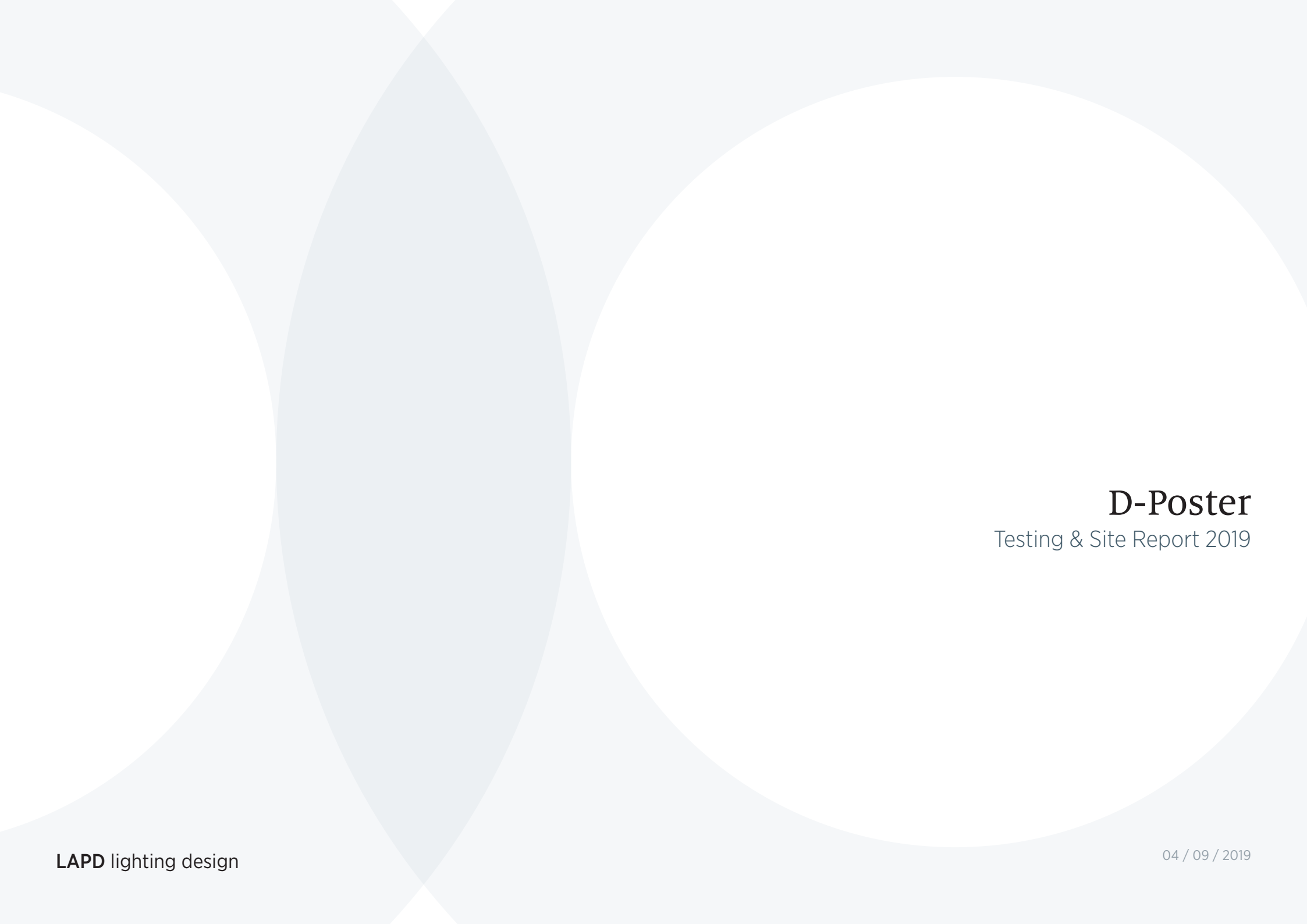




lapd



D-Poster

Testing & Site Report 2019

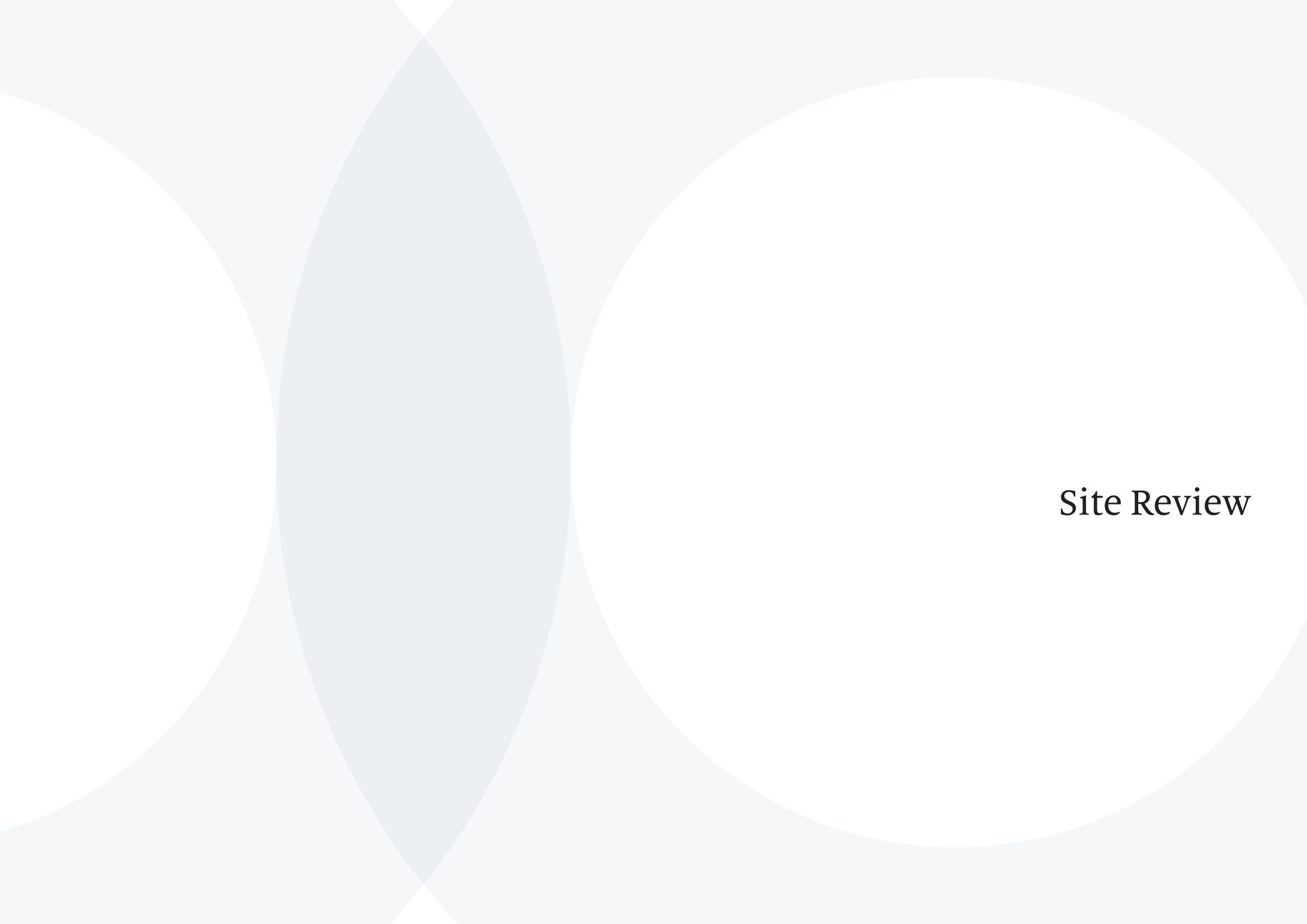
Document summary

The purpose of this document is to compare the Luminance values between the digital media panel (D-Poster) and a traditional, poster & paste, billboard, and to provide guidance on setting a D-Poster in line with ILP guidance appropriate to individual environmental zones. The document also provides indicative values for light spread, at night, at different levels of output.

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Site Review

04



Site Review

Site observations & testing

Aims

1. To observe the D-Poster alongside a traditionally illuminated billboard.
2. To compare the Luminance values of each of the billboards.
3. To determine how the dimming settings affect the Luminance value of the D-Poster, to corroborate the photometry results.
4. To determine the Luminance value of the D-Poster when it is running at maximum output, showing pure white content, to corroborate the photometry results.



Site observations & testing

Methodology

- Upon arrival at the site, we first tested the Luminance output of the D-Poster while it was off. Luminance values were documented as lighting conditions changed (cloud cover etc.).
- We then recorded Luminance values of the poster & paste billboard, under the same daylight conditions. These measurements were taken using various targets on the graphic as reference points.
- The D-Poster was then initialised, and set up to show pure white, at full output. Luminance values for this state were taken, and the control value from the daylight reading was subtracted from the results.
- The D-Poster was then set up to show the same Vodafone graphic as the poster & paste billboard, at maximum output, and readings were taken to correspond to the points used on the poster & paste billboard.
- Next, the poster & paste billboard was lit, and readings were taken from the same targets as used on the D-poster.
- The D-Poster was then set back to pure white, and then dimmed incrementally. Luminance values were taken at each step, in order to corroborate the laboratory results & confirm that the dimming mechanism worked effectively.

Site observations & testing

D-Poster

Initially, control measurements were taken, with the D-Poster off, from varying distances. This was carried out to determine whether or not there was any fluctuation in the readings obtained, at different distances. There was no significant fluctuation, so further measurements were taken at a distance of 5 metres from each panel.

Luminance readings

D-poster off: 484 cd/m²

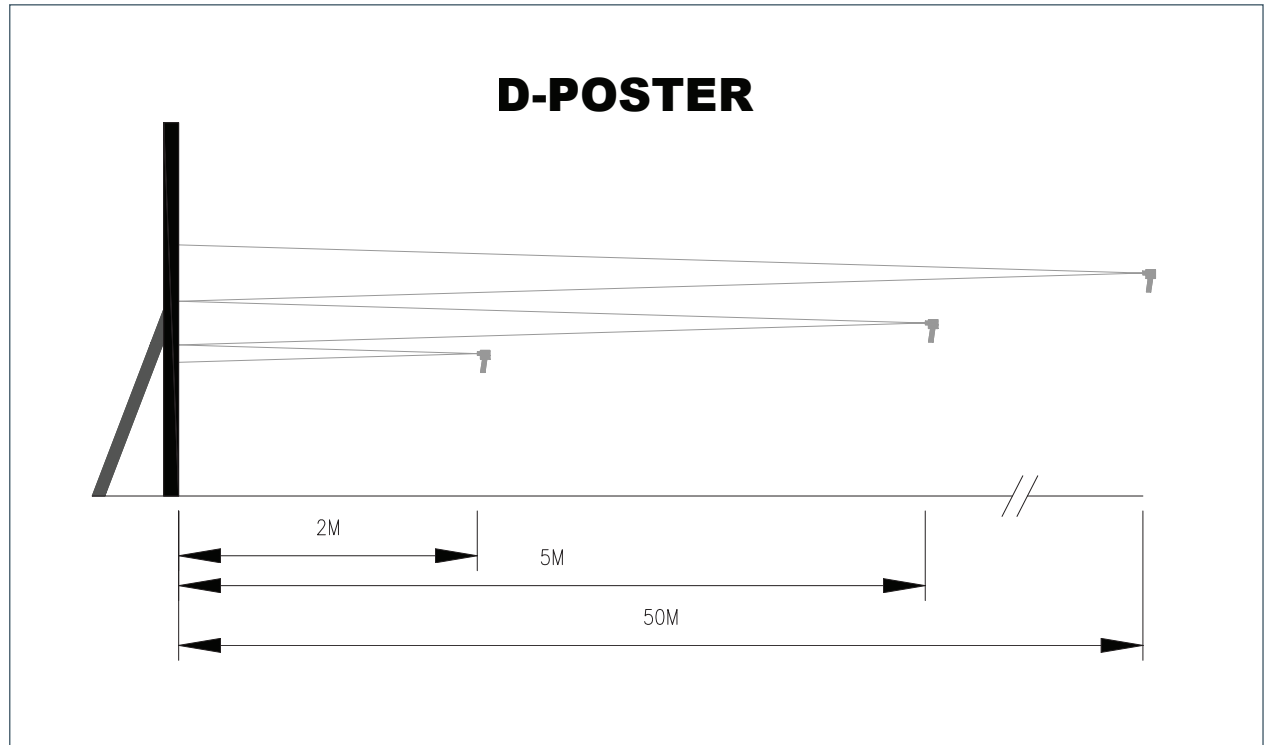
D-poster on, 100%: 5984 cd/m²

Corrected value: 5984 - 484 = 5500 cd/m²

Testing equipment

Testing equipment used: Konica-Minolta LS-100 Luminance Meter, as shown.

This device has a targeting circle within the viewfinder, which means that the measurement can be tailored depending on the requirement of the test. The area covered by the targeting circle is measured as an average, and can even be moved, giving you a “live” measurement as you change the location of the target.



Close up, the LS-100 measures a smaller area, which gives you greater control over the precise location of the measurement. Farther away, the LS-100 measures over a wider area, facilitating easy determination of the luminance average over a greater part of the surface being tested.

Site observations & testing

Poster & paste

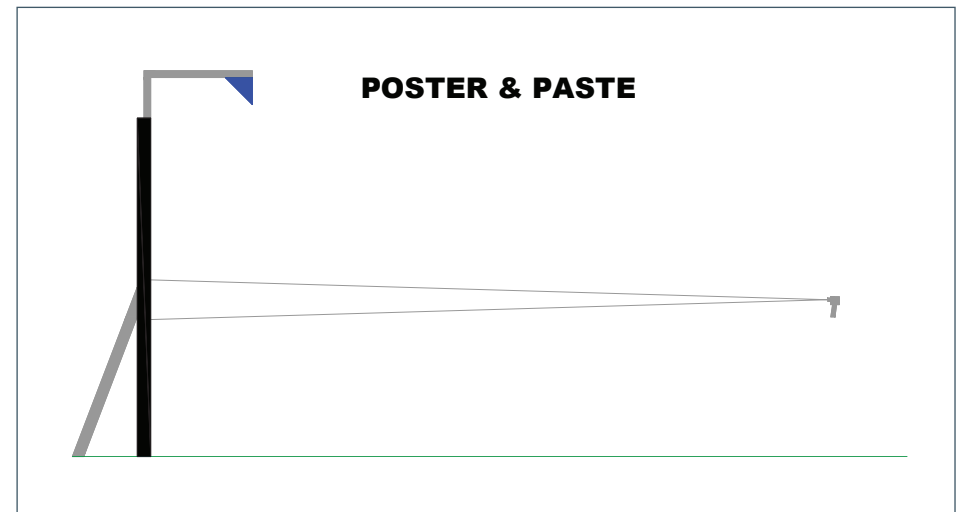
Readings for Luminance on the poster & paste panel were taken for comparison with readings from identical reference points on the D-Poster.

Luminance readings (daylight)

1. White on Vodafone logo: 7946 cd/m²
2. Skin tone on boy's hand: 5903 cd/m²
3. Bright spot in clouds: 7739 cd/m²

Maximum luminance

The ILP guidelines for illuminated signboards state: "During the daytime [digital] sign luminance should never exceed 5000 cd/m²." However, a poster & place billboard is not illuminated during the day, except by natural daylight. Therefore, the limit of 5000 cd/m² does not apply to these systems.



Site observations & testing

D-Poster

Readings for Luminance on the D-Poster were taken for comparison with the readings taken from the poster & paste panel.

Luminance readings (gross, daylight)

1. White on Vodafone logo: 5928 cd/m²
2. Skin tone on boy's hand: 2982 cd/m²
3. Bright spot in clouds: 5229 cd/m²

Control reading

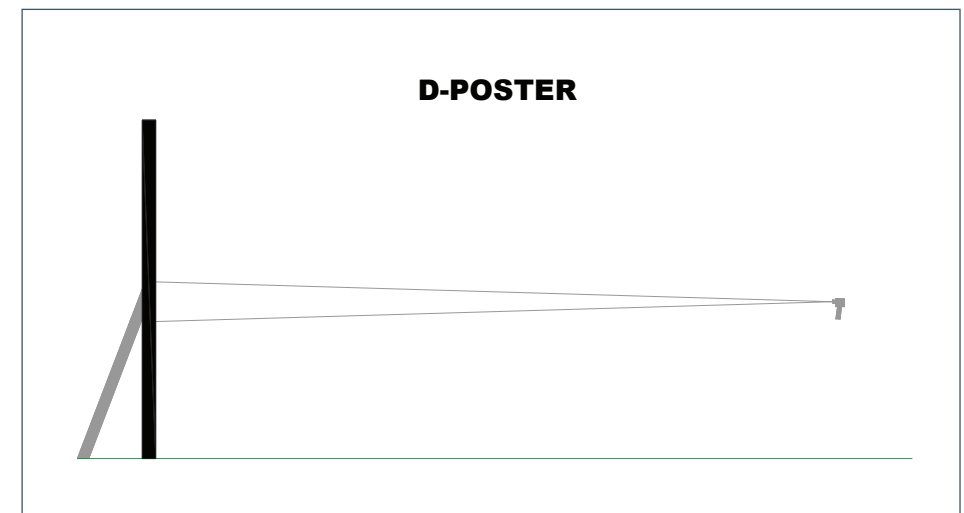
As noted on pages 6 & 7, an initial control reading was taken with the D-poster not powered up. This figure, of 484 cd/m², represents the contribution from daylight reflecting off the surface of the D-Poster. Subtracting this figure from the measured Luminance readings gives a more accurate assessment of the output of the D-Poster, as shown below.

Luminance readings (nett, daylight)

1. White on Vodafone logo: 5444 cd/m²
2. Skin tone on boy's hand: 2498 cd/m²
3. Bright spot in clouds: 4745 cd/m²

Maximum luminance

The ILP guidelines for illuminated signboards state: "During the daytime [digital] sign luminance should never exceed 5000 cd/m²." Taking the data from the laboratory testing, this equates to setting the display to a dimming level of 90%, during the hours of daylight. This is based on pure white content - once coloured content is displayed, the Luminance values drop significantly.



Poster & paste

Night-time white simulation

A simulation was produced, in order to provide optimum Luminance data to assist in the comparison between the two billboard systems. This was necessary in order to obtain luminance values for the “perfect” LED installation.

Simulation data

Panel size: 6m x 3m
 Luminaire: Portland Lighting Ecolux Mini Cool
 Luminaire stand-off: 600mm
 Zero ambient light

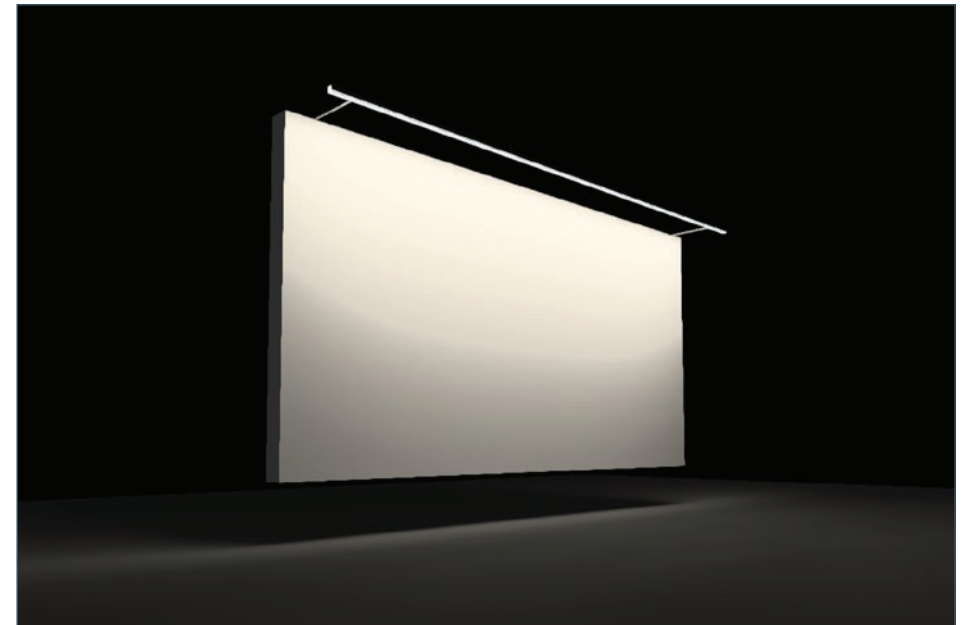
Luminance results

Minimum: 4.96 cd/m²
 Maximum: 197 cd/m²
 Average: 56.0 cd/m²

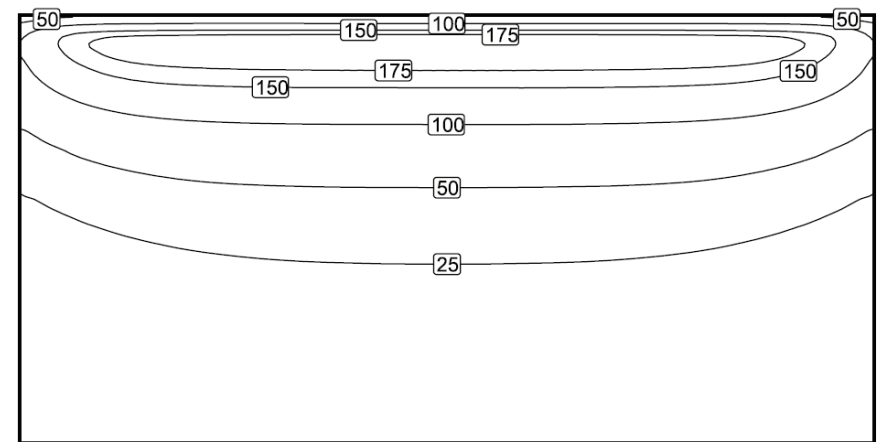
Comments

The illumination of top-lit advertising panels produces inconsistent results, with the top of the panel being relatively bright, and then light output sharply dropping off towards the bottom edge. As a result, average Luminance readings, whilst useful, are not particularly indicative of the visual impact of lit displays.

Taking the maximum reading as the “point of maximum visual impact”, it is clear that in order for the D-Poster to closely mimic the visual impact of the Poster & Place system, it will have to be controlled to achieve a Luminance reading of less than 197 cd/m². The testing results show, that with so many dimming levels available to the control unit, the Luminance levels can easily be set to this level and, in fact, well below it.



Isolines [cd/m²]



D-Poster

Night-time light spill calculation

A simulation was produced, in order to determine the effect of light spill on potential nearby buildings.

Simulation data

Panel size: 6m x 3m
 Luminaire: D-Poster
 Zero ambient light
 Screen output level: 3%

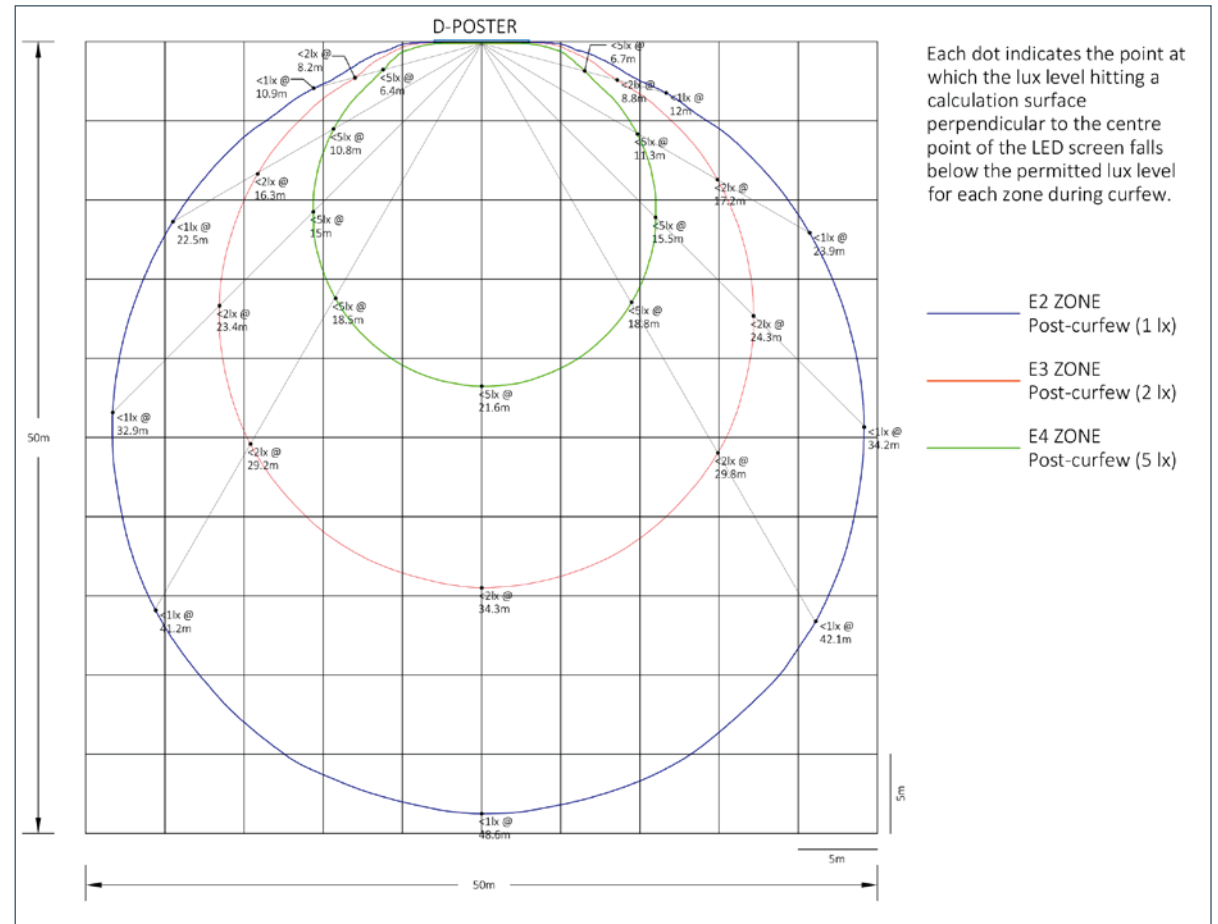
Comments

The ILP limits light intrusion into windows to a certain lux level, depending on the environmental zone in question. In zone E3, for example, the permissible level is 10 lux pre-curfew and 2 lux post-curfew (curfew is currently defined as 23:00).

The graph to the right shows that at a 3% dimming level, the amount of light intrusion directly in front of the D-Poster is less than 1 lux at a distance of 48.6m. This corresponds to the limit for a building in zone E2. The distances decrease to 34.3m for zone E3 and 21.6m for zone E4.

These results are based on a building directly facing the D-Poster - if buildings are at differing offsets to the D-Poster, then the distances become shorter, as shown.

**Comparable level of luminance to a traditional externally illuminated 48-sheet.*



Environmental Zone	Lighting Environment	Light intrusion at windows (pre-curfew)	Light intrusion at windows (post-curfew)	Maximum Nighttime Illuminance of illuminated advertisements	D-Poster Output requires
E1	Intrinsically dark	2 Lux	0	0cd/m2	N/A
E2	Low district brightness	5 Lux	1 Lux	200cd/m2	3%*
E3	Medium district brightness	10 Lux	2 Lux	300cd/m2	5%
E4	High District Brightness	25 Lux	5 Lux	300cd/m2	5%

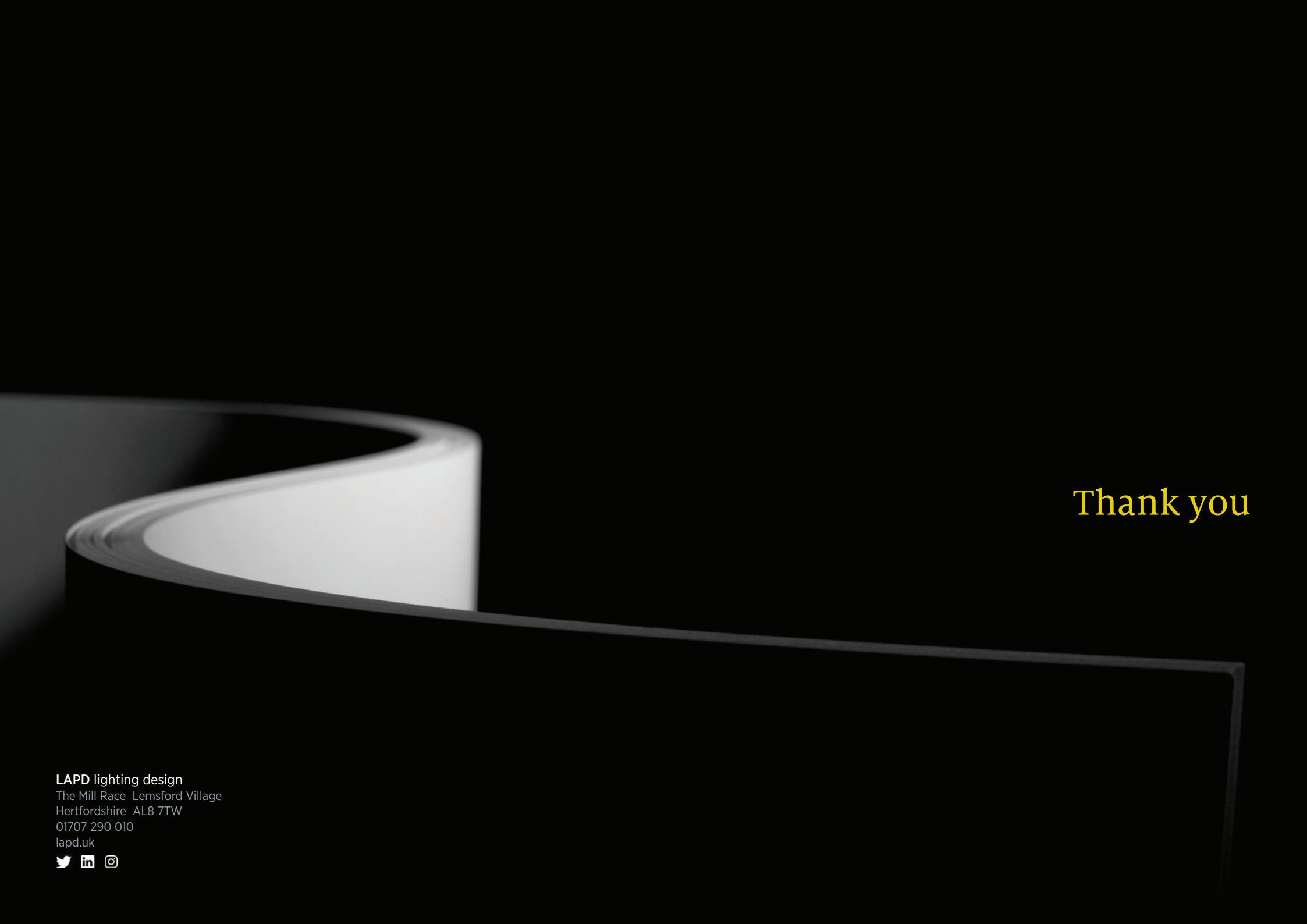
Conclusions and notes

Conclusions

1. The D-Poster is providing a maximum Luminance output of 5500 cd/m². In order to fulfil the requirements that no lit panel emits more than 5000 cd/m² during daylight hours, the D-Poster needs to be dimmed to 90%. However, this is on the basis of all-white content, which provides the WORST CASE scenario. The data gathered shows that once content is displayed through the panel, Luminance values drop.
2. The level of light intrusion can be adjusted using the dimming levels, to satisfy various limits and distances to nearby buildings.
3. The Luminance levels recorded on site align with the photometric test results, thus reassuring us that future simulations of possible light pollution will be accurate.

Notes

Excluding the uniformity of the Luminance values between the panels, the level of control permissible with the media panel (in 1% increments) enables huge flexibility. Dimmed to 1%, the average Luminance value of the D-Poster is equivalent to that of the paste-in-place billboard. Therefore, in our opinion, and under such conditions, there is no material difference in the average Luminance between the systems.



Thank you

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