



Dutch
Metrology
Institute

LED Street Lights

Tested by the Van Swinden Laboratory

National Metrology Institute
of the Netherlands

In the framework of the coordinated evaluation of the LED pilots for public lighting the Van Swinden Laboratory, the National Metrology Institute of the Netherlands, has tested 10 LED light fittings from 8 suppliers. The tests show quite a difference between the electric performance and light quality. Of each type of fitting used in the 35 pilots - divided over 25 participating municipalities - a number of tests regarding the electric performance and the light quality were carried out by the VSL/NMI.

A retrofit light applied in pilots by Ledprojects and Unique Light Brabant was also tested. Reason for these tests was initially to be able to correct the light meter used for practical measurements for the specific LED spectrum. This reference measurement has shown that correction was not necessary.

Measured Values

This overview provides a summary of the above mentioned reports of the results obtained by the Van Swinden Laboratory based on measurements carried out between 16 April 2009 and 29 June 2009.

| Supplier | Power Consumption (W) | Power Factor | Luminous Flux (Lm) | Efficacy (lm/W) | Lm/W in comp. to Stela |
|--|-----------------------|--------------|--------------------|-----------------|------------------------|
| Indal Stela 3000 | 21.67 | 0.94 | 1580 | 73.3 | 100% |
| Philips Urban Line | 17.93 | 0.8 | 561 | 31.3 | 43% |
| Philips City Spirit Cone | 27.47 | 0.91 | 956 | 34.8 | 47% |
| Schröder Altra-2 | 32.74 | 0.92 | 1473 | 45 | 61% |
| Unique Lights Neo-Neon | 31.4 | 0.88 | 1076 | 34.3 | 47% |
| Innolumis Lumis LED G14H | 18.53 | 0.88 | 835 | 45.1 | 62% |
| Innolumis Lumis LED E16H | 21.72 | 0.88 | 1107 | 51 | 70% |
| iGuzzini iTeka B79 | 29.8 | 0.53 | 1266 | 42.5 | 58% |
| Led Projects SP90 High Power LED | 35.11 | 0.97 | 1484* | 42.3* | 58% |

* The SP90 High power LED street light has been tested without the associated light fitting as it could not be delivered in time. Due to the missing light fitting the tested dependencies probably deviate from the actual situation. This is because a light fitting influences the thermal circumstances around the lamp which in turn influences the performance of the street light.

Results

The most obvious results from the measurements were the total luminous flux coming from the light fitting and the power needed for that. In a number of cases the luminous flux appeared to be lower than indicated by the suppliers in the checklist. The efficiency turned out to be between 35 and 51 lm/W with one exception of 73 lm/W. These values do not seem spectacular in comparison to compact fluorescent (approx. 70 lm/W) and high pressure sodium light fittings (approx. 85 lm/W). However for energy saving calculations the final light design is of importance. In these calculations the amount of useful light falling on to the road to be lit is taken into account and for this LED light fittings are better than the conventional systems.

The measured values with regard to the power factor for the tested light fittings were between 0.8 and 0.97 with one exception of 0.53, indicating that the drivers need optimising. However, voltage variations have no significant influence on the power consumption and the luminous flux.

Other sensitivity measurements show that an increased wind and especially a reduction of the ambient temperature have a substantial (positive) influence on the luminous flux of a number of light fittings. In one case this was more than 15%. As the reverse was also applicable the optimisation of the necessary cooling will remain a necessary priority for the suppliers.

It has been agreed with the suppliers that the individual results will be made public and where applicable the results are provided with comments from those suppliers.