

## Stakeholder Feedback on New Standardized Specification Sheets for Quality-Verified Products

**December 2018**

This document describes the feedback received on the revised design of the Standardized Specification Sheets (Spec Sheets) for Lighting Global quality-verified products. With the transition to using the new version of the test methods (IEC/TS 62257-9-5:2018, ed. 4), the Spec Sheets can now report additional information about product performance and capabilities. These new Spec Sheets will be used for products that begin testing after December 1, 2018. Existing Spec Sheets, and Spec Sheets for those products tested to the previous test methods (ed. 3), will only be updated following renewal testing.

The new Spec Sheets are designed to:

- Provide more performance information for pico-products, such as the number of mobile phones that can be charged per day or the hours of radio use per day
- Include key information about ports
- Provide details about individual light points
- Respond to other requests from stakeholders, such as describing a product's dimensions, weight, and battery status indicators, and more clearly reporting the level of water protection

The new Spec Sheets also have a more consistent design between the three main product types: pico-products without charging ports, pico-products with mobile charging, and SHS kits. By necessity, the performance information will differ slightly between these product types, but the majority of the reported information will be presented in the same format.

Between September and November 2018, the Lighting Global team received four comments on the revised Spec Sheets. These comments and the Lighting Global responses are summarized below. (Note, comments were edited and condensed, but changes were not intended to impact the meaning). Where indicated, this feedback has been incorporated into the design of the new Spec Sheets.

### **Comment 1:**

*Overall, the new sheet is nice and easy to follow, but the “Used in combination” column is confusing when there are multiple appliances in a product (see excerpt from Spec Sheet below). Please provide more details on the Spec Sheet to*

clarify if this column means that all appliances are used at once or if each individual appliance is used with lighting.

PERFORMANCE DETAILS			Run time after a typical day of solar charging (assuming 5kWh/m <sup>2</sup> /day)		
	Appliance <sup>a</sup>	Description	Used alone <sup>b</sup>	Used in combination	Featured Combination (All 4lamps on with TV)
included in kit	Main lighting unit	2 LP00 lamps and 2 LP200 lamps totalling to 1100 lumens and 10 W power consumption	9.5 hours	5.5 hours	3.1 hours
	Television	20" diagonal	5.5 hours	3.2 hours	3.1 hours
	Torch	1100mAh torch	6.2 hours	4.5 hours	
sold separately	Radio	portable (3Wh battery)	5.1 hours	3.6 hours	
	Mobile phone	Basic phone (3.7 Wh battery)	30 full charge(s)	20 full charge(s)	

Figure 1. Performance Details table in Spec Sheet with “Used in Combination” column

### Lighting Global Response:

The "Used in combination" column presents the hours of use for each appliance when all of the appliances in that column are used simultaneously. It is based on an "example use profile", which is intended to represent how a customer might use the appliances of a solar home system (SHS) kit or other solar product, and provide a standardized method of comparing run times for different products (though we fully recognize that there are a myriad of different ways that customers might use their products, this is just one standardized example we use). Table 1 provides the "example use profile" for common appliances that we use to determine each appliance's relative proportion of energy allocation for reporting in the "Used in combination" column on the Spec Sheet.

Table 1. Standardized example use profile for calculating the “Used in Combination” column on the Spec Sheet

Appliances	Daily use	Night	Day
		Assumed % use when not solar charging	Assumed % use when solar charging
Lights	4 hr	100%	0%
Fan	5 hr	75%	25%
Radio	3 hr	75%	25%
TV	2 hr	75%	25%
Mobile phone	1 full charge	50%	50%

The percentages and proportions in the table will be applied to every product; however, only appliances that are included or advertised with a given product will be included in the example use profile and “Used in combination” column for that product. For example, for a product that includes lights and a radio and advertises the product can power a TV and charge a smart phone; we will include lights, radio, smart phone and TV in the “Used in combination” column. If the product also advertised or included a fan, we would add the fan into the combination run time calculations. Additionally, the mobile phone is either

assumed to be a 3.7 Wh basic phone or 5.7 Wh smart phone, depending on whether or not a product advertises charging a smart phone.

Due to space restrictions, we have not included this full explanation on the Spec Sheet, but we have added a note next to the “Used in Combination” column that clarifies as follows: “Based on an example use profile with all of the appliances listed in the “Used in combination” column used simultaneously.”

**Comment 2:**

*The respondent recommends the model number of the product be included in the header on the first page to improve the traceability between documents for KEBS and other regulatory organizations.*

**Lighting Global Response:**

Thank you for this suggestion. We have added the model number to the header of the Spec Sheet, directly under the product name.

**Comment 3:**

*The respondent recommends adding information on the Spec Sheet to give credit to systems that have constant current or equivalent drivers and therefore maintain a constant light output for a significant proportion of their full-battery run time. They suggest adding a statement to the Spec Sheet such as the following: “Proportion of run time for which the light output is greater than 95% of the initial, stabilized output is x%”.*

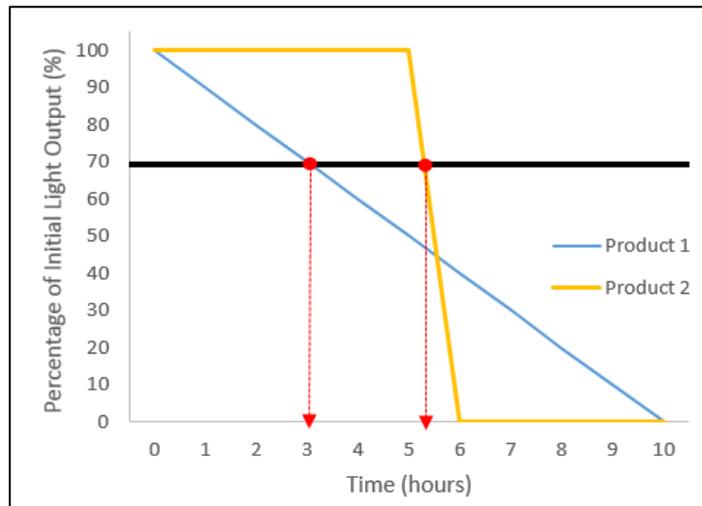
**Lighting Global Response:**

This is an interesting suggestion. However, we do not plan to include any additional information regarding the stability of the light output during the run time. For Lighting Global, the full-battery run time is defined as the time until the light output is 70% of the initial, stabilized output. The choice to use 70% of the initial light output as a cut-off for determining the full-battery run time aligns with research that suggests observers begin to detect a difference in light level with reductions between 15% to 30% of initial light output, and reductions of up to 30% are typically considered acceptable to the user.<sup>1</sup>

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<sup>1</sup> LED Life for General Lighting: Recommendations for the Definition and Specification of Useful Life for Light-emitting Diode Light Sources. ASSIST recommends . . . , Volume 1, Issue 7. Alliance for Solid-State Illumination

Further, this definition of the full-battery run time gives credit to products that maintain a consistent light output over their run time by resulting in a longer measured full-battery run time. Products with light output that quickly falls below 70% of the initial output will have an unexpectedly short reported run time. Figure 1 illustrates this point. In this diagram, hypothetical Product 1 and Product 2 have the same initial light output, same size battery, and provide approximately the same amount of lumen-hours of light; however, the light output of Product 2 is regulated to maintain a consistent light output over the run time. Because of this design, the reported full battery run time of Product 2 is longer (approximately 5.5 hours) than that of Product 1 (approximately 3 hours).



**Figure 2. Comparison of a product with an rapidly declining light output (Product 1) and a product with a light output that maintains a consistent light output over the run time (Product 2)**

In fact, we do still see some products with light output that declines rapidly during the run time; in many cases those manufacturers have redesigned their products to provide a more stable light output after receiving results with a short full battery run time due to the 70% cut-off.

**Comment 4:**

*Will the statement of "Available daily electrical energy" be modified to take into account excess energy that may be available during the day?*

**Lighting Global Response:**

Currently, the estimate of "Available daily electrical energy" as calculated according to the model in IEC/TS 62257-9-5, accounts for the excess energy

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Systems and Technologies (ASSIST), 2006.  
<https://www.lrc.rpi.edu/programs/solidstate/assist/recommends/ledlife.asp>

available during the day in cases where the product fully charges during the day and cuts off charging early. However, it does not account for excess available energy in the case of products where the charging rate for the main battery is purposefully limited to protect the battery, but the PV module provides sufficient power to simultaneously charge additional appliances as well.

Unfortunately, because the issue in the model is in the IEC/TS 62257-9-5 test methods, it likely will not be corrected for at least another year. We will work to address this in the next revision of the test methods (ed. 5), but for now, the Spec Sheets will continue to use the existing calculations to estimate and report the "Available daily electrical energy". When applicable, we will include the qualitative statement under the Wh/day rating that says, "Additional energy may be available for daytime use of appliances."