

**CRITERIA FOR AWARDING THE ENERGY SAVING PROCEL SEAL
TO INTEGRAL LED LAMPS**
(DOCUMENT COMPLEMENTARY TO THE REGULATION FOR AWARDING
THE ENERGY SAVING PROCEL SEAL)

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PFD – DEPARTMENT OF ENERGY EFFICIENCY DEVELOPMENT



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1 Introduction

This document is complementary to the “Regulation for Awarding the Energy Saving Procel Seal”. Its goal is to define the criteria that must be met by **integral LED lamps**, or simply LED lamps, in order to earn the Energy Saving Procel Seal.

2 Scope

This document applies to integral LED lamp, defined as a lamp with LEDs and an integrated LED driver, forming a single piece, not detachable, designed for operating on distribution networks of AC 60 Hz, for nominal voltage of 127 V and/or 220 V, or voltage ranges covering these values, or on DC networks, with protection against electrical surges, input voltage up to 250 V, with the following characteristics:

- Nominal wattage up to 60 W;
- Nominal voltage higher than 50 V and up to 250 V (AC) with lamp bases according to ABNT NBR IEC 62560:2013 (B15d, B22d, E11, E12, E14, E17, E27, G5, G9, G13, GU10, GZ10);
- Nominal voltage up to 50 V (DC or AC) with bases: G4, GU4, GY4, GX5.3, GU5.3, G6.35, GY6.35, G53, GU7, G5, G5.3 e G13; and
- Dimensions according to NBR IEC 60081, G5 and G13 bases and maximum length of 1200 mm, in the case of tubular LED lamps (LED tube), which replace the tubular fluorescent lamps.

NOTE: Integral LED lamps with the following characteristics are excluded from this document:

- Lamps with colored LED, with colored lenses, which emit colored light;
- LED RGB decorative lamps that have colorful housing and emit colored light;
- Integral LED lamps that intentionally produce colored light;
- OLED lamps (Organic Light Emitting Diode).

3 Criteria for awarding the Procel Seal

In order to earn the Procel Seal, the model shall simultaneously meet the following criteria:

3.1 Quality Technical Regulation (RTQ)

To be awarded with the Procel Seal, LED lamps must meet the requirements of the Quality Technical Regulation (RTQ) for integral LED lamps, as established by the Inmetro Ordinance N. 389, of 25/08/2014.

3.2 Electric power of the lamp

The measured electric power of each sample individually tested shall not exceed the electric power declared by the supplier in more than 10%.

Considering:

Measured electric power: is the value of the power, in watts, measured at the end of the lamp stabilization time.

Declared power: is the value of the power, in watts, indicated on the packaging by the supplier.

3.3 Luminous flux

The initial luminous flux of each sample individually tested shall not be less than 90% of the nominal luminous flux declared by the supplier.

Considering:

Initial luminous flux: is the value of the luminous flux, in lumens, measured at the end of the lamp stabilization time.

Declared luminous flux: is the value of the flux, in lumens, indicated by the supplier.

3.4 Energy efficiency

LED lamps shall present a measured and declared energy efficiency value of at least 80lm/W. The LED tube lamps shall meet the minimum values established in Table 1.

Considering:

Measured energy efficiency: is determined by the ratio between the value of the average initial luminous fluxes of 10 (ten) tested lamps by the value of the average measured electric powers.

Declared energy efficiency: is determined by the ratio between the luminous flux value declared on the packaging and the electric power declared on the packaging.

Table 1 - Minimum values of efficiency for LED tube lamps

Nominal length of LED tube lamp (mm)	Base type	Initial minimum efficiency in lm/W (measured and declared)
550-1,150	G5	105
600-1,200	G13	90

Multi-voltage lamps shall meet the minimum efficiency values at the nominal operating voltages of 127V and 220V.

3.5 Power factor

The power factor is obtained by the arithmetic mean of the power factor measured at the end of the stabilization time of 10 (ten) tested lamps.

The measured power factor of each lamp shall not differ by -0.05 from the declared value and no sample can present a measured power factor lower than 0.92.

NOTE: The power factor shall be measured by power analyzer equipment without the use of filters.

3.6 Nominal rated life

The nominal rated life indicated by the supplier shall be at least 25,000 h with the maintenance of at least 70% of the initial luminous flux (L70).

4 Warranty

The supplier company shall guarantee its product to be free from manufacturing defects by exchanging the defective product upon presentation of the invoice by the consumer, within a period not less than 03 (three) years after invoice issuance.

5 Results confirmation

The supplier, for all tested models, shall demonstrate, through the presentation of performance and electrical safety reports, that the products meet the requirements

established in item 3. The test reports shall be prepared by one of the labs listed by Procel (www.procelinfo.com.br).

After finishing the tests, the supplier shall send to Eletrobras/ Procel the test reports and the Technical Specifications Worksheet (Annex A). The submission may be made by email (procel@eletrobras.com).

6 Re-evaluation of the product characteristics

In order to continue making use of the Seal in their models, the suppliers shall ensure that such models keep meeting the criteria required in item 3 of this document.

This way, if requested, the suppliers shall demonstrate annually, as described in item 5 of this document, that the criteria required for awarding the Procel Seal are still being met by their models; for this, the following sampling will be adopted: 1 model chosen at each 5 per family (for families with up to 5 models, one model will be selected and tested; for families with 6 to 10 models, 2 different models will be selected and tested, and so on successively for a number of models larger than 10).

Annex A – TECHNICAL SPECIFICATIONS WORKSHEET

FAMILY DEFINITION					
FAMILY (*)	SUPPLIER	BRAND	RATED VOLTAGE (V)	LED TECHNOLOGY	RATED LIFE

(*) Commercial designation

DEFINITION OF MODELS										
MODEL	BAR CODE	POWER (W)	LUMINOUS FLUX (lm)	EE (lm/W) (**)	CRI	CCT (***)	EQUIVALENT INCANDESCENT LAMP (W)	NO. PERFORMANCE TEST REPORT	NO. SAFETY TEST REPORT	NO. CERTIFICATE LM-80

(**) Energy efficiency

(***) Correlated color temperature

DATE	SIGNATURE OF THE SUPPLIER	SIGNATURE AND STAMP OF THE LAB SUPERVISOR
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