



## IMPLEMENTING GUIDELINES OF THE PHILIPPINE ENERGY LABELING PROGRAM FOR LIGHTING PRODUCTS

Pursuant to Section 9 of Department Circular No. 2020-06-0015, entitled "Prescribing the Guidelines of the Philippine Energy Labeling Program (PELP) for Compliance of Importers, Manufacturers, Distributors and Dealers of Electrical Appliances and Other Energy-Consuming Products (ECP)", the Implementing Guidelines for Self-Ballasted Compact Fluorescent Lamps (CFL), Linear Fluorescent Lamps (LFL) or Double-Capped Fluorescent Lamps (DFL), Single-Capped Fluorescent Lamps (SFL), Lamp Ballasts (BAL), Light Emitting Diodes (LED) Lamps including the Particular Product Requirements (PPR) and Code of Practice (COPE) are hereby issued for the information and guidance of all those concerned and for compliance by all manufacturers, importers, distributors, dealers and other key stakeholders.

### 1. General Particular Product Requirement for Lighting Products

#### 1.1 Definition of Terms

For the purpose of this PPR, the following definitions shall apply:

**Applicants** - refers to Manufacturers / Importers / Distributors / Dealers.

**Ballast** - a device that provide constant voltage for start-up and maintains constant current to the lamp during operation.

**Ballast Efficacy Factor (BEF)** - is the ratio of ballast factor to ballast input power (watts) in terms of percentage.

**Ballast factor** - is the ratio of the light output of a lamp or lamps operated by specific ballast to the light output of the same lamps operated by a reference ballast.

**Color Rendering Index (CRI)** - refers to the measure of how similar object colors appear under one light source as compared to the object color under a reference light source (usually an incandescent light or daylight).

**Chromaticity tolerance** - refers to the allowable deviation in light's color to ensure that the light from an LED product does not have an unacceptable pink or green tint.

**Double-capped fluorescent lamp (DFL)** - fluorescent lamp having two separate caps and mostly of tubular form and linear shape. Also known as Linear Fluorescent Lamps.

**Double-Capped Linear LED Lamp** - a tubular *LED lamp which can be used as a replacement for double capped fluorescent lamps without requiring any internal modification in the luminaire and which, after installation, maintains the same level of safety of the replaced lamp in the luminaire.*

**Early failure rate (maximum)** - refers to the percentage of lamps that fail at a specified point in time.



**Efficacy** - refers to the ratio of claimed light output to claimed lamp power in terms of lumen per watt.

**Endurance test** - refers to the requirement that a solid-state lighting product is rapidly switched on and off to simulate how a product will be used over its lifetime.

**Energy Efficiency Performance Rating (EEPR)** - product's star rating which is based on the ranges of efficacy in lumens per watt which is stated on the energy label.

**Energy Efficiency Performance Rating (EEPR) of Ballast** - a product's rating which is based on the computed BEF.

**Energy Efficiency Rating for Ballast** - refers to a product's rating on its ballast efficacy factor based on the claimed as a percentage per watt (lm/w).

**Energy Efficiency Rating** - refers to a product's rating on its efficacy based on the claimed lumens per watt (lm/w) for lighting.

**General Lighting Service Lamps** - refers to lamps used to satisfy lighting applications traditionally served by general service incandescent lamps.

**Intensified Market Sample** - refers to the 2<sup>nd</sup> and 3<sup>rd</sup> batch of samples and is drawn when the 1<sup>st</sup> batch failed the Verification testing.

**Light Source** - refers to a surface or object emitting light

**Luminous flux maintenance** - refers to the percentage of a lighting product's measured luminous flux after a period of time compared to that light product's luminous flux at the first start of operation.

**Minimum rated lamp lifetime** - refers to the amount of time that it takes for 50% of a statistically significant number of samples to fail.

**Model** - all units within the manufacturers or importers product line which are identical except for serial number and/or other identifying marks.

*Note: Any variation from the base models shall have no effect on the performance and energy efficiency.*

**Routine Market Sample** - refers to the 1<sup>st</sup> batch of samples to be drawn during verification activities.

**Self-ballasted Lamp** - lamps with integral ballast which cannot be dismantled or replaced.

**Self-Ballasted Non-directional LED lamp** - refers to LED lamp with E27 and E14 base intended as replacement for all general lighting service lamps of the same base and similar light distribution.

**Single-Capped Fluorescent Lamp (SFL)** - Circular fluorescent lamp without integral ballast.



## 1.2 Product Verification Testing

- 1.2.1 Selected models for local market sampling shall be tested by Department of Energy - Lighting and Appliances Testing Division (DOE-LATD) or a DOE-recognized testing laboratory.
- 1.2.2 The DOE-LATD or DOE-recognized testing laboratory shall subject the lamp market sample to complete testing up to the claimed life (initial report, lumen maintenance and life test report) of the product and the results shall be submitted to DOE-EPRED.
- 1.2.3 In cases where market sample fails the PPR requirements, 2<sup>nd</sup> and 3<sup>rd</sup> batches shall be drawn and must pass the performance verification.

## 1.3 Presentation of Results

- 1.3.1 Power must be in whole number, rounded to the nearest ones.  
*Note: For power rating with single decimal digit such as 2.5, 3.5, and etc., power shall be rounded off to the nearest single significant figure after the decimal point following the rule of rounding numbers.*
- 1.3.2 Light output must be in whole number, rounded to the nearest tens.
- 1.3.3 Efficacy must be in whole number, rounded to the nearest ones computed from the claimed rating.
- 1.3.4 For Lamp ballast:
  - 1.3.4.1 Ballast Factor must be in two decimal places.
  - 1.3.4.2 Ballast Efficacy Factor must be in two decimal places computed from the claimed rating.

## 1.4 EEPR Requirements:

- 1.4.1 The Lamp models should pass the MEPP requirements prior to issuance of energy label.
- 1.4.2 Claimed efficacy must be consistent with the EEPR and the lamp rating.
- 1.4.3 Basis of EEPR must come from the test report.
- 1.4.4 Applicant should declare the phosphor coating of their SFL and DFL.
- 1.4.5 For Lamp ballast:
  - 1.4.5.1 All ballasts shall comply with the reference standard in supply current, circuit power factor, lamp power and current, crest factor, total circuit power and ballast factor (electric ballast)

## 1.5 Correction of Performance Ratings

- 1.5.1 Applicant has the option to downgrade/upgrade the claimed ratings to comply with the requirements of this PPR based on the result of the first market sample test.

1.5.2 New claims shall conform to the tolerances specified in the reference standard.

## 2. Specific Particular Product Requirement for Lighting Products

The PPR provides the requirements for CFL, LFL or DFL, SFL, BAL, LED and other relevant information.

### 2.1 Self-Ballasted Compact Fluorescent Lamps (CFL)

#### 2.1.1 Scope

This PPR specifies the energy efficiency and labeling requirements for self-ballasted compact fluorescent lamps for domestic and similar general lighting source, having a claimed wattage of 3 watts to 60 watts and rated voltage of 100 V to 250 V, 60 Hz with Edison screw cap particularly E14 and E27.

#### 2.1.2 Normative Reference

**PNS IEC 6096** - Self-ballasted compact fluorescent lamps for general lighting service: Performance requirements

**CIE 84 1<sup>st</sup> edition 1989** - The Measurement of Luminous Flux.

**CIE 13.3 - 1995** - Method of Measuring and Specifying Colour Rendering Properties of Light Source

**PNS 2050-2** - Lamps and related equipment- Energy Efficiency and labelling requirements- Part 2: Self-ballasted lamps for general lighting services

Considering the regular updating of standards, the latest edition of the PNS shall be used as reference. It is understood that future amendments of the PNS indicated in this PPR shall be applied after its promulgation. A transition period of one (1) year shall be provided to give ample time to all stakeholders to adjust and conform to the new requirements, if any.

#### 2.1.3 Sampling Method for Verification Testing

2.1.3.1 Number of models to be drawn from the market at least once a year for performance verification shall be in accordance with Table 1 shown below:

**Table 1: Routine Market Sampling Guide**

Total no. of models	No. of models to be drawn
1 to 14	1
15 to 24	2
25 to 34	3
35 to 44	4
above 45	5

2.1.3.2 Twenty-three (23) pieces per model per brand shall be randomly picked to represent the whole market population for performance verification.

2.1.3.3 Conformance to requirements for various case conditions, conformance shall be evaluated according to the cases shown below:

**Table 2: Conformance Requirements for Market Samples**

Case Condition	1 <sup>st</sup> Batch	2 <sup>nd</sup> Batch	3 <sup>rd</sup> Batch	Conformance
Case 1	Passed	Not Required	Not Required	Passed
Case 2	Failed	Passed	Passed	Passed
Case 3	Failed	Failed	Not Required	Failed
Case 4	Failed	Passed	Failed	Failed

In case of failure of the 1<sup>st</sup> batch, forty-six (46) samples will be taken from the market to represent the 2<sup>nd</sup> and 3<sup>rd</sup> batch, which will be subjected to testing.

- 2.1.3.4** Models that were not covered in the sampling stated in Section 2.1.3.1 shall be scheduled for sampling in the succeeding verification activities.
- 2.1.3.5** The DOE shall draw additional batch samples of the remaining models of a particular brand, according to Table 3 shown below, if found that the initial sampled models failed the verification test in Section 2.1.3.1 and conformance requirements in Section 2.1.3.3.

**Table 3: Intensified Market Sampling Guide**

Total no. of models	No. of models drawn during initial sampling	Failed verification test	No. of models for resampling
1 to 14	1	1	2
15 to 24	2	1	4
25 to 34	3	2	6
35 to 44	4	2	8
above 44	5	3	10

#### **2.1.4 Minimum Energy Performance**

All CFLs must pass the performance requirements of the latest edition PNS IEC 60969 including the following:

- 2.1.4.1** The efficacy of the lamp shall not be less than the value stated in Table 4a.
- 2.1.4.2** The minimum initial luminous efficacy of an encapsulated lamp model (lamp model with an integral cover) shall not be less than 85% of the requirements indicated in Table 4a, rounded off to the nearest whole number.

**Table 4a: Minimum initial Luminous Efficacy of a Bare lamp**

Input power of lamp (W)	Initial Luminous Efficacy (lm/W)	
	Correlated Color Temperature (CCT)	
	≤ 4000K	>4000K
3 to < 5	45	41
≥ 5 to < 9	50	46
≥ 9 to < 15	55	52
≥ 15 to < 25	60	57
≥ 25 to 60	65	62

**Table 4b: Minimum initial Luminous Efficacy of Encapsulated lamp**

Input power of lamp (W)	Initial Luminous Efficacy (lm/W)	
	Correlated Color Temperature (CCT)	
	≤ 4000K	>4000K
3 to < 5	38	35
≥ 5 to < 9	43	39
≥ 9 to < 15	47	44
≥ 15 to < 25	51	48
≥ 25 to 60	55	53

- 2.1.4.3** The rated average life of lamps should not be less than 6,000 hours. Minimum number of samples aged to reach the rated average life is 10. For rated average life above 6,000 hours, lamps shall be subjected to life testing and must reach the claimed average life, otherwise subject for rated life re-rating.
- 2.1.4.4** Mean measured value of the initial power shall not differ by +/-15% of rated value. Minimum sample size is 20 pieces aged for 100 hours.
- 2.1.4.5** All samples shall measure equal to or greater than the rated displacement (or power factor) factor value minus 0.05. Minimum sample size is 20 pieces, aged for 100 hours.
- 2.1.4.6** Mean measured value of the initial luminous flux shall be greater than or equal to 90% of rated value, and all samples shall measure greater than or equal to 85% of rated value. Minimum sample size is 20 pieces aged for 100 hours.
- 2.1.4.7** Chromaticity coordinates of at least 90% of the samples shall measure less than or equal to 5 SDCM (standard deviation of color matching) from the rated value. Minimum sample size is 20 pieces, aged for 100 hours.
- 2.1.4.8** All samples shall measure equal to or greater than the rated CRI value minus 3. Minimum sample size is 20 pieces, aged for 100 hours.
- 2.1.4.9** Lumen maintenance mean measured value(s) shall be equal to or greater than 80%. Minimum sample size is 20 pieces, aged for 2,000 hours.

**Note:**

1. All photometric tests/requirements are on a per batch basis and the computation shall use the mean/average value.
2. For batch sampling, the requirements pertain to the average measured values of n-samples.



2.1.5 Energy Efficiency Performance Rating (EEPR) of self-ballasted compact fluorescent lamps shall be in accordance with Tables 5a and 5b.

**Table 5a: Required EEPR for Bare lamp**

Input power of lamp (W)	Initial luminous efficacy (lm/W)			
	Correlated color temperature (CCT)			
	≤ 4000K	Classification	>4000K	Classification
3 to < 5	45	One-Star	41	One-Star
	46	Two-Star	42	Two-Star
	47	Three-Star	43	Three-Star
	48	Four-Star	44	Four-Star
	≥ 49	Five-Star	≥ 45	Five-Star
≥ 5 to < 9	50	One-Star	46	One-Star
	51	Two-Star	47	Two-Star
	52	Three-Star	48	Three-Star
	53	Four-Star	49	Four-Star
	≥ 54	Five-Star	≥ 50	Five-Star
≥ 9 to < 15	55	One-Star	52	One-Star
	56	Two-Star	53	Two-Star
	57	Three-Star	54	Three-Star
	58	Four-Star	55	Four-Star
	≥ 59	Five-Star	≥ 56	Five-Star
≥ 15 to < 25	60	One-Star	57	One-Star
	61	Two-Star	58	Two-Star
	62	Three-Star	59	Three-Star
	63	Four-Star	60	Four-Star
	≥ 64	Five-Star	≥ 61	Five-Star
≥ 25 to 60	65	One-Star	62	One-Star
	66	Two-Star	63	Two-Star
	67	Three-Star	64	Three-Star
	68	Four-Star	65	Four-Star
	≥ 69	Five-Star	≥ 66	Five-Star

**Table 5b: Required EEPR for Encapsulated lamp**

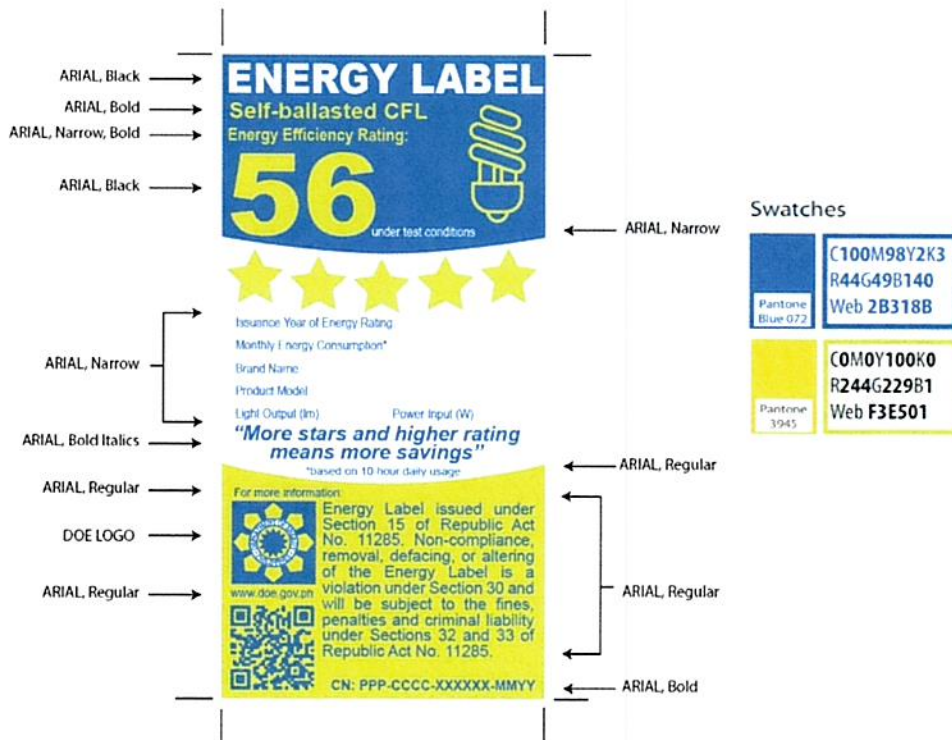
Input power of lamp (W)	Initial luminous efficacy (lm/W)			
	Correlated color temperature (CCT)			
	≤ 4000K	Classification	>4000K	Classification
3 to < 5	38	One-Star	35	One-Star
	39	Two-Star	36	Two-Star
	40	Three-Star	37	Three-Star
	41	Four-Star	38	Four-Star
	≥ 42	Five-Star	≥ 39	Five-Star
≥ 5 to < 9	43	One-Star	39	One-Star
	44	Two-Star	40	Two-Star
	45	Three-Star	41	Three-Star

	46	Four-Star	42	Four-Star
	≥ 47	Five-Star	≥ 43	Five-Star
≥ 9 to < 15	47	One-Star	44	One-Star
	48	Two-Star	45	Two-Star
	49	Three-Star	46	Three-Star
	50	Four-Star	47	Four-Star
	≥ 51	Five-Star	≥ 48	Five-Star
≥ 15 to < 25	51	One-Star	48	One-Star
	52	Two-Star	49	Two-Star
	53	Three-Star	50	Three-Star
	54	Four-Star	51	Four-Star
	≥ 55	Five-Star	≥ 52	Five-Star
≥ 25 to 60	55	One-Star	53	One-Star
	56	Two-Star	54	Two-Star
	57	Three-Star	55	Three-Star
	58	Four-Star	56	Four-Star
	≥ 59	Five-Star	≥ 57	Five-Star

### 2.1.6 Specifications and Dimensions of the Energy Label

**2.1.6.1** Applicants shall use one side panel of the packaging for the energy label. The dimension shall not be less than 4 cm (width) x 10 cm (height). If the size of the side panel is less than 4 cm x 10 cm, the energy label shall be resized to cover the entire side panel maintaining same aspect ratio.

**2.1.6.2** The size of the energy label may vary according to the size of the side panel maintaining the same aspect ratio. The energy label provided by the DOE in electronic copy is ready for resizing but be sure to always maintain the aspect ratio for the desired size.





## 2.1.7 Presentation of Energy Label



## 2.2 Linear Fluorescent Lamps (LFL) or Double Capped Fluorescent Lamps (DFL)

### 2.2.1 Scope

This PPR specifies the energy efficiency and labeling requirements for double-capped fluorescent lamps for general lighting sources.

### 2.2.2 Normative Reference

**PNS IEC 60081** - Double-capped fluorescent lamps – Performance specifications

**PNS 2050-1-1** - Lamps and related equipment – Energy efficiency and labelling requirements Part 1-1: Double-capped fluorescent lamp

Considering the regular updating of standards, the latest edition of the PNS shall be used as reference. It is understood that future amendments of the PNS indicated in this PPR shall be applied after its promulgation. A transition period of one (1) year shall be provided to give ample time to all stakeholders to adjust and conform to the new requirements, if any.

### 2.2.3 Sampling Method for Verification Testing

**2.2.3.1** Number of models to be drawn from the market at least once a year for performance verification shall be in accordance with Table 6 shown below:

**Table 6: Routine Market Sampling Guide**

Total No. of Models	No. of Models to be drawn
1-5	1
6-10	2
11-15	3
≥ 15	4

**2.2.3.2** Twelve (12) pieces will be randomly picked to represent the whole market population for performance verification.

2.2.3.3 Conformance shall be evaluated according to the cases shown below:

**Table 7: Conformance Requirements for Market Samples**

Case Condition	1 <sup>st</sup> Batch	2 <sup>nd</sup> Batch	3 <sup>rd</sup> Batch	Conformance
Case 1	Passed	Not Required	Not Required	Passed
Case 2	Failed	Passed	Passed	Passed
Case 3	Failed	Failed	Not Required	Failed
Case 4	Failed	Passed	Failed	Failed

In case of failure of the 1<sup>st</sup> batch, twenty-four (24) samples will be taken from the market to represent the 2<sup>nd</sup> and 3<sup>rd</sup> batch, which will be subjected to testing.

2.2.3.4 Models that were not covered in the sampling stated in Section 2.2.3.1 shall be scheduled for sampling in the succeeding verification activities.

2.2.3.5 The DOE shall draw additional batch samples of the remaining models of a particular brand, according to Table 8 shown below, if found that the initial sampled models failed the verification test in Section 2.2.3.1 and conformance requirements in Section 2.2.3.3.

**Table 8: Intensified Market Sampling Guide**

Total No. of Models	No. of models drawn during initial sampling	Failed verification test	No. of models for resampling
1 -5	1	1	2
6-10	2	1	2
11-15	3	2	4
≥ 15	4	2	4

## 2.2.4 Minimum Energy Performance

All DFLs must pass the performance requirements including the following:

2.2.4.1 The efficacy of the lamp shall not be less than the value stated in applicable table (Table 9a, table 9b, or table 9c) stating minimum efficacy for each type of lamp below.

**Table 9a: Required minimum Efficacy of LFL or DFL (Halophosphate)**

Input power of lamp (W)	Initial luminous efficacy (lm/W)	
	Correlated color temperature (CCT)	
	≤ 4000K	>4000K
≥ 10 to < 21	60	55
≥ 22 to < 35	65	60
≥ 36 to < 65	70	65

**Table 9b: Required minimum Efficacy of LFL or DFL (Triphosphor)**

Input power of lamp (W)	Initial luminous efficacy (lm/W)	
	Correlated color temperature (CCT)	
	≤ 4000K	>4000K
≥ 14 to < 21	65	60
≥ 22 to < 35	75	70
≥ 36 to < 65	83	78

*Note: This table and requirements are not applicable to high-efficiency preheated cathode double-capped triphosphor T5 fluorescent lamps.*

**2.2.4.2** High-efficiency preheated cathode double-capped triphosphor T5 fluorescent lamps that adopt high frequency shall meet the luminous efficiency requirements specified in Table 9c.

**Table 9c: Required minimum Efficacy of LFL or DFL (Triphosphor T5)**

Input power of lamp (W)	Initial luminous efficacy (lm/W)	
	Correlated color temperature (CCT)	
	≤ 4000K	>4000K
≥ 14 to < 21	85	80
≥ 22 to < 35	95	91

**2.2.4.3** The rated average life of a halophosphate lamp shall not be less than 10,000 hours, while the rated average life of a triphosphor lamp shall not be less than 15,000 hours.

**2.2.4.4** The CRI of a halophosphate lamp shall not be less than 70 while the CRI of triphosphor lamp shall not be less than 80.

**2.2.4.5** Lamp and lamp packages shall comply with any local regulations regarding disclosure and disposal, including regulations regarding hazardous materials such as mercury.

**2.2.4.6** The measured initial value of the initial luminous flux shall be greater than or equal to 90% of the rated value, and all samples shall measure greater than or equal to 85% of rated value. Minimum sample is 10 pieces aged for 100 hours.

**2.2.4.7** Lumen maintenance measured shall be equal to or greater than 80%. Minimum sample is 10 pieces aged for 2,000 hours.

*Note:*

1. All photometric tests/requirements are on a per batch basis and the computation shall use the mean/average value.
2. For batch sampling, the requirements pertain to the average measured values of n-samples.

2.2.5 Energy Efficiency Performance Rating (EEPR) of All DFLs shall be classified according to its claimed Efficacy, as follows:

Table 10a: Required Star Rating for Halophosphate DFLs

Input power of lamp (W)	Initial luminous efficacy (lm/W)			
	Correlated Color Temperature (CCT)			
	≤ 4000K	Classification	>4000K	Classification
10 to 21	60	One-Star	55	One-Star
	61	Two-Star	56	Two-Star
	62	Three-Star	57	Three-Star
	63	Four-Star	58	Four-Star
	≥ 64	Five-Star	≥ 59	Five-Star
22 to 35	65	One-Star	60	One-Star
	66	Two-Star	61	Two-Star
	67	Three-Star	62	Three-Star
	68	Four-Star	63	Four-Star
	≥ 69	Five-Star	≥ 64	Five-Star
36 to 65	70	One-Star	65	One-Star
	71	Two-Star	66	Two-Star
	72	Three-Star	67	Three-Star
	73	Four-Star	68	Four-Star
	≥ 74	Five-Star	≥ 69	Five-Star

Table 10b: Required Star Rating for Triphosphor DFLs

Input power of lamp (W)	Initial luminous efficacy (lm/W)			
	Correlated Color Temperature (CCT)			
	≤ 4000K	Classification	>4000K	Classification
14 to 21	65	One-Star	60	One-Star
	66	Two-Star	61	Two-Star
	67	Three-Star	62	Three-Star
	68	Four-Star	63	Four-Star
	≥ 69	Five-Star	≥ 64	Five-Star
22 to 35	75	One-Star	70	One-Star
	76	Two-Star	71	Two-Star
	77	Three-Star	72	Three-Star
	78	Four-Star	73	Four-Star
	≥ 79	Five-Star	≥ 74	Five-Star
36 to 65	83	One-Star	78	One-Star
	84	Two-Star	79	Two-Star
	85	Three-Star	80	Three-Star
	86	Four-Star	81	Four-Star
	≥ 87	Five-Star	≥ 82	Five-Star

**Table 10c: Required Star Rating for Triphosphor T5 fluorescent lamps**

Input power of lamp (W)	Initial luminous efficacy (lm/W)			
	Correlated Color Temperature (CCT)			
	≤ 4000K	Classification	>4000K	Classification
14 to 21	85	One-Star	80	One-Star
	86	Two-Star	81	Two-Star
	87	Three-Star	83	Three-Star
	88	Four-Star	84	Four-Star
	≥ 89	Five-Star	≥ 85	Five-Star
22 to 35	95	One-Star	91	One-Star
	96	Two-Star	92	Two-Star
	97	Three-Star	93	Three-Star
	98	Four-Star	94	Four-Star
	≥ 99	Five-Star	≥ 95	Five-Star

**2.2.6 Specifications and dimensions of the energy labels**

**2.2.6.1** Applicants shall use one side panel of the packaging for the energy labels label. The dimension shall not be less than 10 cm (length) x 2.5 cm (height). If the size of the side panel is less than 10 cm x 2.5 cm, the energy labels shall cover the entire side panel.

**2.2.6.2** The size of the energy label may vary according to the size of the side panel maintaining the same aspect ratio. The label provided by the DOE is ready for resizing but be sure to always maintain the aspect ratio for the desired size.



## 2.2.7 Presentation of Energy Label



## 2.3 Single-Capped Fluorescent Lamps (SFL)

### 2.3.1 Scope

This PPR specifies the energy efficiency and labelling requirements for Single-capped fluorescent lamps for general lighting sources.

### 2.3.2 Normative Reference

**PNS IEC 60901** - Single-capped fluorescent lamps- Performance specifications

**CIE 84 1<sup>st</sup> edition 1989** - the Measurement of Luminous Flux

**CIE 13.3-1995** - Method of Measuring and Specifying Colour Rendering Properties of Light Source.

**PNS 2050-1-2** - Lamps and related equipment – Energy efficiency and labeling requirements – Part 2: Single-capped fluorescent lamps for general lighting services

Considering the regular updating of standards, the latest edition of the PNS shall be used as reference. It is understood that future amendments of the PNS indicated in this PPR shall be applied after its promulgation. A transition



period of one (1) year shall be provided to give ample time to all stakeholders to adjust and conform to the new requirements, if any.

### 2.3.3 Sampling Method for Verification Testing

2.3.3.1 Number of models to be drawn from the market at least once a year for performance verification shall be in accordance with Table 11 shown below:

**Table 11: Routine Market Sampling Guide**

Total no. of models	No. of models to be drawn
1-5	1
6-10	2
11-15	3
≥ 15	4

2.3.3.2 Twelve (12) pieces per model / brand shall be randomly picked to represent the whole market population for performance verification.

2.3.3.3 Conformance shall be evaluated according to the cases shown below:

**Table 12: Conformance Requirements for Market Samples**

Case Condition	1 <sup>st</sup> Batch	2 <sup>nd</sup> Batch	3 <sup>rd</sup> Batch	Conformance
Case 1	Passed	Not Required	Not Required	Passed
Case 2	Failed	Passed	Passed	Passed
Case 3	Failed	Failed	Not Required	Failed
Case 4	Failed	Passed	Failed	Failed

In case of failure of the 1<sup>st</sup> batch, twenty-four (24) samples will be taken from the market to represent the 2<sup>nd</sup> and 3<sup>rd</sup> batch, which will be subjected to testing.

2.3.3.4 Models that were not covered in the sampling stated in Section 2.3.3.1 shall be scheduled for sampling in the succeeding verification activities.

2.3.3.5 The DOE shall draw additional batch samples of the remaining models of a particular brand, according to Table 13 shown below, if found that the initial sampled models failed the verification test in Section 2.3.3.1 and conformance requirements in Section 2.3.3.3.

**Table 13: Intensified Market Sampling Guide**

Total no. of models	No. of models drawn during initial sampling	Failed verification test	No. of models for resampling
1 -5	1	1	2
6-10	2	1	2
11-15	3	2	4
≥ 15	4	2	4



### 2.3.4 Minimum Energy Performance

All SFLs must pass the performance requirements including the following:

- 2.3.4.1 The efficacy of the lamp shall not be less than the value stated in applicable table (Table 14a, Table 14b,) stating minimum efficacy for each type of lamp below.

**Table 14a: Required minimum Efficacy of Halophosphate SFL**

Input power of lamp (W)	Initial luminous efficacy (lm/W)	
	Correlated color temperature (CCT)	
	≤ 4000K	>4000K
14 to 22	45	40
23 to 40	50	45
>40	55	50

**Table 14b: Required minimum Efficacy of Triphosphate SFL**

Input power of lamp (W)	Initial luminous efficacy (lm/W)	
	Correlated color temperature (CCT)	
	≤ 4000K	>4000K
14 to 22	55	50
23 to 40	60	55
>40	65	60

- 2.3.4.2 The average life of an SFL shall not be less than 10,000 hours.

- 2.3.4.3 The CRI of a halophosphate lamp shall not be less than 70, while the CRI of triphosphor lamp shall not be less than 80.

- 2.3.4.4 Lamp and lamp packages shall comply with any local regulations regarding disclosure and disposal, including regulations regarding hazardous materials such as mercury.

- 2.3.4.5 Lumen maintenance after 2,000 hours of operation including the ageing period shall not be less than 90%, and after 70% of its rated life, the lumen maintenance shall not be less than 75%.

Note:

1. All photometric tests/requirements are on a per batch basis and the computation shall use the mean/average value.
2. For batch sampling, the requirements pertain to the average measured values of n-samples.



2.3.5 All SFLs shall be classified according to its claimed Efficacy, as follows:

**Table 15a: Required EEPR for halophosphate SFL**

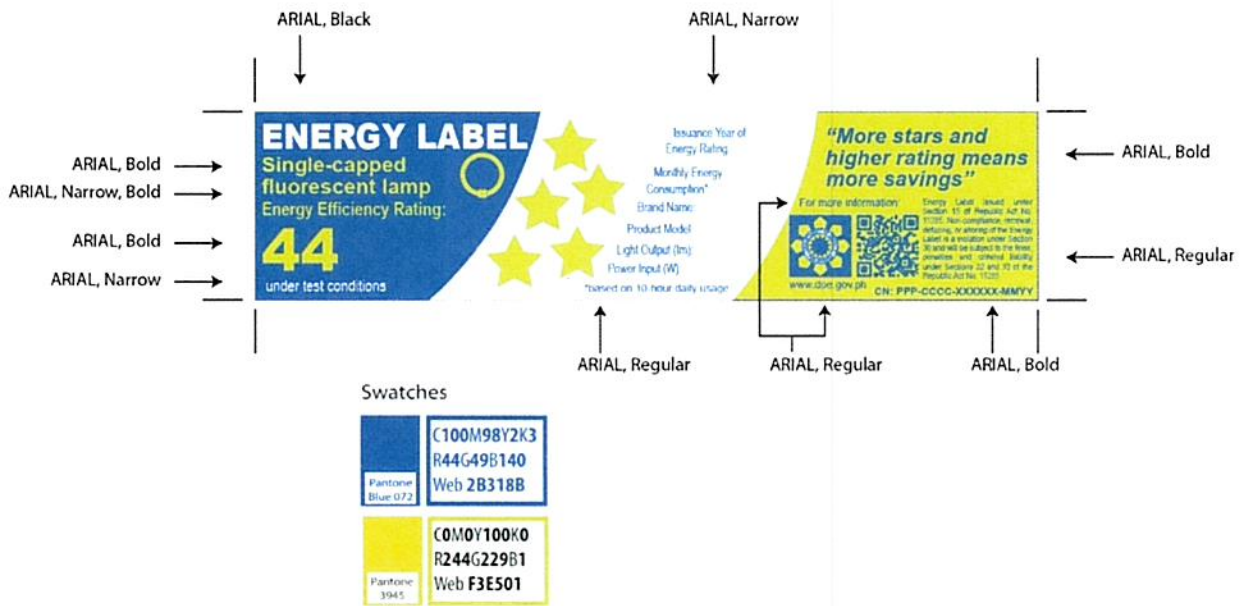
Input power of lamp (W)	Initial luminous efficacy (lm/W)			
	Correlated Color Temperature (CCT)			
	≤ 4000K	Classification	>4000K	Classification
14 to 22	45	One-Star	40	One-Star
	46	Two-Star	41	Two-Star
	47	Three-Star	42	Three-Star
	48	Four-Star	43	Four-Star
	≥ 49	Five-Star	≥ 44	Five-Star
23 to 40	50	One-Star	45	One-Star
	51	Two-Star	46	Two-Star
	52	Three-Star	47	Three-Star
	53	Four-Star	48	Four-Star
	≥ 54	Five-Star	≥ 49	Five-Star
>40	55	One-Star	50	One-Star
	56	Two-Star	51	Two-Star
	57	Three-Star	52	Three-Star
	58	Four-Star	53	Four-Star
	≥ 59	Five-Star	≥ 54	Five-Star

**Table 15b: Required EEPR for triphosphate SFL**

Input power of lamp (W)	Initial luminous efficacy (lm/W)			
	Correlated Color Temperature (CCT)			
	≤ 4000K	Classification	>4000K	Classification
14 to 22	55	One-Star	50	One-Star
	56	Two-Star	51	Two-Star
	57	Three-Star	52	Three-Star
	58	Four-Star	53	Four-Star
	≥ 59	Five-Star	≥ 54	Five-Star
23 to 40	60	One-Star	55	One-Star
	61	Two-Star	56	Two-Star
	62	Three-Star	57	Three-Star
	63	Four-Star	58	Four-Star
	≥ 64	Five-Star	≥ 59	Five-Star
>40	65	One-Star	60	One-Star
	66	Two-Star	61	Two-Star
	67	Three-Star	62	Three-Star
	68	Four-Star	63	Four-Star
	≥ 69	Five-Star	≥ 64	Five-Star

### 2.3.6 Specifications and Dimensions of the Energy Label

**2.3.6.1** Applicants shall use one side panel of the packaging for the energy label. The dimension shall not be less than 10 cm (length) x 2.5 cm (height). If the size of the side panel is less than 10 cm x 2.5 cm, the energy label shall cover the entire side panel. The size of the energy label may vary according to the size of the side panel maintaining the same aspect ratio. The label provided by the DOE is ready for resizing but be sure to always maintain the aspect ratio for the desired size.



### 2.3.7 Presentation of Energy Label



## 2.4 Lamp Ballasts (BAL)

### 2.4.1 Scope

This PPR specifies the energy efficiency and labeling requirements for all ballasts (electromagnetic and electronic up to two (2) lamps) for fluorescent lamps for general lighting sources sold separately or as part of the luminaire.

### 2.4.2 Normative Reference

**PNS IEC 60921-** Ballast for tubular fluorescent lamps

**PNS IEC 60929** - AC supplied electronic ballasts for tubular fluorescent lamps – Performance requirements

**PNS 2050-4** - Lamps and related equipment – Energy labelling requirements – Ballasts

Considering the regular updating of standards, the latest edition of the PNS shall be used as reference. It is understood that future amendments of the PNS indicated in this PPR shall be applied after its promulgation. A transition period of one (1) year shall be provided to give ample time to all stakeholders to adjust and conform to the new requirements, if any.

### 2.4.3 Sampling Method for Verification Testing

2.4.3.1 Number of models to be drawn from the market at least once a year for performance verification shall be in accordance with table shown below:

**Table 16: Routine Market Sampling Guide**

Total no. of models	No. of models to be drawn
1-5	1
6-10	2
11-15	3
≥ 15	4

2.4.3.2 Six (6) pieces will be randomly picked to represent the whole market population for performance verification.

2.4.3.3 Conformance shall be evaluated according to the cases shown below:

**Table 17: Conformance Requirement for Market Samples**

Case Condition	1 <sup>st</sup> Batch	2 <sup>nd</sup> Batch	3 <sup>rd</sup> Batch	Conformance
Case 1	Passed	Not Required	Not Required	Passed
Case 2	Failed	Passed	Passed	Passed
Case 3	Failed	Failed	Not Required	Failed
Case 4	Failed	Passed	Failed	Failed

In case of failure of the 1<sup>st</sup> batch, twelve (12) samples will be taken from the market to represent the 2<sup>nd</sup> and 3<sup>rd</sup> batch, which will be subjected to testing.

**2.4.3.4** Models that were not covered in the sampling stated in Section 2.4.3.1 shall be scheduled for sampling in the succeeding verification activities.

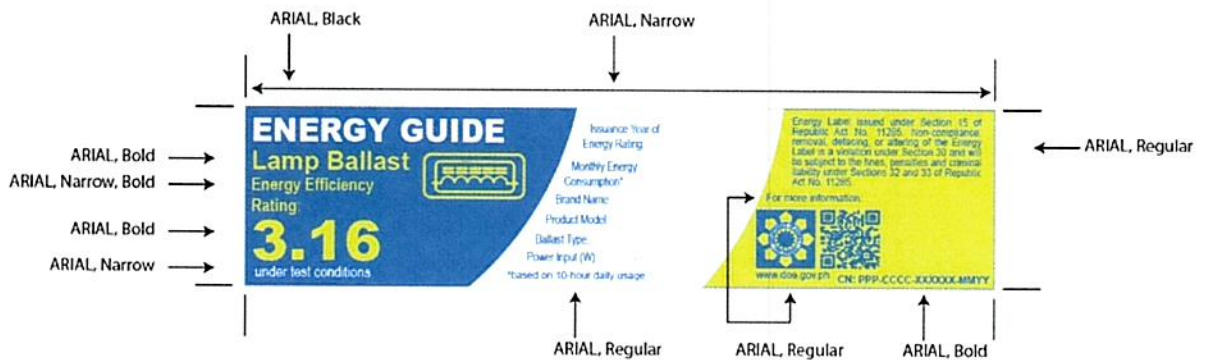
**2.4.3.5** The DOE shall draw additional batch samples of the remaining models of a particular brand, according to Table 18 shown below, if found that the initial sampled models failed the verification test in Section 2.4.3.1 and conformance requirements in Section 2.4.3.3.

**Table 18: Intensified Market Sampling Guide**

Total no. of models	No. of models drawn during initial sampling	Failed verification test	No. of models for resampling
1 -5	1	1	2
6-10	2	1	2
11-15	3	2	4
≥ 15	4	2	4

**2.4.4 Specifications and Dimensions of the Energy Label**

**2.4.5.1** Applicants shall use one side panel of the packaging for the energy label. The dimension shall not be less than 15 mm (height) x 45 mm (width). If the size of the side panel is less than 15 mm x 45 mm, the energy label shall cover the entire side panel.



**Swatches**



## 2.5 Light Emitting Diode (LED) Lamps

### 2.5.1 Scope

This PPR covers LED lamps, as described below:

#### 2.5.1.1 Self-Ballasted Non-Directional LED Lamps

Energy efficiency and labeling requirements of self-ballasted non-directional light emitting diodes (LED) for general lighting service available in the retail market with E27 and E14 base as replacement for all non-directional lamp shapes with the same base, having a rated wattage up to 60 watts and rated voltages of 50 to 250 VAC operating at 50/60 Hz.

#### 2.5.1.2 Double-Capped Linear LED Lamps

Energy efficiency and labeling requirements of double-capped linear LED lamps for general lighting service available in the retail market with (1) G5 and G13 caps, intended for replacing fluorescent tubes (as defined in IEC 60081) with the same caps (as defined in IEC 60081); or (2) caps - as listed in Annex A of IEC 60838-2-3 ED. 1.0 B: 2016 "Miscellaneous lampholders – Part 2-3: Particular requirements – Lampholders for double-capped linear LED lamps." as replacement for all linear fluorescent lamps at voltages of up to 230 VAC operating at 50/60 Hz.

Dimmable, changes correlated color temperature and/or color-changing are not covered in this PPR.

### 2.5.2 Normative Reference

For all the reference standards below the latest version shall be applicable.

**ANSI C78.377-2015** - American National Standard for Electric Lamps-Specifications for the Chromaticity of Solid-State Lighting Products

**CIE S 025/E:2015** - Test Method for LED Lamps, LED Luminaires and LED Modules

**CIE 13.3:1995** - Method of Measuring and Specifying Color Rendering Properties of Light Sources

**IES LM 79-08** - IES Approved Method for the Electrical and Photometric Measurements of Solid-State Lighting Products

**IES LM 80-15** - IES Approved Method for Measuring Lumen Maintenance of LED Light Sources

**PNS IEC 62612** - Self-ballasted LED Lamps for General Lighting Services with Supply Voltages >50V-Performance Requirements

**PNS IEC 61000-3-2** - Electromagnetic Compatibility – Part 2-3 – Limits for harmonic current emissions

**IEC-60838-2-3 ED. 1.0 B:2016** Miscellaneous lampholders – Part 2-3: Particular Requirements– Lampholders for double-capped linear LED lamps

Considering the regular updating of standards, the latest edition of the PNS shall be used as reference. It is understood that future amendments of the PNS indicated in this PPR shall be applied after its promulgation. A transition period of one (1) year shall be provided to give ample time to all stakeholders to adjust and conform to the new requirements, if any.

### 2.5.3 Sampling Method for Verification Testing

2.5.3.1 Number of models to be drawn from the market at least once a year for performance verification shall be in accordance with Table 19 shown below:

**Table 19: Routine Market Sampling Guide**

No. of models per brand	No. of models drawn during initial sampling	No. of models to pass for exemptions to Routine Market Sample
1 to 14	1	1
15 to 24	2	≥1
25 to 34	3	≥2
35 to 44	4	≥3
> 44	5	≥4

2.5.3.2 Thirty (30) pieces per model per brand shall be randomly picked to represent the whole market population for performance verification.

2.5.3.3 Conformance shall be evaluated according to the cases shown in Table 20:

**Table 20: Conformance Requirements for Market Samples**

Case Condition	1 <sup>st</sup> Batch	2 <sup>nd</sup> Batch	3 <sup>rd</sup> Batch	Conformance
Case 1	Passed	Not Required	Not Required	Passed
Case 2	Failed	Passed	Passed	Passed
Case 3	Failed	Passed	Failed	Failed

In case of failure of the 1<sup>st</sup> batch, sixty (60) samples will be taken from the market to represent the 2<sup>nd</sup> and 3<sup>rd</sup> batch, which will be subjected to testing.

2.5.3.4 Models that were not covered in the sampling stated in Section 2.5.3.1 shall be scheduled for sampling in the succeeding semesters.

2.5.3.5 The DOE shall draw additional batch samples of the remaining models of a particular brand, according to Table 21 shown below, if found that the initial sampled models failed the verification test in Section 2.5.3.1 and conformance requirements in Section 2.5.3.3.

**Table 21: Intensified Market Sampling Guide**

No. of models per brand	No. of models drawn during initial sampling	Failed verification test	No. of models for resampling
1 to 14	1	1	2
15 to 24	2	1	4
25 to 34	3	2	6
35 to 44	4	2	8
Above 44	5	3	10

**2.5.4 Performance Requirements for Self-Ballasted Non-Directional LED Lamps and Double-Capped Linear LED Lamps**

**Table 22. Performance Requirements**

Attribute	Requirement		Test Methods
	Non-Directional LED	Linear LED	
Minimum lamp luminous efficacy or Minimum Energy Performance (MEP)	80 lm/W	90 lm/W	PNS IEC 62612
<b>Life</b>			
Lumen Maintenance	An individual LED lamp is considered having passed the test when the measured luminous flux value at 25% of rated life (with a maximum duration of 6,000 h) shall never be less than 80% ( $L_{80}$ ) of the initial measurement.  In lieu of the 25% at 6,000h maximum, Annex G of the latest version of PNS IEC 62612 should be utilized.		IES LM 80 and PNS IEC 62612 (clause 11.2)
Endurance Test	<i>Supply Switching Test</i> At test voltage, the lamp shall be switched on and off for 30 s each. The cycling shall be repeated for a number <i>equal to half the rated life in hours</i> (example: 10 k cycles if rated life is 20,000 h).		PNS IEC 62612 (clause 11.3)
Minimum Rated Lamp Life and Failure Fraction at Rated Life, $F_y$	<b>Minimum Rated Lamp Life <math>\geq 15,000</math> h</b>  Given a sample of $n$ pieces of LED lamps, being subjected to 6,000 h (or 25% of rated life), it is deemed necessary to having passed the test, if at the end of the test, the number of failed units is smaller or equal to $F_{50}$ at $\geq 15,000$ h.  At $F_{50}$ , at least $n-2$ individual lamps shall have passed.		-  PNS IEC 62612 (clause 11)
<b>Color</b>			
Color Rendering Index (CRI or $R_a$ )	Ra $\geq$ 80		CIE 13.3-1995



<b>Chromaticity tolerance</b>	<b>Nominal CCT (K)</b>	<b>Target CCT and Tolerance (K)</b>	<b>Target Duv</b>	<b>Duv Tolerance Range</b>	ANSI C78.377-2015
	2200	2238 ± 102	0.0000	T <sub>x</sub> : CCT of the source	
	2500	2460 ± 120	0.0000		
	2700	2725 ± 145	0.0000		
	3000	3045 ± 175	0.0001	For T <sub>x</sub> < 2870K 0.000 ± 0.0060	
	3500	3465 ± 245	0.0005	For T <sub>x</sub> > 2870K D <sub>w</sub> (T <sub>x</sub> ) ± 0.0060	
	4000	3985 ± 275	0.0010		
	4500	4503 ± 243	0.0015		
	5000	5029 ± 283	0.0020		
	5700	5667 ± 355	0.0025		
6500	6532 ± 510	0.0031	where $D_w(T_x) = 57700 \times (1/T_x)^2 - 44.6 \times (1/T_x) + 0.00854$		
<b>Operation</b>					
<b>Power factor (PF)</b>	For <5W	PF ≥ 0.40		IEC 61000-3-2	
	For 5-25W	PF ≥ 0.50			
	For >25W	PF ≥ 0.90			
<b>Tolerances</b>					
<b>Total Luminous Flux, lm</b>	Measured value for individual lamps shall not be less than 90% of the rated value.  Average of measured value for a batch shall not be less than 92.5% of the rated value.				PNS IEC 62612
<b>Power, W</b>	Measured value for individual lamps shall be +/- 10% of the rated value.  Average of measured value for a batch shall be +/- 7.5% of the rated value.				

Note:

1. Product model/series with batches that have in the market prior to the implementation of PELP but have failed the Minimum Rated Lamp Life may also be applied for exemption and must satisfy the conditions indicated in PELP IG on Registration, Enforcement, Monitoring, Verification, and Compliance Mechanism C.6.

### 2.5.5 Energy Efficiency Performance Rating (EEPR)

The classification of LED lamps shall be in accordance with Table 23 shown below:

**Table 23: Energy Efficiency Performance Rating**

Classification	Lumen/watt	
	Self-Ballasted Non-Directional LED	Double-Capped Linear LED
One-Star	80-90	90-98
Two-Star	91-101	99-107
Three-Star	102-112	108-116
Four-Star	113-123	117-125
Five-Star	> 123	>125



## 2.5.6 Specifications and Dimensions of the Energy Label

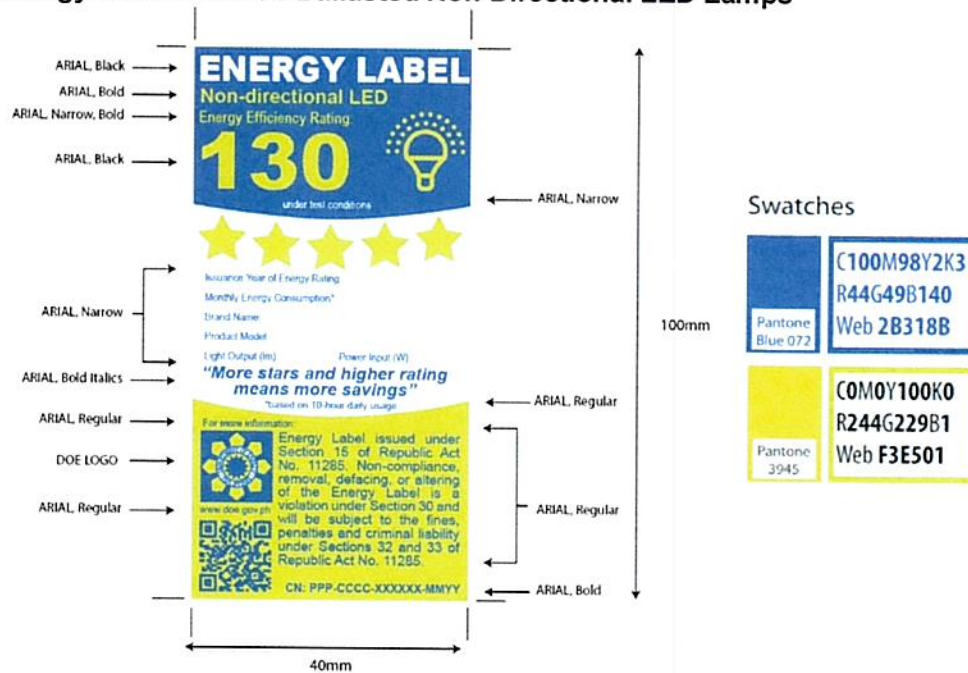
2.5.6.1 Applicants shall use one side panel of the packaging for the energy label. The dimension should be:

- 4 cm (width) x 10 cm (height) for self-ballasted non-directional LEDs
- 10.4 cm (width) x 2.5 cm (height) for double-capped linear LEDs

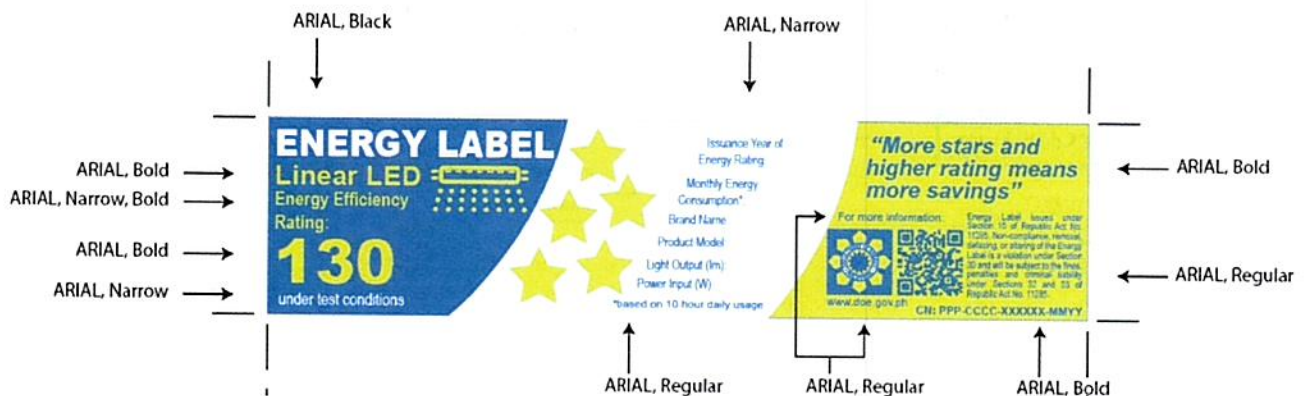
If the size of the side panel is less than the above dimensions, the energy label shall be resized to fit on the side panel maintaining same aspect ratio.

2.5.6.2 The size of the energy label may vary according to the size of the side panel maintaining the same aspect ratio. The energy label provided by the DOE in electronic copy is ready for resizing but be sure to always maintain the aspect ratio for the desired size.

### Energy Labels for Self-Ballasted Non-Directional LED Lamps



### Energy Labels for Double-Capped Linear LED Lamps



## 2.5.7 Presentation of Energy Label

### Energy Labels for Self-Ballasted Non-Directional LED Lamps



### Energy Labels for Double-Capped Linear LED Lamps



**3. Code of Practice on Energy Labeling of Products.** Pursuant to Section 15 of the EEC Act, the Code of Practice on Energy Labeling of Products (COPE) provides for the calculation methods of the following:

**3.1** The Energy Efficiency Performance Rating (EEPR) or the star rating shown in the DOE Energy Label is based on the Efficacy, which is calculated as follows:

For lighting:

$$\text{Efficacy} = \frac{\text{Lighting Output, in lumens}}{\text{Power Input, in watts}}$$

For ballast:

$$\text{Ballast Efficacy Factor} = \frac{\text{Ballast Factor (as a percentage)}}{\text{Power Input, in watts}}$$

Where:

**Efficacy** refers to the ratio of light output to power (lamp power) in terms of lumen per watt. Efficacy must be in whole number rounded to the nearest ones computed from the claimed rating.

**Lighting Output** must be in whole number rounded to the nearest tens.

**Power Input** must be in whole number rounded to the nearest ones.

**Ballast Factor** must be in two decimal places.

**Ballast Efficacy Factor** refers to the ratio of ballast factor (as a percentage) to power input (in watts). BEF must be in two decimal places computed from the claimed rating.

For the actual EEPR or Star-Rating equivalent, please refer to the following:

- 2.1.5 Self-Ballasted Compact Fluorescent Lamps
- 2.2.5 Double-Capped Fluorescent Lamps
- 2.3.5 Single-Capped Fluorescent Lamps
- 2.5.5 Light Emitting Diodes (LED) Lamps

The EEPR reflected on the DOE Energy Label shall correspond to the Efficacy value shown in the product test report during product registration. The EEPR shall be adjusted accordingly (as needed) once the product has undergone verification testing.

**3.2** For the estimation of **monthly energy kWh consumption** (based on a specified hour of daily usage), as shown in the DOE Energy Label, the calculation is as follows:

$$\text{Monthly kWh Consumption} = \text{Power Input} \times \text{Daily Operating Hours} \times 30$$



Where:

**Power Input** is the determined electrical power required by the equipment to operate normally and is expressed in kilowatts (kW). This corresponds to the value declared by the applicant during product registration.

**Operating Hours** is the assumed length of time that the equipment is operated in a day and is expressed in hours. With regards to the DOE Energy Label, this parameter is assumed to be 10 hours.

**3.3** For the estimation of **monthly electricity cost**, the calculation is as follows:

$$\text{Monthly Electricity Cost} = \text{Monthly kWh Consumption} \times \text{Electricity Price}$$

Where:

**Electricity Price** is the prevailing peso per kWh, as indicated in the electricity bill issued by an electric power distribution company.

**3.4** For the estimation of **monthly Greenhouse Gas (GHG) emission** due to monthly electricity consumption, the calculation is as follows:

$$\text{Monthly GHG emission} = \text{Monthly kWh Consumption} \times \text{Emission Factor}$$

Where:

**Emission Factor** is the Simple Operating Margin (OM) Emission Factor derived using the power grid statistics and is available in the DOE Website. The unit of the calculated GHG emission shall be in kg CO<sub>2</sub>.

**4. Lighting Product Registration.** Only registered companies can proceed to the per-model PELP Online Product Registration applicable to both manufactured and imported institutional products using the Product Registration Form – Lighting Source/Lamp and Lamp Ballast, as shown below and is available online.

**Product Registration Form – Lamp Ballast**

Type	<input type="checkbox"/> Magnetic <input type="checkbox"/> Electronic
Brand Name	
Model Number/Code	
Year Model	
Country of Origin	
Original Equipment Manufacturer	
Power Input (W)	
Ballast Efficacy Factor (BEF)	
Testing Facility Qualification (as applicable)	<input type="checkbox"/> Company-owned Lab <input type="checkbox"/> 3 <sup>rd</sup> Party Lab <input type="checkbox"/> ILAC / APLAC Signatory <input type="checkbox"/> MRA Signatory - please specify _____ <input type="checkbox"/> PAB Accredited <input type="checkbox"/> ISO 17025 Accredited <input type="checkbox"/> PS-Licensed (acceptable only within the first 12 months of the effectivity of the IG)
Other Parameters	

### Product Registration Form – Lighting Source/ Lamp

Type	<input type="checkbox"/> Compact Fluorescent Lamp (CFL) <input type="checkbox"/> Double-Capped Fluorescent Lamp (DFL or LFL) <input type="checkbox"/> Single-Capped Fluorescent Lamp (SFL) <input type="checkbox"/> Light Emitting Diode (LED) Lamps
Brand Name	
Model Number/Code	
Year Model	
Country of Origin	
Original Equipment Manufacturer	
Light Output (lm)	
Wattage (W)	
Efficacy (lm/W)	
Rated Lamp Life (h)	
Phosphor Coating	
Correlated Color Temperature (CCT)	
Color Rendering Index (CRI)	
Dimensions (mm)	
Supplier Frequency (Hz)	
Energy Efficiency Performance Rating (EEPR)	<input type="checkbox"/> ★ <input type="checkbox"/> ★★ <input type="checkbox"/> ★★★ <input type="checkbox"/> ★★★★ <input type="checkbox"/> ★★★★★
Testing Facility Qualification (as applicable)	<input type="checkbox"/> Company-owned Lab <input type="checkbox"/> 3 <sup>rd</sup> Party Lab <input type="checkbox"/> ILAC / APLAC Signatory <input type="checkbox"/> MRA Signatory - please specify _____ <input type="checkbox"/> PAB Accredited <input type="checkbox"/> ISO 17025 Accredited <input type="checkbox"/> PS-Licensed (acceptable only within the first 12 months of the effectivity of the IG)
Other Parameters	

**Note:**

1. Applicants are required to submit complete test reports (initial report, lumen maintenance and life test report)
2. Number of samples tested for product registration purposes will be up to the applicant.
3. The validity of test reports for lighting product shall be valid for two (2) years.

**5. Effectivity.** This IG shall take effect fifteen (15) days following its publication in at least two (2) newspapers of general circulation or the Official Gazette. Copies of this IG shall be filed with the University of the Philippines Law Center – Office of the National Administrative Register.

Issued at Energy Center, Bonifacio Global City, Taguig City.



MAY 11 2021

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Director, Energy Utilization Management Bureau