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Data Aprovação: 30/03/2016

1. PURPOSE

To establish the criteria for the Conformity Evaluation Program for LED Lamps with Device Integrated onto the Base through certification, by focusing on performance, electric safety and electromagnetic compatibility, as shown through the National Energy Conservation Label – ENCE, in compliance with the Quality Technical Regulations' requirements for the object and with the Brazilian Labeling Program – PBE.

1.1. SCOPE OF APPLICATION

1.1.1 The current Requirements apply to the LED lamps with device integrated onto the base or body constituting a single and undetachable piece, being destined to operation in a 60-Hz alternate current distribution network, for nominal voltages of 127 V and/or 220 V, or in continuous current (DC or CC) in any voltage range.

1.1.2 Are excluded from the current Requirements those LED Lamps with device integrated onto the base as mentioned below:

- lamps with color LEDs, with color lenses, which release colored light;
- RGB with colored and decorative cases, and that release colored light;
- LED lamps with incorporated control device that intentionally produces colored light;
- OLED (Organic Light Emitting Diode);

1.2. GROUPING FOR CERTIFICATION PURPOSES

1.2.1 In order to certify the object of the current RAC, the concept of family is applied.

1.2.2 The certification of LED lamps with device integrated onto the base must be undertaken for each family, as defined in sub-item 4.2 of the current RAC.

2 ACRONYMS

For the purposes of the current RAC, the following acronyms are adopted, complemented by the acronyms contained in the complementary documents mentioned in item 3 of the current RAC.

ENCE	National Conservation and Energy Label
PBE	Brazilian Labeling Program
PET	Technical Specification Spreadsheet
Procel	National Electric Power Conservation Program
OCP	Product Certification Entities
RGCP	General Product Certification Requirements

3 COMPLEMENTARY DOCUMENTS

Law no. 8078, of September 11, 1990

It disposes on the consumer protection and establishes other measures.

Law no. 10.295, of October 17, 2001

It disposes on the National Policy of Conservation and Rational Use of Energy.

Decree no. 4.059, of December 19, 2001

It regulates Law no. 10.295 of October 17, 2001 and establishes the Energy Efficiency Level and Indicator Management Committee – CGIEE.

Ordinance no. 118, of March 06, 2015 or its General Product Certification Requirements - RGCP. substitute.

Inmetro Ordinance in force Quality Technical Regulations for LED Lamps with device integrated onto the base

4 DEFINITIONS

For the purposes of the current RAC, the following definitions are adopted, complemented by the definitions contained in the documents mentioned in item 3.

4.1. National Energy Conservation Label - ENCE

Type of Conformity Identification Seal that provides technical and energy efficiency information on the object to consumers.

4.2. Family

Set of models manufactured in the same plant, whose functional and mechanical and electric construction principles are grouped, simultaneously, according to the following requirements, and they may present different rated power values:

The same technology as the LED (Ex: dual in line, SMD, COB, S-COB, high power, mid power and other);

The same stated useful life (nominal);

The same type of lamps, according to some models mentioned in table 1 and any other dimensional format.

Table 1 – Lamp types

Lamp type	Dimensional standard	Application
Omnidirectional (Non-directional)	A, BT, P, PS, S, T	Lamp for general lighting
Directional	R, BR, ER, MR and PAR (AR)	Lamp for general lighting and directed beam
Decorative	B, BA, C, CA, DC, F, and G	Lamps for decorative application
Tubular LED	See NBR IEC60081 and base G13,G5 or R17d	Replacement for fluorescent tubular lamps

Note 1: The characteristic drawings of each type of bulb mentioned in Table 1 are presented in Annex C of the RTQ and any other bulb format is comprised by the Ordinance.

Note 2: All the lamps not classified in the formats indicated in Table 1 must follow the test parameters as the Omnidirectional models (non-directional).

Note 3: Lamps with a connection base of type G4 and G9, regardless of their dimension, are classified as decorative lamps.

Note 4: The dimensional standards for Omnidirectional types (non-directional), may also be applied for lamps classified as directional or semi-directional, for that purpose those lamps must comply with the prescriptions described in item 6.7.1 (directional lamps) or 6.7.3 (semi-directional lamps) of the RTQ.

4.3 Model

Name or code identifying the product. Designation or single commercial brand.

5 CONFORMITY EVALUATION MECHANISM

The Conformity Evaluation mechanism utilized by the current RAC is the certification, by focusing on the object's energy efficiency and safety. The object's conformity is confirmed through the National Energy Conservation Label – ENCE.

6. CONFORMITY EVALUATION STAGES

6.1 Definition of the utilized Certification Model(s)

The current RAC establishes 2 (two) different certification models, and the supplier shall opt for one of the models specified below:

- a) Model 5 – Type, evaluation and approval test of the manufacturer's Management Systems, and follow-up through audits at the manufacturer's premises and testing of samples collected from points of sale;
- b) Model 7 – Batch test.

6.1.1 Certification Model 5

6.1.1.1 Initial Evaluation

6.1.1.1.1 Certification Request

The supplier must forward a formal request to TÜV Rheinland do Brasil Ltda., together with the documentation described in the RGCP, in addition to the following items:

- a) Models comprised in the family of the object in question and their respective specifications;
- b) Descriptive memorandum, mentioning their technical and functional description, and nominal and dimensional specifications, use limitations, special care and other relevant data;

Note: The technical datasheets with all the models that are classified in the same family must be forwarded, and they must include at least the product code, the rated power (W), luminous flux (lm), correlated color temperature (CCT), power factor (PF), operational voltage (V), and color rendering index (CRI), according to the specifications of the RTQ;

- c) External and internal photos of the object (body, LED and control device), as well as of the packaging (already with the forecasted ENCE prototype);
- d) Test report IES LM80 on the LED utilized in the lamps (according to Annex A of the RTQ), in case they are requested by the company, the luminous flux maintenance test and definition of the rated useful life according to Phase 1 of item 6.10, letter A of the RTQ.

Note: It will apply to TÜV Rheinland do Brasil Ltda. to request the confirmation that the presented LM80 report on the LED is indeed related to the LED model that is being used in the lamps in question. That confirmation must be provided through means confirming the purchase of the indicated LED and by the manufacturer's statement that has been utilizing the LED mentioned in each one of the lamp models submitted to the analysis.

- e) Specification of the utilized electrolytic capacitor, according to the qualification test established by norm IEC-TR 62380, if applicable;
- f) Datasheet/part number of all LED Lamp's electronic components and Useful life x temperature curve of the electrolytic capacitors, if applicable.

6.1.1.1.2 Analysis of the Request and of the Documentation's Conformity

The Analysis criteria for the Request and the Documentation's Conformity must follow the conditions described in the RGCP.

6.1.1.1.3 Initial Audit of the Quality Management Systems

The criteria for the Management System's Initial Audit must follow the conditions described in the RGCP.

6.1.1.1.4 Initial Test Plan

The Test Plan must forecast the energy efficiency and safety tests, according to the object's RTQ.

6.1.1.1.4.1 Definition of the Tests to be undertaken

The initial tests must confirm that the object of the conformity evaluation fulfills that forecasted in the object's RTQ. The initial tests are all the tests described in sub-item C1 of Annex C of the current RAC.

6.1.1.1.4.2 Definition of the Sampling

The definition of the sampling must follow the general conditions mentioned in the RGCP.

TÜV Rheinland do Brasil Ltda. is responsible for the sealing, collection and remittance of the samples of the different families of objects to be certified, in compliance with the prescribed quantity according to sub-item C.1 of Annex C of the current RAC and taken from each family object of the certification.

6.1.1.1.4.2.1 The values declared in the ENCE for the model will be the obtained from the energy efficiency tests, as described in the RTQ. Those values must be registered in the test report, issued by labs that fulfill that specified in item 6.1.1.1.4.4 of the current RAC.

6.1.1.1.4.2.2 For the values declared in the ENCE Label all the family models must be tested, according to the sampling established in Table 2 of Annex C of the current RAC. For the remaining initial tests the number of models to be tested is established in sub-item C.1.2.1 of Annex C of the current RAC.

6.1.1.1.4.2.3 If there is any model in the family whose characteristics of one of the critical components (Material of the body, electrolytic capacitor's family and/or brand, family and/or brand of the LED) is different from the tested model, it will be necessary that the model is submitted to test to verify its conformity as regards safety and performance.

6.1.1.1.4.3 Acceptance and rejection criteria

The acceptance and rejection criteria are described in Annex C of the current RAC.

6.1.1.1.4.4 Lab Definition

The definition of the lab must follow the conditions described in the RGCP.

6.1.1.1.5 Treatment of nonconformities in the Initial Evaluation stage

The criteria to treat nonconformities in the initial evaluation stage must follow that described in the RGCP. If there are nonconformities in the type tests, the supplier must propose corrective actions, after which the supplier may send new samples.

After an approval result in all the tests, it will apply to TÜV Rheinland do Brasil Ltda. to undertake an audit at the supplier's premises to confirm if the tested product is the same as the one being manufactured.

6.1.1.1.6 Conformity Certificate's Issuance

The criteria to Conformity Certificate's Issuance must follow the conditions described in the RGCP.

6.1.1.1.6.1 Conformity Certificate

The Conformity Certificate will be valid for 3 (three) years and must comply with that established in the RGCP.

6.1.1.1.6.1.1 TÜV Rheinland do Brasil Ltda. must attach the following documents to the Conformity Certificate, in addition to those required by the abovementioned Ordinance:

- a) PET on the family of certified products;
- b) Proposal by the National Energy Conservation Label – ENCE filled out for the certified products.

6.1.1.1.6.1.2 The identification of the certified product's family and model must be as shown below:

Family: LED technology / lamp type / stated rated useful life

Model: brand / power / luminous flux / luminous efficiency / power factor / CCT / dimensional standard

6.1.1.2 Maintenance Evaluation

The maintenance evaluation criteria are described in the RGCP.

6.1.1.2.1 Maintenance Audit

The criteria contemplated in the RGCP must be followed. The frequency of such maintenance activities is of 12 months after the conformity certificate has been granted. TÜV Rheinland do Brasil Ltda. may undertake audits at shorter periods provided it is justified by changes in the production process or denunciations related to the product.

6.1.1.2.2 Maintenance Test Plan

The Maintenance Tests must confirm that the conformity has been kept after the initial evaluation and follow the same periodicity as the maintenance audits. The list of tests is indicated in sub-item C.2 of Annex C of the current RAC.

6.1.1.2.2.1 Definition of the Tests to be undertaken

The objects must be tested in regard to energy efficiency and safety, as disposed in the RTQ.

6.1.1.2.2.2 Definition of Maintenance Sampling

The sampling must follow the general conditions mentioned in the RGCP. TÜV Rheinland do Brasil Ltda. is responsible for the sealing, collection and remittance of the samples related to the different families of

objects to be certified, and kept in compliance with the prescribed quantity according to sub-item C.2 of Annex C of the current RAC and taken from each family object of certification.

Note: Sampling items must be selected by TÜV Rheinland do Brasil Ltda. at the points of sale.

6.1.1.2.2.1 TÜV Rheinland do Brasil Ltda. must undertake new tests, as determined by Inmetro, in the case of a well-founded denunciation.

6.1.1.2.2.3 Acceptance and rejection criteria

The acceptance and rejection criteria are described in sub-item C.2 of Annex C of the current RAC.

6.1.1.2.2.4 Lab Definition

The lab definition must follow the conditions described in the RGCP.

6.1.1.2.3 Treatment of nonconformities in the Maintenance Evaluation stage

The criteria to the treatment of nonconformities in the maintenance evaluation stage must follow the conditions described in the RGCP.

6.1.1.2.4 Maintenance Confirmation

The maintenance confirmation criteria must follow the conditions described in the RGCP.

6.1.1.3 Recertification Evaluation

The criteria for recertification evaluation must follow the conditions described in the RGCP. Once all the requirements have been satisfied, TÜV Rheinland do Brasil Ltda. must release a new Conformity Certificate for the evaluated object, with validity as established in item 6.1.1.1.6.1 of the current RAC.

6.1.1.3.1 Treatment of nonconformities in the Recertification stage

The criteria to the treatment of nonconformities in the recertification evaluation stage must follow the conditions described in the RGCP.

6.1.1.3.2 Recertification Confirmation

The criteria to the recertification confirmation must follow the conditions described in the RGCP.

6.1.2 Certification Model 7

6.1.2.1 Certification Request

6.1.2.1.1 The supplier must forward a formal request to TÜV Rheinland do Brasil Ltda., providing the documentation described in the RGCP, in addition to the following items:

a) Descriptive memorandum, mentioning its technical and functional description, nominal and dimensional specifications, use limitations, special care and other relevant data;

Note: The technical datasheets with all the models classified in the same family must be forwarded, and they must include at least the product code, the rated power (W), luminous flux (lm), correlated color temperature (CCT), power factor (PF), operational voltage (V), and color rendering index (CRI), according to specifications of the RTQ;

b) External and internal photos of the object (body, LED and control device), as well as of the packaging;

c) Test report IES LM80 on the LED utilized in the lamps (according to Annex A of the RTQ), and if they are requested by the company the luminous flux maintenance test and definition of the rated useful life according to the Phase 1 of item 6.10 letter A of the RTQ;

Note: It will apply to TÜV Rheinland do Brasil Ltda. to request the confirmation that the presented LM80 report on the LED is indeed related to the LED model that is being used in the lamps in question. That confirmation must be provided through confirming the purchase of the indicated LED and by the manufacturer's statement that has been utilizing the LED mentioned in each one of the lamp models submitted to the analysis.

d) Specification of the utilized electrolytic capacitor, according to the qualification test established by norm IEC-TR 62380, if applicable;

e) Datasheet/part number of all the LED Lamp's electronic components and Useful life x temperature curve of the electrolytic capacitors, if applicable;

f) Import License (in the case of imported objects);

g) Identification of the models related to the batch to be certified, and that information must be properly confirmed through formal records by the supplier to TÜV Rheinland do Brasil Ltda.;

h) Identification of the size of the batch to be certified, and that information must be properly confirmed through formal records by the supplier to TÜV Rheinland do Brasil Ltda..

6.1.2.2 Analysis of the Request and of the Documentation's Conformity

The criteria of Analysis of the Request and of the Documentation's Conformity must follow the general orientations described in the RGCP.

6.1.2.3 Test Plan

That forecasted in item 6.1.1.1.4 of the current RAC must be followed.

For model 7 the concept of family does not apply and all the models must be tested.

6.1.2.3.1 Definition of the tests to be undertaken

That forecasted in item 6.1.1.1.4.1 of the current RAC must be followed.

6.1.2.3.2 Definition of Sampling

6.1.2.3.2.1 The definition of sampling must be as established in sub-item 6.2.4.2 of the RGCP, complemented with the sub-items below.

6.1.2.3.2.2 TÜV Rheinland do Brasil Ltda. is responsible for accompanying the collection of samples related to the object to be certified. TÜV Rheinland do Brasil Ltda. must identify, seal and forward the sample to the test lab.

6.1.2.3.2.3 TÜV Rheinland do Brasil Ltda., when performing sample collection, must elaborate a sampling report, detailing the date, place, collected batch's identification and the conditions in which this later was obtained.

6.1.2.3.2.4 The collection must be undertaken within the national territory by TÜV Rheinland do Brasil Ltda. from the available batch or from the batches available before their commercialization.

6.1.2.3.2.5 The model selected when elaborating the test plan in order to undertake the type test will be the one found with the most complete configuration or the one that due to its construction or operation provides the most unfavorable condition under the user safety point of view.

6.1.2.3.2.6 Energy efficiency and safety tests must be undertaken.

6.1.2.3.2.7 The samples of each family of LED lamps with integrated control devices found in the certification batch must be collected according to norm ABNT NBR 5426:1985, with a double-normal sampling plan, a special S4 inspection level and a NQA amounting to 0.65.

6.1.2.3.2.8 The collected samples must be divided into adequate parts in order to undertake each one of the forecasted tests.

6.1.2.3.2.9 TÜV Rheinland do Brasil Ltda. is responsible for the selection, sealing and remittance of samples to the accredited lab.

6.1.2.3.3 Acceptance and rejection criteria

6.1.2.3.3.1 Those conforming batches that do not show any nonconformity will be approved.

6.1.2.3.3.2 The acceptance and rejection criteria are described in Annex C of the current RAC.

6.1.2.3.4 Lab Definition

The criteria to the lab definition must follow the orientations described in the RGCP.

6.1.2.4 Treatment of Nonconformities in the Batch Evaluation Process

In case any batch is rejected, this later must not be released for commercialization and the supplier must consider its destruction or its return to the country of origin (in the case of importation) with documentation confirming the adopted action. In the case of a national product, TÜV Rheinland do Brasil Ltda. must evaluate the possibility of reclassifying or destroying the batch.

6.1.2.5 Conformity Certificate's Issuance

The criteria to the conformity certificate's issuance must follow the conditions described in the RGCP and those mentioned in item 6.1.1.1.6. The conformity certificate will only be valid for the batch in question. That information must be mentioned in the certificate itself. For the remaining provisions, they are as established in the RGCP.

7. TREATMENT OF COMPLAINTS

The criteria to the treatment of complaints must follow the conditions described in the RGCP.

8. ACTIVITIES EXECUTED BY FOREIGN OACs

The criteria for activities executed by foreign OAC must follow the conditions described in the RGCP.

9. TRANSFER OF THE CERTIFICATION

The criteria to the transfer of the certification must follow the conditions described in the RGCP.

10. TERMINATION OF THE CERTIFICATION

The criteria to the termination of the Certification must follow the conditions described in the RGCP.

11. CONFORMITY IDENTIFICATION SEAL

11.1 The criteria for the use of the Conformity Identification Seal must follow the conditions of the RGCP.

11.2 The Conformity Identification Seal must be according to Annex A. The Conformity Seal for the object is the National Energy Conservation Label - ENCE of compulsory use for all the models covered by the current regulations.

LED LAMPS WITH DEVICE INTEGRATED TO BASE

11.3 The dimensions of the ENCE label and the technical information that must be contained in the same are described in Annex A of the current document.

11.4 The authorization to use Seals is only provided when the object is in conformity with the criteria defined in the current RAC and after the Object's Registration has been granted.

11.5 The provisions contained in Inmetro Ordinance no. 274, of June 13, 2014, in the Conformity Identification Label Application Manual and in the instructions contained in Annex A of the current document must be fulfilled.

11.6 The labels must be affixed on the product's packaging.

11.5 For the LED Lamps with device integrated onto the base and subject to the energy efficiency test, Inmetro provides their Energy Efficiency Tables in its website at://www.inmetro.gov.br/consumidor/tabelas.asp.

12. AUTHORIZATION TO USE THE CONFORMITY IDENTIFICATION SEAL

The criteria to the authorization to use the Conformity Identification Seals must follow the conditions described in the RGCP.

13. RESPONSIBILITIES AND OBLIGATIONS

The criteria related to responsibilities and obligations must follow the conditions described in the RGCP.

14. MARKET FOLLOW-UP

The criteria for market follow-up must follow the conditions described in the RGCP.

15. PENALTIES

The criteria for the application of penalties must follow the conditions described in the RGCP.

16. DENUNCIATIONS

Inmetro's Ombudsman's Office receives denunciations, complaints and suggestions, through the following channels:

e-mail: ouvidoria@inmetro.gov.br

telephone: 0800 285 18 18

website: www.inmetro.gov.br/ouvidoria

postal address:

Ombudsman's Office - National Institute of Metrology, Quality and Technology (Inmetro)

Rua Santa Alexandrina, 416 – ground floor

Rio Comprido - Rio de Janeiro – RJ

Zip Code 20261-232

17. CHANGES INTRODUCED

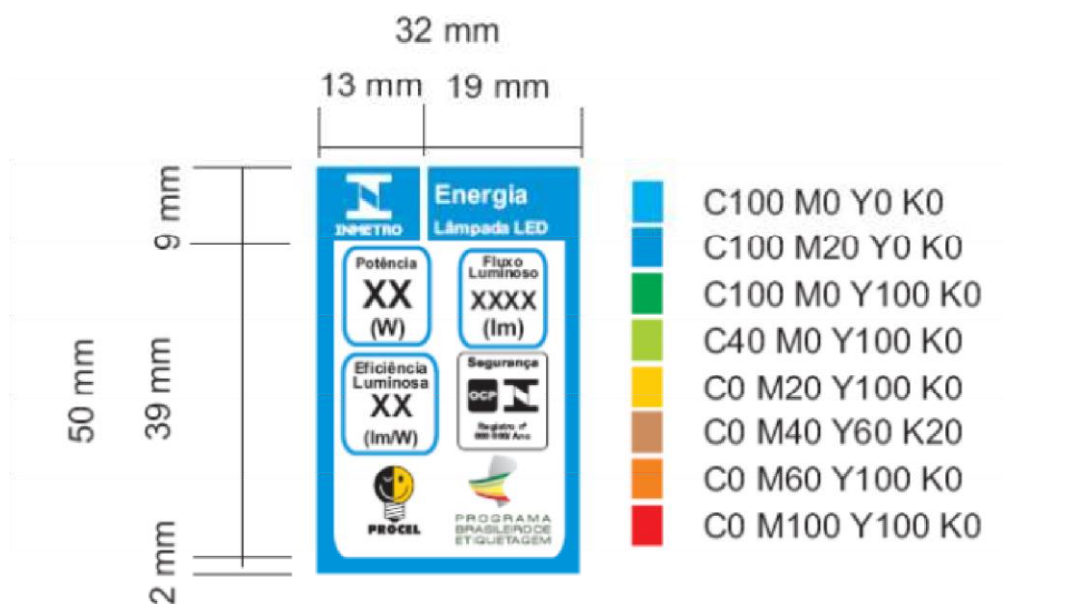
Date	Change	Responsable

ANNEX A – CONFORMITY IDENTIFICATION SEAL - MODELS FOR THE NATIONAL ENERGY EFFICIENCY LABEL - ENCE

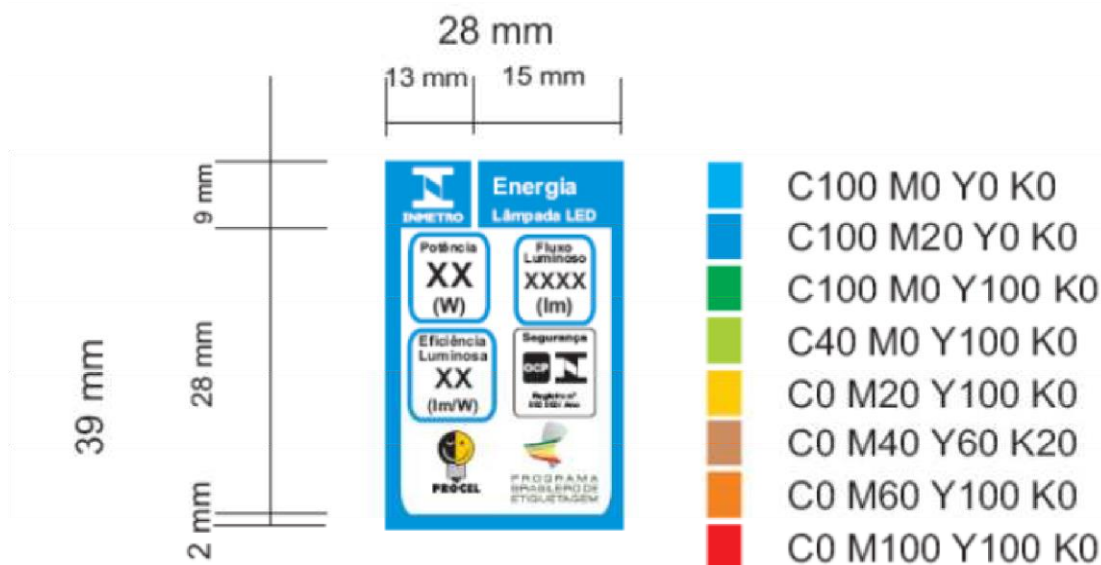
A.1 Models for the National Energy Efficiency Label - ENCE

A.1.1 The ENCE label may be printed in monochromatic form or on a white background and with text and contour in color black.

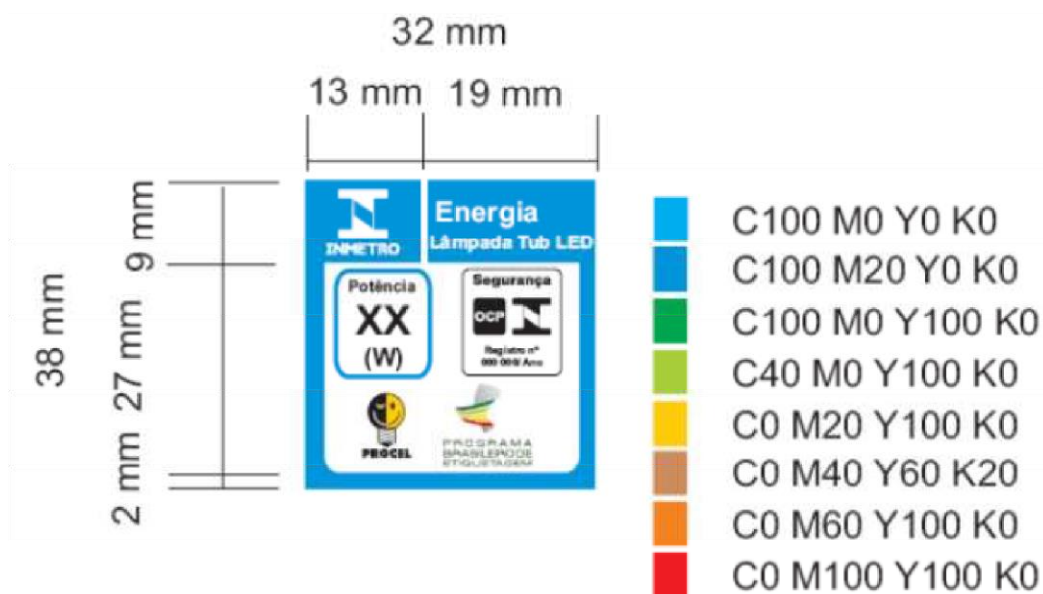
A.2 The ENCE label must have a format and the dimensions in conformity with the Pictures below.



Picture 1 – ENCE – LED Lamp and Tubular LED Lamp (with luminous efficiency) – Normal





Picture 2 – ENCE – LED Lamp and Tubular LED Lamp (with luminous efficiency) – Reduced



Picture 3 – ENCE – Tubular LED Lamp (without luminous efficiency) (only for 2400-m Tubular LED Lamps, while their performance has not been evaluated)

(**) EE – Energy Efficiency.

03 – DATE	04 – LAB'S SEAL AND SIGNATURE	
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	<p>Conformity Evaluation Programs Division - DIPAC/DCONF Brazilian Labeling Program - PBE Address: Rua da Estrela, 67 – 2nd floor - Rio Comprido - Rio de Janeiro - RJ Zip Code: 20.251-900 Telephones: (021) 3216-1006/1091 - Fax: (021) 3216-1093 E-mail: dipac@inmetro.gov.br</p>	 <p>PROGRAMA BRASILEIRO DE ETIQUETAGEM</p>
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ANNEX C – TESTS

C.1 Type Tests

C1.1 Description of type tests - Safety

The type tests related to safety to be undertaken are described in Table 1.

Table 1 - Type Tests – Safety

Order of the tests	RTQ Item	Description	Quantity of samples	Type: Destructive (D) Non-Destructive (ND)
1º	5.2	Marking	1	ND
2º	5.4	Interchangeability of the base	1	ND
3º	5.5	Protection against accidental contact with live parts	1	ND
4º	5.10	Electromagnetic Compatibility	1	ND
5º	5.6	Insulation Resistance and Dielectric Strength after exposition to humidity	1	D
6º	5.7	Resistance to Torsion	1	D
7º	5.8	Resistance to heating	1	D
8º	5.9	Resistance to flame and ignition	1	D

C.1.1.1 Sample

For each tested model, the sample consists of 1 (one) unit. In the case of destructive tests, the samples cannot be utilized for other tests, and so the total sampling is of 4 (four) units of the model to be tested. The number of samples for each test, as well as the test classification, is defined in Table 1. Additional samples may be collected at TÜV Rheinland do Brasil Ltda.'s the discretion.

Note: the number of different tested models in the family will depend on the quantity of models that family has. For families with up to 5 (five) models, one model will be selected and tested.

For families having 6 (six) to 10 (ten) models, 2 (two) different models will be selected and tested, and so on for a number of models superior to 10 (ten).

In any case, the model with the highest power must always be included in the sample.

C.1.1.2 Acceptance/Rejection

In order to accept the sample there shall not be any nonconformity. If any nonconformity is verified in any of the tests, new samples must be sent by the manufacturer with the implemented corrective action, and the occurrence of any nonconformity will not be allowed in the abovementioned samples. If any approval is denied in the family, all the models belonging to the same will be rejected.

C.1.2 Description of type tests - Energy Efficiency

The type tests related to energy efficiency to be undertaken are described in table 2.

Table 2 - Type Tests - Energy Efficiency

Order of the tests	RTQ Item	Description	Quantity of samples	Type: Destructive (D) Non-Destructive (ND)
1º	6.3	Lamp power	10	ND
2º	6.4	Power Factor / Harmonic Limit	10	ND
3º	6.5	Luminous Flux	10	ND
4º	6.9	TCC/IRC	10	ND
5º	6.11	Efficiency and luminous flux for equivalence	10	ND
6º	6.7	Light Distribution	3	ND
7º	6.6	Peak light intensity value ¹	3	ND
8º	6.8	Light Beam Angle ¹	3	ND
9º	6.10 (Phase 1)	Luminous Flux Maintenance and rated life definition	See table 3 of RAC	D
	6.10 (Phase 2)	Luminous Flux Maintenance and rated life definition	10	D
10º	6.10.1.1	Thermal cycle and Commutation	3	D
11º	6.10.1.2	Durability of the incorporated control device	10	D
12º	6.12	Verification of the quality of the electronic project for electrolytic capacitor(s) ¹	1	D
13º	6.13	Accelerated wear test in case there is any electrolytic capacitor(s) ¹	1	D

(1) - When applicable

Table 3 - Additional tests for luminous flux maintenance according to Phase 1

Stage	Test Procedure	No. of samples	Approval criteria
Data from IES LM-80-08 for the LED used in a integral lamp	Annex A of the RTQ (IES LM-80-08)	Individual LEDs: 25 module LEDs: 10	Data provided by the manufacturer of the LED undertaken in an accredited lab. (This test is undertaken by the LED'S manufacturer). The luminous flux maintenance reported in report LM 80, for the temperature and current condition measured in the complete lamp, in 6000h, must be: Decorative Lamps: > 86.7% Remaining Lamps: > 91.8%
LED temperature verification inside the integral lamp and current applied to the LEDs	Item 6.10 and Annex B of the RTQ	1	The measured temperature and current values must be lower than the maximum values in report LM80.
Lamp operating for 3000h	Item 6.10 - Phase 1 of the RTQ	10	Average flux maintenance for 10 Decorative Lamps: ≥ 93.1 % Remaining Lamps: ≥ 95.8 %

C.1.2.1 Sampling

For each tested model the sample consists of 15 (fifteen) units of the same model. In the case of destructive tests, the samples cannot be utilized for other tests. The number of samples for each test, as well as the test sequence, is defined in Table 2. Additional samples may be collected at TÜV Rheinland do Brasil Ltda. the discretion.

C.1.2.1.1 the number of different tested models in the family will depend on the quantity of models that family has. For families with up to 5 (five) models, one model will be selected and tested. For families having 6 (six) to 10 (ten) models, 2 (two) different models will be selected and tested, and so on for a number of models higher than 10 (ten).

C.1.2.1.2 For the energy efficiency tests: Power, Power Factor, Luminous Flux, and Luminous Efficiency must be tested for all the family models.

C.1.2.2 Acceptance/Rejection

For the sample to be accepted there shall not be any nonconformity. If any approval is denied in the family, all the models belonging to the same will be rejected.

C.1.2.2.1 In the luminous flux maintenance test (9th sequence), according to Phase 1, item 6.10 of the RTQ, acceptance will be given if 100% of the tested units comply with the approval criteria mentioned in table 3 of the current RAC. Those criteria are also valid for the integrated control device's durability test (item 6.10.1.2 of the RTQ).

C.1.2.2.2 For the luminous flux maintenance test according to Phase 2 (6000 h or more) acceptance will be given if 90% of the tested units comply with the luminous flux maintenance values for each period, as mentioned in RTQ. Those criteria are also valid for the integrated control device's durability test (item 6.10.1.2 of the RTQ).

C.1.2.2.3 In tests 6.3, 6.4, 6.5, 6.6, 6.7, 6.8, 6.9 and 6.11 shown in table 2, the arithmetic mean of the samples must be in conformity with the limits established in RTQ.

C.2 Maintenance Tests

Samples must be collected from ordinary points of sale.

In case samples are collected from ordinary points of sale, TÜV Rheinland do Brasil Ltda. must find products with a manufacturing date after the concession date of the last maintenance test date. It is preferably advised to collect samples related to models, of a same family, that have not been submitted to previous collections, until all that family's models have been tested.

C.2.1 Description of Maintenance Tests - Safety

Maintenance tests related to electric safety and their periodicity are described in table 4.

Table 4 – Maintenance Tests - Safety

Item of the RTQ	Description	Year 1	Year 2	Year 3
5.2	Marking	X	X	X
5.4	Interchangeability of the base	X		
5.5	Protection against accidental contact with live parts	X		
5.10	Electromagnetic Compatibility	X		
5.6	Insulation Resistance and Dielectric Strength after exposition to humidity		X	
5.7	Resistance to Torsion		X	
5.8	Resistance to heating			X
5.9	Resistance to flame and ignition			X

C.2.1.1 Sampling

The sampling must be undertaken as forecasted in C. 1.1.1.

C.2.1.2 Acceptance/Rejection

The acceptance and rejection criteria must consider that forecasted in C.1.1.2.

C.2.2 Description of Maintenance Tests - Energy Efficiency

The maintenance tests - Energy Efficiency and their periodicity are described in table 5.

Table 5 - Maintenance Tests - Energy Efficiency

Item of the RTQ	Description	Year 1	Year 2	Year 3
6.3	Lamp power	X	X	X
6.4	Power Factor / Harmonic Limit	X	X	X
6.5	Luminous Flux	X	X	X
6.9	TCC/IRC	X	X	X
6.11	Efficiency and luminous flux for equivalence	X	X	X
6.7	Light Distribution			X
6.6	Peak Luminous Intensity ¹			X
6.8	Light Beam Angle ¹			X
6.10 (Phase 1)	Luminous Flux Maintenance and rated life definition		X	
6.10 (Phase 2)	Luminous Flux Maintenance and rated life definition			
6.10.1.1	Thermal cycle test and Commutation		X	
6.10.1.2	Durability of the incorporated control device ¹		X	
6.12	Verification of the quality of the electronic project for electrolytic capacitor(s) ¹			X
6.13	Accelerated wear test in case there is any electrolytic capacitor(s) ¹			X

(1) When applicable

C.2.2.1 Sampling

For each tested model the number of samples for each test, as well as the test sequence, is defined in Table 2. Additional samples may be collected at TÜV Rheinland do Brasil Ltda.'s the discretion.

C.2.2.1.1 The number of different tested models in the family will depend on the quantity of models that family has. For families with up to 5 (five) models, one model will be selected and tested. For families having 6 (six) to 10 (ten) models, 2 (two) different models will be selected and tested, and so on for a number of models higher than 10 (ten).

C.2.2.2 Acceptance/Rejection

The acceptance and rejection criteria must consider that forecasted in C.1.2.2.