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***Luminárias para Iluminação Pública Viária - Luminaires for street and road lighting***

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**Legal Scope:**

TÜV Rheinland do Brasil Ltda.

**Business Scope:**

P.03 Electrical

**Process Scope:**

6.3 Service Delivery

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**1. Objectives**

*Establish the criteria for the Conformity Assessment Program for LED Street Light Fixtures - Discharge Lamps and LED Technology according to /Inmetro Decree n. 020/2017 - through certification, focused on performance, electrical safety and electromagnetic compatibility, evidenced by the National Energy Conservation Label - ENCE, meeting the requirements of the Technical Quality Regulation for the object and the Brazilian Labeling Program - PBE.*

**GROUPING FOR CERTIFICATION EFFECT**

*For the certification of the object of this Regulation, the concept of family applies.*

**2. Terms and Abbreviations**

Terms/Abbreviations	Description
ABNT	Brazilian Associations of Technical Standards
ANSI	American National Standards Institute
ASTM	American Society for Testing and Materials
BS	British Standard
CIE	International Commission on Illumination
CISPR	Comité International Spécial des Perturbations Radioélectriques
ENCE	National Energy Conservation Label
EBTS/SELV	Extra Low Voltage Safety
IEC	International Electrotechnical Commission
IES	Illuminating Engineering Society
ISO	International Organization for Standardization
PBE	Brazilian Labeling Program
PET	Technical Specification Worksheet
CRC	Complementary certification Rule

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**3. Scope of Application**

No specification of the Legal Scope

**4. Activities****DEFINITIONS**

*For the purposes of this RAC, the following definition is adopted, complemented by the definitions contained in the documents cited in item 3.*

**Family****Family characterization for LED luminaires**

*Luminaires, even with different nominal power values, can be grouped into families of models whose functional, mechanical and electrical construction principles are similar. The following items are the requirements which, when met simultaneously, characterize the similarity between products of the same family:*

- Brand and model of LED used;
- IP of the luminaire;
- Life declared.

**Family Characterization for Lamps with Discharge Lamps**

*Luminaires, even with different nominal power values, can be grouped into families of models whose functional, mechanical and electrical construction principles are similar. The following items are the requirements which, when met simultaneously, characterize the similarity between products of the same family:*

- Type of lamp;
- Type of refractor and diffuser;
- IP of the luminaire.

**CONFORMITY ASSESSMENT MECHANISM**

*The mechanism of Conformity Assessment used by this Regulation is the certification.*

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**STAGES OF CONFORMITY ASSESSMENT****Definition of the Certification Model (s) used**

This RAC establishes two (2) distinct certification models to be chosen by the certification requester.

- a) *Model 5 - Initial assessment consisting of tests on samples taken from the manufacturer, including auditing of the Quality Management System, followed by periodic maintenance evaluation through sampling of the product in market, for carrying out conformity assessment activities. Maintenance Evaluations are intended to verify that items produced after initial compliance attestation (Certificate of Conformity issue) remain compliant. Maintenance includes periodic evaluation of the production process, or the audit of the QMS, or both;*
- b) *Model 1b - Batch test. This model involves the certification of a batch of products. The number of units to be tested can be a portion of the lot, collected in a sample form, or even the total number of units in the lot (100% test). The Certificate of Conformity is restricted to the certified lot.*

**Certification Model 5****Initial Evaluation****Certification solicitation**

The certification requester must submit a formal request to the TÜV RHEINLAND DO BRASIL, together with the documentation described in the RGCP, in addition to the following items:

**For luminaires with LED technology**

- a) *Models that make up the family of the object in question and its specifications;*
- b) *Descriptive memorial, referring to its technical functional description, nominal specifications, dimensional, limitations of use, special care and other relevant data;*

*Note: The technical information must be sent to all models that are classified in the same family, which should include at least the product code, nominal power (W), luminous flux (lm), correlative color temperature (TCC), Power factor (VF), operating voltage (V), color reproduction index (IRC), according to RTQ specifications;*

- c) *External and internal photos of the object (body, LED and control device) as well as the packaging (already with the expected ENCE prototype);*

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d) Report of the IES LM80 and TM-21 test of the LEDs used in LED luminaires (according to Annex B2 of the RTQ), if requested by the certification requester, the maintenance test of the luminous flux and definition of the nominal life according to Option 1 of item B.2.2.1 of Annex IB of this Regulation.

Note: It is up to the TÜV RHEINLAND DO BRASIL to request that the LM80 report of the LED shown be in fact the model of the LED being used in the luminaires in question. This must be verified by the purchase of the indicated LED and by the manufacturer's declaration that he is using the LED mentioned in each of the models of luminaires submitted for analysis.

e) IES LM79 test reports of the luminaires submitted for analysis when opting for the flow maintenance and life definition tests according to Option 2 of item B.2.2.1 of Annex I-B to this Regulation.

**For luminaires with discharge lamp**

- a) Models that make up the family of the object in question and its specifications;
- b) Descriptive memorial, referring to its technical functional description, nominal specifications, dimensional, limitations of use, special care and other relevant data;

Note: The technical information must be sent to all models that are classified in the same family, which should include at least the product code, the nominal power (W), luminous flux (lm), correlative color temperature (TCC), Power factor (FP), operating voltage (V), according to RTQ specifications;

- c) Characteristics of the refractor and the diffuser;
- d) External and internal photos of the object (body, lamp and reactor), as well as the packaging (already with the expected ENCE prototype).

**Analysis of Documentation Request and Conformity**

The Documentation Request and Compliance Analysis criteria should follow the conditions described in the RGCP.

**Initial Audit of the Quality Management System and Evaluation of the Production Process**

The criteria for the Initial Audit of the Quality Management System and Evaluation of the Productive Process must follow the conditions described in the RGCP.

**Plan of Initial Testing**

The criteria for the Initial Test Plan shall follow the conditions outlined in the RGCP and predict the energy efficiency and safety tests according to the RTQ of the object.

**Definition of the tests to be performed**

The initial tests shall demonstrate that the object of the conformity assessment meets the requirements of the RTQ of the object. The initial tests are all the tests described in item 1 (luminaires with discharge lamps) of Annex B and item 1 (luminaires with LED technology) of Annex C of this Regulation.

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***Definition of Sampling***

*The definition of sampling should follow the general conditions set out in the RGCP.*

*The TÜV RHEINLAND DO BRASIL is responsible for sealing, collecting and sending samples of the different families of objects to be certified, according to the quantity prescribed according to item 1 (lamps with discharge lamps) of Annex B and item 1 (luminaires with LED technology) of Annex C of this Regulation and withdrawals from each family subject to certification.*

*The values declared in the ENCE for the model shall be those obtained in the energy efficiency tests, as described in the RTQ. These values shall be recorded in the test report, issued by laboratories that meet the requirements specified in item **Definition of the Laboratory** of this Regulation.*

*For the values declared in the ENCE label, all models of the family must be tested, according to the sampling established in Annex B and C of this Regulation. For the others initial tests, the number of models to be tested is established in subsection **Sampling** of Annex B and subsection **Sampling** of Annex C of this Regulation.*

*If there is a model (s) within the family whose characteristics of one of the critical components (Body Material, etc.) are different from the tested model (s), it shall be necessary a test for safety and performance of this model.*

***Acceptance and rejection criteria***

*The acceptance and rejection criteria are described in Annex B and C of this Regulation.*

***Definition of the Laboratory***

*The definition of the laboratory should follow the conditions described in the RGCP.*

***Treatment of nonconformities in the Initial Evaluation stage***

*The criteria for treatment of nonconformities in the initial evaluation stage should follow the one described in the RGCP.*

***Issuance of the Conformity Certificate***

*The criteria for Issuance of the Conformity Certificate must follow the conditions described in the RGCP.*

***Conformity Certificate***

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*The Conformity Certificate is valid for four (4) years and must obey what is determined by RGCP.*

*The TÜV RHEINLAND DO BRASIL shall attach to the Certificate of Conformity the following documents, in addition to those required by said Administrative Rule:*

*a) PET of the family of certified products;*

*b) Proposal of the National Energy Conservation Label - ENCE completed for certified products.*

*The identification of the family and the model of the certified product shall be as follows:*

*For LED luminaires:*

- Family: Luminaire Type / Luminaire LED Mark / IP / Nominal Life Declared*
- Model: Brand / Power / Luminous Flux / Light Efficiency / Power Factor / TCC*

*For Lamps with Discharge Lamps:*

- Family: Lamp Type / Refractor Type / Diffuser Type / Luminaire IP / Rated Life time*
- Model: Mark / Power / Luminous Flux / Light Efficiency*

***Maintenance Evaluation***

*Maintenance evaluation criteria are described in the RGCP.*

***Maintenance Audit***

*The criteria set out in the RGCP must be followed. The frequency of such maintenance is 12 (twelve) months after the granting of the Conformity Certificate. The TÜV RHEINLAND DO BRASIL may conduct audits in shorter periods as long as justified by changes in the production process or complaints about the product.*

***Maintenance Test Plan***

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*The Maintenance Test shall demonstrate that the conformity maintenance is maintained after the initial assessment and complies with the same periodicity of maintenance audits. The list of tests is indicated in item 2 of Annex B and Annex C of this Regulation.*

***Definition of the tests to be performed***

*The objects must be tested for energy efficiency and safety, as provided in the RTQ.*

***Maintenance Sampling Definition***

*Sampling should follow the general conditions set out in the RGCP. The TÜV RHEINLAND DO BRASIL is responsible for sealing, collecting and sending samples of the different families of objects to be certified, kept in compliance with the quantity prescribed in accordance with item 2 of Annex B and item 2 of Annex C of this Regulation and withdrawals from each object family Certification.*

*Note: Sample items should be selected by TÜV RHEINLAND DO BRASIL in the market.*

*The TÜV RHEINLAND DO BRASIL shall carry out further tests, as determined by Inmetro, in the event of a substantiated complaint.*

***Acceptance and rejection criteria***

*The acceptance and rejection criteria are described in item 2 of Annex B and item 2 of Annex C of this Regulation.*

***Laboratory Definition***

*The laboratory definition should follow the conditions described in the RGCP.*

***Treatment of nonconformities in the Maintenance Evaluation stage***

*The criteria for handling nonconformities in the maintenance evaluation stage should follow the conditions described in the RGCP.*

***Maintenance Confirmation***

*Maintenance confirmation criteria must follow the conditions described in the RGCP.*

***Recertification Evaluation***

*The Criteria to evaluate the recertification should follow the conditions described in the RGCP.*

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**Special Cases**

Product certification subject to multiple certification (hybrid product) shall follow the conditions described in the RGCP.

**Certification Model 1b****Certification Request**

The supplier requesting the certification shall send a formal request to the TÜV RHEINLAND DO BRASIL, providing the documentation described in the RGCP, in addition to the following items:

For luminaires with LED technology:

a) Descriptive memorial, referring to its functional technical description, nominal specifications, dimensional, limitations of use, special care and other relevant data;

Note: The technical information must be sent to all models that are classified in the same family, which should include at least the product code, nominal power (W), luminous flux (lm), correlative color temperature (TCC), Power factor (VF), operating voltage (V), color reproduction index (IRC), according to RTQ specifications;

b) External and internal photos of the object (body, LED and the control device), as well as the packaging already with the prototype of the ENCE model;

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

d) Identification of the models referred to in the batch to be certified, and this information must be adequately evidenced by means of formal records by the supplier to the TÜV RHEINLAND DO BRASIL;

e) Identification of the lot size to be certified, and this information should be adequately evidenced through formal records by the supplier to the TÜV RHEINLAND DO BRASIL.

f) Report of the IES LM-80 and TM-21 test of the LEDs used in LED luminaires (according to Appendix B2 of the RTQ, if requested by the certification requester, the maintenance of the luminous flux test and definition of the nominal life according to Option 1 of item B.2.2.1 of Annex IB of this Regulation.

Note: It is up to the TÜV RHEINLAND DO BRASIL to request that the LM80 report of the LED shown be in fact the model of the LED being used in the luminaires in question. This must be verified by the purchase of the indicated LED and by the manufacturer's declaration that he is using the LED mentioned in each of the models of luminaires submitted for analysis.

g) IES LM-79 Test reports of the luminaires submitted for analysis when opting for the maintenance of flow and life definition test according to Option 2 of item B.2.2.1 of Annex I-B to this Regulation.

For luminaires with discharge lamps:

a) Models that make up the family of the object in question and its specifications;



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b) *Descriptive memorial, referring to its technical functional description, nominal specifications, dimensional, limitations of use, special care and other relevant data;*

*Note: The technical information must be sent to all models that are classified in the same family, which must include at least the product code, the nominal power (W), power factor (PF), operating voltage (V), According to RTQ specifications;*

c) *External and internal photos of the object (body, lamp and electromagnetic reactor), as well as the packaging (already with the expected ENCE prototype);*

d) *Import License (in the case of imported objects);*

e) *Identification of the models referred to in the batch to be certified, and this information must be adequately evidenced by means of formal records by the supplier to the TÜV RHEINLAND DO BRASIL;*

f) *Identification of the lot size to be certified, and this information should be adequately evidenced by means of formal records by the supplier to the TÜV RHEINLAND DO BRASIL.*

***Application and Conformity Examination of Documentation***

*The Documentation Request and Compliance Analysis criteria should follow the conditions described in the RGCP.*

***Test Plan***

*The provisions of item **Plan of Initial Testing** of this Regulation shall be followed.*

*For model 1b the concept of family is not applied and all models must be tested.*

***Definition of the tests to be performed***

*The provisions of item **Plan of Initial Testing 1** of this Regulation shall be followed.*

***Sampling Definition***

*The sampling definition shall follow the conditions described in the RGCP, supplemented by the sub-items below.*

*The energy efficiency and safety tests shall be carried out.*

*Samples of each model of luminaires present in the certification batch shall be collected according to ABNT NBR 5426: 1985, with double-normal sampling plan, special inspection level S4 and NQA of 0.65.*

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***Acceptance and rejection criteria***

*Batches in which no non-conformities are found shall be approved.*

***Laboratory Definition***

*The criteria for defining the laboratory should follow the conditions described in the RGCP.*

***Treatment of Non Conformities in Initial Evaluation***

*The criteria for treatment of nonconformities in the initial evaluation stage should follow the conditions described in the RGCP.*

***Issuance of Conformity Certificate***

*The criteria for issuing the compliance certificate must follow the conditions described in the RGCP and those presented in item **Issuance of the Conformity Certificate**. The certificate of conformity shall be valid only for the lot concerned. This information must be on the certificate itself.*

***COMPLAINT HANDLING***

*The criteria for complaint handling dealing should follow the conditions described in the RGCP.*

***ACTIVITIES PERFORMED BY OCP ACCREDITED BY MLA MEMBER OF IAF***

*The criteria for activities performed by OCP accredited by MLA member of IAF should follow the conditions described in the RGCP.*

***TRANSFER OF CERTIFICATION***

*The criteria for transfer of certification should follow the conditions described in the RGCP.*

***10 TERMINATION OF CERTIFICATION***

*The criteria for termination of certification should follow the conditions described in the RGCP.*

***CONFORMITY IDENTIFICATION STAMP***

*The criteria for conformity identification stamp utilization should follow the conditions described in the RGCP.*

*The conformity identification stamp shall be carried according to the Annex III. The Conformity Identification Stamp to the object is the National Energy Conservation Label - ENCE of mandatory use for all models covered by this Regulation.*

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*The dimensions of ENCE and the technical information that should be contained in it are described in Annex III of this Regulation.*

*The labels must be affixed to the packaging and to the product.*

**AUTHORIZATION FOR CONFORMITY IDENTIFICATION STAMP USE**

*The criteria for Authorization for Conformity Identification Seal use should follow the conditions described in the RGCP.*

**RESPONSIBILITIES AND OBLIGATIONS**

*The criteria for responsibilities and obligations should follow the conditions described in the RGCP.*

**FOLLOW-UP ON THE MARKET**

*The criteria for follow-up on the market should follow the conditions described in the RGCP.*

**PENALTIES**

*The criteria for penalties on the market should follow the conditions described in the RGCP.*

**COMPLAINT**

*The channels to forward complaints, protests and suggestions through the Inmetro's Office are described in the RGCP.*

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**ANNEX A – DESCRIPTIVE MEMORIAL****GENERAL DATA**

*MANUFACTURER/ IMPORTER COMPANY NAME*

*MANUFACTURER/IMPORTER ADDRESS*

*MANUFACTURER/IMPORTER FANTASY NAME (if applicable)*

*LUMINAIRE TYPE*

*LUMINAIRE MODEL*

*BRANDS WHICH THE MODEL IS MARKETED (if applicable):*

*VERSIONS*

**CONSTRUCTIVE CHARACTERISTICS**

*DIMENSIONS*

*LOCKING SYSTEM*

*ACCESSORIES*

*PRODUCT DRAWING*

*LUMINAIRE IP*

*REFRACTOR TYPE*

*DIFFUSER TYPE*

**ACCESSORIES**

*In case of the public lighting luminaire contain any accessory, briefly describe what accessories are, the used material and the corresponding versions.*

**POSITIONING OF MANDATORY MARKINGS**

*MANUFACTURER AND OR IMPORTER: (Indicate the position on the product)*

*CONFORMITY IDENTIFICATION STAMP: (Indicate the position on the product)*

**SCHEMATIC DRAWINGS**

*Attach drawings in the 3 views: front, side and top.*

**SIGNATURE OF APPLICANT MANUFACTURER OF CERTIFICATION****TÜV RHEINLAND DO BRASIL SIGNATURE**

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### ANNEX B

#### TESTING FOR LUMINAIRES WITH DISCHARGE LAMPS

##### TYPE TESTS

##### *Description of type tests - Safety*

The reference tests regarding the safety and the services are included in Table 1 in accordance with Annex I-A in this regulation.

**Table 1 - Type tests – Safety**

(*)	<i>RTQ Item</i>	<i>Description</i>	<i>Samples Quantity</i>	<i>Type: Destructive (D) Non-destructive (ND)</i>	<i>When</i>
	A.1 A.2	<i>Marking Specific Conditions</i>	1	ND	
	A.5.1	<i>Voltage addition at the lamp terminals</i>	1	ND	
	A.5.3 A.5.2 A.5.4	<i>Insulation Resistance and Dielectric Rigidity Interference Electromagnetic and Radiofrequency</i>	1	D	
	A.3 A.4	<i>Lamp Holder Internal and external wiring Socket for photoelectric relay* Protection Degree</i>	1	D	
	B.4.1 B.4.2 B.4.3 A.5.5	<i>Durability Thermal test (normal operation) Resistance to ultraviolet radiation (UV) Protection against external mechanical impacts</i>	1	D	

applied

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### **Sample**

*The total sampling is 3 (three) units per model to be tested within the family, considering that for the destructive tests, the samples can not be used for other tests. 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's discretion.*

*Note: the number of different models tested in the family will depend on the number of models that this family has. For families with up to 5 (five) models, a model will be selected and tested. For families that have 6 (six)*

*to 10 (ten) models, 2 (two) different models will be selected and tested, and so on for a number of models greater than 10 (ten).*

*In any case, the most powerful model should always be part of the sample.*

### **Acceptance / Rejection**

*For acceptance of the sample, no non-conformities may occur. If there is any non-conformity in any of the tests, new samples must be sent by the certification requesting supplier provider with the corrective action implemented, not admitting any non-conformity incident in the referred samples. If there is a disapproval in the family, all the models belonging to it will be disapproved.*

### **Description of type tests – Energy Efficiency**

*The type tests regarding the energy efficiency to be performed are described in Table 2.*

**Table 2 – Type tests – Energy Efficiency**

<i>RTQ Item</i>	<i>Description</i>	<i>Samples Quantity</i>	<i>Type: Destructive (D) Non-destructive (ND)</i>
<i>B.2</i>	<i>Luminous Intensity Distribution Classification</i>	<i>1</i>	<i>ND</i>
<i>B.3.1</i>	<i>Energy Efficiency</i>		
<i>B.3.2</i>	<i>Luminous Distribution Control</i>		

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**Sampling**

*For each model tested in the family, the sample consists of 1 (one) unit of the same model. Additional samples can be selected by TÜV RHEINLAND DO BRASIL criteria.*

*The number of different models tested in the family will depend on the number of models that this family has. For families with up to five (5) models, a model will be selected and tested. For families that have 6 (six) to 10 (ten) models, 2 (two) different models will be selected and tested, and so on for a number of models greater than 10 (ten).*

*The Energy Efficiency and luminous distribution Control tests shall be performed for all family models.*

**Acceptance / Rejection**

*For acceptance of the sample, no non-conformities may occur. If there is a disapproval in the family, all the models belonging to it will be disapproved.*

**Maintenance Tests**

*The samples collection must take place in the commerce. If models are not evidenced in the commerce, sealing and collection may be done in the supplier's storage/dispatch.*

**Description of Maintenance tests – Safety**

*The maintenance tests for electrical safety and its accomplishment periodicity are described in table 3.*

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**Table 3 - Maintenance tests – Safety**

<i>RTQ Item</i>	<i>Description</i>	<i>Year 1</i>	<i>Year 2</i>	<i>Year 3</i>
A.1 A.2	<i>Marking Specific Conditions</i>	X	X	X
A.3 A.4	<i>Lamp Holder</i> <i>Internal and external wiring</i> <i>Socket for photoelectric relay*</i> <i>Protection Degree</i>	X	X	X
A.5.1	<i>Voltage addition at the lamp terminals</i>	X	X	X
A.5.2 A.5.3 A.5.4	<i>Insulation Resistance and Dielectric Rigidity</i> <i>Interference Electromagnetic and Radiofrequency</i>		X	
B.4.1 B.4.2 B.4.3 A.5.5	<i>Durability</i> <i>Thermal test (normal operation)</i> <i>Resistance to ultraviolet radiation (UV)</i> <i>Protection against external mechanical impacts</i>		X	

(\*) When applied

### **Sample**

The sample shall be carried out as provided in **Sample**.

### **Acceptance / Rejection**

The criteria for acceptance and rejection must consider what is provided in **Acceptance / Rejection**.

### **Description of Maintenance tests - Energy Efficiency**

The maintenance tests - Energy Efficiency and its realization periodicity are described in table 4.



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### ANNEX C

#### TESTS FOR LUMINAIRES WITH LED TECHNOLOGY

#### Type Tests

#### Description of type tests - Safety

The type tests regarding the safety to be carried out are described in Table 1 according to Annex I-B of this regulation.

**Table 1 - Type tests – Safety**

RTQ Item	Description	Samples Quantity	Type: Destructive (D) Non-destructive (ND)
A.1	<i>Marking</i>	1	ND
A.4 A.4.2	<i>Operating Conditions Packaging</i>	1	ND
A.5.5 A.5.6	<i>Power Supply Voltage and output current</i>	1	ND
A.7	<i>Leakage current</i>	1	ND
A.8	<i>Protection against electric shock</i>	1	ND
A.9.1	<i>Torque resistance of screws and connections</i>	1	ND
A.2.1.1 A.2.1.2 A.3	<i>Internal and external wiring Socket for photoelectric relay* Protection Degree</i>	1	D
A.5.2 A.5.1	<i>Isolation Resistance and Dielectric Rigidity</i>	1	D
A.9.2 A.9.3 A.9.4	<i>Resistance to Wind Strength Resistance to Vibration Protection against external mechanical impacts</i>	1	D
A.9.5	<i>Resistance to Ultraviolet Radiation</i>	1	D

(\*) When applied

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### **Sample**

The total sampling is 4 (four) units per model to be tested within the family, considering that for the destructive tests, the samples can not be used for other tests. 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's discretion.

Note: the number of different models tested in the family will depend on the number of models that this family has. For families with up to 5 (five) models, a model will be selected and tested. For families that have 6 (six) to 10 (ten) models, 2 (two) different models will be selected and tested, and so on for a number of models greater than 10 (ten). In any case, the most powerful model should always be part of the sample.

### **Acceptance / Rejection**

For acceptance of the sample, no non-conformities may occur. If there is any non-conformity in any of the tests, new samples must be sent by manufacturer with the corrective action implemented, not admitting any non-conformity incident in the referred samples. If there is a disapproval in the family, all the models belonging to it will be disapproved.

### **Description of type tests – Energy Efficiency**

The type tests regarding the energy efficiency to be performed are described in Table 2.

**Table 2 - Type tests – Energy Efficiency**

RTQ Item	Description	Samples Quantity	Type: Destructive(D) Nondestructive(ND)
A.5.3	Total circuit power	3	ND
A.5.4	Power Factor		
A.5.5 A.5.6	Power Supply Voltage and output current		
B.2	Luminous Intensity Distribution Classification		
B.4 B.5	TCC/IRC		
B.3	Energy Efficiency		
B.6.1	Luminous Distribution Control		
B.6.2.1 (Option 1)	Luminous flux of luminaire maintenance - Performance of LED component	1	ND

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B.6.2.2 (Option 2)	Luminous flux of luminaire maintenance - Performance of Luminaire		
B.6.3	Qualification of electronic control device DC or AC for LED modules		

**Sampling**

For each model tested in the family, the sample consists of 3 (three) units of the same model. Additional samples may be collected at TÜV RHEINLAND DO BRASIL's discretion.

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

For Energy Efficiency tests: Power, Power Factor, Luminous flux and Energy Efficiency shall be performed for all family models.

**Acceptance / Rejection**

For acceptance of the sample, no non-conformities may occur. If there is a disapproval in the family, all the models belonging to it will be disapproved.

1.2.2.2 In tests A.5.3, A.5.5, A.5.6, B.2, B. 3, B.4, B.3 and B.6.1 of table 2, the arithmetic mean of the samples shall be in agreement with the limits established in the RTQ.

**Maintenance Tests**

The samples collection must take place in the commerce.

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### ***Description of Maintenance tests – Safety***

*The maintenance tests for electrical safety and its accomplishment periodicity are described in table 3.*

**Table 3 - Maintenance tests – Safety**

<i>RTQ Item</i>	<i>Description</i>	<i>Year 1</i>		<i>Year 2</i>	<i>Year 3</i>
A.1	<i>Marking</i>	X		X	X
A.2.1.1	<i>Internal and external wiring</i>				
A.2.1.2	<i>Socket for photoelectric relay*</i>	X		X	X
A.3	<i>Protection Degree</i>				
A.4 A.4.2	<i>Operating Conditions Packaging</i>	X		X	X
A.6	<i>Electromagnetic and Radiofrequency Interference</i>	X			
A.8	<i>Protection against electric shock</i>			X	
A.7	<i>Leakage current</i>			X	
A.9.1	<i>Torque resistance of screws and connections</i>				X
A.5.2	<i>Isolation Resistance and</i>			X	
A.5.1	<i>Dielectric Rigidity</i>				
A.9.2	<i>Resistance to Wind Strength</i>				
A.9.3	<i>Resistance to Vibration</i>			X	
A.9.4	<i>Protection against external mechanical impacts</i>				
A.9.5	<i>Resistance to Ultraviolet Radiation</i>			X	

*(\*) When applied*

## ***Luminárias para Iluminação Pública Viária - Luminaires for street and road lighting***

### **Sample**

The sample shall be carried out as provided in **Sample**.

### **Acceptance / Rejection**

The criteria for acceptance and rejection must consider what is provided in **Acceptance / Rejection**.

### **Description of Maintenance tests - Energy Efficiency**

The maintenance tests - Energy Efficiency and its realization periodicity are described in table 4.

**Table 4 - Maintenance tests – Energy Efficiency**

RTQ Item	Description	Year 1	Year 2	Year 3
A.5.3	Total circuit power	X	X	X
A.5.4	Power Factor	X	X	X
A.5.5 A.5.6	Power Supply Voltage and output current		X	
B.2	Luminous Intensity Distribution Classification	X	X	X
B.4 B.5	TCC/IRC	X	X	X
B.3	Energy Efficiency	X	X	X
B.6.1	Luminous Distribution Control			X
B.6.2.1 (Option 1)	Luminous flux of luminaire maintenance - Performance of LED componente			X
B.6.2.2 (Option 2)	Luminous flux of luminaire maintenance - Performance of Luminaire			X
B.6.3	Qualification of electronic control device DC or AC for LED modules		X	

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**Sample**

*For each model tested, the number of samples for each test is defined in Table 2. Additional samples may be collected at TÜV RHEINLAND DO BRASIL's discretion.*

*The number of different models tested in the family will depend on the number of models that this family has. For families with up to five (5) models, a model will be selected and tested. For families that have 6 (six) to 10 (ten) models, 2 (two) different models will be selected and tested, and so on for a number of models greater than 10 (ten).*

**Acceptance / Rejection**

*The criteria for acceptance and rejection must consider what is provided in **Acceptance / Rejection***



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**ANNEX III****SEAL OF IDENTIFICATION OF CONFORMITY****Objective**

*Standardize the format and application of the Energy Conservation National Label - ENCE to be affixed to luminaires for road public lighting.*

**Specific conditions****Label**

*The supplier must request the file containing the format and dimensions of ENCE to Inmetro through the e-mail [dconf@inmetro.gov.br](mailto:dconf@inmetro.gov.br).*

*The label shall be affixed to the packaging and to the appliance itself, glued entirely to the front, top, left side so that it is fully visible to the consumer.*

*The size of Energy Conservation National Label - ENCE for luminaires for road public lighting will be 130 mm x 95 mm.*

*The label must be printed on white background and black text color. The efficiency ranges will be colored according to the CMYK standard (cyan, magenta, yellow and black).*



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**Label Templates**



Figure 1 – ENCE - Luminaire for public lighting – LED Technology and Discharge Lamps

The energy efficiency classes of each model are represented by the letters A through D, Whose efficiency levels are established in this Regulation.

Note: Inmetro is able to periodically review the efficiency levels.

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**ANNEX IV  
CLASS OF ENERGY EFFICIENCY**

**1 – LUMINAIRES FOR STREET AND ROAD LIGHTING – DISCHARGE LAMPS**

*ENERGY EFFICIENCY TO LUMINAIRES WITH DISCHARGE LAMPS*

<b>Class</b>	<b>Efficiency level (lm/W)</b>	<b>Minimum measured value (lm/W)</b>
<b>A</b>	$EE \geq 90$	88
<b>B</b>	$80 \leq EE < 90$	78
<b>C</b>	$70 \leq EE < 80$	68
<b>D</b>	$EE < 70$	-

**2- LUMINAIRES FOR STREET AND ROAD LIGHTING – LED TECHNOLOGY**

*ENERGY EFFICIENCY TO LUMINAIRES WITH LED TECHNOLOGY*

<b>Class</b>	<b>Efficiency level (lm/W)</b>	<b>Minimum measured value (lm/W)</b>
<b>A</b>	$EE \geq 100$	98
<b>B</b>	$90 \leq EE < 100$	88
<b>C</b>	$80 \leq EE < 90$	78
<b>D</b>	$70 \leq EE < 80$	68

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**5. Roles & Responsibilities**

Process Roles	Responsibilities
<i>Sales &amp; Sales Support</i>	<i>Responsible for sales</i>
<i>Cerifier</i>	<i>Approver, Decision Maker</i>
<i>Coordinator / Coordinator Support</i>	<i>Operations Coordinator.</i>
<i>Experts / Reviewer</i>	<i>Process Information Reviewer.</i>

**6. Specifications**

*N/A*

**7. Attachments**

*N/A*

**8. Related Documents**

*N/A*

**9. External Reference Documents**

*Lei n.º 10.295, de 17 de outubro de 2001 Dispõe sobre a Política Nacional de Conservação de Uso Racional de Energia.*

*Decreto n.º 4.059, de 19 de dezembro de 2001 - Regulamenta a Lei 10.295 de 17 de outubro de 2001 e institui o Comitê Gestor de Indicadores e Níveis de Eficiência Energética – CGIEE.*

*Portaria Inmetro n.º 335, de 29 de agosto de 2011 Aprovar as informações obrigatórias para os dispositivos elétricos de baixa tensão.*

*Portaria Inmetro n.º 454, de 01 de dezembro de 2010 - Aprovar os requisitos de avaliação da conformidade e suas revisões para reatores eletromagnéticos para lâmpadas a vapor de sódio e lâmpadas a vapor metálico (halogenetos)*

*Portaria n.º 118, de 06 de março de 2015 Requisitos Gerais de Certificação de Produtos – ou sua substituta. RGCP.*

*Portaria Inmetro n.º 248, de 25 de maio de 2015 e substitutivas - Aprova o Vocabulário Inmetro de Avaliação da Conformidade.*

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*Portaria Inmetro n.º 020, de 15 de fevereiro de 2017 RTQ - Anexo I – Regulamento técnico da Qualidade para Luminárias para Iluminação Pública Viária*

*Portaria Inmetro n.º 020, de 15 de fevereiro de 2017 RAC - Anexo II – Requisitos de Avaliação da Conformidade para Luminárias para Iluminação Pública Viária.*

*ABNT IEC/TS - 62504*

*2013 Termos e definições para LED e os módulos de LED de iluminação geral.*

*ABNT NBR 13593*

*2011 Reator e Ignitor para Lâmpada a Vapor de Sódio a Alta Pressão – Especificação e Ensaio*

*ABNT NBR 14305*

*1999 Reator e ignitor para lâmpada a vapor metálico (halogenetos) – requisitos e ensaios*

*ABNT NBR 15129*

*2012 - Luminárias para Iluminação Pública – Requisitos particulares*

*ABNT NBR 16026*

*2012 - Dispositivo de controle eletrônico c.c. ou c.a. para módulos de LED – Requisitos de desempenho*

*ABNT NBR 5101*

*2012 - Iluminação pública*

*ABNT NBR 5123*

*1998 Relé fotelétrico e tomada para iluminação - especificação e método de ensaio*

*ABNT NBR 5461*

*1991 - Iluminação – Terminologia*

*ABNT NBR IEC 60061-1*

*1998 Bases de lâmpadas, porta-lâmpadas, bem como gabaritos para o controle de intercambialidade e segurança - Parte 1: Bases de lâmpadas*

*ABNT NBR IEC 60238*

*2005 Porta lâmpada de Rosca Edison*

*ABNT NBR IEC 60529*

*2005 Graus de proteção para invólucros de equipamentos Elétricos (código IP)*

*ABNT NBR IEC 60598-1*

*2010 Luminárias – Parte 1: Requisitos gerais e ensaios*

*ABNT NBR IEC 60662*

*1997 Lâmpadas a vapor de sódio a alta pressão*

*ABNT NBR IEC 61167*

*1997 - Lâmpadas a vapor metálico (halogenetos)*

*ABNT NBR IEC 61347-2-13*

*2012 Dispositivo de controle da lâmpada – Parte 2-13: Requisitos particulares de controle eletrônicos alimentados em c.c. ou c.a para os módulos de LED*

*ABNT NBR IEC 62031*

*2013 Módulos de LED para iluminação em geral –*

*Especificações de segurança*

*ANSI/NEMA/ANSLG*

*C78.377/2015 Specifications for the Chromaticity of Solid State Lighting Products*

*ASTM G154 Standard Practice for Operating Fluorescent Ultraviolet (UV)*

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*BS EN 55015*

*2013 Limits and methods of measurement of radio disturbance characteristics of electrical lighting and similar equipment*

*CIE 84*

*1989 Measurement of Luminous Flux*

*CISPR 15*

*2013 Limits and methods of measurement of radio disturbance characteristics of electrical lighting and similar equipment*

*IEC 60050-845*

*1987 International Electrotechnical Vocabulary, Lighting*

*IEC 60061-3*

*2005 Lamp caps and holders together with gauges for the control of interchangeability and safety Part 3*

*Gauges IEC 61000-3-2:2014 Electromagnetic compatibility (EMC). Limits for harmonic current emissions (equipment input current < 16 A per phase)*

*IEC 62722-2-1*

*2014, Ed. 1.0 Luminaire performance – Part 2-1: Particular requirements for LED luminaires*

*IEC 62471*

*2006 Photobiological safety of lamps and lamp systems*

*IES TM-21-11 Projecting Long Term Lumen Maintenance of LED Light Sources*

*IESNA LM-79-08 Electrical and Photometric Measurement of Solid State Lighting Products*

*IESNA LM-80-08 Approved Method for Measuring Lumen Maintenance of LED Light Sources*

*ABNT NBR IEC 62262*

*2015 Graus de proteção assegurados pelos invólucros de equipamentos elétricos contra os impactos mecânicos externos(Código IK)*

*Nota: Havendo versão da norma ABNT que corresponda à norma IEC ou CISPR ou ISO na sua versão mais atual, a NBR deverá ser usada em substituição às normas citadas*