1. OBJECTIVE
Establish the criteria for the voluntary conformity assessment Program for luminaires with LED lamps for street and road lighting, through voluntary certification, with a focus on performance, electrical safety and electromagnetic compatibility.

1.1. Scope of application

1.1.1 These requirements apply to the following types of lamp intended for road lighting:

a) Luminaires with LED bulbs.

1.1.2 The following types of luminaires are excluded from these requirements:

a) Fixed general purpose Luminaires;
b) Recessed lighting;
c) Portable general purpose Luminaires;
d) Luminaires with built-in transformers or tungsten filament lamps;
e) Portable Luminaires for garden use;
f) Luminaires for stage lighting Studios, television and cinema (interior and exterior);
g) Luminaires for swimming pools and similar applications;
h) Luminaires for emergency lighting;
i) Luminaires with extra low voltage lighting systems for filament lamps;
j) Luminaires for use in clinical areas of hospitals and health care buildings.

1.2. For the purpose of group certification

1.2.1 For this certification, it applies the concept of family.
1.2.2 Certification of luminaires intended for road lighting should be performed for each family, as defined in sub-item 4 of this CRC.

2. ACRONYMS

RC – Certification rule
CRC-Complementary certification rule.

3. ADDITIONAL DOCUMENTS

700-RC-001 – Certification – Product rule.
ABNT NBR IEC 60598-1:2010-Fixtures – part 1: General requirements and tests
ABNT NBR 15129:2004-Luminaires for street lighting-particular requirements

For purposes of this CRC, the following definitions are adopted, supplemented by the definitions contained in the documents referred to in item 3.

4. CHARACTERIZATION FOR LUMINAIRES WITH LED LAMPS

The light fixtures, even showing different values of rated power, can be grouped into families of models whose functional principles of mechanical and electrical construction are similar. The following are the requirements that, when met at the same time, characterize the similarity between products of the same family:
LED luminaires for road and street lighting

- Nominal voltage;
- Make and model of LED used;
- Life Time.

5. CONFORMITY ASSESSMENT MECHANISM
The mechanism of conformity assessment, used by this CRC is the certification, with a focus on performance, electrical safety and electromagnetic compatibility. The completeness of the object is evidenced through tests and audits.

6. STEPS OF CONFORMITY ASSESSMENT

6.1 Definition of type (s) of certification (s)
This CRC establishes only one certification model as follows:

a) Model 5-initial Evaluation consisting of tests on samples taken from the manufacturer, including audit of the QMS (quality management system), followed by evaluation of periodic maintenance through product sampling in Commerce, to carry out the conformity assessment activities. Maintenance assessments are intended to verify that the items produced after initial conformity attestation (certificate of conformity) remain in compliance. Maintenance includes periodic evaluation of the production process, or the audit of QMS, or both.

6.1.1 Certification model

6.1.1.1 Initial assessment

6.1.1.1.1 Certification request
The requestor must submit a formal request to the TÜV RHEINLAND, along with documentation (Design or artwork to packaging option for the Certification model, company information, address and number registration of the requesting Supplier certification, contact person, telephone number and electronic address, identification of the manufacturer with full address, information of activities/outsourced processes that may affect the conformity of the product object of certification Documentation certifying the Complaint handling service, plus the following items:

a) Models that make up the family of the object in question and their specifications;
b) Descriptive Memorial, referencing his technical description, nominal specifications functional, dimensional limitations, special care and other relevant data;
Note: must be forwarded the technical information with all models that are classified in the same family, where must be at least the product code, the rated power (W) luminous flux (lm), correlated color temperature (CCT), power factor (PF), Operating voltage (V), color rendering index (CRI);
c) External and internal Photos of the object (body, LED and the control device), as well as of the packaging;
d) Test report IES LM80 and TM-21 of LED used in luminaires with LED, if requested by the requesting supplier certification, the maintenance of the luminous flux and definition of nominal life.
Note: the TUV RHEINLAND request proof of the report LED LM80 presented is actually LED model that is being used in the lamps in question. This proof must be through certifying the purchase of the LED indicated and by the manufacturer’s declaration that the LED is quoted in each one of the models of lamps submitted for analysis.
e) IES LM79 test reports of light fixtures submitted to analysis how to opt for maintaining the flow test and definition of life.

6.1.1.2 Request and analysis of compliance of the documentation
- The TUV RHEINLAND, upon receiving the documentation specified, must file a suit of grant of the certificate of conformity and perform an analysis as to the relevance of the request, as well as an assessment of the conformity of the documentation forwarded by the requestor of the certification.
- If non-compliance is identified in the documentation received, this must be formally forwarded to the requesting Supplier certification for its correctness and proper formalization by the TUV RHEINLAND, aiming to highlight the implementation of same (s) for further analysis.
- If any of the documents referred to in 6.1.1 is not presented in its final form by the requestor of the certification, upon presentation of the documentation, and provided that this fact does not interfere in other stages of the process of Initial Evaluation, this fact must be made explicit by TUV RHEINLAND and the completion of certification will only when all the documents are in their final form and duly approved by TUV RHEINLAND.

6.1.1.3 Initial audit quality management systems and evaluation of the production process
The QMS audit must be performed whenever the chosen certification model so the set regardless of the manufacturer or service provider to possess the quality management System certificate based on the current edition of ISO 9001 or standard ABNT NBR ISO 9001.
According to the model adopted, the TUV RHEINLAND evaluates the documents and records of the QMS, and audits on the premises of the service provider or of the plant, in order to check the conformity of the production process, including facilities and staff training. Audit the QMS must seek the objective of demonstration that the production process is systematic and monitored effectively, providing evidence of the product requirements in this CRC. In this way, the requirements of the QMS are complementary to requirements defined in this CRC. Records of compliance in meeting these requirements should be obtained consistently. The date of the visit to the audit should be scheduled in agreement with the requesting Supplier certification.
The assessment of the QMS must be made by TUV RHEINLAND on the basis of the scope of the certification process and the requirements of the current edition of ISO 9001 or standard ABNT NBR ISO 9001, with the minimum requirements set out in tables A and B below:

Table a: minimum requirements for verification of the QMS for manufacturers or service providers with valid certification on ISO 9001 or standard ABNT NBR ISO 9001

<table>
<thead>
<tr>
<th>REQUIREMENTS OF THE QMS</th>
<th>ISO 9001 or ABNT NBR ISO 9001</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control of records</td>
<td>4.2.4</td>
</tr>
<tr>
<td>Planning of product realization</td>
<td>7.1</td>
</tr>
<tr>
<td>Communication with the client</td>
<td>7.2.3</td>
</tr>
<tr>
<td>Procurement process</td>
<td>7.4.1</td>
</tr>
<tr>
<td>Verification of purchased product</td>
<td>7.4.3</td>
</tr>
<tr>
<td>Control of production and service provision</td>
<td>7.5.1</td>
</tr>
<tr>
<td>Identification and traceability</td>
<td>7.5.3</td>
</tr>
<tr>
<td>Customer property</td>
<td>7.5.4</td>
</tr>
<tr>
<td>Preservation of product</td>
<td>7.5.5</td>
</tr>
<tr>
<td>Control of monitoring and measuring equipment</td>
<td>7.6</td>
</tr>
<tr>
<td>Monitoring and measurement of processes</td>
<td>8.2.3</td>
</tr>
<tr>
<td>Monitoring and measurement of product</td>
<td>8.2.4</td>
</tr>
<tr>
<td>Control of non-conforming product</td>
<td>8.3</td>
</tr>
</tbody>
</table>
### Corrective action 8.5.2

**Table b: minimum requirements for verification of the QMS for manufacturers and service providers without certification in ISO 9001 or standard ABNT NBR ISO 9001**

<table>
<thead>
<tr>
<th>REQUIREMENTS OF THE QMS</th>
<th>ISO 9001 or ABNT NBR ISO 9001</th>
</tr>
</thead>
<tbody>
<tr>
<td>Document control</td>
<td>4.2.3</td>
</tr>
<tr>
<td>Control of records</td>
<td>4.2.4</td>
</tr>
<tr>
<td>Critical analysis by Direction</td>
<td>5.6.1 5.6.2 5.6.3//</td>
</tr>
<tr>
<td>Competence, training and awareness</td>
<td>6.2.2</td>
</tr>
<tr>
<td>Infrastructure</td>
<td>6.3</td>
</tr>
<tr>
<td>Planning of product realization</td>
<td>7.1</td>
</tr>
<tr>
<td>Communication with the client</td>
<td>7.2.3</td>
</tr>
<tr>
<td>Procurement process</td>
<td>7.4.1</td>
</tr>
<tr>
<td>Verification of purchased product</td>
<td>7.4.3</td>
</tr>
<tr>
<td>Control of production and service provision</td>
<td>7.5.1</td>
</tr>
<tr>
<td>Validation of processes for production and service provision</td>
<td>7.5.2</td>
</tr>
<tr>
<td>Identification and traceability</td>
<td>7.5.3</td>
</tr>
<tr>
<td>Customer property</td>
<td>7.5.4</td>
</tr>
<tr>
<td>Preservation of product</td>
<td>7.5.5</td>
</tr>
<tr>
<td>Control of monitoring and measuring equipment</td>
<td>7.6</td>
</tr>
<tr>
<td>Customer satisfaction</td>
<td>8.2.1</td>
</tr>
<tr>
<td>Internal audit</td>
<td>8.2.2</td>
</tr>
<tr>
<td>Monitoring and measurement of processes</td>
<td>8.2.3</td>
</tr>
<tr>
<td>Monitoring and measurement of product</td>
<td>8.2.4</td>
</tr>
<tr>
<td>Control of non-conforming product</td>
<td>8.3</td>
</tr>
<tr>
<td>Data analysis</td>
<td>(b) 8.4 (c), (d)</td>
</tr>
<tr>
<td>Corrective action</td>
<td>8.5.2</td>
</tr>
</tbody>
</table>

Even upon presentation of valid certificate, according to the current edition of ISO 9001 or Standard ABNT NBR ISO 9001, issued by an accredited by INMETRO OCS or member of the MLA of the IAF, for the scope of accreditation, the TÜV RHEINLAND must carry out the initial audit of the QMS in the factory or the service provider during the initial assessment phase, in accordance with the table of this CRC, in order to check the conformity of the production process.
Note: the certificates issued by a foreign MEDIA must be accompanied by a sworn translation in Portuguese language, when these are issued in language other than English or Spanish. The other documents relating to the Management System, in language other than English or Spanish, they must be translated into Portuguese.

During the audit, the requesting Supplier certification must place at the disposal of the TUV RHEINLAND all documents corresponding to the certification of the quality management system based on the current edition of ISO 9001 or standard ABNT NBR ISO 9001 and present the records of the production process where the record clearly identifying the object of certification.

The TUV RHEINLAND, after the audit, should issue report, recording the result of the same, with reference to this CRC.

The audit report shall be signed at least by the audit team, and a copy must be made available to the requesting Supplier certification.

Any change in the production process must be informed to the TUV RHEINLAND and may imply, if impact on compliance of the product, in a new audit.

In the case of certification based on prototypes, the TUV RHEINLAND, during the audit, ensuring that the product produced in scale corresponds to the tested prototype.

6.1.1.1.4 Initial test plan

The initial tests should prove that the object of conformity assessment meets the requirements defined in the standard base and provide the energy efficiency and safety tests as tests table attached on this CRC.

The TUV RHEINLAND is responsible for drawing up the plan of tests, which should contain, at least, the initial tests to be conducted, the clear definition of the methods of testing, number of samples and the acceptance/rejection criteria for these tests. In the case of the certification test plan should also be developed so as to contemplate at least the models that contain the largest number of pre-set requirements by standard reference base. The TUV RHEINLAND conduct critical analysis of laboratory test reports, confronting them with the previously established test plan.

The TUV RHEINLAND should require that laboratories test reports inform measurement uncertainties.

Any amendment (s) critical component (s) shall be informed to the TUV RHEINLAND and shall lead to the realization of new tests.

6.1.1.1.4.1 Definition of the tests to be carried out

The initial tests are all the tests described below:
### LED luminaires for road and street lighting

#### Table 1-type tests – safety

<table>
<thead>
<tr>
<th>Annex table item</th>
<th>Description</th>
<th>Samples quantity</th>
<th>Type: Destructive (D)</th>
<th>Non-Destructive (ND)</th>
</tr>
</thead>
<tbody>
<tr>
<td>II. A. 1</td>
<td>Marking</td>
<td>1</td>
<td>ND</td>
<td></td>
</tr>
<tr>
<td>II. A. 4 II. A. 4.2</td>
<td>Packaging operation conditions</td>
<td>ND</td>
<td></td>
<td></td>
</tr>
<tr>
<td>II. A. 5.5 II. A. 5.6</td>
<td>Power supply Voltage and current output current</td>
<td>ND</td>
<td></td>
<td></td>
</tr>
<tr>
<td>II. A. 6</td>
<td>Electromagnetic and radio frequency interference</td>
<td>ND</td>
<td></td>
<td></td>
</tr>
<tr>
<td>II. A. 7</td>
<td>Leakage current</td>
<td>ND</td>
<td></td>
<td></td>
</tr>
<tr>
<td>II. A. 8</td>
<td>Protection against electric shock</td>
<td>ND</td>
<td></td>
<td></td>
</tr>
<tr>
<td>II. A. 9.1</td>
<td>Torque resistance of screws and connections</td>
<td>ND</td>
<td></td>
<td></td>
</tr>
<tr>
<td>II. A. 10</td>
<td>Resistance of voltage surge protection (DPS)</td>
<td>ND</td>
<td></td>
<td></td>
</tr>
<tr>
<td>II. A. 2.1.1 II. A. 2.1.2</td>
<td>Internal and external wiring Light dependent relay socket *</td>
<td>ND</td>
<td></td>
<td></td>
</tr>
<tr>
<td>II. A. 3 II. A. 4</td>
<td>Degree of protection Sealing rings</td>
<td>(D)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>II. A. 5.2 II. A. 5.1</td>
<td>Insulation resistance and stiffness Dielectric</td>
<td>1</td>
<td>(D)</td>
<td></td>
</tr>
<tr>
<td>II. A. 9.2 II. A. 9.3</td>
<td>Resistance to wind force resistance to vibration</td>
<td>1</td>
<td>(D)</td>
<td></td>
</tr>
<tr>
<td>II. A. 9.4</td>
<td>Resistance to ultraviolet radiation</td>
<td>1</td>
<td>(D)</td>
<td></td>
</tr>
</tbody>
</table>

### Sampling-Table1

For each model tested, the sample consists of 1 (one) unit of proof and must be collected the same quantities for rebuttal and witness. In the case of a destructive test, the samples shall not be used for other tests, so the total sampling is 4 (four) units of model test sample to be tested. The number of samples for each test, as well as, the classification of the test, is defined in Table 1. Additional samples may be collected at the discretion of TUV RHEINLAND.

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

In any case, the model of higher power should always be selected.

### Acceptance/rejection – Table 1

For sample acceptance cannot occur non-conformities. Any non-compliance found in some of the trials, new samples are to be submitted by the manufacturer with the corrective action implemented not being
admitted to the occurrence of any non-compliance in these samples. A disapproval in the family, all models belonging will be disapproved.

Table 2-type tests – energy efficiency

<table>
<thead>
<tr>
<th>Annex table item</th>
<th>Description</th>
<th>Samples quantity</th>
<th>Type: Destructive (D)</th>
<th>Non-Destructive (ND)</th>
</tr>
</thead>
<tbody>
<tr>
<td>II. A. 5.3</td>
<td>Total power of the circuit</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>II. A. 5.4</td>
<td>Power factor</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>II. A. 5.5</td>
<td>Power supply Voltage and current output current</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>II. A. 5.6</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>II. B. 2</td>
<td>Classification of luminous intensity distributions</td>
<td>3</td>
<td></td>
<td>ND</td>
</tr>
<tr>
<td>II. B. 4</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>II. B. 5</td>
<td>CTT/IRC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>II. B. 3</td>
<td>Energy Efficiency</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>II. B. 6.1</td>
<td>Control of light distribution</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>II. B. 6.2.1</td>
<td>Maintenance of the luminous flux of the lamp-LED Component performance</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>II. B. 6.2.2</td>
<td>Maintenance of the luminous flux of the lamp-Lamp performance</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>II. B. 6.3</td>
<td>Electronic control device qualification CC or CA for LED modules (1)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(1) – where applicable

– Table 2 Sampling

For each model, tested sample of evidence consists of 3 (three) units of the same model. Additional samples may be collected at the discretion of TUV RHEINLAND.

Table 2 tests shall be tested all models in the family.

Acceptance/rejection – Table 2

For sample acceptance cannot occur non-conformities. A disapproval in the family, all models belonging will be disapproved.

6.1.1.1.4.2 Definition of the sampling

The TUV RHEINLAND is responsible for the selection and remittance of the seal, samples of the different families of objects to be certified according to the amount prescribed in accordance with item 6.1.1.1.4.1 (sampling-1 and 2 Tables) and withdrawals of each family object of certification.

6.1.1.1.4.2.1 In case of model (s) within the family the characteristics of one of the critical components (body Material, etc.) are different from the models tested, it will be necessary for this model is tested to verify conformity on the safety and performance.
6.1.1.4.3 Acceptance and rejection
The criteria for acceptance and rejection are described in item 6.1.1.4.1 of this CRC (acceptance/rejection – Table 1 and 2).

6.1.1.4.4 Definition of the lab
The definition of the laboratory must follow the conditions described in the 700-RC-001.

6.1.1.5 Treatment of non-conformity in initial assessment
In the event of non-conformity in the type tests, the applicant should propose corrective actions, after which new samples can be sent by the requestor to retest.

After the result of passing all the tests, it will be up to the TÜV Rheinland conduct an audit at the supplier to confirm that the product tested is the same that is being manufactured.

6.1.1.6 Issue of certificate of conformity
Critical analysis and certification decision

The TUV RHEINLAND must designate at least one person to analyze critically the information and results related to evaluation. Critical analysis must be carried out by persons not involved in the evaluation process. Critical analysis should include all the information on the documentation, audits, and results of tests and treatment of non-conformity.

The recommendations for certification based on critical analysis should be documented. The TUV RHEINLAND is responsible for decisions relating to certification.

The certification decision will be carried out by a person or group of persons not involved in the evaluation process.

The TUV RHEINLAND must notify the requestor of the certification if you decide not to grant the certification, reporting the reasons for the decision.

6.1.1.6.1 Certificate of conformity
The certificate of conformity is valid for a period of 4 (four) years and must conform to the standard form used by the TUV Rheinland of Brazil for voluntary product certification.

The identification of the family and product model certificate should be as below:

- Family: Nominal voltage/LED/make and model stated nominal life
- Model: Brand/power/luminous flux/luminous efficiency/power factor/CBT

6.1.1.2 Maintenance assessment
After the grant of the certificate of conformity, control of the certification is conducted by the TUV RHEINLAND, to see if the technical and organizational conditions that gave rise to the initial award of certification are still met.

The assessment of maintenance should be scheduled by TUV RHEINLAND, according to periodicity and the criteria set out in this CRC. The periods shall be counted from the date of issue of the certificate.

It is up to the holder of the certificate, to notify any changes to the project, descriptive memorial or production process.

In the case of certification by family, the inclusion of a new model in certified family may be made at any time, in the same certificate, the validity of the original certificate issued, containing the information of the date of inclusion of new model(s).

6.1.1.2.1 Maintenance audit
The TÜV RHEINLAND must schedule periodical maintenance audit on the production process of the manufacturer or the service provider.

The date of the visit for the audit of maintenance should be scheduled in agreement with the requesting Supplier certification.

The frequency of such maintenance is of 12 (twelve) months after the granting of the certificate of conformity.

6.1.1.2.2 Maintenance testing plan
Maintenance testing must follow the provisions of this CRC, in order to verify conformity maintenance after initial evaluation, obeying the same periodicity of audits.

The relationship of essays is indicated in the tables below:

<table>
<thead>
<tr>
<th>RTQ item</th>
<th>Description</th>
<th>1 year</th>
<th>Year 2</th>
<th>Year 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>II. A. 1</td>
<td>Marking</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>II. A. 2.1.1</td>
<td>Internal and external wiring Light dependent relay socket *</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>II. A. 2.1.2</td>
<td>Degree of protection Sealing rings</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>II. A. 3</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>II. A. 4</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>II. A. 4</td>
<td>Packaging operation conditions</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>II. A. 6</td>
<td>Electromagnetic and radio frequency interference</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>II. A. 8</td>
<td>Protection against electric shock</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>II. A. 7</td>
<td>Leakage current</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>II. A. 9.1</td>
<td>Torque resistance of screws and connections</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>II. A. 10</td>
<td>Resistance of voltage surge protection (DPS)</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>II. A. 5.2</td>
<td>Insulation resistance and stiffness Dielectric</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>II. A. 5.1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>II. A. 9.2</td>
<td>Resistance to wind force resistance to vibration</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>II. A. 9.3</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>II. A. 9.4</td>
<td>Resistance to ultraviolet radiation</td>
<td>X</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Sampling-Table 3
The sampling must be carried out as provided for in item 6.1.1.1.4.1 (sampling-Table 1)

Acceptance/rejection – Table 3
The criteria for acceptance and rejection should consider the provisions of item 6.1.1.1.4.1 (acceptance/rejection – Table 1)
## LED luminaires for road and street lighting

<table>
<thead>
<tr>
<th>RTQ item</th>
<th>Description</th>
<th>1 year</th>
<th>Year 2</th>
<th>Year 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>II. A. 5.3</td>
<td>Total power of the circuit</td>
<td>X</td>
<td>X</td>
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</table>

(1) – if applicable

### Sampling-4 Table

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

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

### Acceptance/rejection – 4 Table

The criteria for acceptance and rejection should consider the provisions in 6.1.1.2.2 (Acceptance/rejection – Table 3 and 4)

6.1.1.2.2.1 Definition of the tests to be carried out

The objects should be tested on energy efficiency and safety, as provided for in annex of this CRC.

6.1.1.2.2.2 Definition of the sampling of Maintenance

The TÜV RHEINLAND is responsible for the selection and remittance of the seal, samples of the different families of objects to have their certificates held, according to the amount prescribed in accordance with sub item 6.1.1.1.4.1 (Sampling-1 and Table 2) taken from each family object of certification.

6.1.1.2.2.3 Acceptance and rejection

The criteria for acceptance and rejection should follow this CRC and are described in item 6.1.1.2.2 (Acceptance/rejection – Table 3 and 4)

6.1.1.2.2.4 Definition of the lab

The definition of the laboratory must follow the conditions described in the 700-RC-001.
6.1.1.2.3 Treatment of non-conformities in step maintenance assessment
In the event of non-conformity in the tests, the supplier shall propose corrective action, after which new samples can be sent by the supplier for retest.

After the result of passing all the tests, it will be up to the TÜV Rheinland conduct an audit at the supplier to confirm that the product tested is the same that is being manufactured.

6.1.1.2.4 Confirmation of maintenance
The TUV RHEINLAND must send confirmation of maintenance after the critical analysis, covering the information on the documentation, audits, tests, treatment of non-conformities, market monitoring and handling of complaints.

The requirements demanded in this CRC, the TUV RHEINLAND sends the document named "Confirmation of maintenance", formalizing the certification is maintained.

6.1.1.3 Recertification review
Once satisfied all the requirements of this CRC, the TÜV RHEINLAND shall issue a new certificate of compliance of the evaluated object, with validity as laid down in item 6.1.1.6.1 of this CRC.

7. Treatment of complaints
The treatment of complaints described in this document applies to the requesting Supplier certification.

7.1 the process of treating complaints must include:

a) A system for complaints, signed by the responsible formally designated for this purpose, showing that the requesting Supplier of certification:
   Value and give effective treatment to complaints;
   Know and undertake to comply with and be bound by the penalties provided for in the laws, specifically in law No. 8078/1990;
   Critically analyze the results, as well as take appropriate arrangements, on the basis of complaints received;
   Define responsibilities regarding the treatment of complaints;
   Undertake to respond to Inmetro any claim within 15 (fifteen) calendar days;
   Undertake to reply to the complainant as to the receipt, processing and completion of the complaint, as deadlines set internally.

b) A system for the treatment of complaints containing the record of each, the treatment given and the current stage;

c) The formal nomination of a person or team, duly qualified and with freedom for the treatment of complaints;

d) Telephone number or other means of meeting the claims and complaints registration form that includes code or protocol number provided to the consumer for follow up.

7.2 the requesting Supplier must still perform certification annually a critical analysis of the complaints received and evidence of the implementation of the corresponding corrective actions, as well as the opportunities for improvement, recording your results.

The TUV RHEINLAND should audit all locations where the Complaints-handling activity is exercised, to checking the requirements set out above, whatever the certification model adopted in the initial assessments, maintenance and recertification, when available.

8. ACTIVITIES CARRIED OUT BY FOREIGN OAC
Conformity assessment activities, carried out by a body accredited by a member of the IAF MLA, may be accepted, provided that it observed all the conditions below: a) the Agency shall have an MoU with the TUV RHEINLAND;
The MoU must include, at a minimum, the conditions below:

a) The parties must agree to keep the signatories informed about changes of their accreditation in the country of origin;

b) The parties should wake up what documents of the certification process, issued in language other than English or Spanish, should be accompanied by a sworn translation for the Portuguese language;

c) The Parties shall make clear the activities that are covered by the MoU, as for example, audit, test plan, test reports, audit report evaluation.

9. TERMINATION OF CERTIFICATION
The closure of the certification shall be in the cases of termination of the manufacture/importation of the products, or by choice of the holder of the certificate in the case of voluntary certifications.

The TUV RHEINLAND must ensure that objects certified prior to this decision are in accordance with this CRC.

The TUV RHEINLAND must ask the client the following information filled in on letterhead, signed and dated by the responsible:

a) manufacturing date and size of the last batches of certificate object;

b) material available in stock;

c) amount of finished products in stock and forecast for this consignment is distributed;

d) compliance with the requirements provided for in this CRC since the last audit tracking;

e) routine tests performed in recent batches produced;

f) stock of stamps purchased.

When deemed necessary, TUV RHEINLAND can program either the selection of samples and tests to assess compliance of products in stock.

If the result of these tests presents any non-conformity, the TUV RHEINLAND, before considering the case closed, calls on the relevant treatment certificate holder, setting out the arrangements and time limits for implementation.

In the event of non-compliant products on the market, before considering the case closed, and, depending on the commitment to the non-conformity identified can impose on the use of the product, must be considered by the TUV RHEINLAND the need for withdrawal of the product from the market, getting the certificate holder responsible for this action.

From the closure of certification, the product can no longer be manufactured or imported, being admitted strictly the distribution and sales of stock produced within the validity of the certification. Similarly, the closure of the service, certification implies the prevention of the provision of services.

10. IDENTIFICATION SEAL OF COMPLIANCE (SAFETY)
The product can receive individually tags or other identification as figures 1 and 2 below.

The seal may not be used on business cards, and the TÜV must approve formally the use of disclosure material brand, Office, or for any other use.
11. RESPONSIBILITIES AND OBLIGATIONS

The criteria for responsibilities and obligations must follow the conditions described in the 700-RC-001.

12. PENALTIES

Failure to comply with the requirements included in this CRC will cause the application to their offenders, the penalties of suspension and cancellation of the certification.

13. CHANGES

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<td>Translation of the procedure for the English version.</td>
<td>25/11/2016</td>
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### ANNEX-TESTS FOR LUMINAIRE WITH LED

<table>
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| II. A. 1 | Marking | ABNT NBR 15129 | The markings shall be in accordance with ABNT NBR 15129, recorded legibly and indelibly marked on the lamp. Additionally, the fixtures must carry the following information:  
- Manufacturing serial number of the luminaire;  
- Model of the luminaire;  
The leaflet shall submit in addition to the markings provided for in ABNT NBR 15129, the following information: a) name and or mark of the supplier; b) model or vendor code; c) photometric classification, indicating the corresponding elevation angle; d) nominal power, in watts; e) nominal voltage range in volts; f) nominal frequency, in hertz; g) country of origin of the product; h) information on the controller; i) instructions for the user about the electrical installation, handling and recommended care; j) information about the importer or distributor; k) product warranty, from the date of sale to the consumer, being at least 60 months; l) expiration date for storage: indefinite; m) type of protection against electric shock; n) life expectancy (h) that corresponds to the maintenance of the luminous flux of 70% (L70) or 80% (L80); a) guidelines for obtaining the IES file of photometry.  
The controller must possess marking according to ABNT NBR IEC 61347-2-13 and ABNT NBR 16026. |
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<td>Output voltage and current</td>
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The luminaires must be individually wrapped in packaging suitable for transport type (what is applied) and the usual operations of loading, unloading, handling and storage.

The packaging should be identified externally with the following minimum information, legibly and indelibly marked:

a) name and/or Brand of the manufacturer;
b) model or type of luminaire;
c) CNPJ and address of the supplier;
d) Gross weight;
e) Capacity and stacking position;

Nominal voltage, the power shall not differ by more than 10% of the value marked on the device or control declared in the manufacturer’s literature. Note: with luminaires that have voltage ranges, the tests shall be conducted on the nominal voltage of 127 V, 220 V and 277 V, when included in the voltage range. The harmonics of the power should be in accordance with IEC 61000-3-2. Output voltage and current control device during operation

To control devices with non-stabilized output voltage, when fed with nominal voltage, the output voltage shall not differ by more than ± 10% of the nominal voltage of the LED modules.

To control devices with a stabilized output voltage, when fed into any tension between 92% and 106% of the nominal voltage, the output voltage shall not differ by more than ± 10% of the nominal voltage of the LED modules.

To control devices with non-stabilized output current, when fed with nominal voltage, the output current must not differ by more than ± 10% of the nominal current of LED modules.

To control devices that have a stabilized output current, when fed into any tension between 92% and 106% of the nominal voltage, the output current must not differ by more than ± 10% of the nominal current of LED modules.
II. A. 6
- **Interference Electromagnetic and radio frequency**
  - En55015 or CISPR 15.
  - Provision must be made for electromagnetic interference suppression filters and frequency.
  - Compliance is evaluated by subjecting the driver to one of the following standards:
    - Or CISPR 15 en55015.

II. A. 7
- **Leakage current**
  - ABNT NBR IEC 60598-1.
  - The lamp must be subjected to the test of leakage current according to ABNT NBR IEC 60598-1.

II. A. 8
- **Protection against electric shock**
  - ABNT NBR IEC 60598-1.
  - The lamp must be subjected to the test of protection against electric shock as the standard ABNT NBR IEC 60598-1.

II. A. 9.1
- **Torque resistance of screws and connections**
  - NBR IEC 60598-1
  - The screws used in the making of the fixtures and fittings for the installation of the luminaires shall be tested according to ABNT NBR IEC 60598-1 and must not show any deformation during tightening and loosening or cause deformation and/or breakage of the luminaire.

II. A. 10
- **Protection resistance voltage surges (DPS)**
  - ANSI/IEEE C. 62.411991
  - The luminaire with LED technology must have a device to protect against voltage surges. This device must support at least one impulse voltage cycle of 10 kV peak (standard waveform 1.2/50 µs) and 10 kA discharge current (standard waveform 8/20 µs), for both common mode and differential mode (L1Terra, L1/L2-N, L2/N-Earth) in accordance with ANSI/IEEE standard c. 62.41-1991.

II. A. 2.1.1
- **Internal and external wiring**
  - ABNT NBR 15129.
  - Internal and external wiring must be in accordance with the requirements of ABNT NBR 15129.

II. A. 2.1.2
- **Light dependent relay socket**
  - NBR 5123.
  - This component must comply with the ABNT NBR 5123.
<table>
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<th>II. A. 3</th>
<th>Degree of protection</th>
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</tr>
</thead>
</table>

The housing of the luminaire shall ensure the degree of protection against the penetration of dust, solid objects and moisture, according to the classification of the luminaire and the IP code marked on the luminaire according to ABNT NBR IEC 60598-1.

A. 3.2 The accommodation of the vital parts (LED, optical system and controller) should take at least IP66-rated protection. The luminaires shall be tested, for this item, according to ABNT NBR IEC 60598-1.

Note: If the controller is IP-65, or higher than, the accommodation of the controller in the light fixture should be at least IP-44.
II. A. 4 | Sealing rings |
|----------------|
The sealing rings must be silicone rubber or equivalent (declare), resistant to a minimum temperature of 200°C, shall ensure the degree of protection specified in (B). 4 and keep unchanged its characteristics throughout the useful life of the luminaire, considered 50,000 h.

A. 4.2 the sealing rings shall be manufactured and installed so they remain in its standard position in the opening and closing operations of the luminaire, without any permanent deformation or displacement.

The fixtures should be designed to work under the following conditions of use:
- a) altitude not exceeding 1,500 m;
- b) average temperature of the ambient air in 12:00 am not more than +35°C;
- c) ambient air temperature between -5°C and +50°C;
- d) relative humidity up to 100%.

Conditions of use outside the limits specified in 4.1 shall be defined on a case by case basis, depending on the region or application.

Packaging
The luminaires must be individually wrapped in packaging suitable for transport type (what is applied) and the usual operations of loading, unloading, handling and storage.

The packaging should be identified externally with the following minimum information, legibly and indelibly marked:
- a) name and/or Brand of the manufacturer;
- b) model or type of luminaire;
- c) CNPJ and address of the supplier;
- d) Gross weight;
- e) Capacity and stacking position;

II. A. 5.2 | Resistance of ABNT |
The lamp must be subjected to the test of
| LED luminaires for road and street lighting |

| Isolation and dielectric strength | NBR IEC 60598-1. | dielectric strength according to ABNT NBR IEC 60598-1. A practically sinusoidal voltage frequency 50 Hz, 60 Hz or, and with the values specified in Table 1, must be applied for 1 min, via the insulations shown in the same table. The overcurrent protection device should not act when the output current is less than 100 mA. |

In class II luminaires, incorporating both reinforced insulation as double insulation, reinforced insulation applied tension should not request overly basic insulation or supplementary insulation. In the case of lamps with insulating parts accessible to standard indicates that engage these parts with a metal sheet and the voltage is applied between the metal sheet and live parts. For more details consult the standard ABNT NBR IEC 60598-1. |

When you are performing the test of dielectric strength in lighting fixtures that contain electronic control device for LEDs, the nominal voltage of the circuit of the LED can be higher than the values of the supply voltage of the luminaire. In these circumstances, you should use the value of the nominal voltage of the LED circuit in place of U for the calculation of the test voltage. |

NOTE: "U" = working voltage |

For luminaires with protection devices against voltage surges (DPS) connected to the power supply and to the body of the luminaire, the same must be disconnected to the dielectric strength test. |

Insulation resistance |
The lamp must be subjected to the test of insulation resistance in accordance with ABNT NBR IEC 60598-1. |

The insulation resistance must not be less than the values specified in Table 2. |

The coatings and insulating barriers shall be tested only if the distance between live parts and metal parts accessible, without the coating or barrier, is less than the prescribed in the standard ABNT NBR IEC 60698-1. |

Insulations of dowels, cord anchorage, guides or claws of wires shall be tested according to the table 2 and, during the |
test the cable or cord must be covered with a metal or foil should be replaced by a metal rod of the same diameter.

| II. A. 9.2 | Resistance to wind force resistance to vibration | ABNT NBR 15129 ABNT NBR IEC 60598-1 | The fixtures should be resistant to wind force, as provided for in the ABNT NBR 15129.

Vibration resistance
The light fixtures shall be resistant to vibration, according to ABNT NBR IEC 60598-1. The test shall be carried out with the light fully assembled with all the components.

To be considered approved test, in addition to the evaluations provided for in the ABNT NBR IEC 60598-1, luminaires should operate after the test in the same way as before the test and must not show any electrical or mechanical flaws such as cracks, breaks, warps, opening of latches and others that could compromise its performance.

| II. A. 9.3 | Resistance to ultraviolet radiation | EN 50102 | The fixtures must have a resistance to external mechanical impacts corresponding at least to the protection degree IK08, to garden lamps, and for applied fixtures IK06 in automobile traffic routes, according to the standard EN 50102.

| II. A. 5.3 | Total power of the circuit |  | Nominal voltage, the total power of the circuit must not exceed 110% of the value declared by the manufacturer.

Note: with luminaires that have voltage ranges, the tests shall be conducted on the nominal voltage of 127 V, 220 V and 277 V, when included in the voltage range.
| II. A. 5.4 | Power factor | The measured power factor should be not less than 0.92. The measured power factor of the circuit should not be less than the value marked by more than 0.05 when the luminaire is supplied with nominal voltage and frequency. The power factor must be measured without the inclusion of the strip of the measuring instrument. Filters to eliminate high frequency noises must be inside the lamp driver, so that while feeding the lamp the power grid are not conducted high frequency noise to the network. |
| II. A. 5.5 | Power supply current | Nominal voltage, the power shall not differ by more than 10% of the value marked on the device or control declared in the manufacturer’s literature. Note: with luminaires that have voltage ranges, the tests shall be conducted on the nominal voltage of 127 V, 220 V and 277 V, when included in the voltage range.

The harmonics of the power should be in accordance with IEC 61000-3-2.

Output voltage and current control device during operation | 61000-3-2. |
# LED luminaires for road and street lighting

## II. A. 5.6 Output voltage and current

To control devices with non-stabilized output voltage, when fed with nominal voltage, the output voltage shall not differ by more than ± 10% of the nominal voltage of the LED modules.

To control devices with a stabilized output voltage, when fed into any tension between 92% and 106% of the nominal voltage, the output voltage shall not differ by more than ± 10% of the nominal voltage of the LED modules.

To control devices with non-stabilized output current, when fed with nominal voltage, the output current must not differ by more than ± 10% of the nominal current of LED modules.

To control devices that have a stabilized output current, when fed into any tension between 92% and 106% of the nominal voltage, the output current must not differ by more than ± 10% of the nominal current of LED modules.

## II. B. 2 Classification of distributions luminous intensity

The light fixtures are sortable, based in ABNT NBR 5101, transverse distribution, longitudinal distribution and control of distribution, according to table 3.

## II. B. 4 CTT/IRC

The color rendering index of a light source is a set of calculations that provides the measure of how much the perceived color of the object illuminated by this source closely match those of the same object illuminated by a default font (reference illuminant). The quantification is given by the General color rendering index (Ra), ranging from 0 to 100. Only for the case of light sources like daylight, the meaning of Ra is a measure of how much the reproduction of colors for this source approaches that by natural light. The higher the value of Ra, better color reproduction. The public lighting fixtures with LED technology are required to present Ra ≥ 70.

## II. B. 3 Energy Efficiency

Energy efficiency is the ratio of the luminous flux of the luminaire (lm) and the total power consumed (W). The measurement shall be performed after the stabilization period of the luminaire in the test voltage. The luminaires with LED technology must provide the minimum acceptable value measured (lm/W) for energy efficiency level (lm/W)

Note: the method and condition of measurement should follow the recommendations of the IES LM-79.
### Control of the Distribution Bright

#### II. B. 6.1

Control of light distribution is defined by the standard ABNT NBR 5101 and their values shown in table 5. Should be informed to CDL classification corresponding to the possible elevation angles in the installation, one of the following: 0°, 5°, 10°, 15°, as well as meet the requirements according to the classification of the same according to the limits specified in table 5.

#### II. B. 6.2.1 (option 1)

The LED component performance option, allows the manufacturer to demonstrate compliance with the requirements for maintenance of the luminous flux by providing the ISTMT (as described in Appendix b. 1), the report on the tests of maintenance of luminous flux according to LM-80 for the LED used in lamp and the calculation of luminous flux designed as TM-21. To assess compliance by the performance of the LED component, the following conditions must be met:

- **a)** The highest temperature measured at the ISTMT should be below the highest temperature value of the component measured in the LM-80.
- **b)** The location of the temperature measurement point (TMP) is set by the manufacturer, as much for the tests pertaining to LM-80 as to the ISTMT.
- **c)** The LED current, provided by luminaire LED controller, should be less than or equal to the current in the LED measured for the report from the LM-80.
- **d)** The maintenance of the luminous flux in time (t), estimated according to the TM-21, must be greater than or equal to the percentage of the maintenance of flow corresponding to the point end designed, listed in Table 6. The time (t), corresponds to the maximum value permitted by extrapolation of the TM-21, that is 6 times the value of the test data time LM-80.
| II. B. 6.2.2 (option 2) | The luminous flux maintenance lamp-Luminaire performance | In cases where the option 1: performance of the component cannot be applied, as products using secondary optics with remote or phosphorus when the LM-80 data are not available, the suppliers can demonstrate compliance with maintenance of luminous flux through the luminaire performance requirements. The completeness of the performance of the luminaire for maintenance of luminous flux is checked by subjecting the complete lamp photometric tests of LM-79, comparing the initial luminous flux (time = 12:00 am) with the luminous flux after 6000 h operation (time ≥ 6000 h). |
| II. B. 6.3 | Device qualification electronic control CC or CA for LED modules (1) | The electronic control device for LED, independent type or embedded, must be tested on application situation (inside of the luminaire, if assigned to do so) in nominal operating conditions (nominal voltage and ambient temperature), measuring the temperature of the controller housing at the point indicated (tc). For the test the luminaire must operate in an ambient temperature of 35°c. Compliance of this item is checked if the measured temperature (tc) is less than or equal to the value of guaranteed temperature specified by the manufacturer LED controller that ensures a minimum lifespan of 50 000 h. For the verification of compliance with the supplier shall make available the diagram/picture of the location of (tc), if not marked on the casing of the controller, with an arrow indicating the point for fixing the thermocouple. |

(1) – if applicable