

DEVICES OF PROTECTION AND COMMAND

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1 – OBJECTIVE

This document presents the complementary criteria of the “Rules of the Certification of the Products” - RC-002 for the Program of the Evaluation of the Conformity of the Devices of Protection and Command, focusing the safety, by the mechanism of **voluntary** certification, for the grant and maintenance of the license for the use of the Conformity Marking, Inmetro and/or TÜV Rheinland do Brasil Ltda.

2 – APPLICATION FIELD

The application is for all the companies that apply the grant of the license for the use of the Conformity Marking **on the products.**

- IEC 60320-1:2001 - Household and similar general purposes – part 1 general requirements
- IEC 60320-2-2:1998 - Appliance couplers for household and similar general purposes – part 2-2 – interconnection couplers for household and similar equipment
- IEC 60799:1998 - Cords Sets and Interconnection Cord Sets
- NBR IEC 60269-1:2003 – Low-voltage fuses - Part 1: General requirements
- NBR IEC 60269-3-1:2003 - Low-voltage fuses - Part 3: Supplementary requirements for fuses for use by unskilled persons (fuses mainly for household or similar applications) – Sections from I to IV
- NBR 11841:1992 - Low voltage fuses for use by authorized persons - Fuser-links with blade contacts – Specification
- NBR 15465:2008 - Plastic conduit systems for low voltage electrical installations – Performance requirements ABNT NBR IEC 60439-1:2003 - Low-voltage switchgear and controlgear assemblies Part 1: Type-tested and partially type-tested assemblies
- ABNT NBR IEC 60439-3:2004 - Low-voltage switchgear and controlgear assemblies Part 3: Particular requirements for low-voltage switchgear and controlgear assemblies intended to be installed in places where unskilled persons have access for their use - Distribution board
- NBR IEC 60670-1:2005 - Boxes and enclosures for electrical accessories for household and similar fixed electrical installations Part 1: General requirements
- IEC 60670-24:2011 - Boxes and enclosures for electrical accessories for household and similar fixed electrical installations - Part 24: Particular requirements for enclosures for housing protective devices and other power dissipating electrical equipment;
- NBR 5431:2008 - Boxes and enclosures for electrical accessories for household and similar fixed electrical installations – Dimensions
- ABNT NBR IEC 62208:2003 - Empty enclosures for low-voltage switchgear and controlgear assemblies - General requirements
- IEC 62208:2002 - Empty enclosures for low-voltage switchgear and controlgear assemblies - General requirements
- NBR IEC 61643-1:2007 - Low-voltage surge protective devices - Part 1: Surge protective devices connected to low-voltage power distribution systems – Performance requirements and test methods
- **NBR NM 60884-1:2004 - Plugs and socket-outlets for household and similar purposes - Part 1: General requirements.**
- **IEC 60884-1:2006 - Plugs and socket-outlets for household and similar purposes - Part 1: General requirements.**

3 - RESPONSIBILITY

The responsibility for the revision of this “Complement” is (of) TÜV Rheinland do Brasil Ltda.

4 - ACRONYMS AND ABBREVIATIONS

The requirements of the clause 4 of the Rule - RC-002 is applicable.

5 - DEFINITIONS

The requirements of the clause 5 of the Rule - RC-002 is applicable.

5.2 - License for the Use of the Conformity Marking.

5.1.1 – The requirements of the clause 5.2 are:

- the item a) is applicable with the changed text for: Corporate's name, ID Card Number or Registration Business Entry and Main Address of the Applicant and of the Manufacturer.

Note: The companies located abroad, with no representative person in Brazil, must present the updated articles of the incorporation registered in the Notary or a certificate from the Notary bearing the same information namely company's name, main business, representation's requirements, shareholders in the origin country;

- the item b) is applicable, being the identification of the license for the use of the Conformity Marking, the number of the certificate. Applicable the date of issue and the valid term;

- the item c) is not applicable.

5.1.2 Beyond the requirements established in the clause 5.2, the License must contain

d) the system of certification is of Model 5

e) the effected date of the certificate;

f) the product description;

g) the technical standard applicable to the certified product;

h) the grant for the use of the marking (License for the use of the Conformity Marking of TÜV Rheinland do Brasil)

5.1.3 The license for the use of the Conformity Marking for the Devices of Protection and Command will have valid term according to the established in the standards of the products in the Annex B.3.

Note: the expiry date can suffer adjustment in order to allow that in the valid term, all the activities supposed to be finished in the period, be concluded. For instance: when the company is already a customer and it has other issued certificates and/or in reason of the planned audits.

5.2 - Certification Commission of TÜV (Technical Commission of TÜV):

For the voluntary certifications, with or without accreditation scope, within the ambit of this "Complement", the Certification Commission is formed by, at least, the representative persons from the professional associations of the manufacturers, consumers and other neutral organizations, all of them with recognized competence.

5.3 - Model of the Product

Product of designation, trade mark or reference of catalog, unique.

5.4 Data Sheet

Report provided by the applicant of the certification including the characteristics of the product to be certified, must contain, at least, the trade mark of the product, model and drawing with the specification of the internal components.

5.5 Family

Set of models whose characteristics, included in the Data Sheet, are equal, differing only as to its design of product.

5.6 Critical items

List of the items that affect directly the performance of the product to the tests in the relevant standard of this product and/or eventual adjustments established in the Annex of this CRC. **These items normally are informed in the form, Construction Data File - FO-263, when the request of the commercial proposal.**

5.7 – Complementary Documents

Inmetro rule n° 268 from June 21st, 2011.

NBR ISO 9001:2008 - Quality management systems - Requirements;

ABNT ISO/IEC Guide 2:1998 - Standardization and related activities -- General vocabulary;

ABNT ISO/IEC 17025:2005 – General requirements for the competence of testing and calibration laboratories;

ABNT ISO/IEC 17030:2005 – Conformity assessment -- General requirements for third-party marks of conformity;

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ABNT ISO/IEC 17000:2005 – Conformity assessment -- Vocabulary and general principles;

ABNT ISO/IEC Guide 67:1998 – Conformity assessment -- Fundamentals of product certification;

ABNT ISO/IEC Guide 28:1998 – Conformity assessment -- Guidance on a third-party certification system for products;

ABNT NBR ISO/IEC 17065 – Requirements for bodies certifying products, processes and services;

NBR 5410:2004 - Electrical installations of buildings - Low voltage.

NBR 5426:1985 - Sampling Plans and Procedures in the inspection by Attributes - Procedure

NBR IEC 60529:2005 - Degrees of protection provided by enclosures (IP Code)

Law nº 8.078/1990 – Consumer Protection and Defense Code, section IV – On Abusive Practices.

6 - GENERAL CONDITIONS

The requirements of the clause 6 of the rule - RC-002.

7 - GRANT CONDITIONS

The requirements of the clause 7 of the rule - RC-002.

8 - MECHANISM OF THE CONFORMITY EVALUATION

The mechanism for the evaluation of the conformity is the Certification. The model of Certification to be used if the model with type tests, evaluation and approval for the manufacturer's quality system, followed through the audits in the manufacturer and test on the samples taken in the commerce and in the manufacturer - Model 5.

The steps described in the clause 8 of the Rule - RC-002 are applicable, complemented with the others as below.

8.5 – Initial audit

8.5.2 – The items checked in the initial audit are those established in the annex A of this “Complement”.

8.6 – Type Tests

The type tests are those established in the annex B of this “Complement”.

8.11 – Maintenance of the Certification

8.11.1 The evaluation of the quality system of the manufacturer is through surveillance audits carried out according to the established in the annex A of this “Complement”.

8.11.2 The surveillance tests will be carried out according to the established in the annex B of this “Complement”.

8.12 – Renewal

The renewal (renewal of the certificate) is carried out when the presentation of the processes to the Technical Commission of TÜV Rheinland do Brasil, with the results of the tests and surveillance audits.

9 – RECOGNITION OF THE ACTIVITIES OF CERTIFICATION

The requirements of the clause 9 of the Rule – RC-002 are applicable.

10 – OBLIGATIONS OF THE APPLICANT (LICENSED COMPANY)

The requirements of the clause 10 of the Rule – RC-002 are applicable.

11 – OBLIGATIONS OF THE CERTIFICATION BODY

The requirements of the clause 11 of the Rule – RC-002 are applicable.

12 – EXTENSION OR REDUCTION OF THE SCOPE OF CERTIFICATION

The requirements of the clause 12 of the Rule – RC-002 are applicable.

13 – APPELLATE

The requirements of the clause 13 of the Rule – RC-002 are applicable.

14 – TERM AND MAINTENANCE OF THE CERTIFICATION

The requirements of the clause 14 of the Rule – RC-002 are applicable.

15 – COMPLAINTS AND DENUNCIATIONS

The requirements of the clause 15 of the Rule – RC-002 are applicable.

16 – UNDUE USE OF THE CERTIFICATION

The requirements of the clause 16 of the Rule – RC-002 are applicable.

17 – SUSPENSION OF THE CERTIFICATION

The requirements of the clause 17 of the Rule – RC-002 are applicable.

18 – CANCELLATION OF THE CERTIFICATION

The requirements of the clause 18 of the Rule – RC-002 are applicable.

19 – RESIGNATION

The requirements of the clause 19 of the Rule – RC-002 are applicable.

20 – DEVIATION OF THE REQUIREMENTS OF THE CERTIFICATION

The requirements of the clause 20 of the Rule – RC-002 are applicable.

21 – REVISIONS MADE

Change in the encoding of the document

Change in the item 5.11 Complementary Documents in the term where contains “Guide 65” to “ABNT NBR ISO/IEC 17065”.

ANNEX A – EVALUATION OF THE SYSTEM OF THE QUALITY CONTROL OF MANUFACTURING

A.1 The evaluation, initial and periodical, of the quality management system of the manufacturing, must be carried out by TÜV RHEINLAND.

A.2 The evaluation, initial and periodical, the quality management system of the manufacturing must check the fulfillment of the requirements related below, when applicable, in the scope of the manufacturing's Quality Management System:

1. Control of records (*) to fulfill the sub item 4.2.4 of the standard
2. Control of production (*) to fulfill the sub items 7.5.1 and 7.5.2 of the standard
3. Identification and traceability (*) to fulfill the sub item 7.5.3 of the standard
4. Preservation of product (*) to fulfill the sub item 7.5.5 of the standard
5. Control of monitoring and measuring devices (*) to fulfill the sub item 7.6 of the standard
6. Monitoring and measurement of product (*) to fulfill the sub item 8.2.4 of the standard
7. Control of nonconforming product (*) to fulfill the sub item 8.3 of the standard
8. Corrective action (*) to fulfill the sub item 8.5.2 of the standard
9. Preventive action (*) to fulfill the sub item 8.5.3 of the standard

(*) **Note:** for this evaluation, must be used, as reference, the content presented in the NBR ISO 9001:2008 Quality Management Systems – Requirements.

A.3 During the evaluation, initial and periodical, of the system of the quality control of the manufacturing, the performance of the routine tests by the manufacturer will be checked, as established in the respective standards of the Annex B.3 and their results, indicating the product type, date of the tests, place of manufacturing (if made in different places), quantity tested, fail numbers and actions taken, i.e., scrapped or repaired. The manufacturer must keep the records of the routine tests carried out.

A.4 If the manufacturer has quality management system certified by a CB (Certification Body of Systems) accredited by Inmetro, according to NBR ISO 9001:2008, TÜV RHEINLAND must analyze the documentation related to the certification of the quality system, assuring that the requirements described above were checked focusing the product to be certified. Otherwise, TÜV RHEINLAND must check the fulfillment of the requirements described in the sub items A.2, A.3 and Routine Tests established in the Annex, specific for the product.

A.5 The periodical evaluation of the system of the quality control of the manufacturing will be carried out, after the grant of the license for the use of the Conformity Marking, with minimum periodicity established in the standards of the products of the Annex B.3.x.4.

ANNEX B – TESTS AND SAMPLINGS

B.1 The tests described in this CRC are established in the specific standards, any corrigendum, amendment or up-to-date versions of these standards, only can be used with TÜV Rheinland authorization.

B.2 General

The collect of samples for the tests is carried out by TÜV Rheinland do Brasil.

B.2.1 Initial or Certification Tests

The tests of certification and the respective samplings for each product established in this Complement are established in the annexes B.3.x.5.

In case of prototypes, the manufacturer can collect and forward the necessary samples to the Laboratory and/or TÜV Rheinland do Brasil, by agreement among them, and under responsibility of TÜV Rheinland do Brasil. The approval of the prototype on the initial tests does not exempt TÜV Rheinland do Brasil of validating the products after the beginning of the functioning of the production line.

For the products that have already certification, can be considered the type test reports issued within at maximum 2 (two) years.

B.2.2 Surveillance tests

The conduction of the surveillance tests will be carried out by TÜV Rheinland do Brasil, being taken from the commerce (or from the manufacturing logistic) or from the manufacturer stock.

The periodicity of performance for each product established in this Complement is established in the annexes B.3.x.4.

At the end of the tests cycle, the sequence must be restarted.

The collected samples must be sent to the laboratory within a term of 15 days after collected. If these samples are not being sent within the established term, the certificates can be suspended.

The surveillance tests are established in the annexes B.3.x.6.

B.2.3 Routine tests

The routine tests and their respective samplings are established in the annex B.3.x.3.

B.2.4 Periodic tests

Periodical tests, when established, and their respective samplings are established in the annex B.3.x.7.

B.3 Particularities

The tests for the products established in this “Complement” are those described from the items B.3.1 to B.3. **10.**

B.3.1 CONNECTORS

B.3.1.1 Product description

Appliance couplers for household and similar general purposes - Part 1: General requirements according to the standard IEC 60320-1/2007.

B.3.1.2 Criteria for the establishment of families (basic design)

The connectors and the plug connectors can be considered as having the same basic design if:

- Same basic design (relevant number related to the standard sheet in the standards IEC 60320-1/2007);
- Same type of contacts;
- Same materials (PVC, insert, contact and pins); and
- Same method of fixing of the conductors and the pins.

For the same family of connectors and plug connectors, it is acceptable the following variation:

- Type of cable;
- Cable section;
- Angle of the cable exit; and
- Colors.

B.3.1.3 Routine tests to be carried out by the manufacturer

The routine tests to be carried out are established in the Annex A of the standard IEC 60320-1/2007.

B.3.1.4 Frequency for the surveillances and the certificate validity term

Semesterly, an evaluation of the manufacturing and surveillance tests for the maintenance of the certified product will be done.

The validity term of the certificate is of 2 (two) years.

B.3.1.5 Initial tests and quantity of samples

The initial tests are the type tests and the minimum quantity of the samples is established in the section 5 (General conditions about tests) of the standard IEC 60320-1/2007.

B.3.1.5.a Additional tests carried out when certified taking advantage of tests

For one same family of connectors must be carried out additional tests according to the section of the standards as indicated in the table:

Variation of the same family	<u>Sections of the standard</u>
Cable type (smaller cable section)	8 and 22
Cable section (smaller cable section)	8 and 22
Angle of the cable exit (bigger cable section)	8, 9, 10, 13, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24 and 26
Colors	27

B.3.1.6 Surveillance tests and quantity of samples

For each one of the samples collected during the surveillances for the connectors, must be carried out the tests and checkings, as to the standards IEC 60320-1/2007, indicated as follow:

- a) Standard ratings (section 6);
- b) Classification (section 7);
- c) Markings (section 8);
- d) Dimensions and compatibility (section 9);

Beyond the tests and checkings established above, must be carried out, additionally, when applicable, the tests and the checkings, according to the standards IEC 60320-1/2007, indicated as follow:

1st Semester: Provision for earthing (section 11), Forces necessary to insert and to withdraw the connector (section 16), Resistance to heating of appliance couplers for hot conditions or very hot conditions (section 18), Breaking capacity (section 19), Normal operation (section 20), Temperature rise (section 21), Cords and their connection (section 22) and Mechanical strength (section 23).

2nd Semester: Moisture resistance (section 14), Insulation resistance and electric strength (section 15) and Cords and their connection (section 22).

3rd Semester: Forces necessary to insert and to withdraw the connector (section 16), Operation of contacts (section 17), Breaking capacity (section 19), Normal operation (section 20), Temperature rise (section 21), Cords and their connection (section 22), Resistance to heat and ageing (section 24), Screws, current-carrying parts and connections (section 25), Creepage distances, clearances and distances through insulation (section 26), Resistance to rusting (section 28) and Electromagnetic compatibility (EMC) requirements (section 29).

4th Semester: Protection against electric shock (section 10), Provision for earthing (section 11), Terminals and terminations (section 12), Construction (section 13), Cords and their connection (section 22) and Resistance of insulating material to heat, fire and tracking (section 27).

B.3.2 PLUG CONECTORS

B.3.2.1 Product description

Appliance couplers for household and similar general purposes - Part 2-2: Interconnection couplers for household and similar equipment according to the standard IEC 60320-2-2/1998.

B.3.2.2 Criteria for the establishment of families (basic design)

The plug connectors can be considered as having the same basic design if:

- same basic design (number correspondent to the standard sheet established in the standard IEC 60320-2-2/1998);
- same type of contacts;
- same materials (PVC, insert, contact and pins); and
- same method of fixing of the conductors and of the pins.

For one same family of plug connectors are accepted the following variations:

- cable type;
- cable section;
- cable exit angle; and
- colors.

B.3.2.3 Routine tests to be carried out by the manufacturer

The routine tests to be carried out are established in the Annex A of the standard IEC 60320-1/2001.

B.3.2.4 Frequency of the surveillance and the validity of the certificates

For the maintenance of the certified product, semesterly, an evaluation of the manufacturing and surveillance tests will be carried out.

The validity of the certificate will be of 02 (two) years.

B.3.2.5 Initial tests and quantity of samples

Plug connectors – the initial tests are the type tests and the minimum quantity of samples are established in the section 5 (General conditions about the tests) of the standard IEC 60320-2-2/1998.

B.3.2.5.a Additional tests used when certified by taken advantage of tests

For one same family of plug connectors must be carried out the additional tests on the sections of the standards as established in the table:

Variation in the family	Sections of the standard
Cable type (small cable section)	8 and 22
Cable section (small cable section)	8 and 22
Cable exit angle (highest cable section)	8, 9, 10, 13, 15, 21, 22, 23, 24 e 26
Colors	27

B.3.2.6 Surveillance tests and quantity of samples

On each one of the surveillance samplings for plug connectors, must be carried out the tests and the checkings, as the standard IEC 60320-2-2/1998, indicated as follow:

- ✓ Standard ratings (section 6);
- ✓ Classification (section 7);
- ✓ Marking (section 8);
- ✓ Dimensions and compatibility (section 9);

Beyond the tests and checkings established above, must be carried out additionally, when applicable, the tests and checkings, according to the standard IEC 60320-2-2/1998, indicated as follow:

- ✓ **1º Semester:** Provision for earthing (section 11), Forces necessary to insert and to withdraw the connector (section 16), Resistance to heating of appliance couplers for hot conditions or very hot conditions (section 18), Breaking capacity (section 19), Normal operation (section 20), Temperature rise (section 21), Cords and their connection (section 22) and Mechanical strength (section 23).
- ✓ **2º Semester:** Moisture resistance (section 14), Insulation resistance and electric strength (section 15) and Cords and their connection (section 22).
- ✓ **3º Semester:** Forces necessary to insert and to withdraw the connector (section 16), Operation of contacts (section 17), Breaking capacity (section 19), Normal operation (section 20), Temperature rise (section 21), Cords and their connection (section 22), Resistance to heat and ageing (section 24), Screws, current-carrying parts and connections (section 25), Creepage distances, clearances and distances through insulation (section 26), Resistance to rusting (section 28) and Electromagnetic compatibility (EMC) requirements (section 29).
- ✓ **4º Semester:** Protection against electric shock (section 10), Provision for earthing (section 11), Terminals and terminations (section 12), Construction (section 13), Cords and their connection (section 22) and Resistance of insulating material to heat, fire and tracking (section 27).

B.3.3 CORD SETS

B.3.3.1 Product description

Electrical accessories - Cord sets and interconnection cord sets according to IEC 60799/1998.

B.3.3.2 Criteria for the establishment of families (basic design)

The plug connectors can be considered as having the same basic design if:

- For the cord sets the criteria for the establishment of families are not applicable, however the components must fulfill the following requirements:
- The plug of the cord set must be certified according to ABNT NBR NM 60884-1/2004 or IEC 60884-1/2002.
- The connector of the cord set must be certified or fulfill the requirements of IEC 60320-1/2007.
- The plug connector of the cord set must be certified or fulfill the requirements of IEC 60320-2-2/1998.
- The cable of the cord set must be certified according to the NBR or fulfill the requirements of IEC 60245 or IEC 60227.

B.3.3.3 Routine tests to be carried out by the manufacturer

The routine tests to be carried out are those established in the Annex A of the standard IEC 60779/1998.

B.3.3.4 Frequency of the surveillance and the validity of the certificate

For the surveillance of the certified product, semesterly, will be carried out an evaluation of the manufacturing and surveillance tests.

The validity of the certificate is 02 (two) years.

B.3.3.5 Initial tests and quantity of samples

The initial tests are the type tests according to IEC 60799/1998 and 6 samples, at minimum, are necessary.

B.3.3.6 Surveillance tests and quantity of samples

For the cord sets certified according to IEC 60799/1998 must be carried out, within two years, the tests of the sections 5 and 6.

B.3.4 LOW VOLTAGE FUSES

B.3.4.1 Product description

Low-voltage fuses - Part 1: General requirements – fuses type “D” - NBR IEC 60269-1/03 and NBR IEC 60269-3-1 – Section I/03; Low voltage fuses for use by authorized persons - fuser-links with blade contacts - Specification – NBR IEC 60269-1/03 and NBR 11841/92.

B.3.4.2 Criteria for the establishment of families (basic design)

According to the items 8.1.5.2 of the standard NBR IEC 60269-1.

B.3.4.3 Routine tests to be carried out by the manufacturer

- a) Electrical resistance;
- b) Checking of the compression of the sand.

B.3.4.4 Frequency for the surveillances and the validity of the certificate

For the surveillance of the certified product, semesterly, will be carried out an evaluation of the manufacturing and surveillance tests.

The validity of the certificate is of 3 (three) years.

B.3.4.5 – Initial tests and quantity of samples

According to the conditions of the tables of 7A, 7B, 7C and 8 of the standard NBR IEC 60269-1.

B.3.4.6 – Surveillance tests and quantity of samples

Check of the acting regions, according to the table 3 of the standard NBR IEC 60269-1/03 and respectively specific standard.

Tests to be carried out on 3 samples as proof, 3 samples as counterproof and 3 samples as witness, of the higher and the lower nominal current of each homogeneous series in a way that occur at least one collect of samples in the market during 3 years of the cycle.

B.3.5 SPD

B.3.5.1 Product description

Low-voltage surge protective devices connected to low-voltage power distribution systems, according to ABNT NBR IEC 61643-1:2007

B.3.5.2 Criteria for the establishment of families (basic design)

The SPD can be considered as having the same basic design if:

- They have the same non-linear device (e.g.: varistors or suppression diodes);
- The materials, finish and dimensions of the internal current carrying parts are identical;
- The terminals are of similar design;
- The contact size, the material, the configuration and the method of fixation of the SPD are identical;
- The moulding and insulating materials are identical;

It is authorized the following differences since that SPD fulfills in all other points of indicated above prescriptions:

- a) Terminal dimensions;

B.3.5.3 Routine tests to be carried out by the manufacturer

The appropriated tests must be carried out to check that SPD fulfills its performance. The manufacturer must declare the method of test.

To check that I_c is inferior to the specified value by the manufacturer at the specified voltage U_c .

B.3.5.4 Frequency for the surveillance and validity of the certificate

For the surveillance of the certified product, semesterly, will be carried out the evaluation of the manufacturing and surveillance tests.

The validity of the certificate is of 4 (four) years.

B.3.5.5 Initial tests and quantity of samples

Initial tests according to the conditions of the table 2 of the standard ABNT NBR IEC 61643-1 carried out on three samples by series of tests.

B.3.5.6 Surveillance tests and quantity of samples

The number of samples is defined by the ABNT NBR IEC 61643-1 for each test.

First year:

<u>Series of test</u>	<u>Description (Type of tests)</u>	<u>Subsection</u>
2	Degree of protection	6.2.2 / 7.5
	Determination of the presence of a switching element	7.5.1
	Residual voltage	7.5.2
	Front-of-wave sparcover voltage	7.5.3
	Measured limiting voltage with combination wave	7.5.4 / 7.5.5
	Determination of the value of the subsequent current	7.6.2
6	Short circuit withstand capability	6.2.7 / 6.2.11 / 7.7.3
7	TOV test	6.2.7 / 6.5.5 / 7.7.6
	TOV test	6.2.7 / 6.5.5 / 7.7.4

Second year:

<u>Series of test</u>	<u>Description (Type of tests)</u>	<u>Subsection</u>
1	Identification and marking	6.1.1 / 6.1.2 / 7.2
	Terminals and electrical connections	6.2.1 / 6.3 / 7.3
	Protection against direct contact	6.5.1 / 7.4
	Standby power consumption and residual current test	6.5.3 / 6.5.4 / 7.7.5
3	Operating duty test	6.2.6 / 7.6
	Precondicioning	7.6.4 / 7.7.1
	Class I and II operating duty test	6.2.3 / 6.2.4 / 7.6.5 / 7.6.6 / 7.7.1
	Class III operating duty test	6.2.5 / 7.6.7 / 7.7.1
4	Class I and II total discharge current	6.5.6 / 7.9.10

Third year:

<u>Series of test</u>	<u>Description (Type of tests)</u>	<u>Subsection</u>
5	Test of thermal stability	6.2.7 / 7.7.2
7	TOV test	6.2.7 / 6.5.5 / 7.7.6
	TOV test	6.2.7 / 6.5.5 / 7.7.4
8	Flexible cables and cords and their connection	7.9.1
	Mechanical strength	6.3 / 6.5.1.1 / 7.9.2.1
	Mechanical strength	6.3 / 6.5.1.1 / 7.9.2.2
	Insulation resistance	6.5.1.3 / 7.9.7
	Dielectric withstand	6.2.10 / 7.9.8
	Heat resistance	6.5.1.2 / 7.9.3
	Verification of air clearances and creepage distances	6.2.8 / 7.9.5.1
	Resistance to abnormal heat and fire	6.5.2 / 7.9.4
Tracking resistance	6.2.9 / 7.9.6	

Fourth year:

<u>Series of test</u>	<u>Description (Type of tests)</u>	<u>Subsection</u>
3	Operating duty test	6.2.6 / 7.6
	Precondicioning	7.6.4 / 7.7.1
	Class I and II operating duty test	6.2.3 / 6.2.4 / 7.6.5 / 7.6.6 / 7.7.1
	Class III operating duty test	6.2.5 / 7.6.7 / 7.7.1
9	Additional tests for the SPD of two gates and devices of one gate with terminals of separated input/output	
	Percentage voltage regulation	6.6.1 / 7.8.1
	Rated load current	6.6.2 / 7.8.2
	Load-side surge withstand capability	6.6.3 / 7.8.4
	Overload behaviour	6.6.4 / 7.8.5
	Load-side short circuit withstand capability test	6.2.7 / 7.8.3

It must be collected at least once samples from the market during 4 years of the cycle.

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B.3.6 PLASTIC CONDUIT SYSTEMS FOR LOW VOLTAGE ELETRICAL INSTALLATIONS – PERFORMANCE REQUIREMENTS

B.3.6.1 Product description

Rigid plastic conduit (up to DN 110) or pliable plastic conduit (up to DN 40), of circular cross-section, intended to be installed concealed, buried or exposed, for use in electrical installation buildings in systems up to and including 1000 V in alternating current, having a frequency less than 400 Hz, or to 1500 V in continuous current. The conduits covered by this CRC must be also used in lines of signal (telephony, cable TV etc.), as to the standard ABNT NBR 15465:2008.

B.3.6.2 The Criteria for the establishment of families (basic design)

The conduits can be considered as having the same basic design if:

- **Have the same classification, as to the sections 4 and 5.1 of ABNT NBR 15465:2008;**
- **Use the same raw materials; and**
- **Have the same colors.**

For one same family of conduits are accepted the following variations:

- **Dimensional.**

B.3.6.3 Routine tests to be carried out by the manufacturer

Routine tests (AQL and IL according to the manufacturer's procedure and under its responsibility):

B.3.6.3.1 Non-destructive tests:

- a) **Classification of the conduits and their connections (section 4)**
- b) **Classification (section 5.1)**
- c) **Dimensions (section 5.2)**
- d) **Visual aspect (section 5.3)**
- e) **Methods of supply (section 8)**
- f) **Marking (section 9)**

B.3.6.3.2 Destructive tests:

- a) **Resistance to curvature (section 6.2.1)**
- b) **Resistance to compression (section 6.2.2)**
- c) **Resistance to impact (section 6.2.3)**
- d) **Resistance to heat (section 6.2.4)**
- e) **Resistance to flame (section 6.2.5)**
- f) **Dielectric strength (section 6.2.6)**
- g) **Electrical insulation resistance (section 6.2.7)**
- h) **Specific requirements for the connections (section 6.3)**

The tests must be carried out as established in the standard ABNT NBR 15465:2008.

B.3.6.4 Frequency of the surveillances and validity of the certificate

For the surveillance of the certified product, semesterly, the evaluation of the manufacturing and surveillance tests will be carried out.

The validity of the certificate is of 03 (three) years.

B.3.6.5 Initial tests and quantity of samples

The initial tests are the type tests and the minimum quantity of samples is 25 meters.

B.3.6.6 Surveillance tests and quantity of samples

- **1º Semester: Classification of the conduits and their connections, Classification, Dimensions, Visual aspect, Methods of supply, Marking and Resistance to curvature;**
- **2º Semester: Classification of the conduits and their connections, Classification, Dimensions, Visual aspect, Methods of supply, Marking and Resistance to compression;**
- **3º Semester: Classification of the conduits and their connections, Classification, Dimensions, Visual aspect, Methods of supply, Marking and Resistance to impact;**
- **4º Semester: Classification of the conduits and their connections, Classification, Dimensions, Visual aspect, Methods of supply, Marking and Resistance to heat;**
- **5º Semester: Classification of the conduits and their connections, Classification, Dimensions, Visual aspect, Methods of supply, Marking and Resistance to flame; and**
- **6º Semester: Classification of the conduits and their connections, Classification, Dimensions, Visual aspect, Methods of supply, Marking, Dielectric strength and Electrical insulation resistance.**

Note: The samples must be collected in the factory.

B.3.7 ELECTRICAL PASSAGE BOX

B.3.7.1 Product description

Boxes and enclosures for electrical accessories with a rated voltage not exceeding 1000Vc.a. and 1500Vc.c., intended for household or similar fixed electrical installations – Dimensions, according to the standard NBR 5431:2008

Boxes and enclosures for electrical accessories with a rated voltage not exceeding 1000Vc.a. and 1500Vc.c., intended for household or similar fixed electrical installations, internal and external, according to the standard NBR IEC 60670-1:2005.

B.3.7.2 Criteria for the establishment of families (basic design)

Passage boxes can be considered as having the same basic design since:

- **Have the same classification, as to the section 7 of IEC 60670-1:2002, and**
- **Use the same raw materials.**

For one same family of conduits are accepted the following variations:

- **Dimensional.**

B.3.7.3 Routine tests to be carried out by the manufacturer

Routine tests (AQL and IL according to the manufacturer's procedure and under its responsibility):

- a) **marking; and**
- b) **visual.**

B.3.7.4 Frequency of the surveillances and validity of the certificate

For the surveillance of the certified product, yearly, the evaluation of the manufacturing and surveillance tests will be carried out.

The validity of the certificate is of 03 (three) years.

B.3.7.5 Initial tests and quantity of samples

The initial tests are those established in the standards and the minimum quantity of samples is of 10 pieces.

B.3.7.6 Surveillance tests and quantity of samples

- **1^o year: classification (7), marking (8), Dimensions (NBR 5431), construction (12), insulation resistance and electrical strength (14), Protection against electric shock (10), Provision for earthing (11).**
- **2^o year: classification (7), marking (8), Dimensions (NBR 5431), construction (12), insulation resistance and electric strength (14), resistance to ageing, protection against ingress of solid objects and against harmful ingress of water (13), mechanical strength (15), resistance to heat (16).**
- **3^o year: classification (7), marking (8), Dimensions (NBR 5431), construction (12), insulation resistance and electric strength (14), resistance of insulating material to abnormal heat and fire (18), resistance to tracking (19), resistance to corrosion (20).**

Note: The samples must be collected in the factory.

B.3.8 DISTRIBUTION BOARDS

B.3.8.1 Product description

Low-voltage switchgear and controlgear assemblies intended to be installed in places where unskilled persons have access for their use - Distribution boards, according to ABNT NBR IEC 60439-3:2004

B.3.8.2 Criteria for the establishment of families (basic design)

The distribution boards can be considered as having the same basic design if:

- ✓ **Have the same rated nominal current “In”, indicated by the manufacturer;**
- ✓ **Have the same rated voltage of operation (Ue), specified by the manufacturer;**
- ✓ **Derive of the same line and/or type declared by the manufacturer;**
- ✓ **Have the same code IP;**
- ✓ **Are installed in the same way (i.e.: flushed installation or surface installation);**
- ✓ **The insulating materials are identical [Enclosure/box and cover(s)] (1);**
- ✓ **The metallic materials are identical [Enclosure/box and cover(s)] (2);**

(1) If determined board(s) has(ve) the alternative of using of frontal door(s) of different materials, specific test(s) applicable must be carried out on the respective surveillances with, at least 1 sample of each family;

(2) If determined metallic board(s) has(ve) the possibility of using of door and/or finish cover in thermoplastic material, must be carried out the relevant tests in the initial certification (type tests) and during the respective surveillance.

B.3.8.3 Routine tests to be carried out by the manufacturer

The appropriated test(s) must be carried out in order to check if the DISTRIBUTION BOARD fulfills its performance. The manufacturer must declare the test method(s).

Routine tests according to the conditions of the table 7b of the ABNT NBR IEC 61643-3:2004.

Dielectric test (see 8.3.2 – ABNT NBR IEC 60439-1:2003):

A dielectric test is not required for distribution boards that contains only busbar and/or pre-made conductors of the main circuit, neither in simple constructions where an inspection according to (ABNT NBR IEC 60439-1:2003), is enough.

B.3.8.4 Frequency of the surveillances and validity of the certificate

For the surveillance of the certified product, yearly, an evaluation of the factory and surveillance tests will be carried out.

The validity of the certificate is of 03 (three) years.

B.3.8.5 Initial tests and quantity of samples

Initial tests according to the conditions of the table 7a of ABNT NBR IEC 61643-3. The type tests are arranged in three different sequences as detailed in the table 7a. A selected sample for a given sequence must complete all the tests for that sequence, in the established order.

The tests must be carried out on the board of biggest and smallest capacity of modules of standard circuit breakers DIN (Width=18,0mm), as to the following table:

<u>Standard(s) of reference</u>	<u>Capacity of Boards (Number of Thermomagnetic – Modules DIN – Width=18mm)</u>	<u>Items to be tested</u>
<u>ABNT NBR IEC 60439-1:2003</u>	<u>SMALLEST capacity of modules</u>	<u>ALL the items applicable as to the standard(s) of reference</u>
<u>ABNT NBR IEC 60439-3:2004</u>	<u>ALL the intermediate boards</u>	<u>8.2.6 – 8.2.10 – 8.2.15</u>
<u>ABNT NBR IEC 60670-1:2005</u>		
<u>IEC 60670-24:2005</u>	<u>BIGGEST capacity of modules</u>	<u>ALL the items applicable as to the standard(s) of reference</u>

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B.3.8.6 Surveillance tests and quantity of samples

First year:

Standard (s)	Description of the standard item	Standard item(s)	
ABNT NBR IEC 60439-1:2003	Nameplates	5.1	
	Project and Construction – Clearances, creepage distances and	7.1.2	
	Project and Construction – terminals for external conductors	7.1.3	
	Protection against both direct and indirect contact	7.4.1	
	Protection against direct contact	7.4.2	
	Protection against indirect contact	7.4.3	
	ABNT NBR IEC 60439-3:2004	Installation	7.6.2
		Fixed parts	7.6.3
		Removable parts and withdrawable parts	7.6.4
		Identification	7.6.5
	Internal separation of assemblies by barriers or partitions	7.7	
ABNT NBR IEC 60439-1:2003	Verification of temperature-rise limits	8.2.1	
	Verification of dielectric properties	8.2.2	
	Verification of the effectiveness of the protective circuit	8.2.4	
ABNT NBR IEC 60439-3:2004	Verification of degree of protection	8.2.7	
	Verification of construction and marking	8.2.9 (*4)	
	Resistance of insulating materials to abnormal heat and to fire	8.2.13	
ABNT NBR IEC 60670-1:2005	Marking	8	
IEC 60670-24:2005	Verification of the maximum capability to dissipate power	101	

Second year:

Standard(s)	Description of the standard item	Standard item(s)	
ABNT NBR IEC 60439-1:2003	Nameplates	5.1	
	Project and Construction – Clearances, creepage distances and	7.1.2	
	Project and Construction – terminals for external conductors	7.1.3	
	Protection against both direct and indirect contact	7.4.1	
	Protection against direct contact	7.4.2	
	Protection against indirect contact	7.4.3	
	ABNT NBR IEC 60439-3:2004	Installation	7.6.2
		Fixed parts	7.6.3
		Removable parts and withdrawable parts	7.6.4
		Identification	7.6.5
	Internal separation of assemblies by barriers or partitions	7.7	
ABNT NBR IEC 60439-1:2003	Verification of temperature-rise limits	8.2.1	
	Verification of clearance and creepage distances	8.2.5	
	Verification of mechanical operation	8.2.6	
ABNT NBR IEC 60439-3:2004	Verification of resistance to rusting and to humidity	8.2.11 e 8.2.14	
	Verification of resistance of insulating materials to heat	8.2.12	
	Verification of the resistance of insulating materials to abnormal and	8.2.13	
ABNT NBR IEC 60670-1:2005	Marking	8	
IEC	Verification of the maximum capability to dissipate power	101	

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Third year:

Standard(s)	Description of the standard item	Standard item(s)
ABNT NBR IEC 60439-1:2003	Nameplates	5.1
	Project and Construction – Clearances, creepage distances and	7.1.2
	Project and Construction – terminals for external conductors	7.1.3
	Protection against both direct and indirect contact	7.4.1
	Protection against direct contact	7.4.2
	Protection against indirect contact	7.4.3
ABNT NBR IEC 60439-3:2004	Installation	7.6.2
	Fixed parts	7.6.3
	Removable parts and withdrawable parts	7.6.4
	Identification	7.6.5
	Internal separation of assemblies by barriers or partitions	7.7
ABNT NBR IEC 60439-1:2003	Electrical connections inside an ASSEMBLY: bars and insulated	7.8 (*3)
ABNT NBR IEC 60439-3:2004	General	7.8.1
	Dimensions and rating of busbars and insulated conductors	7.8.2
ABNT NBR IEC 60439-1:2003	Wiring	7.8.3
	Verification of temperature-rise limits	8.2.1
	Verification of short-circuit withstand strength	8.2.3 (*5)
	Verification of construction and marking	8.2.9 (*4)
	Verification of impact strength	8.2.10
ABNT NBR IEC 60439-3:2004	Verification of the resistance of insulating materials to abnormal	8.2.13
	Verification of mechanical strength of fastening means of	8.2.15
ABNT NBR IEC 60670-1:2005	Marking	8
IEC	Verification of the maximum capability to dissipate power	101

Observations:

⁽³⁾ - The item 7.8 will be evaluated only in the surveillance referred to the Third year because the results of all type tests are necessary, divided in the First and Second surveillances, for evaluation and to close the respective cycle;

⁽⁴⁾ - The item 8.2.9 request the evaluation together with the items 5.1, 7.1, 7.4, 7.6, 7.7. For the item 7.8, see observation ⁽³⁾;

⁽⁵⁾ - The test of the item 8.2.3 is applicable only for the product that is not for the item 8.2.3.1 of ABNT NBR IEC 60439-1;

Boards with different capacities of Modules must be collected / Circuit breakers DIN (1 reference / surveillance), for each homogeneous series, during the annual surveillances.

B.3.9 EMPTY ENCLOSURES

B.3.9.1 Product description

Empty enclosures for low-voltage switchgear and controlgear assemblies, according to ABNT NBR IEC 62208:2003

B.3.9.2 Criteria for the establishment of families (basic design)

The empty cubicles can be considered as having the same basic design since:

- **Have the same height (independently of width and depth);**
- **Have the same raw material ⁽¹⁾;**
- **Have the same basic design ⁽²⁾;**
- **Have the same code IP;**
- **Have the same code IK;**
- **Are installed in the same way [example: exposed to the weather (OUTDOOR) - sheltered (INDOOR)].**

(1) – For enclosures where they the same material is used, the same thickness and the same type of surface treatment for all the families, the tests of the items 9.11 and 9.12 must be carried out, in one unique family and extended to the others.

(2) - For the enclosures where a variation occurs of profile of columns, additionally the tests of the items 9.3, 9.4 and 9.6 must be carried out, applied to the enclosures of highest cross section and highest height.

B.3.9.3 Routine tests to be carried out by the manufacturer

Verification of the contituity of the protective circuit (see 9.10 – ABNT NBR IEC 62208:2003). The verification must be carried out in 100% of the empty enclosures made.

According to the manufacturer's procedure, other tests can be carried out.

B.3.9.4 Frequency of the surveillances and validity of the certificate

For the surveillance of the certified product, yearly, an evaluation of the factory and surveillance tests will be carried out.

The validity of certificate is of 03 (three) years.

B.3.9.5 Initial tests and quantity of samples

Initial tests according to the conditions of the table 1 ABNT NBR IEC 62208:2003. The enclosures to be tested must be assembled and installed in the normal condition of use, as the instructions of the enclosure's manufacturer.

The tests must be carried out on the empty enclosures, of highest volume, of each family.

B.3.9.6 Surveillance tests and quantity of samples

The quantity of samples is established by the standard ABNT NBR IEC 62208:2003 for each test.

First year:

<u>Standard(s)</u>	<u>Description of the standard item</u>	<u>Standard item(s)</u>
<u>ABNT NBR IEC 62208:2003</u>	<u>Marking</u>	<u>9.2</u>
	<u>Static loads</u>	<u>9.3</u>
	<u>Verification of axial loads of metal inserts</u>	<u>9.5</u>
	<u>Verification of resistance to abnormal heat and fire</u>	<u>9.8.3</u>
	<u>Verification of resistance to weathering</u>	<u>9.11</u>

Second year:

<u>Standard(s)</u>	<u>Description of the standard item</u>	<u>Standard item(s)</u>
<u>ABNT NBR IEC 62208:2003</u>	<u>Marking</u>	<u>9.2</u>
	<u>Verification of degree of protection against external mechanical impacts (IK code)</u>	<u>9.6</u>
	<u>Verification of thermal stability</u>	<u>9.8.1</u>
	<u>Verification of dielectric strength</u>	<u>9.9</u>
	<u>Verification of resistance to abnormal heat and fire</u>	<u>9.8.3</u>

Third year:

<u>Standard(s)</u>	<u>Description of the standard item</u>	<u>Standard item(s)</u>
<u>ABNT NBR IEC 62208:2003</u>	<u>Marking</u>	<u>9.2</u>
	<u>Lifting</u>	<u>9.4</u>
	<u>Verification of degree of protection (IP code)</u>	<u>9.7</u>
	<u>Verification of resistance to heat</u>	<u>9.8.2</u>
	<u>Verification of resistance to abnormal heat and fire</u>	<u>9.8.3</u>
	<u>Verification of resistance to corrosion</u>	<u>9.12</u>

B.3.10 PLUGS AND SOCKETS (VOLUNTARY)

B.3.10.1 Product description

Plugs and fixed or portable sockets exclusively for alternating current, with or without earthing contact, incorporated or not into the cord sets and extension cords, with rated voltage greater than 50 V but not exceeding 440 V and a rated current not exceeding 32A, intended for household and similar purposes, either indoors or outdoors, according to the standards ABNT NBR NM 60884-1:2004 or IEC 60884-1: 2006, that does not fit in the standard of NBR 14136.

Note:

As the accessories are forbidden as established by the Conmetro Resolution nº 08, from August 31st, 2009, the commercialization of these products inside the Brazilian territory is forbidden. The certification will be granted exclusively for products to be commercialized abroad. This observation must be included in the certificate for the product.

B.3.10.2 Criteria established for the families (basic design)

The accessories can be considered of the same family since the following conditions as kept:

B.3.10.2.a For a set of fixed socket be considered of the same family must, necessarily, fulfill the following requirements.

- **same basic design (correspondent number of the standard sheet of the item 6, except as to the earthing contact existing);**
- **same contacts;**
- **same materials (base, cover, contact etc); and**
- **same conductor spaces.**

For one same family of fixed sockets are accepted the following variations:

- **assembly type as established by ABNT NBR NM 60884-1;**
- **installations method as established by ABNT NBR NM 60884-1;**
- **existing of shutters;**
- **existing of earthing contact;**
- **colors;**
- **types of terminals; and**
- **cover plates.**

B.3.10.2.b For one set of portable sockets and plugs be considered of the same family must, necessarily, fulfill the following requirements

- **same basic design (correspondent number of the standard sheet of the item 6);**
- **same type of contacts;**
- **same materials (base, insert, contact or pins etc);**
- **same method of fixing of conductors and of pins; and**
- **same type of terminals.**

For one same family of portable sockets and plugs are accepted the following variations:

- **type of cable;**
- **cable section;**
- **angle of cable exits;**
- **type of pins (solid or non-solid, with insulating sleeves or not); and**
- **colors.**

Note: Rewirable and non-rewirable accessories can not be considered of the same family

B.3.10.3 Routine tests to be carried out by the manufacturer

Safety-related routine tests for factory-wired portable accessories (as Annex A of ABNT NBR NM 60884-1)

<u>Test</u>	<u>Number of poles</u>	
	<u>2</u>	<u>More than 2</u>
<u>a) Polarized system, phase (L) and neutral (N) – correct connection</u>	<u>X</u>	<u>X</u>
<u>b) Earth continuity</u>	<u>---</u>	<u>X</u>
<u>c) Short-circuit, wrong connection and reduction of creepage distance and clearances between phase (L) or neutral (N) to earth (⏚)</u>	<u>---</u>	<u>X</u>

The manufacturer must carry out the functional checking of the equipment of this test, before and after each period of use and for the continuous uses at least, once at 24h.

During the checking, the equipment must indicate the fails, when the accessories known as failed, are tested or when the fails are simulated.

The equipment of test must be calibrated at least once a year.

The records of the checkings and all of the necessary interventions must be kept.

B.3.10.4 Frequency of the surveillances and validity of the certificate

For the surveillance for the certified product, yearly, an evaluation and surveillance tests will be carried out.

The validity of the certificate is of 02 (two) years.

B.3.10.5 Initial tests and quantity of samples

The initial tests are the type tests established by the standards ABNT NBR NM 60884-1 or IEC 60884-1:2006, with adjustments established by this Complement.

Note: The standards of certifiable plugs and sockets are those indicated in the respective standard sheets issued by competent bodies of each intended market.

The number of specimens needed for the type tests is established by the standard ABNT NBR NM 60884-1 or IEC 60884-1:2006, as proof. The same number of specimens will be collected simultaneously, for the counterproof and witness.

The collect of samples for the initial tests must be carried out by TÜV, obeying one minimum quantity to be carried out the tests, as the tables A.1 and A.2

Tabela A.1 – Specimens needed for the tests

<u>Sections and Subsections</u>		<u>Fixed sockets</u>	<u>Portable sockets</u>	<u>Plugs</u>
<u>6</u>	<u>Ratings</u>	<u>A</u>	<u>A</u>	<u>A</u>
<u>7</u>	<u>Classification</u>	<u>A</u>	<u>A</u>	<u>A</u>
<u>8</u>	<u>Marking</u>	<u>A</u>	<u>A</u>	<u>A</u>
<u>9</u>	<u>Checking of dimensions</u>	<u>ABC</u>	<u>ABC</u>	<u>ABC</u>
<u>10</u>	<u>Protection against electric shock</u>	<u>ABC</u>	<u>ABC</u>	<u>ABC</u>
<u>11</u>	<u>Provision for earthing</u>	<u>ABC</u>	<u>ABC</u>	<u>ABC</u>
<u>12</u>	<u>Terminals and terminations</u>	<u>ABC^{a)}</u>	<u>ABC</u>	<u>ABC</u>
<u>13</u>	<u>Construction of fixed socket-outlets</u>	<u>ABC^{b)}</u>	<u>----</u>	<u>----</u>
<u>14</u>	<u>Construction of plugs and portable socket-outlets</u>	<u>----</u>	<u>ABC^{b)}</u>	<u>ABC^{b)}</u>
<u>15</u>	<u>Interlocked socket-outlets</u>	<u>ABC</u>	<u>ABC</u>	<u>ABC</u>
<u>16</u>	<u>Resistance to ageing, protection provided by enclosures, and resistance to humidity</u>	<u>ABC</u>	<u>ABC</u>	<u>ABC</u>
<u>17</u>	<u>Insulation resistance and electric strength</u>	<u>ABC</u>	<u>ABC</u>	<u>ABC</u>
<u>18</u>	<u>Operation of earthing contacts</u>	<u>ABC</u>	<u>ABC</u>	<u>ABC</u>
<u>19</u>	<u>Temperature rise</u>	<u>ABC</u>	<u>ABC</u>	<u>ABC</u>
<u>20</u>	<u>Breaking capacity</u>	<u>ABC</u>	<u>ABC</u>	<u>ABC</u>
<u>21</u>	<u>Normal operation</u>	<u>ABC</u>	<u>ABC</u>	<u>ABC</u>
<u>22</u>	<u>Force necessary to withdraw the plug</u>	<u>ABC</u>	<u>ABC</u>	<u>----</u>
<u>23</u>	<u>Flexible cables and their connection</u>	<u>----</u>	<u>ABC^{c)}</u>	<u>ABC^{c)}</u>
<u>24</u>	<u>Mechanical strength</u>	<u>ABC^{d) e)}</u>	<u>ABC^{d)}</u>	<u>ABC^{f)}</u>

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25	<u>Resistance to heat</u>	<u>ABC</u>	<u>ABC</u>	<u>ABC</u>
26	<u>Screws, current-carrying parts and connections</u>	<u>ABC</u>	<u>ABC</u>	<u>ABC</u>
27	<u>Creepage distances, clearances and distances through sealing compound</u>	<u>ABC</u>	<u>ABC</u>	<u>ABC</u>
28.1	<u>Resistance of insulating material to abnormal heat and fire</u>	<u>DEF</u>	<u>DEF</u>	<u>DEF</u>
28.2	<u>Resistance to tracking^{g)}</u>	<u>DEF</u>	<u>DEF</u>	<u>DEF</u>
29	<u>Resistance to rusting</u>	<u>ABC</u>	<u>ABC</u>	<u>ABC</u>
30	<u>Additional tests on pins provided with insulating sleeves</u>	<u>---</u>	<u>---</u>	<u>GHI^{h)}</u>
	<u>TOTAL</u>	<u>06</u>	<u>06</u>	<u>09</u>

The capital letters identifies the different test pieces to be tested

- a) **Supplementary samples are used for the test of 12.3.10, five additional samples of screwless terminals are used for the tests of 12.3.11 and the supplementary samples are used for 12.3.12.**
- b) **Supplementary samples of membranes are needed for the tests of 13.22 and 13.23.**
- c) **Supplementary samples are needed for 23.2 and 23.4 of non-rewirable accessories of each cable type and section.**
- d) **Supplementary samples are needed for the tests of 24.8 for shutters.**
- e) **Supplementary samples are needed for the tests of 24.14.1 and 24.14.2.**
- f) **Supplementary samples are needed for the tests of 24.10 for plugs.**
- g) **Supplementary samples can be needed.**
- h) **Supplementary samples are needed for the tests of 30.2 e 30.3 for plugs with insulating sleeves.**

Table A.2 – Additional tests due to the variations in the families

<u>Variation in the same family</u>	<u>Fixed sockets</u>	<u>Portable sockets</u>	<u>Plugs</u>
<u>assembly type</u>	<u>sections 8, 13, 24, 25, 26, 27, 28, 29</u>	<u>---</u>	<u>---</u>
<u>Installation method</u>	<u>sections 8, 13, 24, 26, 27, 28, 29</u>	<u>---</u>	<u>---</u>
<u>existing of shutters</u>	<u>sections 10, 21, 24, 28, 29</u>	<u>sections 10, 21, 24, 28, 29</u>	<u>---</u>
<u>terminals types</u>	<u>sections 12, 19, 20, 21, 22, 24, 26, 29</u>	<u>sections 12, 19, 20, 21, 22, 24, 26, 29</u>	<u>sections 12, 19, 20, 21, 24, 26, 29</u>
<u>cover plates</u>	<u>sections 8, 16, 24, 28</u>	<u>---</u>	<u>---</u>
<u>cable type</u>	<u>---</u>	<u>sections 14, 23, 27</u>	<u>sections 14, 23, 27</u>
<u>cable section</u>	<u>---</u>	<u>sections 8, 14, 19, 20^{a)}, 21^{b)}, 22, 23, 27</u>	<u>sections 8, 14, 19, 20^{a)}, 21^{b)}, 23, 27</u>
<u>angle of cable exits</u>	<u>---</u>	<u>sections 8, 14, 23, 24, 27</u>	<u>sections 8, 14, 23, 24, 27</u>
<u>types and numbers of pins (solid or not, with insulating sleeves or not)</u>	<u>---</u>	<u>---</u>	<u>sections 9, 14, 19, 20, 21, 23, 24, 27, 30</u>

DEVICES OF PROTECTION AND COMMAND

Colors	section 28	section 28	section 28
a)	<u>The accessory must be tested only on the cable section correspondent to its rated current. If the accessory of same rated current is constructed with different cable sections, the lowest declared section must be tested;</u>		
b)	<u>The accessory must be tested only on the cable section correspondent to the highest declared rated current.</u>		

B.3.10.6 Surveillance tests and quantity of samples

The surveillance tests are carried out as follow:

Representative samples of the production must be submitted to the surveillance tests. From each certified basic design certified must be collected samples, at least, from each one model, considering the totality of surveillance tests to be carried out.

On each one of the samplings of surveillance, must be carried out the tests and the checkings, as ABNT NBR NM 60884-1 or IEC 60884-1: 2006, indicated as follow:

- a) Ratings (section 6);
- b) Classification (section 7);
- c) Marking (section 8)
- d) Checking of dimensions (section 9)
- e) Flexible cables and their connection (section 23);

Beyond the tests and checkings established in the sub item above, must be carried out additionally, when applicable, the tests and the checkings, as ABNT NBR NM 60884-1 or IEC 60884-1: 2006, indicated as follow:

- 1º semester: operation of earthing contacts (section 18); temperature rise (section 19); breaking capacity (section 20); normal operation (section 21); force necessary to withdraw the plug (section 22); mechanical strength (section 24).
- 2º semester: interlocked socket-outlets (section 15); resistance to ageing, protection provided by enclosures, and resistance to humidity (section 16); insulation resistance and electric strength (section 17); Resistance of insulating material to abnormal heat and fire and to tracking (section 28);
- 3º semester: resistance to heat (section 25); screws, current-carrying parts and connections (section 26); creepage distances, clearances and distances through sealing compound (section 27); resistance to rusting (section 29); additional tests on pins provided with insulating sleeves (section 30); operation of earthing contacts (section 18); temperature rise (section 19); breaking capacity (section 20); normal operation (section 21); force necessary to withdraw the plug (section 22);
- 4º semester: protection against electric shock (section 10); provision for earthing (section 11); terminals and terminations (section 12); construction of fixed socket-outlets (section 13); construction of plugs and portable socket-outlets (section 14); resistance of insulating material to abnormal heat and fire and to tracking (section 28).

B.3.10.7 Periodic tests and quantity of samples

Routine tests (AQL and IL as to the manufacturer's procedure and under its responsibility):

- a) Checking of dimensionals (section 9 of the standard);
- b) Pull, torque and flexing test (section 23 of the standard);
- c) Resistance to heat (section 25 of the standard);
- d) Temperature rise (section 19 of the standard);
- e) Force necessary to withdraw the plug (section 22 of the standard);
- f) Insulation resistance and electric strength (section 17 of the standard);
- g) resistance of insulating material to abnormal heat and fire and to tracking (section 28 of the standard).

The manufacturer must keep the records of the tests made, indicating the product type, date of test, place of manufacturing (since made in different places), tested quantity, number of defects and actions taken, i.e., destructed or repaired.

ANNEX C – ACTIONS AGAINST THE NON-CONFORMITIES

C.1 In one initial certification, eventual non-conformities must be corrected before the conclusion of the process.

C.2 Identified any non-conformity in anyone of the surveillance tests, this test must repeated on two samples new, counterproof and witness, for the attribute non-conform, not being admitted the identification of any non-conformity.

Note: If TÜV Rheinland do Brasil deems suitable and in agreement with the manufacturer, the non-conformity might be confirmed without the execution of the counterproof and witness tests.

C.3 When the non-conformity confirmation, TÜV Rheinland do Brasil will suspend immediately the license for the use of the conformity marking, requesting the manufacturer the relevant treatment, with the establishment of the corrective actions and implementation deadlines.

Note: If the non-conformity found, does not put at risk the safety of the user, under TÜV Rheinland do Brasil's analysis and responsibility, the manufacturer can not have its license for the use of the conformity marking suspended, since it has assured TÜV Rheinland do Brasil through corrective actions, the correction of the non-conformity on the existing products in the market and the implementation of these actions of the production line.

ANNEX D – CONFORMITY MARKINGS

D.1 The Conformity Markings to be applied on the products and packages are those determined in the items D.1.1 and D.1.2.

D.1.1 When **have** INMETRO accreditation

TÜV RHEINLAND + OCP 0004 or UCIEE + OCP 0004

a) for product and package



b) Alternative, only for product, as note 2.



Notes:

1) The marking “TUV + OCP-0004” will be granted for the scopes that are included in the voluntary annex of the accreditation of TÜV Rheinland do Brasil, together with INMETRO.

The marking “UCIEE + OCP-0004” will be granted only for the customers that had already the authorization for the use of this marking and in the scopes that were included in the voluntary annex of the accreditation of TÜV Rheinland do Brasil, together with INMETRO, in April, 2009. For this “Complement”, the scopes in the standards IEC 60320-1/2001, IEC 60320-2-2/1998 and IEC 60799/1998 are in this condition.

2) Nowadays, the standards established in this "Complement" is part of the Accreditation Scope of TÜV Rheinland do Brazil Ltda., the standards NBR 11841/1992, IEC 60799/1998, IEC 60320-2-2/1998 and IEC 60320-1, are still in 2001 version.

D.1.2 When **do not have** INMETRO accreditation

TÜV RHEINLAND or UCIEE

c) for product and packing



d) Alternative, only for product, as note 2.



Notes:

1) The marking “UCIEE” will be granted only for the customers that had already the authorization for the use of this marking, and that did not want to replace the marking to TUV.