



*Omission of certain tests
judged to be unnecessary*

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- *Guidance on how to determine whether tests may be judged as unnecessary and the required justification for reporting in ExTR*
- *Consideration of the views from TC 31 experts*
- *Deviation from the standard requirements by specific condition of use – marking “X”*
- *Consideration of the views from TC 31 experts*

How to determine whether tests may be judged as unnecessary

IEC 60079-0:2011 statement

- “certain tests judged to be unnecessary, may be omitted from the testing programme”

How to determine whether tests may be judged as unnecessary

Exemption possibilities

- Standard include alternative requirement
- Standard includes guidance for exemption
- Test already performed on identical part of product
- Assessment of global range
- Recognized technical knowledge
- Deviations by specific condition of use

Required justification for reporting in ExTR

IEC 60079-0:2011 statement

- “certain tests judged to be unnecessary, may be omitted from the testing programme. **A record shall be made** of all tests carried out and of the justification for those omitted.”

Required justification for reporting in ExTR

IECEX OD010-2:2012 statements

- “The purpose of an Ex Test Report is to provide a standardized clause-by-clause documentation of the evaluation and testing”
- The column “Result - Remark” is to be completed as part of the evaluation and testing. In this column, a measured value or an explanation **shall be entered** to detail the results from the “Requirement – Test” column.

Common examples :

Alternative requirement

- In some cases, omissions are authorized by the standard.
- The standard clearly mentions this possibility and associated alternative requirement.
- Reporting in the ExTR should be based on the standard wording

Common examples :

Alternative requirement

- Clause 7.3 of IEC 60079-0 : Materials compliant with requirements (f1) in ANSI/UL 746C considered satisfactory
- Reporting in ExTR :
“Enclosure material is not otherwise protected from exposure to light. Material was tested in accordance with the ultraviolet light exposure requirements (f1) in ANSI/UL 746C and considered satisfactory. See attached data sheet.”

Common examples :

Guidance for exemption

- For recognized technical knowledge, document issued by TC31 includes guidance.
- This guidance is given to allow omission of test depending on the product specificities.
- The ExTR should detail which part of the product is concerned by the test omission.

Common examples :

Guidance for exemption

- Note 2 to 7.4.1 of IEC 60079-0 : Glass considered as not susceptible to storing an electrostatic charge
- Reporting in ExTR :
 - “The window mounted in the front panel is made of glass. The ESD test has not been judged necessary.”

Common examples :

Guidance for exemption

- Note to 26.8 and 26.9 of IEC 60079-0 : ceramic materials are not adversely affected by the thermal endurance
- Reporting in ExTR :
 - “Isolators mounted on the enclosure are made of ceramic. The sample as been submitted to endurance to heat and without isolators which are considered not affected by this test.”

Common examples :

Test performed on other product

- Same Ex e enclosure (material and dimensions) with different content has been previously assessed in the frame of IECEx CoC.
- The tests relative to enclosure do not have to be repeated (Therman endurance, IP, ...)
- Special attention required about standard update and/or ExTAG DS issued since original tests.

Common examples :

Test performed on other product

- Reporting in ExTR :
 - it should be include reference of the original tested item (ExTR ref. number, model) along with main results supporting the « pass » criteria.
 - If necessary, explanation about how the original tested item has been considered as indentical to the product assessed should be given.

Common examples :

Assessment of global range

- Manufacturers very often apply for the certification of a large range of products.
- It is then not practical to perform all the tests on all the models.
- ExCBs and ExTLs commonly choose representative samples based on analysis of the range to be covered.
- This principle also exists for product that may include many options

Common examples :

Assessment of global range

- An ExTR is basically dedicated to the test of a sample with a clause by clause compliance assessment.
- Only few guidance exists (e.g. OD020 for group I flameproof motors) for range assessment, when selection is related to the judgement made by the ExCB and ExTL from a certification perspective.

Common examples :

Assessment of global range

Examples :

- Temperature measurement on selected product of a range considered the unfavorable.
- Explosion test on smaller and larger equipement of Ex d enclosure range.
- Test of Ex e enclosure including maximum number accessories in the front panel.
- IP test on ISO threads models only of cable entry range

Common examples :

Assessment of global range

- In order to ensure acceptance of ExTRs, eg. for local or regional certification purpose :
 - How this should be reported within ExTRs ?
 - What level of detail is expected to support the sample selection ?

Common examples :

Use of softwares

- Softwares exists that may be an alternative to physical test (e.g. iSpark software for Intrinsic safety evaluation according to IEC 60079-11)
- Some ExCBs may already include software results on assessment.
- No specific rule or guidance is given in the scheme documentation about such principle.

Common examples : use of softwares

- How should the scheme handle softwares ?
- Is this allowed as an alternative to product testing or only as a complement ?
- Should software be approved by the scheme or standardization committees to be used for assessments ?

Special conditions of use - "X" on certificates

- Some TC 31 standards permit a deviation from the requirements for a standard – by specific condition of use – marking "X"
- For example IEC 60079-0 and -11
- Definition in IEC 60079-0:

3.53

symbol "X"

symbol used to denote specific conditions of use

NOTE The symbol "X" is used to provide a means of identifying that essential information for the installation, use, and maintenance of the equipment is contained within the certificate.

Special conditions of use - "X" on certificates

- Following is the relevant part regarding marking:

29.3 General

The marking shall include the following:

e) if it is necessary to indicate specific conditions of use, the symbol "X" shall be placed after the certificate reference. An advisory marking may appear on the equipment as an alternative to the requirement for the "X" marking;

NOTE 2 The advisory marking may be a specific reference to a specific instruction document containing the detailed information.

NOTE 3 The manufacturer should ensure that the requirements of the specific conditions of use are passed to the purchaser together with any other relevant information.

Special conditions of use - "X" on certificates

- Following is the relevant part regarding instructions:

30 Instructions

30.1 General

The documentation prepared as required by Clause 24 shall include instructions, providing the following particulars as a minimum:

- where applicable, specific conditions of use according to 29.3 e);
- where applicable, any special conditions of use, including particulars of possible misuse which experience has shown might occur;

Using "X" on certificates

- **Some standards may give an indication of the extent of deviation required and the measures to be taken**
- **But not all**
- **Examination of IECEx certificates shows this can lead to significantly different approaches by certifying bodies and very different wording in conditions**

Using "X" on certificates

- This was initially discussed in TC 31 CAG in March 2017
- Recommendations CAG to TC 31:
 - Better guidance in TC 31 good working practice document (GWP)
 - TC 31 editing committee to review the “Specific Conditions of Use”
 - MT/PT/WG consider minimizing the use of “Specific Conditions of Use” when possible

Using "X" on certificates

- **Recommendations CAG to IECEx:**
 - The TC 31 CAG recommends to IECEx that “Specific Conditions of Use” are not used to relax requirements of a standard unless permitted by that standard.

Options regarding compliance with standards

- **Complies in all respects – no problem!**
- **For no technical change**
 - Interpretation by ExCB/ExTL of requirement
 - Guidance from Decision Sheet – either existing or raised by body – but this should not be an interpretation
 - Guidance from TC 31 interpretation sheet (I-SH)
- **For deviation from current standard**
 - Use of “X”, but only as permitted
 - Use of Ex s
 - Amendment to standard

Examples of deviations allowed by standards – IEC 60079-0

The following are examples for deviations/ relaxations allowed in IEC 60079-0:

- Resistance to impact allows 'low risk' impact value and marking of "X". The standard does not comment on whether lower risk can be accepted via a condition. No indication if an even lower impact with appropriate condition is acceptable.
- Resistance to light - If the equipment is protected from light then use of "X" to indicate specific conditions of use.

Examples of deviations allowed by standards – IEC 60079-0

- **Electrostatic charges on external non-metallic materials - Various options such as resistance or area. Requirements are different for Groups I/II and Group III.**
- **Maximum surface temperature with respect to dust layers - condition of use if dust layer specified in documentation.**
- **Group I light alloys - exception portable measuring equipment but with "X"**
- **Group II light alloys - When the material limits are exceeded for equipment of EPL Ga or Gb, then "X" and special conditions. No indication of how much limits could be exceeded.**

How “specific conditions of use” is applied

- For impact there is clear indication of how much lower an impact can be tolerated when the equipment is marked "X". Hence the equipment is non-compliant with the technical requirements of the standard and the only way the ensuring risk is dealt with is by the special conditions of use.
- Other situations do not indicate to what degree the extent of non-compliance that can be tolerated – examples follow

How “specific conditions of use” is applied – example

- If a plastics enclosure intended for a fixed installation (7.4.2 e) has no antistatic properties at all, it can still be used if the instructions provide guidance for the user to minimize the risk from electrostatic discharge. There is no indication of what these instructions might be. (But it appears this will be rectified in Edition 7.0, which also reinstates the recommendation to have a warning label.)

How “specific conditions of use” is applied – example

- If a piezoelectric device cannot pass the impact test, there is no restriction on the level once "X" is used and no guidance on what the specific conditions of use might be.

How “specific conditions of use” is applied – example

- **Dielectric strength - The insulation between an intrinsically safe circuit and the frame - test 500 V r.m.s., or greater. Where the circuit does not satisfy this requirement the apparatus shall be marked with the symbol “X” and the documentation shall indicate the necessary information regarding the correct installation. There is no requirement to establish what voltage it can pass.**

Example of use of “X” in certificates - electrostatic

- Due to the risk of static hazards of the CZ086 Series Luminaire Range, the equipment should **only be cleaned with a damp cloth**.
- Under certain extreme circumstances, the non-metallic parts incorporated in the enclosure of this equipment may generate an ignition-capable level of electrostatic charge. Therefore the equipment shall **not be installed in a location where the external conditions are conducive to the build-up of electrostatic charge** on such surfaces. **In addition, the equipment shall only be cleaned with a damp cloth.**
- Advanced terminals type MAGELIS GTO present a potential electrostatic charging hazard, **safety precautions are defined in the instructions guide**.
- The equipment label on the FH07C model may pose an electrostatic hazard and should not be rubbed in service, should **only be cleaned using a damp cloth**.

Example of use of “X” in certificates - electrostatic

- 1. **Precautions shall be taken** to minimize the risk from electrostatic discharge or propagating brush discharge of painted parts of the enclosure. 2. In case of the enclosure of TDLS8000 with paint layers, if it is mounted in an area where the use of EPL Db equipment is required, it shall be installed in such a way that the **risk from electrostatic discharges and propagating brush discharges** caused by rapid flow of dust is **avoided**.
- The equipment must be mounted inside an enclosure which must be **selected to avoid electrostatic charging hazard**.
- There is a risk of explosion due to static electricity discharge derived from antennas which plastic parts can accumulate electrostatic charge. **Care should be taken during installation and maintenance** - do not touch the antenna with hand or a tool when explosive atmosphere is present. **Install in hard-to-reach areas**.
- To avoid the risk of ignition as a result of electrostatic charging, the IFC 100W housing **can not be used in locations** in which
 - High charge generating processes,
 - Mechanical friction and separation processes,
 - Electron emission (e.g. near electrostatic coating equipment) may occur.

Example of use of “X” in certificates - electrostatic

- For the use in the area where an EPL Da apparatus is required, **electrostatic discharge shall be avoided**.
- Due to a potential electrostatic charging hazard, the equipment should be **cleaned only with a damp cloth**.
- If the load cells are installed in areas requiring EPL Ga gas group IIC, EPL Da or EPL Db equipment (depending on the variant), the cables (permanently connected or fastened at the connector) have to be **installed in a way that electrostatic charging/discharging will be precluded**.
- installation in areas requiring EPL Ga or EPL Da equipment is only permitted if the load cells are **protected against electrostatic charging/discharging**.
- **Electrostatic charges** on the non-metallic or coated parts of the two wire analyzer **shall be avoided**.
- It is a condition of safe use that **no precautions against electrostatic discharge are necessary for portable equipment** that has an enclosure made of plastic, metal or a combination of the two, except where a significant static generating mechanism has been identified. Activities such as placing the item in a pocket or on a belt, operating a keypad or cleaning with a damp cloth, do not present a significant electrostatic risk. However, **where a static-generating mechanism is identified**, such as repeated brushing against clothing, then suitable **precautions shall be taken**, e.g. the use of anti-static footwear.

Example of use of “X” in certificates – light alloys (Ga)

- The meriGauge housing material contains aluminium. **Consideration must be given towards the risk of ignition due to impact or friction sparks.**
- If the enclosure of the AT9000 Advanced Transmitter Model SuperAce is made of aluminium, if it is mounted in an area where the use of EPL Ga equipment is required, it must be installed such, that, **even in the event of rare incidents, ignition sources due to impact and friction sparks are excluded.**
- Due to the presence of aluminium, the equipment must **be protected against impact or friction when in Zone 0** areas.
- The Model 775 enclosure may be made of aluminium alloy and given a protective polyurethane paint finish; however, care should be taken to **protect it from impact or abrasion if located in a zone 0.**

What should IECEx do about “X”?



Thank you!



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