Impact of new IEC 60079-32

ExTAG Training Session

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Impact of new IEC and IEC/TS 60079-32

- Background
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- IEC/TS 60079-32-1 : Electrostatic hazards, guidance
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- On going Standardization projects
- How to deal with current IEC 60079-0:2011 Ed. 6.0 ?
- Proposed solution to deal with transferred charge method
- Use of other TC 31 publications, TS

Impact of new IEC and IEC/TS 60079-32

► Background

- Since 2011, the normative publications have impacted the requirements relative to the assessment of electrostatic charges on external non-metallic materials.
- Requirements and guidance can now be found in the following documents :
  - IEC 60079-0:2007 Ed. 5.0 (N-1 edition)
  - IEC 60079-0:2011 Ed. 6.0 (N edition)
  - IEC/TS 60079-32-1:2013 Ed. 1.0
  - IEC 60079-32-2:2015 Ed. 1.0
- Nevertheless, all these documents may lead to different requirements for assessments and introduce different practices.

Impact of new IEC and IEC/TS 60079-32

► Comparison between current and past requirements in IEC 60079-0

	IEC 60079-0:2007 Ed 5.0	IEC 60079-0:2011 Ed 6.0	Comment
Limitation of surface resistance	7.4.2 a) Rs ≤10^9 Ω measured at (50±5)% RH Tested according to 26.13.	7.4.2 a) Rs ≤ 10^9 Ω measured at (50±5)% RH or Rs ≤ 10^{11}Ω measured at (30±5)% RH Tested according to 26.13.	Identical requirements and test with addition of new limit value regarding RH.
Limitation of the surface area	7.4.2 b)	7.4.2 b)	Identical requirements.
Limitation of a non-metallic layer	7.4.2 c)	7.4.2 c)	Identical requirements with addition of breakdown voltage limit as an option
Limitation of the transferred charge	Clause 7.4.2 d) Tested according to 26.14	Removed from the standard.	Could be re-introduced with modifications in the next edition of the standard.
		Addition of a Note: *"Guidance on the risk of ignition from electrostatic discharge can be found in EN TR 50404 and future IEC/TS 60079-32."*	

Impact of new IEC and IEC/TS 60079-32

► IEC/TS 60079-32-1 : Electrostatic hazards, guidance

- Annex G (informative) introduces test methods

	IEC/TS 60079-32-1:2013 Ed 1.0	Comment
Limitation of surface resistance	6.2.2 G.2	The test is equivalent to the test required in the standards IEC 60079-0 Ed. 5.0 and IEC 60079-0 Ed. 6.0 excepted regarding HR.
Limitation of the transferred charge	6.3.9 G.10	The test method is different and more detailed than previous method defined in IEC 60079-0 Ed. 5.0 Acceptance criterias are different than previous criterias defined in IEC 60079-0 Ed. 5.0 (IIA : 60 nC ; IIB : 30 nC ; IIC : 10 nC)

Explosion Group	EPL Ma EPL Mb Mining	EPL Ga Zone 0	EPL Gb Zone 1	EPL Gc Zone 2	EPL Da Zone 20	EPL Db Zone 21	EPL Dc Zone 22
I	60 nC	-	-	-	-	-	-
IIA	-	25 nC	60 nC	60 nC	-	-	-
IIB	-	10 nC	25 nC	25 nC	-	-	-
IIC	-	No measurabl edischarge	10 nC	10 nC	-	-	-
III	-	-	-	-	60 nC [a]	200 nC [a]	200 nC [a]

Impact of new IEC and IEC/TS 60079-32

► IEC/TS 60079-32-1 : How to consider within IECEx 02 Scheme ?

- This document is not a standard but a Technical Specification.
- It contains more guidance than detailed requirements for assessment of product.
- It modifies requirements from existing standards.
- Its use may lead to different approach by all ExCBs.

► IEC 60079-32-2 : Electrostatics hazards – Tests

- General remark extracted from the standard

"In some other standards, e.g. IEC 60079-0, different limit values based on measurement taken at 50 % RH or 30 % RH have been specified in the past in the absence of an effective dehumidified test chamber. Experience shows that measurement results in this climate are not obtained with the same degree of consistency as those measured according to this standard. ***However, it may be necessary to use the climate specified in other standards in order to maintain continuity for previously evaluated equipment."***

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► IEC 60079-32-2 : Electrostatics hazards – Tests

- This standard introduces detailed test methods, especially regarding :
  - Limitation of surface resistance
  - Limitation of the transferred charge

	IEC/TS 60079-32-1:2013 Ed 1.0	Comment
Limitation of surface resistance	4.2	The test is equivalent to the test required in the standards IEC 60079-0 Ed. 5.0 and IEC 60079-0 Ed. 6.0 excepted regarding HR.
Limitation of the transferred charge	4.11	The test method is different and more detailed than previous method defined in IEC 60079-0 Ed. 5.0 Acceptance criterias are different than previous criterias defined in IEC 60079-0 Ed. 5.0 (IIA : 60 nC ; IIB : 30 nC ; IIC : 10 nC)

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► IEC 60079-0 Ed. 7 (Committee draft 31/1197/CD)

- The current project of IEC 60079-0 Ed. 7 introduces the transferred charge method with modifications compared to Ed. 5.0.
- The test method is identical to IEC 60079-32-2 Ed. 1.0 excepted regarding the RH : (30 ± 5) % RH instead of (25 ± 5) % RH.
- The acceptance limits are identical to IEC 60079-0 Ed. 6 expected regarding requirements for group IIB : 25nC instead of 30 nC.

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► IEC 60079-32-1 Amendment 1 (Committee draft 31/1207/CD)

- This amendment is intended to clarify the requirements of IEC 60079-0:2011 regarding the assessment of electrostatic charges on external non-metallic materials
- Re-introduces the transferred charge method.
- IEC 60079-32-2 Ed. 1.0 test method required.
- The acceptance limits are identical to IEC 60079-0 Ed. 5 expected regarding requirements for group IIB : 25nC instead of 30 nC.

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► How to deal with current IEC 60079-0:2011 Ed. 6.0 ?

- Preferred methods for assessment are the option given in the standard:
  - Limitation of surface resistance
  - Limitation of the surface area
  - Limitation of a non-metallic layer
  - To avoid confusion there is no need to refer to IEC/TS 60079-32-1 or IEC 60079-32-2 for these methods of assessment

- However :
  - Transferred charge method as been removed.
  - This method has been re-introduced in IEC 60079-32-2:2015 with modifications.
  - This method may be re-introduced in next edition of IEC 60079-0.

- The discontinuity in the standards leads to difficulties in assessments.

Impact of new IEC and IEC/TS 60079-32

► Proposed solution to deal with transferred charge method :

- based on the reference to IEC/TS 60079-32 in the IEC 60079-0:2011 Ed. 6.0, assessment could be possible according to transferred charge method with :
  - Use of test method defined IEC 60079-32-2 Ed. 1.0 with (30 ± 5) % RH
  - Use of acceptance limits of IEC 60079-0 Ed. 5

► Is an ExTAG DS required ?

- Yes in order to deal with this matter until publication of next IEC 60079-0, harmonized practices between ExTL and give guidance to manufacturers.

► Is a specific ExTR required ?

- No the current ExTR already adresses the assessment of electrostatic charges on external non-metallic materials for all methods excepted transferred charge.
- A reference to a published IECEx ExTAG DS may be sufficient is the transferred charge method is used.

Use of other TC 31 publications, TS

- The current IECEx rules are written for the use of standards in order to assess equipment.
- There may be a need for use of other publications from TC31 (for example TS 60079-40).
- A case by case analysis should be required to determine the relevance of a TS in the purpose of assessment of products.
- Further discussion expected during ExTAG meeting regarding the use of TS (see ExTAG_377_CD).

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