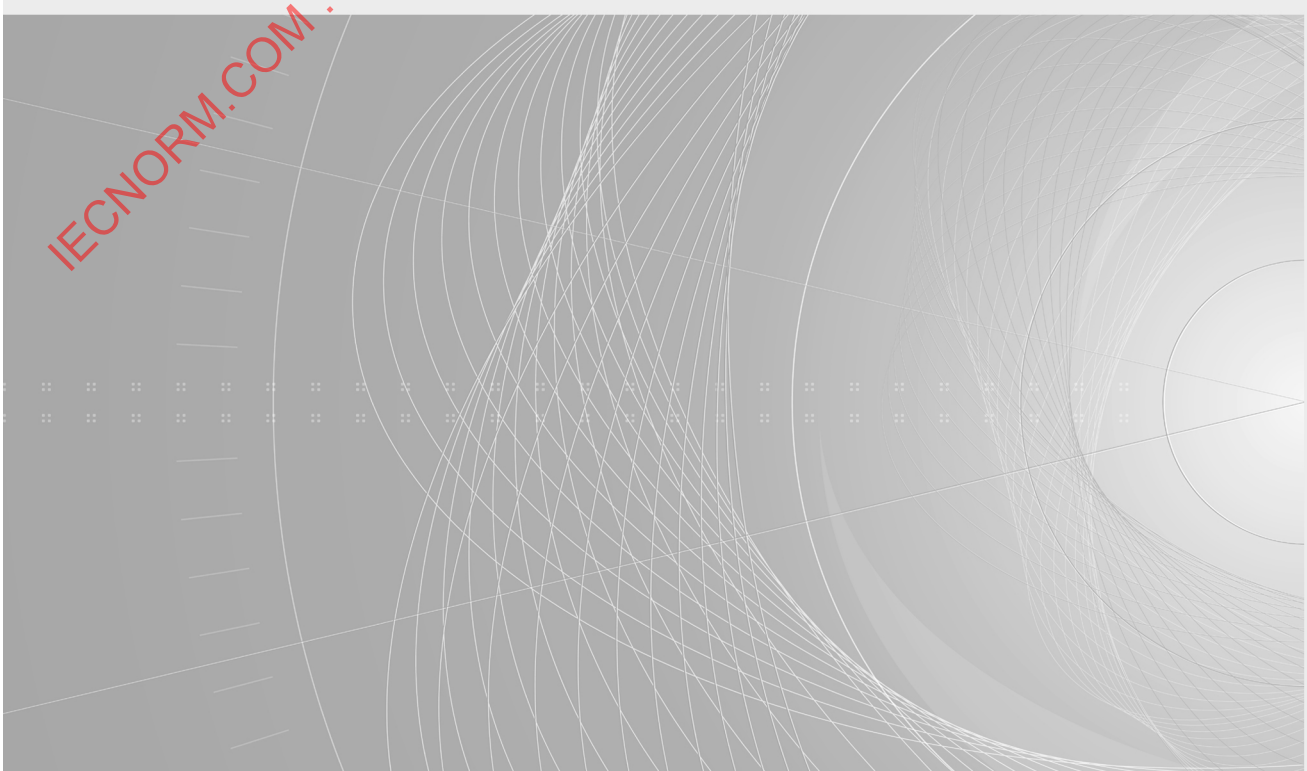
IEC TR 61340-1

Edition 1.0 2020-06

TECHNICAL REPORT

AMENDMENT 1

Electrostatics –
Part 1: Electrostatic phenomena – Principles and measurements



IEC TR 61340-1:2012-06/AMD1:2020-06(en)

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INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

ICS 17.220.99; 29.020

ISBN 978-2-8322-8394-3

FOREWORD

This amendment has been prepared by IEC technical committee 101: Electrostatics.

The text of this amendment is based on the following documents:

Draft TR	Report on voting
101/598/DTR	101/604/RVDTR

Full information on the voting for the approval of this amendment can be found in the report on voting indicated in the above table.

The committee has decided that the contents of this amendment and the base publication will remain unchanged until the stability date indicated on the IEC website under "http://webstore.iec.ch" in the data related to the specific publication. At this date, the publication will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

2 Normative references

Add the following new references:

IEC TS 60079-32-1:2013, *Explosive atmospheres – Part 32-1: Electrostatic hazards, guidance*

IEC 60079-32-2, *Explosive atmospheres – Part 32-2: Electrostatic hazards – Tests*

IEC 61340-6-1, *Electrostatics – Part 6-1: Electrostatic control for healthcare – General requirements for facilities*

ISO/IEC 80079-20-2, *Explosive atmospheres – Part 20-2: Material characteristics – Combustible dusts test methods*

ISO 80079-36:2016, *Explosive atmospheres – Part 36: Non-electrical equipment for explosive atmospheres – Basic method and requirements*

Replace the reference to IEC 61340-5-2 with the following reference:

IEC TR 61340-5-2, *Electrostatics – Part 5-2: Protection of electronic devices from electrostatic phenomena – User guide*

Delete the references to IEC 61241-2-3 and BS EN 13821.

3 Terms and definitions

3.13
explosion groups

Replace Note 2 to entry with the following new Note 2 to entry:

Note 2 to entry: See [10][1] for definitions of classification method.

5 Electrostatic problems and hazards

5.2.3 Problems and threats at different life cycle periods

Add the following text at the end of the final paragraph of 5.2.3:

The machine model is no longer in common use for ESD sensitivity classification of devices. For the purposes of establishing limits for ESD control programs, MM discharges are now considered in the broader category of discharges from isolated conductors.

5.3.7.4 Brush discharges

Replace the fourth and fifth paragraphs of 5.3.7.4 with the following text and note:

The minimum charge transfer for brush discharges to cause ignition of gases and vapours in different explosion groups can be derived from Table 4 of IEC TS 60079-32-1:2013 as:

- 60 nC for explosion groups I or IIA;
- 25 nC for explosion group IIB;
- 10 nC for explosion group IIC.

Table 4 of IEC TS 60079-32-1:2013 specifies the above charge transfer values as being the maximum acceptable in Zones 1 and 2. For Zone 0, the limits are reduced to account for abnormal situations and the high level of safety required for Zone 0. More information on explosion groups and hazardous area zones can be found in IEC 60079-10-1 and IEC 60079-10-2.

NOTE In D.4.2.4 of ISO 80079-36:2016, the maximum acceptable charge transfer for explosion group IIB is specified as 30 nC. The value specified in IEC TS 60079-32-1:2013 has been reduced in light of recent work in order to equalize all safety margins.

5.5.4 Machine model

Replace the first paragraph of 5.5.4 with:

The machine model (MM) is used to simulate a discharge from a large metal object, such as a machine part. It is no longer in common use for ESD sensitivity classification of devices.

6 General solutions to problems and hazards

6.1 General

Replace the second paragraph of 6.1 with:

The handling of electrostatic sensitive components is described in IEC 61340-5-1 and IEC TR 61340-5-2, and the avoidance of hazards due to static electricity is described in IEC TS 60079-32-1. Electrostatic control for healthcare facilities is described in IEC 61340-6-1. Common approaches are summarized in 6.2.

8 General aspects of measurements

8.10 Energy in capacitive discharges

Replace the final sentence of 8.10 with:

The method for testing powered electronic equipment is described in IEC 61000-4-2 while the determination of minimum ignition energy of dust/air mixtures is given in ISO/IEC 80079-20-2.

8.11.1 General

Replace the final sentence of the first paragraph of 8.11.1 with:

The method of determination of minimum ignition energy of dust/air mixtures is given in ISO/IEC 80079-20-2.

8.12.2 Discharge electrode

Insert, between the second sentence of 8.12.2 and the third sentence beginning with "For surfaces with lower charge density...", the following new sentence:

Spherical electrodes of (25 ± 5) mm diameter are specified in IEC 60079-32-2 and ISO 80079-36 for measuring charge transferred in electrostatic discharges.

Bibliography

Delete the references to [4] CLC/TR 50404/2003, [11] IEC 60079-12:2002 *and* [13] IEC 60079-20:2002.

Replace the reference to [10] IEC 60079-1-1 *with the following new reference* [10]*:*

[10] ISO/IEC 80079-20-1, *Explosive atmospheres – Part 20-1: Material characteristics for gas and vapour classification – Test methods and data*

Replace the reference to [17] IEC 61340-3-1 *with the following new reference* [17]*:*

[17] IEC 60749-26, *Semiconductor devices – Mechanical and climatic test methods – Part 26: Electrostatic discharge (ESD) sensitivity testing – Human body model (HBM)*

Replace the reference to [18] IEC 61340-3-2 *with the following new reference* [18]*:*

[18] IEC 60749-27, *Semiconductor devices – Mechanical and climatic test methods – Part 27: Electrostatic discharge (ESD) sensitivity testing – Machine model (MM)*

Replace the reference to [22] ANSI/ESD STM5.3.1-1999 *with the following new reference* [22]*:*

[22] VON PIDOLL, U. et al., *Determining the incendivity of electrostatic discharges without explosive gas mixtures*. IEEE Transactions on Industry Applications, 40 (2004), 1467-1475

Add the following new reference [26]*:*

[26] IEC 60749-28, *Semiconductor devices - Mechanical and climatic test methods – Part 28: Electrostatic discharge (ESD) sensitivity testing – Charged device model (CDM) – device level*