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colour inside

Electrostatics –
Part 1: Electrostatic phenomena – Principles and measurements

INTERNATIONAL
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COMMISSION

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REDLINE VERSION

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Part 1: Electrostatic phenomena – Principles and measurements



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

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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Part 1: Electrostatic phenomena – Principles and measurements

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IEC TR 61340-1, which is a technical report, has been prepared by IEC technical committee 101: Electrostatics.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

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INTRODUCTION

Static electricity has been known for around 2 500 years but until recently had little impact on humankind. More recently in the last century the nature of static electricity became better understood and the principles of charge separation and accumulation could be described. Despite this improved understanding, it remains difficult to predict with certainty the polarity and magnitude of charges built up in any situation due to the many factors involved, and to, many electrostatics remains a “black art” rather than a science.

The development of modern materials, especially polymers, and their nearly ubiquitous application in fields such as floor materials, furnishings, clothing and engineering materials, has made static electricity an everyday phenomenon. In some industries, such as electronics manufacture and processes using flammable materials, unintended and invisible electrostatic discharges can lead to substantial component damage or unreliability, or fires or explosions. In everyday life, experience of electrostatic shocks to personnel has become commonplace. This has led to increasing need to understand such phenomena, and to specify materials, equipment and procedures for use in preventing and controlling electrostatic problems in the human environment.

This technical report gives an overview of the field of electrostatics and has been prepared to give the user a view of the background, principles, methods of measurement and industrial applications prepared in conformity with IEC TC101 publications.

ELECTROSTATICS –

Part 1: Electrostatic phenomena – Principles and measurements

1 Scope

This part of IEC 61340, which is a technical report, describes the fundamental principles of electrostatic phenomena including charge generation, retention and dissipation and electrostatic discharges.

Methods for measuring electrostatic phenomena and related properties of materials are described in a general way.

Hazards and problems associated with electrostatic phenomena and principles of their control are outlined.

Useful applications of electrostatic effects are summarized.

The purpose of this technical report is to serve as a reference for the development of electrostatics related standards, and to provide guidance for their end-users.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

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IEC 60243-1, *Electrical strength of insulating materials – Test methods – Part 1: Tests at power frequencies*

IEC 60243-2, *Electric strength of insulating materials – Test methods – Part 2: Additional requirements for tests using direct voltage*

~~IEC 61241-2-3, *Electrical apparatus for use in the presence of combustible dust – Part 2: Test methods – Section 3: Method for determining minimum ignition energy of dust/air mixtures*~~

~~BS EN 13821, *Potentially explosive atmospheres. Explosion prevention and protection. Determination of minimum ignition energy of dust/air mixtures*~~

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*

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