

INTERNATIONAL STANDARD

NORME INTERNATIONALE

**Safety of machinery – Electrical equipment of machines –
Part 33: Requirements for semiconductor fabrication equipment**
(standards.iteh.ai)

**Sécurité des machines – Equipement électrique des machines –
Partie 33: Exigences pour les équipements de fabrication des semi-conducteurs**

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**SAFETY OF MACHINERY –
ELECTRICAL EQUIPMENT OF MACHINES –**

Part 33: Requirements for semiconductor fabrication equipment

FOREWORD

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- amended.

The following differences exist in some countries:

- 4.3.1: The voltage characteristics of electricity supplied by public distribution systems in Europe are given in EN 50160:1999, Voltage characteristics of electricity supplied by public distribution systems.
- 5.1.3: Exception is not allowed (USA).
- 5.1.3: TN-C systems are not permitted in low-voltage installations in buildings (Norway).
- 5.2: Terminals for the connection of the protective earthing conductors may be identified by the colour green, the letters "G" or "GR" or "GRD" or "GND", or the word "ground" or "grounding", or with the graphical symbol IEC 60417-5019 (2006-08) or any combination (USA).
- 6.3.3: TT systems are preferred over TN systems (Japan).
- 6.3.3 b), 13.4.5 b), 18.2.1: TT power systems are not allowed (USA).
- 7.2.3: Disconnection of the neutral conductor is mandatory in a TN-S system (France and Norway).
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- 7.2.3: Third paragraph: distribution of a neutral conductor with an IT system is not allowed (USA and Norway).
- 13.4.2: For the protective conductor, the colour identification GREEN (with or without YELLOW stripes) is used as equivalent to the bicolour combination GREEN-AND-YELLOW (USA and Canada).
- 13.4.3: The colour identification WHITE or GREY is used for earthed neutral conductors instead of the colour identification BLUE (USA and Canada).
- 15.2.2: First paragraph: Maximum value between conductors 150 V (USA).
- 15.2.2: 2nd paragraph, 5th bullet: The full load current rating of lighting circuits does not exceed 15 A (USA).

INTRODUCTION

IEC 60204-33 has been created to reflect the unique needs of electrical safety within the semiconductor manufacturing environment. This includes the specialized clean room environment in which semiconductors are fabricated as well as the specialized nature of the semiconductor fabrication equipment itself. IEC 60204-33 ensures a level of safety consistent with IEC 60204-1 while still permitting the flexibility needed in the design and operation of semiconductor fabrication equipment. It has been drafted to satisfy the electrical safety needs of the semiconductor industry.

This standard is not intended to address those functional aspects of semiconductor fabrication equipment that do not relate directly to safety.

Note relating to SEMI: SEMI is the global industry association serving the manufacturing supply chains for the microelectronic, display and photovoltaic industries. SEMI maintains offices in Austin, Beijing, Brussels, Hsinchu, Moscow, San Jose, Seoul, Shanghai, Singapore, Tokyo, and Washington, D.C. The SEMI Standards Program, established in 1973, covers all aspects of semiconductor process equipment and materials, from wafer manufacturing to test, assembly and packaging, in addition to the manufacture of flat panel displays, photovoltaic systems and micro-electromechanical systems (MEMS). More than 2,100 volunteers worldwide participate in the program, which is made up of 19 global technical committees. Visit www.semi.org/standards for further details about SEMI Standards. Some information contained in this document was derived from SEMI S22 and S2. Republished with permission from Semiconductor Equipment and Materials International, Inc. (SEMI) © 2009

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SAFETY OF MACHINERY – ELECTRICAL EQUIPMENT OF MACHINES –

Part 33: Requirements for semiconductor fabrication equipment

1 Scope

This part of IEC 60204 applies to electrical and electronic equipment associated with semiconductor fabrication equipment for the manufacture, measurement, assembly, and test of semiconductors.

NOTE 1 In this standard, the term electrical includes electrical, electronic, and programmable electronic matters (i.e. electrical equipment means electrical, electronic, and programmable electronic equipment).

NOTE 2 In the context of this standard, the term person refers to any individual and includes those persons who are assigned and instructed by the user or his agent(s) in the installation, use, and care of the fabrication equipment in question.

The electrical equipment covered by this standard commences at the point of connection of the supply to the electrical equipment (see 5.1), and includes proper instruction for its safe installation.

NOTE 3 For the requirements for the electrical supply installation in buildings, see IEC 60364 series.

This part is applicable to the electrical equipment or parts of the electrical equipment that operate with nominal supply voltages not exceeding 1 000 V for alternating current (a.c.) and not exceeding 1 500 V for direct current (d.c.), and with nominal supply frequencies not exceeding 200 Hz. For higher voltages or frequencies, special requirements may be needed.

NOTE 4 Electrical equipment within which derived voltages exceed these supply voltage limits is within the scope of this standard.

Included are requirements for protective measures against electrical safety hazards as well as electrical interlock circuits that protect against non-electrical hazards. However, it does not cover all the requirements that are needed or required by other standards or regulations in order to safeguard persons from hazards other than electrical hazards (e.g. chemical hazards, mechanical hazards, radiation hazards). Each type of machine has unique requirements to be accommodated to provide adequate safety.

Additional and special requirements can apply to the electrical equipment of fabrication equipment that:

- use, process, or produce potentially explosive material;
- are used in potentially explosive and/or flammable atmospheres;
- have special risks when producing or using certain materials;
- are hoisting machines (which are covered by IEC 60204-32).

This standard does not include specifications for performance or functional characteristics of the fabrication equipment.

This standard does not deal with the possible effects on human health that can result from emissions (for example EMFs, noise) from the fabrication equipment.

This standard does not specify requirements for electromagnetic compatibility (EMC).