

Explosive atmospheres - Part 45: Electrical ignition systems for internal combustion engines

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NATIONAL FOREWORD

<p>See Eesti standard EVS-EN IEC 60079-45:2025 sisaldab Euroopa standardi EN IEC 60079-45:2025 ingliskeelset teksti.</p> <p>Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas.</p> <p>Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 17.10.2025.</p> <p>Standard on kättesaadav Eesti Standardimis- ja Akrediteerimiskeskusest.</p>	<p>This Estonian standard EVS-EN IEC 60079-45:2025 consists of the English text of the European standard EN IEC 60079-45:2025.</p> <p>This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation and Accreditation.</p> <p>Date of Availability of the European standard is 17.10.2025.</p> <p>The standard is available from the Estonian Centre for Standardisation and Accreditation.</p>
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ICS 29.260.20, 43.060.50

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EUROPEAN STANDARD

EN IEC 60079-45

NORME EUROPÉENNE

EUROPÄISCHE NORM

October 2025

ICS 29.260.20; 43.060.50

English Version

**Explosive atmospheres - Part 45: Electrical ignition systems for
internal combustion engines
(IEC 60079-45:2025)**

Atmosphères explosives - Partie 45: Systèmes d'allumage
électrique pour les moteurs à combustion interne
(IEC 60079-45:2025)

Explosionsgefährdete Bereiche - Teil 45: Elektrische
Zündsysteme für Verbrennungsmotoren
(IEC 60079-45:2025)

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European foreword

The text of document 31/1880/FDIS, future edition 1 of IEC 60079-45, prepared by TC 31 "Equipment for explosive atmospheres" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN IEC 60079-45:2025.

The following dates are fixed:

- latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2026-10-31
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In the official version, for Bibliography, the following notes have to be added for the standard indicated:

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IEC 60079-15	NOTE	Approved as EN IEC 60079-15
IEC 60079-18	NOTE	Approved as EN 60079-18
IEC 60079-25	NOTE	Approved as EN IEC 60079-25
IEC 60079-33	NOTE	Approved as CLC/TR 60079-33
ISO 19879:2021	NOTE	Approved as EN ISO 19879:2021 (not modified)

INTERNATIONAL STANDARD

NORME INTERNATIONALE

**Explosive atmospheres -
Part 45: Electrical ignition systems for internal combustion engines**

**Atmosphères explosives -
Partie 45: Systèmes d'allumage électrique pour les moteurs à combustion
interne**



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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**Explosive atmospheres -
Part 45: Electrical ignition systems for internal combustion engines**

FOREWORD

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IEC 60079-45 has been prepared by IEC technical committee TC 31, Equipment for explosive atmospheres. It is an International Standard.

ANSI/UL 122001 Standard for safety, *General Requirements for Electrical Ignition Systems for Internal Combustion Engines in Class I, Division 2 or Zone 2, Hazardous (Classified) Locations*, has served as a basis for the elaboration of this document.

Users of this document are advised that interpretation sheets clarifying the interpretation of this document can be published. Interpretation sheets are available from the IEC webstore and can be found in the "history" tab of the page for each document.

The text of this International Standard is based on the following documents:

Draft	Report on voting
31/1880/FDIS	31/1895/RVD

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

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/publications.

A list of all parts in the IEC 60079 series, published under the general title *Explosive atmospheres*, can be found on the IEC website.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under webstore.iec.ch in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn, or
- revised.

INTRODUCTION

This part of IEC 60079 also refers to IEC 60079-0 and its associated standards for the construction, testing and marking requirements of suitable electrical Ex Equipment.

This document has been developed from ANSI/UL 122001 Standard for safety, *General Requirements for Electrical Ignition Systems for Internal Combustion Engines in Class I, Division 2 or Zone 2, Hazardous (Classified) Locations*.

The original content was developed primarily by the user community in response to operations and maintenance problems arising from the use of shielded ignition systems (flameproof or explosionproof) on reciprocating engines driving compressors and pumps handling flammable materials and installed in hazardous areas. Experience has shown that these types of ignition systems are subjected to significant dielectric stress due to being completely encapsulated in grounded metallic raceways and suffer premature failure resulting in engine cylinder misfiring and engine miss-operation and shutdown.

This document is intended to supplement ISO/IEC 80079-41 with the requirements for ignition systems for reciprocating spark-ignited engines to be installed in hazardous areas for EPL Gc applications. In addition, it is a standalone set of requirements for a complete ignition system or for the individual components thereof to be installed on a reciprocating engine to meet EPL Gc requirements in a repair or replacement activity.

Examples of reciprocating gas engines which typically need to be EPL Gc are:

- a) Offshore oil and gas platforms that are typically crowded or congested by design and the gas engine and driven equipment is required to achieve EPL Gc.
- b) Onshore facilities where the gas engine and driven equipment assembly is located under a shelter or in an enclosed building for environmental protection or noise suppression.

NOTE 1 Certified ignition systems can also be considered as an alternative replacement to non-Ex systems for engines located in a non-hazardous area where the driven equipment is located in an EPL Gc area. This could provide the additional explosion protection for larger than anticipated flammable releases.

NOTE 2 Ongoing inspection, maintenance and repair aspects also play an important role in control of hazardous area installations and the user's attention is drawn to IEC 60079-17, IEC 60079-19 and manufacturer's instructions for further information concerning these aspects.

NOTE 3 In any industrial installation, irrespective of size, there can be numerous sources of ignition apart from those associated with electrical equipment. Precautions are necessary to ensure safety from other possible ignition sources, but guidance on this aspect is outside the scope of this document.

1 Scope

This part of IEC 60079 is intended to enhance the safety of personnel by providing minimum requirements for electrical ignition systems for spark-ignited reciprocating internal combustion engines, parts of which provide Equipment Protection Level (EPL) Gc.

This document provides minimum construction and test requirements, in addition to manufacturer installation and maintenance recommendations, for the safe operation of ignition systems and components for spark-ignited reciprocating internal combustion engines providing EPL Gc for equipment Group IIB+H₂, IIB or IIA. These requirements apply to systems rated for normal operation with secondary voltages less than or equal to 60 kV.

This document applies only to the ignition systems or the individual ignition system components used on reciprocating internal combustion engines that are stationary when in operation and mobile machinery where the internal combustion engine can be potential source of ignition. Applications addressed by the scope of this document include but are not limited to gas compressors, electric power generators, forklift trucks, and pumps.

This document does not apply to:

- a) Engine ignition systems that utilize a breaker point or magneto type ignition systems as these would not be suitable for use in a hazardous area.
- b) Road vehicles.
- c) Low voltage parts and electrical installation that are not included in the ignition system, such as various sensors and thermocouples, throttle actuator(s), fuel control valve(s), human machine interface (HMI), respective harness and wiring and all the other items that might belong to the integrated control system besides the ignition system.

This document supplements and modifies the general requirements of IEC 60079-0 and the requirements of ISO/IEC 80079-41. Where a requirement of this document conflicts with IEC 60079-0 or ISO/IEC 80079-41, the requirement of this document takes precedence.

NOTE See ISO/IEC 80079-41 for the requirements for explosion protection for EPL Gc reciprocating internal combustion engines.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60079-0, *Explosive atmospheres - Part 0: Equipment - General requirements, Edition 7.0*

IEC 60079-1, *Explosive atmospheres - Part 1: Equipment protection by flameproof enclosures "d"*

IEC 60079-7, *Explosive atmospheres - Part 7: Equipment protection by increased safety "e"*

IEC 60079-11, *Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i"*

ISO 11565, *Road vehicles - Spark-plugs - Test methods and requirements*

ISO/IEC 80079-41, *Explosive atmospheres - Part 41: Reciprocating internal combustion engines*¹

SAE J2031, *High-Tension Ignition Cable*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

- IEC Electropedia: available at <https://www.electropedia.org/>
- ISO Online browsing platform: available at <https://www.iso.org/obp>

3.1

ignition coil

inductive device used to convert primary voltage to secondary voltage intended to initiate combustion

3.2

ignition control unit

ICU

component assembly that transforms energy from the ignition system power source and provides it to the primary distribution system

Note 1 to entry: The ignition control unit is sometimes referred to as an ignition control module.

3.3

engine control module

ECM

electronic processor managing the timing relationship of the engine, transfer of data between engine sensors, actuators, control elements, and information-storage and display units

3.4

ignition system

electrical system designed to produce and distribute electrical energy to initiate combustion

Note 1 to entry: An ignition system can be a part of integrated control system of the engine and hence connected to the engine control module ECM. This can be any type of electrical system but is typically a capacitive or inductive type system.

Note 2 to entry: A capacitive discharge ignition system is a type of ignition system, a charging circuit creates an intermediate voltage on a capacitor, and at the instant of ignition timing applies the capacitor energy and voltage to the ignition coil primary side which subsequently reflects to the secondary coil winding and spark plug.

Note 3 to entry: An inductive discharge ignition system is where the primary winding is directly connected to the battery and stores energy while the primary winding conducts current from the battery. At the desired ignition timing, the primary winding current is interrupted which drives a flyback event on the primary, which is reflected to the secondary and generates a voltage high enough to ionize the spark plug gap. Following ionization of the spark plug gap, most of the ignition coil energy is driven through the spark plug gap.

3.5

installation drawing

drawing or other document prepared by the equipment manufacturer that details the allowed interconnections of ignition system components, indicates any Specific Conditions of Use, provides initial parameters if required, and provides the necessary information for operational use of the system or any component

¹ Under development. Stage at the time of publication: ISO/IEC/CCDV 80079-41:2025.