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BSI Standards Publication

Explosive atmospheres

Part 43: Equipment in adverse service conditions

bsi.

National foreword

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The UK participation in its preparation was entrusted to Technical Committee EXL/31, Equipment for explosive atmospheres.

A list of organizations represented on this committee can be obtained on request to its secretary.

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Part 43: Equipment in adverse service conditions

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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FOREWORD

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Technical specifications are subject to review within three years of publication to decide whether they can be transformed into International Standards.

IEC TS 60079-43, which is a technical specification, has been prepared by IEC Technical committee 31: Equipment for explosive atmospheres.

The text of this technical specification is based on the following documents:

Enquiry draft	Report on voting
31/1311/DTS	31/1328A/RVDTS

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

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

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 "http://webstore.iec.ch" in the data related to the specific document. At this date, the document will be

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- withdrawn,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

A bilingual version of this publication may be issued at a later date.

INTRODUCTION

IEC 60079-0 specifies the requirements for electrical equipment intended for use in explosive atmospheres at standard atmospheric conditions:

- temperature –20 °C to +60 °C;
- pressure 80 kPa (0,8 bar) to 110 kPa (1,1 bar); and
- air with normal oxygen content, typically 21 % v/v.

In some cases, other parts of the IEC 60079 series also specify conditions outside the above range, for example in IEC 60079-1.

IEC 60079-0 states the normal ambient temperature range as –20 °C to +40 °C and states that electrical equipment designed for use in other than this normal ambient temperature range is considered to be special and includes additional marking to communicate this to the user.

IEC 60079-14 includes requirements for users to select and install equipment so that it is suitable for the environmental conditions, but does not provide any specific guidance for installations outside of the standard atmospheric conditions or for other adverse environmental conditions.

Extreme climate conditions in Polar environments are challenging to explosion protection technology and solutions. Conditions such as snow build-up, icing from spray and freezing of precipitation can negatively affect the operation and safety of equipment. Extreme low temperatures and weather conditions make it difficult to process hydrocarbons in open outdoor process areas and it can also be challenging for equipment operation. Measures to deal with these challenges are often called 'winterization'.

This document is a guide for equipment subject to adverse service conditions, for example equipment considered as 'special' in IEC 60079-0. It is applicable to the design, manufacture, installation, inspection and use of such equipment. Annex A gives recommendations on materials and Annex C gives information on electric motors in low temperatures. It is possible that some details in this technical specification will be relocated to relevant parts of the IEC 60079 series at the next edition of each of those relevant parts as guidance material.

This technical specification does not at this time address other environmental conditions such as high temperatures, which will be explored further at a later date.

EXPLOSIVE ATMOSPHERES –

Part 43: Equipment in adverse service conditions

1 Scope

This part of IEC 60079, which is a Technical Specification, provides guidance for equipment for use in explosive atmospheres in environments which may include ambient temperatures below –20 °C, and additional adverse conditions, including maritime applications.

The purpose of this document is to provide recommendations to be considered for the design, manufacture and use of equipment. It is intended that this document be used for equipment operating within the environmental range specified on the certificate for the equipment.

NOTE For detailed classification of climate conditions refer to IEC 60721 series and IEC 60068-1.

This document is intended to be used in conjunction with the IEC 60079 series and the ISO/IEC 80079 series.

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 60034-5, *Rotating electrical machines - Part 5: Degrees of protection provided by the integral design of rotating electrical machines (IP code) - Classification*

IEC 60068 (all parts), *Environmental testing*

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

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

IEC 60079-14, *Explosive atmospheres - Part 14: Electrical installations design, selection and erection*

IEC 60079-17, *Explosive atmospheres - Part 17: Electrical installations inspection and maintenance*

IEC 60529, *Degrees of protection provided by enclosures (IP Code)*

IEC 60721-1, *Classification of environmental conditions - Part 1: Environmental parameters and their severities*

IEC 60721-2-1, *Classification of environmental conditions - Part 2-1: Environmental conditions appearing in nature - Temperature and humidity*

IEC TR 60721-4 (all parts), *Classification of environmental conditions*