IEC 60480

Edition 3.0 2019-04

INTERNATIONAL STANDARD

NORME INTERNATIONALE

colour inside

Specifications for the re-use of sulphur hexafluoride (SF_6) and its mixtures in electrical equipment

Spécifications pour la réutilisation de l'hexafluorure de soufre (SF_6) et des mélanges contenant du SF_6 dans le matériel électrique

IEC 60480:2019-04(en-fr)

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INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

COMMISSION
ELECTROTECHNIQUE
INTERNATIONALE

ICS 29.040.20; 29.130.01

ISBN 978-2-8322-6697-7

CONTENTS

INTERNATIONAL ELECTROTECHNICAL COMMISSION

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SPECIFICATIONS FOR THE RE-USE OF SULPHUR HEXAFLUORIDE (SF_6) AND ITS MIXTURES IN ELECTRICAL EQUIPMENT

FOREWORD

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International Standard IEC 60480 has been prepared by IEC technical committee 10: Fluids for electrotechnical applications.

This third edition cancels and replaces the second edition, published in 2004. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

- specifications for the re-use of SF_6 have been confirmed;
- specifications for the re-use of SF_6 mixtures, namely SF_6/N_2 and SF_6/CF_4 mixtures are included;
- as a result of a new repartition of annexes in IEC 60376, IEC 60480 and IEC 62271-4, this new edition now contains the following five annexes:
  - Annex A: Description of methods of analysis (on-site and laboratory);
  - Annex B: By–products of SF_6 and its mixtures;

– Annex C: Procedure for evaluating the potential effects on health from by-products of SF_6 and its mixtures;

– Annex D: Reclaiming recommendations.

– Annex E: Cryogenic reclaiming of SF_6;

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

FDIS	Report on voting
10/1075/FDIS	10/1080/RVD

Full information on the voting for the approval of this International Standard 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.

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

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- withdrawn,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

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SPECIFICATIONS FOR THE RE-USE OF SULPHUR HEXAFLUORIDE (SF_6) AND ITS MIXTURES IN ELECTRICAL EQUIPMENT

1 Scope

This document provides criteria for the re-use of sulphur hexafluoride (SF_6) and its mixtures after recovery and reclaiming from electrical equipment (e.g. for maintenance, at the end-of-life).

Sulphur hexafluoride (SF_6), nitrogen (N_2) and carbon tetrafluoride (CF_4), are gases commonly used for electrical equipment. Taking into account environmental concerns, particular attention is paid to re-use criteria for SF_6 and its mixtures with N_2 and CF_4 for its use in electrical equipment. Procedures for recovering and reclaiming used SF_6 and its mixtures are outside the scope of this document and are described in IEC 62271-4.

This document provides several annexes on the description of the different methods of analysis, on by-products, on the procedure for evaluating the potential health effects from by-products, on cryogenic reclaiming of SF_6, and on reclaiming recommendations.

Storage, transportation and disposal of SF_6 and its mixtures are outside the scope of this document and are covered by IEC 62271-4. Procedures to determine SF_6 leakages are described in IEC 60068-2-17 [4][1].

For the purposes of this document, the complementary gases used in SF_6 mixtures will be limited to N_2 or CF_4.

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 60050-192, *International Electrotechnical Vocabulary – Part 192: Dependability* (available at http://www.electropedia.org)

IEC 60050-212, *International Electrotechnical Vocabulary – Part 212: Electrical insulating solids, liquids and gases* (available at http://www.electropedia.org)

IEC 60050-441, *International Electrotechnical Vocabulary – Part 441: Switchgear, controlgear and fuses* (available at http://www.electropedia.org)

IEC 60050-826, *International Electrotechnical Vocabulary – Part 826: Electrical installations* (available at http://www.electropedia.org)

IEC 62271-4:2013, *High-voltage switchgear and controlgear – Part 4: Handling procedures for sulphur hexafluoride (SF_6) and its mixtures*

[1] Numbers in square brackets refer to the bibliography.

3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 60050-192, IEC 60050-212, IEC 60050-441 and IEC 60050-826, and the following apply.

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

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

3.1
electrical equipment
item used for such purposes as generation, conversion, transmission, distribution or utilization of electrical energy, such as electric machines, transformers, switchgear and controlgear, measuring instruments, protective devices, wiring systems, current-using equipment, insulated bushings, surge arresters

[SOURCE: IEC 60050-826:2004, 826-16-01, modified – "insulated bushings, surge arresters" has been added.]

3.2
container
vessel (cylinder) suitable for the containment of pressurized gases either in gaseous or liquid phase, according to local and/or international safety and transportation regulations

3.3
used sulphur hexafluoride
SF_6 which has been introduced into electrical equipment

3.4
reclaiming
process of contaminants removal from an insulating liquid or gas

3.5
recovery
process of transferring gas from electrical equipment to an alternate container

3.6
SF_6 mixture
gas mixture formed by SF_6 and a complementary gas, typically N_2 or CF_4

3.7
contaminant
foreign substance or material in an insulating liquid or gas which usually has a deleterious effect on one or more properties

[SOURCE: IEC 60050-212:2010, 212-17-27, modified – "or solid" has been deleted.]

3.8
by-products
contaminants which are formed by the degradation of SF_6 and its mixtures by electrical arcs or sparks

3.9
ambient air
normal atmosphere surrounding the equipment