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IEC 61558-2-3

Edition 3.0 2023-06
REDLINE VERSION

INTERNATIONAL STANDARD



GROUP SAFETY PUBLICATION

**Safety of transformers, reactors, power supply units and combinations thereof –
Part 2-3: Particular requirements and tests for ignition transformers for gas and
oil burners**

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

ICS 29.180

ISBN 978-2-8322-7157-5

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CONTENTS

FOREWORD.....	3
INTRODUCTION.....	2
1 Scope.....	7
2 Normative references	8
3 Terms and definitions	8
4 General requirements	9
5 General notes on tests	9
6 Ratings.....	9
7 Classification.....	9
8 Marking and other information	10
9 Protection against electric shock	12
10 Change of input voltage setting	13
11 Output voltage and output current under load	13
11 Output voltage and output current.....	13
12 No-load output voltage	14
13 Short-circuit voltage.....	14
14 Heating.....	14
15 Short-circuit and overload protection	14
16 Mechanical strength	15
17 Protection against harmful ingress of dust, solid objects and moisture.....	15
18 Insulation resistance, dielectric strength and leakage current	16
19 Construction	16
20 Components	17
21 Internal wiring.....	17
22 Supply connection and other external flexible cable or cords	18
23 Terminals for external conductors.....	18
24 Provisions for protective earthing.....	18
25 Screws and connections	18
26 Creepage distances, clearances and distances through insulation.....	18
27 Resistance to heat, fire and tracking.....	19
28 Resistance to rusting.....	19
Annexes	21
Bibliography.....	22
Figure 101 – Arcing horn	20
Table 101 – Symbols indicating the kind of transformer	12
Table 101 102 – Preferred values of operational parameters	13
Table 102 103 – Test time for short-circuit test	15
Table 103 104 – Creepage distances and clearances for output terminals	19

INTERNATIONAL ELECTROTECHNICAL COMMISSION

SAFETY OF TRANSFORMERS, REACTORS, POWER SUPPLY UNITS AND COMBINATIONS THEREOF –

Part 2-3: Particular requirements and tests for ignition transformers for gas and oil burners

FOREWORD

- 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as “IEC Publication(s)”). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
- 2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
- 3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
- 4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
- 5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
- 6) All users should ensure that they have the latest edition of this publication.
- 7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
- 8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
- 9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

This redline version of the official IEC Standard allows the user to identify the changes made to the previous edition IEC 61558-2-3:2010. A vertical bar appears in the margin wherever a change has been made. Additions are in green text, deletions are in strikethrough red text.

International standard IEC 61558-2-3 has been prepared by IEC technical committee 96: Transformers, reactors, power supply units and combinations thereof. It is an International Standard.

This third edition cancels and replaces the second edition published in 2010. This edition constitutes a technical revision.

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

- a) adjustment of structure and references in accordance with IEC 61558-1:2017.

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

Draft	Report on voting
96/577/FDIS	96/580/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.

It has the status of a group safety publication in accordance with IEC Guide 104.

This International Standard is to be used in conjunction with IEC 61558-1:2017.

This document supplements or modifies the corresponding clauses in IEC 61558-1:2017, so as to convert that publication into the IEC standard: *Particular requirements and tests for ignition transformers for gas and oil burners*.

A list of all parts in the IEC 61558 series published under the general title *Safety of transformers, reactors, power supply units and combinations thereof*, can be found on the IEC website.

Future standards in this series will carry the new general title as cited above. Titles of existing standards in this series will be updated at the time of the next edition.

Where this document states "*addition*", "*modification*" or "*replacement*", the relevant text of IEC 61558-1:2017 is to be adopted accordingly.

In this document, the following print types are used:

- requirements proper: in roman type;
- *test specifications: in italic type*;
- explanatory matter: in smaller roman type:

In the text of this document, the words in **bold** are defined in Clause 3.

Subclauses, notes, figures and tables additional to those in IEC 61558-1:2017 are numbered starting from 101; supplementary annexes are entitled AA, BB, etc.

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

IMPORTANT – The "colour inside" logo on the cover page of this document indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

The contents of the corrigendum 1 (2023-09) have been included in this copy.

INTRODUCTION

IEC TC 96 has a group safety function in accordance with IEC Guide 104 for transformers other than those intended to supply distribution networks, in particular transformers and power supply units intended to allow the application of protective measures against electric shock as defined by TC 64, which is about Electrical installations and protection against electric shock, but in certain cases including the limitation of voltage and horizontal safety function for SELV, in accordance with IEC 60364-4-41.

The group safety function (GSF) is used because of responsibility for safety extra-low voltage (SELV) in accordance with IEC 61140:2016, 5.2.6 and IEC 60364-4-41:2005, 414.3.1 or control circuits in accordance with IEC 60204-1:2016, 7.2.4.

The group safety function is used for each part of the IEC 61558-2 series because different standards of the IEC 61558 series can be combined in one construction but in certain cases with no limitation of rated output power.

For example, an auto-transformer in accordance with IEC 61558-2-13 can be designed with a separate SELV-circuit in accordance with the particular requirements for IEC 61558-2-6 relating to the general requirements of IEC 61558-1.

SAFETY OF TRANSFORMERS, REACTORS, POWER SUPPLY UNITS AND COMBINATIONS THEREOF –

Part 2-3: Particular requirements and tests for ignition transformers for gas and oil burners

1 Scope

Replacement:

This part of IEC 61558 deals with the safety of **ignition transformers** for gas and oil burners. **Ignition transformers** incorporating **electronic circuits** are also covered by this document.

NOTE 1 Safety includes electrical, thermal, and mechanical ~~and chemical~~ aspects.

Unless otherwise specified, from here onward, the term **transformer** covers **ignition transformers** for gas and oil burners.

For **switch mode power supply units** IEC 61558-2-16 is applicable together with this document. Where two requirements are in conflict, the most severe takes precedence.

This document is applicable to **fixed** single-phase, air-cooled (natural or forced) **associated dry-type transformers** used in the ignition systems of gas and oil burners. The windings ~~may~~ can be encapsulated or non-encapsulated.

The **rated supply voltage** does not exceed 1 000 V AC and the **rated supply frequency** and the ~~internal operational frequency~~ **operating frequencies** do not exceed 500 Hz.

The **rated short-circuit output current** does not exceed 500 mA AC.

The **no-load output voltage** or the **rated output voltage** does not exceed 15 000 V AC.

This part is not applicable to external circuits and their components intended to be connected to the input and output terminals or socket-outlets of the **transformers**.

NOTE 2 **Transformers** covered by this document are used in applications where **double or reinforced insulation** between circuits is not required by the installation rules or by the end product standard.

~~NOTE 2~~ Attention is drawn to the following, if necessary:

- for **transformers** intended to be used in vehicles, on board ships, and aircraft, additional requirements (from other applicable standards, national rules, etc.) ~~may be necessary~~;
- measures to protect the **enclosure** and the components inside the enclosure against external influences such as fungus, vermin, termites, solar-radiation, and icing ~~should also be considered~~;
- the different conditions for transportation, storage, and operation of the **transformers** ~~should also be considered~~;
- additional requirements in accordance with other appropriate standards and national rules ~~may~~ can be applicable to **transformers** intended for use in special environments.

~~NOTE 3~~ Future technological development of **transformers** ~~may~~ can necessitate a need to increase the upper limit of the frequencies. Until then this document ~~may~~ can be used as a guidance document.

This group safety publication focusing on safety guidance is primarily intended to be used as a product safety standard for the products mentioned in the scope, but is also intended to be used by technical committees in the preparation of publications for products similar to those mentioned in the scope of this group safety publication, in accordance with the principles laid down in IEC Guide 104 and ISO/IEC Guide 51.

One of the responsibilities of a technical committee is, wherever applicable, to make use of basic safety publications and/or group safety publications in the preparation of its publications.

2 Normative references

This clause of IEC 61558-1:2017 is applicable, except as follows:

Addition:

IEC 61558-1:~~2005~~2017, ~~Safety of power transformers, power supplies, reactors and similar products~~ *Safety of transformers, reactors, power supply units and combinations thereof – Part 1: General requirements and tests*

IEC 61558-2-16, *Safety of transformers, reactors, power supply units and combinations thereof – Part 2-16: Particular requirements and tests for switch mode power supply units and transformers for switch mode power supply units for general applications*

ISO 3864-1:~~2002~~2011, *Graphical symbols – Safety colours and safety signs – Part 1: Design principles for safety signs* ~~in workplaces and public areas~~ *and safety markings*

INTERNATIONAL STANDARD

NORME INTERNATIONALE

GROUP SAFETY PUBLICATION
PUBLICATION GROUPEE DE SÉCURITÉ

**Safety of transformers, reactors, power supply units and combinations thereof –
Part 2-3: Particular requirements and tests for ignition transformers for gas and
oil burners**

**Sécurité des transformateurs, bobines d'inductance, blocs d'alimentation et des
combinaisons de ces éléments –
Partie 2-3: Exigences particulières et essais pour les transformateurs d'allumage
pour brûleurs à gaz et combustibles liquides**

CONTENTS

FOREWORD.....	3
INTRODUCTION.....	5
1 Scope.....	6
2 Normative references	7
3 Terms and definitions	7
4 General requirements	8
5 General notes on tests	8
6 Ratings.....	8
7 Classification.....	8
8 Marking and other information	9
9 Protection against electric shock	11
10 Change of input voltage setting	11
11 Output voltage and output current under load	11
11 Output voltage and output current.....	11
12 No-load output voltage	12
13 Short-circuit voltage.....	12
14 Heating.....	12
15 Short-circuit and overload protection	13
16 Mechanical strength	14
17 Protection against harmful ingress of dust, solid objects and moisture.....	14
18 Insulation resistance, dielectric strength and leakage current	14
19 Construction	15
20 Components	16
21 Internal wiring.....	16
22 Supply connection and other external flexible cable or cords	16
23 Terminals for external conductors.....	16
24 Provisions for protective earthing.....	16
25 Screws and connections	16
26 Creepage distances, clearances and distances through insulation.....	16
27 Resistance to heat, fire and tracking.....	17
28 Resistance to rusting.....	17
Annexes	19
Bibliography.....	20
Figure 101 – Arcing horn	18
Table 101 – Symbols indicating the kind of transformer	11
Table 102 – Preferred values of operational parameters	12
Table 103 – Test time for short-circuit test.....	14
Table 104 – Creepage distances and clearances for output terminals	17

INTERNATIONAL ELECTROTECHNICAL COMMISSION

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Part 2-3: Particular requirements and tests for ignition transformers for gas and oil burners

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Part 2-3: Particular requirements and tests for ignition transformers for gas and oil burners

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This document is applicable to **fixed** single-phase, air-cooled (natural or forced) **associated dry-type transformers** used in the ignition systems of gas and oil burners. The windings can be encapsulated or non-encapsulated.

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The **rated short-circuit output current** does not exceed 500 mA AC.

The **no-load output voltage** or the **rated output voltage** does not exceed 15 000 V AC.

This part is not applicable to external circuits and their components intended to be connected to the input and output terminals or socket-outlets of the **transformers**.

NOTE 2 **Transformers** covered by this document are used in applications where **double or reinforced insulation** between circuits is not required by the installation rules or by the end product standard.

Attention is drawn to the following, if necessary:

- for **transformers** intended to be used in vehicles, on board ships, and aircraft, additional requirements (from other applicable standards, national rules, etc.);
- measures to protect the **enclosure** and the components inside the enclosure against external influences such as fungus, vermin, termites, solar-radiation, and icing;
- the different conditions for transportation, storage, and operation of the **transformers**;
- additional requirements in accordance with other appropriate standards and national rules can be applicable to **transformers** intended for use in special environments.

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2 Normative references

This clause of IEC 61558-1:2017 is applicable, except as follows:

Addition:

IEC 61558-1:2017, *Safety of transformers, reactors, power supply units and combinations thereof – Part 1: General requirements and tests*

IEC 61558-2-16, *Safety of transformers, reactors, power supply units and combinations thereof – Part 2-16: Particular requirements and tests for switch mode power supply units and transformers for switch mode power supply units for general applications*

ISO 3864-1:2011, *Graphical symbols – Safety colours and safety signs – Part 1: Design principles for safety signs and safety markings*

SOMMAIRE

AVANT-PROPOS	23
INTRODUCTION.....	25
1 Domaine d'application	26
2 Références normatives	27
3 Termes et définitions	27
4 Exigences générales	28
5 Généralités sur les essais.....	28
6 Caractéristiques assignées.....	28
7 Classification.....	29
8 Marquage et indications.....	30
9 Protection contre les chocs électriques.....	31
10 Changement de la tension primaire d'alimentation	31
11 Tension secondaire et courant secondaire en charge	31
11 Tension secondaire et courant secondaire	31
12 Tension secondaire à vide	32
13 Tension de court-circuit	32
14 Échauffements.....	32
15 Protection contre les courts-circuits et les surcharges	33
16 Résistance mécanique.....	34
17 Protection contre les effets nuisibles dus à la pénétration de poussière, d'objets solides et de l'humidité	34
18 Résistance d'isolement, rigidité diélectrique et courant de fuite	34
19 Construction	35
20 Composants	36
21 Conducteurs internes.....	36
22 Raccordement à l'alimentation et câbles souples externes	36
23 Bornes pour conducteurs externes	36
24 Dispositions en vue de la mise à la terre de protection	36
25 Vis et connexions	36
26 Lignes de fuite, distances d'isolement et distances à travers l'isolation.....	37
27 Résistance à la chaleur, au feu et aux courants de cheminement	37
28 Protection contre la rouille	37
Annexes	39
Bibliographie.....	40
Figure 101 – Éclateur à cornes	38
Tableau 101 – Symboles qui indiquent le type de transformateur.....	31
Tableau 102 – Valeurs préférentielles des paramètres opérationnels.....	32
Tableau 103 – Temps d'essai pour les essais de court-circuit.....	34
Tableau 104 – Lignes de fuite et distances d'isolement pour les bornes secondaires	37

COMMISSION ÉLECTROTECHNIQUE INTERNATIONALE

SÉCURITÉ DES TRANSFORMATEURS, BOBINES D'INDUCTANCE, BLOCS D'ALIMENTATION ET DES COMBINAISONS DE CES ÉLÉMENTS –

Partie 2-3: Exigences particulières et essais pour les transformateurs d'allumage pour brûleurs à gaz et combustibles liquides

AVANT-PROPOS

- 1) La Commission Électrotechnique Internationale (IEC) est une organisation mondiale de normalisation composée de l'ensemble des comités électrotechniques nationaux (Comités nationaux de l'IEC). L'IEC a pour objet de favoriser la coopération internationale pour toutes les questions de normalisation dans les domaines de l'électricité et de l'électronique. À cet effet, l'IEC – entre autres activités – publie des Normes internationales, des Spécifications techniques, des Rapports techniques, des Spécifications accessibles au public (PAS) et des Guides (ci-après dénommés "Publication(s) de l'IEC"). Leur élaboration est confiée à des comités d'études, aux travaux desquels tout Comité national intéressé par le sujet traité peut participer. Les organisations internationales, gouvernementales et non gouvernementales, en liaison avec l'IEC, participent également aux travaux. L'IEC collabore étroitement avec l'Organisation Internationale de Normalisation (ISO), selon des conditions fixées par accord entre les deux organisations.
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- 8) L'attention est attirée sur les références normatives citées dans cette publication. L'utilisation de publications référencées est obligatoire pour une application correcte de la présente publication.
- 9) L'attention est attirée sur le fait que certains des éléments du présent document de l'IEC peuvent faire l'objet de droits de brevet. L'IEC ne saurait être tenue pour responsable de ne pas avoir identifié de tels droits de brevets.

La Norme internationale IEC 61558-2-3 a été établie par le comité d'études 96 de l'IEC: Transformateurs, bobines d'inductance, blocs d'alimentation et combinaisons de ces éléments. Il s'agit d'une Norme internationale.

Cette troisième édition annule et remplace la deuxième édition parue en 2010. Cette édition constitue une révision technique.

Cette édition inclut les modifications techniques majeures suivantes par rapport à l'édition précédente:

- a) la structure et les références ont été alignées sur l'IEC 61558-1:2017.

Le texte de cette Norme internationale est issu des documents suivants:

Projet	Rapport de vote
96/577/FDIS	96/580/RVD

Le rapport de vote indiqué dans le tableau ci-dessus donne toute information sur le vote ayant abouti à son approbation.

La langue employée pour l'élaboration de cette Norme internationale est l'anglais.

Ce document a été rédigé selon les Directives ISO/IEC, Partie 2, il a été développé selon les Directives ISO/IEC, Partie 1 et les Directives ISO/IEC, Supplément IEC, disponibles sous www.iec.ch/members_experts/refdocs. Les principaux types de documents développés par l'IEC sont décrits plus en détail sous www.iec.ch/publications.

Il a le statut de publication groupée de sécurité conformément au Guide 104 de l'IEC.

La présente Norme internationale doit être utilisée conjointement avec l'IEC 61558-1:2017.

Le présent document complète ou modifie les articles correspondants de l'IEC 61558-1:2017, de façon à transformer cette publication en norme IEC: *Exigences particulières et essais pour les transformateurs d'allumage pour brûleurs à gaz et combustibles liquides*.

Une liste de toutes les parties de la série IEC 61558, publiées sous le titre général *Sécurité des transformateurs, bobines d'inductance, blocs d'alimentation et des combinaisons de ces éléments*, se trouve sur le site web de l'IEC.

Les futures normes de cette série porteront le nouveau titre général cité ci-dessus. Le titre des normes qui existent déjà dans cette série sera mis à jour lors de leur prochaine édition.

Lorsque ce document mentionne "*addition*", "*modification*" ou "*remplacement*", le texte correspondant de l'IEC 61558-1:2017 doit être adapté en conséquence.

Dans le présent document, les caractères d'imprimerie suivants sont utilisés:

- exigences proprement dites: caractères romains;
- *modalités d'essais: caractères italiques*;
- commentaires: petits caractères romains.

Dans le texte du présent document, les termes en **gras** sont définis à l'Article 3.

Les paragraphes, notes, figures et tableaux qui s'ajoutent à ceux de l'IEC 61558-1:2017 sont numérotés à partir de 101; les annexes qui sont ajoutées sont désignées AA, BB, etc.

Le comité a décidé que le contenu de ce document ne sera pas modifié avant la date de stabilité indiquée sur le site web de l'IEC sous "<http://webstore.iec.ch>" dans les données relatives au document recherché. À cette date, le document sera

- reconduit,
- supprimé,
- remplacé par une édition révisée, ou
- amendé.

The contents of the corrigendum 1 (2023-09) have been included in this copy.

INTRODUCTION

Le CE 96 de l'IEC a une fonction groupée de sécurité, conformément au Guide 104 de l'IEC pour les transformateurs autres que ceux destinés à alimenter les réseaux de distribution, notamment les transformateurs et les blocs d'alimentation destinés à permettre l'application de mesures de protection contre les chocs électriques, comme cela est défini par le CE 64, qui traite des installations électriques et de la protection contre les chocs électriques, mais en incluant également dans certains cas la limitation de la tension et de la fonction de sécurité horizontale pour la TBTS, conformément à l'IEC 60364-4-41.

La fonction groupée de sécurité (GSF, *Group Safety Function*) est utilisée en raison de la responsabilité de la très basse tension de sécurité (TBTS), conformément au 5.2.6 de l'IEC 61140:2016 et au 414.3.1 de l'IEC 60364-4-41:2005, ou des circuits de commande, conformément au 7.2.4 de l'IEC 60204-1:2016.

La fonction groupée de sécurité est utilisée pour chacune des parties de l'IEC 61558-2, car différentes normes de la série IEC 61558 peuvent être combinées en une seule et même construction, mais dans certains cas sans aucune limitation de la puissance secondaire assignée.

Un autotransformateur conforme à l'IEC 61558-2-13 peut par exemple être conçu avec un circuit TBTS séparé, conformément aux exigences particulières de l'IEC 61558-2-6 liées aux exigences générales de l'IEC 61558-1.

SÉCURITÉ DES TRANSFORMATEURS, BOBINES D'INDUCTANCE, BLOCS D'ALIMENTATION ET DES COMBINAISONS DE CES ÉLÉMENTS –

Partie 2-3: Exigences particulières et essais pour les transformateurs d'allumage pour brûleurs à gaz et combustibles liquides

1 Domaine d'application

Remplacement:

La présente partie de l'IEC 61558 traite de la sécurité des **transformateurs d'allumage** pour brûleurs à gaz et combustibles liquides. Les **transformateurs d'allumage** qui incorporent des **circuits électroniques** sont également couverts par le présent document.

NOTE 1 La sécurité comprend les aspects électrique, thermique et mécanique.

Sauf spécification contraire, dans la suite du document, le terme **transformateur** couvre les **transformateurs d'allumage** pour brûleurs à gaz et combustibles liquides.

Pour les **blocs d'alimentation à découpage**, l'IEC 61558-2-16 s'applique conjointement avec le présent document. Lorsque deux exigences sont en contradiction, c'est la plus sévère qui prévaut.

Le présent document s'applique aux **transformateurs secs associés installés à poste fixe**, monophasés, à refroidissement par air (naturel ou forcé) utilisés dans les systèmes d'allumage pour brûleurs à gaz ou combustibles liquides. Les enroulements peuvent être enrobés ou non enrobés.

La **tension primaire assignée** ne dépasse pas 1 000 V en courant alternatif, et la **fréquence primaire assignée** et les **fréquences de fonctionnement interne** ne dépassent pas 500 Hz.

Le **courant secondaire de court-circuit assigné** ne dépasse pas 500 mA en courant alternatif.

La **tension secondaire à vide** ou la **tension secondaire assignée** ne dépasse pas 15 000 V en courant alternatif.

La présente partie ne s'applique pas aux circuits externes et à leurs composants destinés à être connectés aux bornes primaires et secondaires ou aux socles de prises de courant des **transformateurs**.

NOTE 2 Les **transformateurs** couverts par le présent document sont utilisés dans le cadre d'applications pour lesquelles les règles d'installation ou la norme du produit final n'exigent aucune **isolation double ou renforcée** entre les circuits.

L'attention est attirée sur les points suivants, si nécessaire:

- exigences supplémentaires (issues d'autres normes applicables, règles nationales, etc.) pour les **transformateurs** destinés à être utilisés dans des véhicules, à bord de navires ou d'avions;
- mesures qui visent à protéger l'**enveloppe** et les composants à l'intérieur de l'enveloppe contre les influences externes, telles que les champignons, la vermine, les termites, le rayonnement solaire et le givre;
- différentes conditions de transport, de stockage et de fonctionnement pour les **transformateurs**;

- exigences supplémentaires qui peuvent s'appliquer aux **transformateurs** destinés à être utilisés dans un environnement particulier, au regard d'autres normes et règles nationales applicables.

Les évolutions techniques futures des **transformateurs** peuvent nécessiter une augmentation de la limite supérieure des fréquences. En attendant, le présent document peut être utilisé à titre de recommandation.

La présente publication groupée de sécurité centrée sur les recommandations de sécurité est essentiellement destinée à être utilisée en tant que norme de sécurité des produits pour les produits mentionnés dans le domaine d'application, mais elle est également destinée à être utilisée par les comités d'études dans le cadre de l'élaboration de publications pour des produits analogues à ceux mentionnés dans le domaine d'application de la présente publication groupée de sécurité, conformément aux principes établis dans le Guide 104 de l'IEC et le Guide 51 de l'ISO/IEC.

L'une des responsabilités d'un comité d'études consiste, le cas échéant, à utiliser les publications fondamentales de sécurité et/ou les publications groupées de sécurité dans le cadre de l'élaboration de ses publications.

2 Références normatives

L'article de l'IEC 61558-1:2017 s'applique, avec l'exception suivante:

Addition:

IEC 61558-1:2017, *Sécurité des transformateurs, bobines d'inductance, blocs d'alimentation et des combinaisons de ces éléments – Partie 1: Exigences générales et essais*

IEC 61558-2-16, *Sécurité des transformateurs, bobines d'inductance, blocs d'alimentation et des combinaisons de ces éléments – Partie 2-16: Exigences particulières et essais pour les blocs d'alimentation à découpage et les transformateurs pour blocs d'alimentation à découpage pour applications d'ordre général*

ISO 3864-1:2011, *Symboles graphiques – Couleurs de sécurité et signaux de sécurité – Partie 1: Principes de conception pour les signaux de sécurité et les marquages de sécurité*