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Australian Standard®

Wrought aluminium and aluminium alloy enclosures for gas-filled high-voltage switchgear and controlgear

This Australian Standard® was prepared by Committee EL-007, Power Switchgear. It was approved on behalf of the Council of Standards Australia on 4 November 2008.
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The following are represented on Committee EL-007:

- Australasian Railway Association
- Australian British Chamber of Commerce
- Australian Electrical and Electronic Manufacturers Association
- Energy Networks Association
- Engineers Australia
- Testing interests (Australia)

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PREFACE

This Standard was prepared by the Standards Australia Committee EL-007, Power Switchgear.

The objective of this Standard is to specify the requirements for wrought aluminium and aluminium alloy enclosures for use in high-voltage switchgear and controlgear and associated gas-filled equipment.

This Standard is identical with, and has been reproduced from, EN 50064:1989, *Wrought aluminium and aluminium alloy enclosures for gas-filled high-voltage switchgear and controlgear* (including its Amendment 1).

The formatting of this document has been updated to reflect current style and minor editorial errors have been corrected.

This document forms a supplement to EN 50052 (1986), *Cast aluminium alloy enclosures for gas-filled high-voltage switchgear and controlgear*, concerning enclosures for the same type of switchgear and controlgear but made of wrought aluminium and aluminium alloys. It is based on the general specifications given in IEC 60517 (1986), which are, however, not sufficient to satisfy the conditions for the service allowance of pressurized high-voltage switchgear and controlgear.

These specifications are appropriate for pressurized switchgear enclosures allowing an economic production without sacrificing aspects of safety. For unusual shapes dictated by electrical conditions they permit the verification of sound design by proof tests instead of calculations. Nevertheless this Standard makes use of many internationally well acknowledged calculation rules and the Technical Committee will in addition pursue the progress in standardization in CEN/TC 121 and ISO/TC 44 on welding and allied processes.

For the time being reference can only be made to published International Standards as far as they are appropriate for the purpose of production of enclosures to be used in gas-filled switchgear and controlgear.

The present EN has been established as an international specification for the design, construction, testing, inspection and certification of pressurized enclosures used in high-voltage switchgear and controlgear. This Standard follows to that extent also Article 2 of the Directive 76/767/EEC.

As this Standard is reproduced from an International Standard, the following applies:

(a) Its number appears on the cover and title page, while the International Standard number appears only on the cover.

(b) In the source text 'EN 50064' should read 'AS 50064'.

(c) Substitute a full point for a comma as a decimal marker.

References to International Standards should be replaced by references to Australian or Australian/New Zealand Standards, as follows:

Reference to International Standard		*Australian Standard*
IEC 60517 (1986) and HD 358 S2	Gas-insulated metal-enclosed switchgear for rated voltages of 72.5 kV and above (all versions superseded by IEC 62271-203)	All versions superseded by AS 62271.203

ISO 373:1964	General principles for fatigue testing of metals	—
3134:1985	Light metals and their alloys – Terms and definitions Part 1: Materials Part 3: Wrought products Part 5: Methods of processing and treatment	—
6213:1983	Welding – Items to be considered to ensure quality in welding structures	—
6520:1982	Classification of imperfections in metallic fusion welds, with explanations	—
9000:1987	Guidelines for selection and use of the standards on quality management, quality system elements and quality assurance	—
ISO/IEC Guide 2:1986	General terms and their definitions concerning standardization and related activities	—

The terms ‘normative’ and ‘informative’ are used to define the application of the annex to which they apply. A normative annex is an integral part of a Standard, whereas an informative annex is only for information and guidance.

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1 Introduction

This standard covers the requirements for the design, construction, testing, inspection and certification of gas-filled enclosures for use specifically in high-voltage switchgear and controlgear, or for associated gas-filled equipment. Special consideration is given to these enclosures for the following reasons:

(a) The enclosures usually form the containment of electrical equipment, thus their shape is determined by electrical rather than mechanical considerations.

(b) The enclosures are installed in restricted access areas and the equipment is operated by experts and instructed persons only.

(c) As the thorough drying of the inert, non-corrosive gas-filling medium is fundamental to the satisfactory operation of the electrical equipment it is periodically checked. For this reason, no internal corrosion allowance is required on the wall thickness of these enclosures.

(d) The enclosures are subjected to only small fluctuations of pressure as the gas-filling density shall be maintained within close limits to ensure satisfactory insulating and arc-quenching properties. Therefore, the enclosures are not liable to fatigue due to pressure cycling.

(e) The operating pressure is relatively low.

For the foregoing reasons, and to ensure the minimum disturbance hence reducing the risk of moisture and dust entering the enclosure which would prevent correct electrical operation of the switchgear, no pressure tests shall be carried out after installation and before placing in service and no periodic inspection of the enclosure interiors or pressure tests shall be carried out after the equipment is placed in service.

2 Scope and field of application

2.1 Type of equipment

This standard applies to fusion welded wrought aluminium and aluminium alloy enclosures pressurized with dry air, inert gases, for example sulphur hexafluoride or nitrogen or a mixture of such gases, used in indoor or outdoor installations of high-voltage switchgear and controlgear, where the gas is used principally for its dielectric and/or arc-quenching properties, and with rated voltages.

- kV up to and including 52 kV and with gas-filled compartments with design pressure greater than 3 bar (gauge);
- 72.5 kV and above.

The enclosures comprise parts of electrical equipment not necessarily limited to the following examples:

- Circuit-breakers
- Switch-disconnectors
- Disconnectors