



**Hydrogen generators using water
electrolysis — Industrial, commercial,
and residential applications (ISO
22734:2019, MOD)**



AS 22734:2020

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- Australian Energy Market Operator
- Australian Gas Association
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Preface

This Standard was prepared by the Standards Australia Committee ME-093, Hydrogen Technologies.

The objective of this document is to define the construction, safety, and performance requirements of modular or factory-matched hydrogen gas generation appliances, herein referred to as hydrogen generators, using electrochemical reactions to electrolyse water to produce hydrogen.

This document is applicable to hydrogen generators that use the following types of ion transport medium:

- (a) Group of aqueous bases.
- (b) Group of aqueous acids.
- (c) Solid polymeric materials with acidic function group additions, such as acid proton exchange membrane (PEM).
- (d) Solid polymeric materials with basic function group additions, such as anion exchange membrane (AEM).

This document is applicable to hydrogen generators intended for industrial and commercial uses, and indoor and outdoor residential use in sheltered areas, such as car-ports, garages, utility rooms and similar areas of a residence.

Hydrogen generators that can also be used to generate electricity, such as reversible fuel cells, are excluded from the scope of this document.

Residential hydrogen generators that also supply oxygen as a product are excluded from the scope of this document.

This document is an adoption with national modifications, and has been reproduced from, ISO 22734:2019, *Hydrogen generators using water electrolysis — Industrial, commercial, and residential applications*. The modifications are additional requirements and are set out in [Appendix ZZ](#) which has been added at the end of the source text.

[Appendix ZZ](#) lists the variations to ISO 22734:2019, for the application of this document in Australia.

As this document has been reproduced from an International Standard, a full point substitutes for a comma when referring to a decimal marker.

Australian or Australian/New Zealand Standards that are identical adoptions of international normative references may be used interchangeably. Refer to the online catalogue for information on specific Standards.

The terms “normative” and “informative” are used in Standards to define the application of the appendices or annexes to which they apply. A “normative” appendix or annex is an integral part of a Standard, whereas an “informative” appendix or annex is only for information and guidance.

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 197, *Hydrogen technologies*.

This first edition cancels and replaces ISO 22734-1:2008 and ISO 22734-2:2011, which have been combined and technically revised. The technical revisions add Alkaline Exchange Membranes to the document scope, update Normative references, clarify pressure terminology definitions, and simplify Risk Management requirements. This document is reorganized into 7 clauses, where all design requirements are now found in [Clause 4](#), and all test methods are now found in [Clause 5](#).

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

In a hydrogen generator electrochemical cell, electricity causes dissociation of water into hydrogen and oxygen molecules. An electric current is passed between two electrodes separated by a conductive electrolyte or “ion transport medium”, producing hydrogen at the negative electrode (cathode) and oxygen at the positive electrode (anode). As water is H₂O, twice the volume of hydrogen is produced compared with oxygen.

Hydrogen gas produced using electrolysis technology can be utilized immediately or stored for later use.

The cell(s), and electrical, gas processing, ventilation, cooling, monitoring equipment and controls are contained within an enclosure. Gas compression, feed water conditioning, and auxiliary equipment may also be included.

This document is intended to be used for certification purposes.

Australian Standard®

Hydrogen generators using water electrolysis — Industrial, commercial, and residential applications (ISO 22734:2019, MOD)

1 Scope

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Hydrogen generators that can also be used to generate electricity, such as reversible fuel cells, are excluded from the scope of this document.

Residential hydrogen generators that also supply oxygen as a product are excluded from the scope of this document.

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.

ISO 1182, *Reaction to fire tests for products — Non-combustibility test*

ISO 3746, *Acoustics — Determination of sound power levels and sound energy levels of noise sources using sound pressure — Survey method using an enveloping measurement surface over a reflecting plane*

ISO 3864-2, *Graphical symbols — Safety colours and safety signs — Part 2: Design principles for product safety labels*

ISO 4126-1, *Safety devices for protection against excessive pressure — Part 1: Safety valves*

ISO 4126-2, *Safety devices for protection against excessive pressure — Part 2: Bursting disc safety devices*

ISO 4126-6, *Safety devices for protection against excessive pressure — Part 6: Application, selection and installation of bursting disc safety devices*

ISO 7010, *Graphical symbols — Safety colours and safety signs — Registered safety signs*

ISO 7866, *Gas cylinders — Refillable seamless aluminium alloy gas cylinders — Design, construction and testing*

ISO 9300, *Measurement of gas flow by means of critical flow Venturi nozzles*

ISO 9951, *Measurement of gas flow in closed conduits — Turbine meters*