

AS 22444.1:2025



STANDARDS
Australia



Rare earth — Vocabulary

Part 1: Minerals, oxides and other compounds (ISO 22444-1:2020, MOD)



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AS 22444.1:2025

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The following are represented on Committee MN-011:

Association of Mining and Exploration Companies
Australasian Institute of Mining & Metallurgy
Australian Nuclear Science and Technology Organisation
CSIRO
Curtin University
Department of Industry, Science and Resources
Department of Resources (QLD) — Geological Survey of Queensland
Minerals Council of Australia
National Association of Testing Authorities Australia
The Chamber of Minerals and Energy of Western Australia

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How to read this Standard

This page explains the meaning of the language and structure of this Standard.

Refer to Standards Australia's [Standardisation Guide 006](#) for more details about drafting rules.

Australian and Australian/New Zealand Standards are voluntary unless they are referenced in legislation or called up in contracts.

Requirements

To conform to a Standard, all requirements in the Standard need to be met.

A requirement is any statement in the Standard which uses the word "shall".

Recommendations, permissions and possibilities

The following words are commonly used in Standards, but statements using them do not have to be followed to conform to the Standard:

- (a) "should" means that something is recommended.
- (b) "may" means that something is permitted.
- (c) "can" means that something is possible.

Structure of Standards

A Standard always has the following parts:

- (i) The Preface states who developed the Standard, what the Standard is aiming to do, and how it relates to other documents.
- (ii) The Scope states what the Standard is about, what it covers and what it does not cover.
- (iii) The Normative references clause lists other documents that are referenced in the Standard as part of requirements.
- (iv) The Terms and definitions clause defines important terms to help with understanding the Standard.

A Standard may also include other parts, such as the following:

- (1) A normative appendix sets additional requirements that need to be conformed to.
- (2) An informative appendix provides additional information or guidance. They usually do not contain requirements. If an informative appendix does contain requirements, the Technical Specification will explain when those requirements apply.
- (3) A Bibliography lists documents referenced in the Standard but not as part of requirements.

Many Standards include notes. Notes provide recommendations and/or guidance only. They never contain requirements.

This Standard is a modified adoption of an International Standard. It makes changes to the international text.

The changes to the international text are shown in boxes in the text. These boxes have the heading "National Variation".

To use this Standard in Australia/New Zealand, the changes in the national variation boxes need to be followed.

Preface

This Standard was prepared by the Standards Australia Committee, MN-011, Rare Earth.

The objective of this document is to define the terms for rare earth minerals, oxides and other compounds, as well as for related production processes.

This document is an adoption with national modifications, and has been reproduced from ISO 22444-1, *Rare earth — Vocabulary — Part 1: Minerals, oxides and other compounds*. The modifications are set out in national variations boxes which give instructions where the ISO text is to be modified for use in Australia. Due to ISO copyright policy, it is not possible to directly modify the ISO content.

As this document has been reproduced from an international document, 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.

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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 298, *Rare earth*.

A list of all parts in the ISO 22444 series can be found on the ISO website.

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

Rare earth elements are widely used. Different business and industry sectors have various descriptions for rare earth elements and their compounds and alloys. Therefore, it is of vital importance to unify the terminology used in the rare earth industry.

About 250 minerals contain significant amounts of rare earth elements although there are only a few that are economically exploited at this time. Various rare earth oxides and other compounds are obtained from these rare earth minerals as they are processed through to intermediate products and on to final products.

This document specifies terms for use by producers, consumers and traders in the field of rare earth minerals, oxides and other compounds. This document will serve as a reference that will help to reduce discrepancies or trade disputes caused by inconsistencies in terms used when dealing with rare earth minerals, oxides and other compounds.

Australian Standard®

Rare earth — Vocabulary

Part 1: Minerals, oxides and other compounds (ISO 22444-1:2020, MOD)

1 Scope

The document defines the terms for rare earth minerals, oxides and other compounds, as well as for related production processes.

This document can be used as a reference to unify technical terms in rare earth production, application, inspection, circulation, trading, scientific research and education.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

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

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

3.1

rare earth element

collective name for scandium (Sc), yttrium (Y) and the lanthanides (La, Ce, Pr, Nd, Pm, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, Lu), which was approved by the International Union for Pure and Applied Chemistry (IUPAC) in its 2005 Nomenclature of Inorganic Chemistry Recommendations^[1]

Note 1 to entry: Certain terms and corresponding abbreviated terms are common such as rare earth element (REE or RE) and *rare earth oxide (REO)* (2.1)

Note 2 to entry: Rare earth elements are frequently referred to as being either light rare earth (LREE), medium rare earth (MREE) or heavy rare earth (HREE), with LREE including the elements between lanthanum (La) and neodymium (Nd), MREE including the elements between samarium (Sm) and gadolinium (Gd), and HREE including the elements from terbium (Tb) to lutetium (Lu) as well as scandium (Sc) and yttrium (Y).

NATIONAL VARIATION

Note 2, at the end of the note, *add* the following:

In addition, scandium is not always included in the rare earth element grouping by mineral explorers as it commonly occurs in different geological settings to the lanthanides and is reported separately.

Note 3 to entry: Didymium is commonly used to express a mixture of the elements Pr and Nd.

Note 4 to entry: Characteristics of rare earth elements are described in [Annex A](#).

3.2

rare earth mineral

mineral containing one or more *rare earth elements* (3.1)

Note 1 to entry: Rare earths can be present as a simple compound, incorporated in the lattice of another mineral, or sorbed to another mineral, such as *bastnaesite* (4.1.1), *monazite* (4.1.2) or montmorillonite as in ionic clay deposits.