AS 2706—2003
Reconfirmed 2018

Australian Standard™

Numerical values—Rounding and interpretation of limiting values

STANDARDS AUSTRALIA

This Australian Standard was prepared by Committee ME-071, Quantities, Units and Conversions. It was approved on behalf of the Council of Standards Australia on 28 July 2003 and published on 31 December 2003.

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CSIRO Telecommunications and Industrial Physics
Department of Industry Science and Resources
National Association of Testing Authorities Australia
University of Melbourne

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STANDARDS AUSTRALIA

RECONFIRMATION

OF
AS 2706–2003
Numerical values–Rounding and interpretation of limiting values

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Major stakeholders of this publication have reviewed the content of this publication and in accordance with Standards Australia procedures for reconfirmation, it has been determined that the publication is still valid and does not require change.

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NOTES

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Numerical values—Rounding and interpretation of limiting values

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PREFACE

This Standard was prepared by the Standards Australia Committee ME-071, Quantities, Units and Conversions, to supersede AS 2706—1984.

The objective of this Standard is to adopt a consistent procedure in the presentation and interpretation of numerical values, particularly the number of figures to be used and the procedure for rounding. Values are expressed appropriately without using too few or too many figures, and a standard practice is adopted for rounding the last figure.

General principles and working rules relating to the different aspects are set out and illustrated with examples. It is, however, not possible to deal fully with all aspects.

In the preparation of this Standard, reference was made to the following Standards:

(a) AS ISO 1000 SI units and recommendations for the use of their multiples and of certain other units

(b) ISO GUM Guide to the Expression of Uncertainty in Measurement

(c) AS 3807 Vocabulary of basic and general terms in metrology

(d) AS 3912.1 Quality assurance requirements for measuring equipment, Part 1: Metrological confirmation system for measuring equipment

(e) ASTM E29 Standard Practice for Using Significant Digits in Test Data to Determine Conformance with Specifications

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

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SECTION 1 SCOPE AND GENERAL

1.1 SCOPE

This Standard deals with certain aspects of the rounding and interpretation of numerical values. It includes the following:

(a) Rules for the rounding of numbers, assuming a prior decision on the appropriate number of figures to be retained (see Section 3).

(b) A discussion of the number of significant figures to be retained in presenting any particular value (see Section 4).

(c) Conventions concerning the interpretation of specification limits in relation to their mode of expression (see Section 5).

1.2 FORM OF NOTATION

For the purpose of this Standard, all numerical values are expressed in accordance with the decimal system.

1.3 TYPES OF NUMERICAL VALUE

Numerical values may be regarded as being of three different kinds as follows:

(a) *Exact numerical values* Exact numerical values are expressed to as many figures as are required to give the complete value, without approximation. Many definitive values are of this kind.

Example 1:

1 kilowatt hour (1 kW.h) = 3.6 MJ, exactly

Example 2:

Standard acceleration of free fall, $g_n = 9.806\ 65\ m/s^2$, exactly

Example 3:

1 litre (L) = $10^{-3}\ m^3$, exactly

(b) *Inexact decimal expressions of exactly defined numbers* Exactly defined numbers can be expressed with any desired accuracy by taking sufficient figures. Many values having a purely mathematical basis fall into this category.

Example 4:

The expressions 1/7, 1/3, $\sqrt{2}$, π and e stand for exactly defined numbers. Decimal expressions for these are non-terminating, i.e.—

(a) 0.142 857 1;

(b) 0.333 333 3;

(c) 1.414 213 5;