

Australian/New Zealand Standard™

**Welding consumables—Covered  
electrodes for manual metal arc welding  
of high-strength steels—Classification**



## **AS/NZS 4857:2006**

This Joint Australian/New Zealand Standard was prepared by Joint Technical Committee WD-002, Welding Consumables. It was approved on behalf of the Council of Standards Australia on 10 October 2006 and on behalf of the Council of Standards New Zealand on 20 October 2006.

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The following are represented on Committee WD-002:

Australian Chamber of Commerce and Industry  
Bureau of Steel Manufacturers of Australia  
Business New Zealand  
CSIRO Manufacturing & Infrastructure Technology  
Standards New Zealand  
Welding Technology Institute of Australia

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*This Standard was issued in draft form for comment as DR 06361.*

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STANDARDS AUSTRALIA/STANDARDS NEW ZEALAND

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**RECONFIRMATION**

**OF**

**AS/NZS 4857:2006**

**Welding consumables—Covered electrodes for manual metal arc welding of high-strength steels—Classification**

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Technical Committee WD-002 has 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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The following are represented on Technical Committee WD-002:

Australian Chamber of Commerce and Industry  
Bureau of Steel Manufacturers of Australia  
New Zealand Heavy Engineering Research Association  
Welding Technology Institute of Australia

## NOTES

Australian/New Zealand Standard™

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Originated in Australia as part of AS B322—1973.  
Previous edition part of AS/NZS 1553.2:1999.  
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## PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee WD-002, Welding Consumables to supersede Standard AS/NZS 1553.2:1999 (in part).

The objective of this Standard is to specify requirements for classification of covered electrodes and deposited metal in the as-welded condition and in the post-weld heat-treated condition for manual metal arc welding of high-strength steels.

This Standard is identical with, and has been reproduced from ISO 18275:2005.

An informative Annex ZA, has been included to provide guidance on health and safety in welding.

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 'ISO 18275' should read 'AS/NZS 4857'.
- (c) A full point substitutes for a comma when referring to a decimal marker.

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

<i>Reference to International Standard</i>	<i>Australian/New Zealand Standard</i>
ISO	AS
6947 Welds—Working positions— Definitions of angles of slope and rotation	3545 Welding positions
544 Welding consumables—Technical delivery conditions for welding filler metals—Type of product, dimensions, tolerances and markings	AS/NZS ISO 544 Welding consumables— Technical delivery conditions for welding filler metals—Type of product, dimensions, tolerances and markings
3690 Welding and allied processes— Determination of hydrogen content in ferritic steel arc weld metal	AS/NZS 3752 Welding and allied processes— Determination of hydrogen content in ferritic steel arc weld metal
14344 Welding and allied processes—Flux and gas shielded electrical welding processes—Procurement guidelines for consumables	AS/NZS ISO 14344 Welding and allied processes— Flux and gas shielded electrical welding processes— Procurement guidelines for consumables

Only international references that have been adopted as Australian or Australia/New Zealand Standards have been listed. The term 'informative' has been used in this Standard to define the application of the annex to which it applies. An 'informative' annex is only for information and guidance.

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## INTRODUCTION

This International Standard was prepared by Technical Committee ISO/TC 44/SC 3 through the International Institute of Welding, Commission II. It recognizes that there are two somewhat different approaches in the global market to classifying a given electrode, and allows for either or both to be used, to suit a particular market need. Application of either type of classification designation (or of both where suitable) identifies a product as classified in accordance with this International Standard. The classification in accordance with system A is mainly based on EN 757. The classification in accordance with system B is mainly based upon standards used around the Pacific Rim.

This International Standard proposes a classification system for covered electrodes for high-tensile steels in terms of the tensile properties, impact properties and chemical composition of the all-weld metal, as well as the type of electrode covering. The ratio of yield strength to tensile strength of the weld metal is generally higher than that of the parent metal. Users should note that matching weld metal yield strength to parent metal yield strength will not necessarily ensure that the weld metal tensile strength matches that of the parent metal. Where the application requires matching tensile strength, therefore, selection of the consumable should be made by reference to column 3 of Table 1A or Table 8B.

It should be noted that the mechanical properties of all-weld metal test specimens used to classify covered electrodes will vary from those obtained in production joints because of differences in welding procedure such as electrode size, width of weave, welding position and parent metal composition.

Requests for official interpretations of any aspect of this International Standard should be directed to the Secretariat of ISO/TC 44/SC 3 via your national standards body. A complete listing of these bodies can be found at [www.iso.org](http://www.iso.org).

## STANDARDS AUSTRALIA/STANDARDS NEW ZEALAND

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**1 Scope**

This International Standard specifies requirements for classification of covered electrodes and deposited metal in the as-welded condition and in the post-weld heat-treated condition for manual metal arc welding of high-strength steels with a minimum yield strength greater than 500 MPa or a minimum tensile strength greater than 570 MPa.

This International Standard is a combined specification providing a classification utilizing a system based upon the yield strength and an average impact energy of 47 J of the all-weld metal, or utilizing a system based upon the tensile strength and an average impact energy of 27 J of the all-weld metal.

- 1) Subclauses and tables which carry the suffix letter "A" are applicable only to covered electrodes classified under the system based upon the yield strength and an average impact energy of 47 J of the all-weld metal given in this International Standard.
- 2) Subclauses and tables which carry the suffix letter "B" are applicable only to covered electrodes classified under the system based upon the tensile strength and an average impact energy of 27 J of the all-weld metal given in this International Standard.
- 3) Subclauses and tables which do not have either the suffix letter "A" or the suffix letter "B" are applicable to all covered electrodes classified under this International Standard.

**2 Normative references**

The following referenced documents are indispensable for the application 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 31-0:1992, *Quantities and units — Part 0: General principles*

ISO 544, *Welding consumables — Technical delivery conditions for welding filler materials — Type of product, dimensions, tolerances and markings*

ISO 2401, *Covered electrodes — Determination of the efficiency, metal recovery and deposition coefficient*

ISO 2560:2002, *Welding consumables — Covered electrodes for manual metal arc welding of non-alloy and fine grain steels — Classification*

ISO 3690, *Welding and allied processes — Determination of hydrogen content in ferritic steel arc weld metal*

ISO 6847, *Welding consumables — Deposition of a weld metal pad for chemical analysis*

ISO 6947, *Welds — Working positions — Definitions of angles of slope and rotation*

ISO 14344, *Welding and allied processes — Flux and gas shielded electrical welding processes — Procurement guidelines for consumables*