SUPERSEDED by AS/NZS 2717:1996

AS 2717.1—1984
UDC 621.791.042.4:621.791.85

Australian Standard 2717.1—1984

WELDING—ELECTRODES—GAS METAL ARC

Part 1—FERRITIC STEEL ELECTRODES

STANDARDS ASSOCIATION OF AUSTRALIA
Incorporated by Royal Charter

E

This Australian standard was prepared by Committee WD/2, Electrodes and Filler Rods. It was approved on behalf of the Council of the Standards Association of Australia on 17 April 1984 and published on 3 August 1984.

The following interests are represented on Committee WD/2:

Australian Gas Association

Australian Institute of Petroleum Limited

Australian Welding Institute

Australian Welding Research Association

Bureau of Steel Manufacturers of Australia

Confederation of Australian Industry

Department of Defence

Department of Defence Support

Department of Industrial Relations, N.S.W.

Department of Labour and Industry, Vic.

Lloyd's Register of Shipping

Metal Trades Industry Association of Australia

Metropolitan Water, Sewerage and Drainage Board, N.S.W.

Railways of Australia Committee

This standard was issued in draft form for comment as DR 83045.

AUSTRALIAN STANDARD

WELDING—ELECTRODES—GAS METAL ARC

Part 1—FERRITIC STEEL ELECTRODES

AS 2717.1—1984

First published 1984

PUBLISHED BY THE STANDARDS ASSOCIATION OF AUSTRALIA
STANDARDS HOUSE, 80 ARTHUR ST, NORTH SYDNEY, N.S.W.

ISBN 0 7262 3405 2

PREFACE

This standard was prepared by the Association's Committee on Electrodes and Filler Rods and is one of a proposed series of standards for continuous wire (welding) processes that is being developed to suit Australian conditions.

Australian standards covering electrodes and other welding consumables are as follows:

AS 1167 Welding and Brazing—Filler Metals
Part 1—Filler Metals for Brazing and Braze Welding

AS 1552 Classification of Covered Electrodes

AS 1553 Covered Electrodes for Welding
Part 1—Low Carbon Steel Electrodes for Manual Metal-arc Welding of Carbon and Carbon-manganese Steels

AS 1586 Low Alloy Steel Covered Electrodes for Manual Metal-arc Welding

AS 1588 Filler Rods for Welding

AS 1858 Electrodes and Fluxes for Submerged-arc Welding of Carbon and Low Alloy Steels

AS 2203 Carbon Steel Electrodes, Cored (for Arc Welding)

AS 2576 Welding Consumables for Build-up and Wear Resistance—Classification System.

The classification system adopted has been designed to be compatible with AS 1858 and AS 2203, and similarly has mechanical requirements complying with the Ship Classification Societies' unified rules. It also takes into consideration recent documents of the International Institute of Welding and the American National Standards Institute.

To assist designers, the concept of weld metal classification which was introduced in AS 1858 has been incorporated in the classification of these electrodes. This concept of weld metal classification is regarded by the committee as being of great significance.

For ease of selection, the weld metal is classified according to its tensile strength and is divided into grades related to its Charpy V-notch impact energy value. The intent here is that the designer needs only to specify on the drawing the weld metal classification which will thereby nominate the mechanical properties required for the satisfactory functioning of the welded joint. The fabricator, taking into account recommendations by the manufacturer of the consumables, can select the electrode or electrode/gas combination appropriate to the materials of construction and the conditions pertaining at the time.

If procedure qualification is called up in the relevant application code, it may be necessary for the chosen electrode to be qualified by procedure testing.

CONTENTS

STANDARDS ASSOCIATION OF AUSTRALIA

Australian Standard
for
WELDING—ELECTRODES—GAS METAL ARC

PART 1—FERRITIC STEEL ELECTRODES

SECTION 1. SCOPE AND GENERAL

1.1 SCOPE. This standard specifies requirements for the following solid electrodes for gas metal arc welding:

(a) Carbon steel electrodes.

(b) Low or intermediate alloy ferritic steel electrodes.

Additional information concerning electrodes is given in Appendix B.

1.2 REFERENCED DOCUMENTS. A list with titles of the documents referred to in this standard is given in the Annex.

1.3 DEFINITIONS. For the purpose of this standard, the definitions in AS Z5, Part 1, and the following apply:

1.3.1 Basket—a type of package consisting of a continuous length of electrode wound on a rigid open wire framework forming a cylinder, flanged at both ends.

1.3.2 Coil—a type of package consisting of a continuous length of electrode in coil form, with or without internal support.

1.3.3 Drum—a type of package consisting of a continuous length of electrode wound or coiled within an enclosed cylindrical container.

1.3.4 Lot or batch number—a number from which the manufacturer is able to identify the electrode composition and the date of manufacture.

1.3.5 Reel—a type of package consisting of a continuous length of electrode wound on a cylinder, flanged at both ends, with a flange diameter exceeding 450 mm.

1.3.6 Rim—a type of package consisting of a continuous length of electrode wound on a flanged liner of the type shown in Fig. 2.4.

1.3.7 Shall and should—the word 'shall' is to be understood as mandatory and the word 'should' as non-mandatory, advisory or recommended.

1.3.8 Spool—a type of package consisting of a continuous length of electrode wound on a cylinder, flanged at both ends, with a maximum diameter of 450 mm at the flanged ends.

1.4 CLASSIFICATION.

1.4.1 Basis of classification. Electrodes shall be classified on the basis of their chemical composition. Provision is made in the designation for specification of the type of external shielding gas and the mechanical properties of the deposited weld metal.

1.4.2 Description of the classification system. The classification system shall consist of three groups of elements separated by hyphens, each group comprising letters or letters and figures. The letters used in the system are given below in their group subdivisions and the figures used are given in Table 2.2. (See Clause 1.4.3 for examples of the use of the system.)

(a) *First group*—chemical composition of electrode:

ES = electrode, solid, followed by an alphanumeric code taken from Table 2.2 indicating chemical composition.

(b) *Second group*—type of external shielding:

G = gas shielding, followed by a letter as follows:

C = shielding with carbon dioxide
M = shielding with mixed gases
I = shielding with inert gas.

The gas used in the qualification tests shall be specified by trade name or by composition (percentage of constituents).

(c) *Third group*—mechanical properties of the weld metal:

W = weld metal. This is followed by a three-digit number indicating the weld metal properties. This number is extracted from Tables 2.3 and 2.4.

(i) *The first two digits*—being approximately 0.1 of the specified minimum tensile strength of the weld metal, in megapascals, as listed in Table 2.3.

(ii) *The third digit*—for carbon steel electrodes, indicates the impact energy grade number as listed in Table 2.4. For low alloy ferritic steel electrodes, the third digit is 9 and the minimum impact value shall be as stated in Table 2.4.

H = the gas metal arc welding process is hydrogen controlled, i.e. contains not more than 15 mL of diffusible hydrogen per 100 g of deposited weld metal. (See Appendix B.)

1.4.3 Use of classification system.

1.4.3.1 *Order of expression.* Where an electrode, shielding gas and the resultant weld metal classification are to be quoted in combination they should be set out in the order illustrated in Fig. 1.1 and separated by hyphens. In Fig. 1.1, the letter 'X' indicates a variable.