AS 1450—1983

Australian Standard®

STEEL TUBES FOR MECHANICAL PURPOSES

[Title allocated by Defence Cataloguing Authority: PIPE AND TUBE, METALLIC (Carbon and Carbon-manganese Steel, for Mechanical Purposes) ... NSC 4710]

This Australian standard was prepared by Committee MT/1, Iron and Steel. It was approved on behalf of the Council of the Standards Association of Australia on 10 March 1983 and published on 6 June 1983.

The following interests are represented on Committee MT/1:

Australasian Institute of Metals
Australian Foundry Institute
Bureau of Steel Manufacturers of Australia
Confederation of Australian Industry
Department of Defence
Department of Industry and Commerce
Institute of Steel Service Centres of Australia
Metal Trades Industry Association of Australia
Railways of Australia Committee
Society of Automotive Engineers— Australasia

This standard was issued in draft form for comment as DR 82104.

Australian Standard®

STEEL TUBES FOR MECHANICAL PURPOSES

First published (as AS G32) 1971
AS 1450 first published 1974
Second edition 1983

PUBLISHED BY STANDARDS AUSTRALIA
(STANDARDS ASSOCIATION OF AUSTRALIA)
1 THE CRESCENT, HOMEBUSH, NSW 2140
ISBN 0 7262 2995 4

PREFACE

This edition of this standard was prepared by a subcommittee of the Association's Committee on Iron and Steel to supersede AS 1450—1974. It applies to carbon steel and carbon-manganese steel tubes of round, square, rectangular or other non-circular cross-section made by various processes and intended for use in mechanical applications.

In this edition, alignment with AS 1163, Structural Steel Hollow Sections, has been effected as far as practicable, resulting in a modification to the designation system and properties. Grades have been rationalized, and the electric fusion welded (EFW) and hot-finished seamless (HFS) types have been deleted from the standard. The appendix detailing maximum size limits normally applicable to each process of manufacture has also been deleted, as manufacturers' product literature is regarded as the preferred reference to size, shape and grade.

An appendix has been added which presents purchasing guidelines, including contractual requirements previously covered in the body of AS 1450—1974, and which directs attention to matters requiring consideration at the time of enquiry and/or order. The intention of the appendix is to prevent misinterpretation or other problems and to ensure a clear understanding of product requirements by both purchaser and supplier.

CONTENTS

STANDARDS ASSOCIATION OF AUSTRALIA

Australian Standard
for
STEEL TUBES FOR MECHANICAL PURPOSES

1 SCOPE. This standard specifies the technical requirements for the production and supply of carbon and carbon-manganese steel tubes of round, square, rectangular or other non-circular cross-section produced by either cold-forming or hot-forming, and intended for use in mechanical applications.

NOTE: Guidelines to purchasers on requirements that must be specified by the purchaser and those that must be agreed at the time of enquiry and/or order are given in Appendix A.

2 REFERENCED DOCUMENTS. The following standards are referred to in this standard:

AS 1050	Methods for the Analysis of Iron and Steel
AS 1171	Methods for Magnetic Particle Testing of Ferromagnetic Products and Components
AS 1213	Iron and Steel — Methods of Sampling
AS 1391	Methods for Tensile Testing of Metals
AS 2084	Methods for Eddy Current Testing of Metal Bar and Tubular Products
AS K1	Methods for the Sampling and Analysis of Iron and Steel
ISO 2566/1	Steel — Conversion of Elongation Values Part 1 — Carbon and Low Alloy Steels

3 GRADE DESIGNATION. All tubes shall be designated in the following manner:

AS 1450/XY/Z

where

AS 1450 is the number of this standard

X is the steel condition as follows:
H — hot — formed or heat treated
C — cold — formed

Y is the specified minimum yield strength in megapascals, i.e. 200, 250, 350, 450 (see Table 2)

Z is the process reference symbol as follows:

CW — continuous welded

ERW — electric resistance welded

CEW — cold-drawn electric resistance welded

CFS — cold-finished (including cold-drawn) seamless

Examples of designation:

(a) AS 1450/ H200/ CW is a continuous welded hot-formed or heat-treated tube having a specified minimum yield strength of 200 MPa.

(b) AS 1450/H250/CFS is a cold-drawn seamless tube, heat-treated and having a specified minimum yield strength of 250 MPa.

4 DEFINITIONS. For the purpose of this standard, the following definitions apply:

4.1 Batch — a number of tubes of the same shape, size, wall thickness, grade designation and heat treatment.

4.2 Cold-formed (C) — made by a process involving shaping, sizing or cold working at ambient temperature, including electric resistance welded, cold-drawn electric resistance welded and cold-finished (including drawn) seamless.

4.3 Hot-formed or heat treated (H) — made by a process involving shaping, sizing, or hot working at temperatures above 600°C, or by heat treating cold-formed tube at temperatures above 600°C.

5 STEEL REQUIREMENTS.

5.1 Steelmaking Process. The steel shall be made by the open hearth, basic oxygen or an electric process.

NOTES:
1. A basic oxygen process means the process of making steel in a basic converter blown with commercially pure oxygen.
2. Additional refining by vacuum-arc-remelt (VAR), electro-slag-refining (ESR) or vacuum degassing is permitted.

5.2 Chemical Composition.

5.2.1 *General.* The method of sampling for chemical analysis shall be in accordance with AS 1213. Chemical composition shall be determined by any procedures which are not less accurate than AS 1050 or AS K1.

NOTE: A product analysis is not required by this standard and need be performed only where specified by the purchaser (see Paragraph A1 of Appendix A). Details of product analysis are given in Table 1.

5.2.2 *Cast analysis.* A chemical analysis of the steel from each ladle shall be made to determine the proportions of the specified elements. In cases where it is impractical to obtain samples from liquid steel, analysis on test samples taken in accordance with Clause 3.5 of AS 1213 may be reported as cast analysis.

The reported cast analysis of the steel shall conform to the limits given in Table 1 for the appropriate steel grade.

6 FREEDOM FROM DEFECTS. The tubes shall be free from segregation, lamination, surface flaws and other defects detrimental to their use for the applications defined in Clause 1.

The ends of each length shall have the burr held to a minimum.

Notwithstanding that tubes have been accepted previously if subsequent processing reveals that they contain defects found to be detrimental, the tubes shall be deemed not to comply with this standard, provided that they have not been improperly treated after delivery.