AS 2180—1986

Australian Standard®

Metal rainwater goods—Selection and installation

This Australian standard was prepared by Committee WS/20, Metal Rainwater Goods. It was approved on behalf of the Council of the Standards Association of Australia on 16 December 1985 and published on 3 February 1986.

The following interests are represented on Committee WS/20:

Department of Housing & Construction (Commonwealth)

Division of Building Research, CSIRO

Building Regulations Committee, Victoria

Department of Local Government, Western Australia

Aluminium Development Council

Australian Zinc Development Association

Bureau of Steel Manufacturers of Australia

Confederation of Australian Industry

Copper Development Association of Australia Limited

Master Builders Federation of Australia

Master Plumbers and Mechanical Contractors Association of N.S.W.

Metal Building Products Manufacturers Association

Metal Trades Industry Association of Australia

Sheet Metal Manufacturers Association of South Australia

The following also participated in the drafting of this standard:

Ralph Jones and Associates

Review of Australian Standards. *To keep abreast of progress in industry, Australian Standards are subject to periodic review and are kept up to date by the issue of amendments or new editions as necessary. It is important therefore that Standards users ensure that they are in possession of the latest edition, and any amendments thereto.*

Full details of all Australian Standards and related publications will be found in the Standards Australia Catalogue of Publications; this information is supplemented each month by the magazine 'The Australian Standard', which subscribing members receive, and which gives details of new publications, new editions and amendments, and of withdrawn Standards.

Suggestions for improvements to Australian Standards, addressed to the head office of Standards Australia, are welcomed. Notification of any inaccuracy or ambiguity found in an Australian Standard should be made without delay in order that the matter may be investigated and appropriate action taken.

This standard was issued in draft form for comment as DR 82156..

Australian Standard®

Metal rainwater goods—Selection and installation

First published 1978
Second Edition 1986

Incorporating:
Amdt 1—1986
Amdt 2—1990
Amdt 3—1994

PUBLISHED BY STANDARDS AUSTRALIA
(STANDARDS ASSOCIATION OF AUSTRALIA)
1 THE CRESCENT, HOMEBUSH, NSW 2140

ISBN 0 7262 4046 X

PREFACE

This edition of this standard was prepared by the Association's Committee on Metal Rainwater Goods to supersede AS 2180–1978, Code of Practice for the Selection and Installation of Metal Rainwater Goods.

Published concurrently with this standard is the second edition of AS 2179, Metal Rainwater Goods–Specification.

This standard differs from the previous edition as follows:

(a) It is now issued as a separate standard and is no longer bound together with AS 2179.

(b) Section 4, Design Factors for Internal Box Gutters, is now updated in the light of present experience.

(c) Section 5, Method for the Sizing of Gutters and Downpipes, is now updated and is no longer an appendix.

AS 2179 is superseded by AS/NZS 2179.1.

CONTENTS

Page

SECTION 1. SCOPE AND GENERAL REQUIREMENTS

1.1 Scope 4
1.2 Referenced Documents 4
1.3 General Considerations 4
1.4 Transport, Handling and Storage 4
1.5 Sizing of Gutters 4
1.6 Thermal Expansion 4
1.7 Avoidance of Contact Between Incompatible Materials 4
1.8 Drainage 5
1.9 Crevice Corrosion 6
1.10 Debris 6
1.11 Removal of Debris after Installation 6

SECTION 2. INSTALLATION

2.1 Eaves and Internal Box Gutters 7
2.2 Valley Gutters 7
2.4 Downpipes 7

SECTION 3. JOINTING METHODS

3.1 Soldered Joints 9
3.2 Jointing by Other Methods 9

SECTION 4. DESIGN FACTORS FOR INTERNAL BOX GUTTERS

4.1 Aluminium 11
4.2 Aluminium/Zinc–coated Steel 11
4.3 Copper 11
4.4 Zinc–coated Steel 11
4.5 Stainless Steel 12
4.6 Zinc 12

SECTION 5. METHOD FOR THE SIZING OF GUTTERS AND DOWNPIPES

5.1 General 14
5.2 Method for Sizing Eaves, Gutters and Downpipes 14
5.3 Method for Sizing Internal Box Gutters 15b
5.4 Selection of Valley Gutter Sizes 16

STANDARDS ASSOCIATION OF AUSTRALIA

Australian Standard
for
METAL RAINWATER GOODS—SELECTION AND INSTALLATION

SECTION 1. SCOPE AND GENERAL REQUIREMENTS

1.1 SCOPE. This standard sets out procedures for the selection and installation of metal rainwater goods complying with AS/NZS 2179.1. Where necessary, designers should take proper precaution to provide for hail and snowfall conditions.

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

AS 1834	Material for Soldering
AS/NZS 2179	Specifications for Rainwater Goods, Accessories and Fasteners
AS/NZS 2179.1	Part 1: Metal Shape and Sheet Rainwater Goods, and Metal Accessories and Fasteners
CSIRO	Division of Building Research, Technical Paper (Second Series) No 1 1973—Roof Drainage Reprint 1978 as amended
IE Aust	Australian Rainfall and Runoff: A Guide to Flood Estimation, Volumes 1 and 2. Revised edition, 1987

1.3 GENERAL CONSIDERATIONS. Factors to be considered in the design of roof drainage systems are the area to be drained, size and fall of gutters, downpipes and rainfall intensity.

1.4 TRANSPORT, HANDLING AND STORAGE. Metal rainwater goods shall be transported, handled and stored with care so that no damage occurs during these operations. The goods shall be stored on the site in sheltered positions, preferably near parts of the building to which they are to be installed.

1.5 SIZING OF GUTTERS. To ensure adequate drainage, gutters of adequate size, together with a sufficient number and size of downpipes and outlets, shall be provided.

A method for the sizing of gutters and downpipes is given in Section 3.

NOTE: The basis of the method is of only a general nature and designers should take into account any abnormal influence on the rainfall distribution in the locality of the building. Local factors, such as high winds and the likelihood of soil movement, may be overcome by provision of additional freeboard to the depth of the gutter.

1.6 THERMAL EXPANSION.

1.6.1 General. Where thermal expansion of metal rainwater goods would otherwise have a deleterious effect, adequate provision shall be made to accommodate such expansion.

Where thermal expansion of metal rainwater goods is to be restrained, due consideration shall be given to the forces that will be imposed on the installation by the restraint system.

NOTES:

1. Coefficients of thermal expansion are given in Table 1.1.
2. An appreciation of the amount of expansion that occurs in metal rainwater goods may be gained from the following example for steel which has the lowest coefficient of thermal expansion of the materials considered in this standard.

   Example. A 15 m metal sheet expands through approximately 12 mm for a temperature rise from 0°C to 65°C.
3. The temperature variation experienced by metal gutters will depend upon geographical location, extent of shading and absorptivity of surface. During summer in most Australian cities, the temperature of metal gutters with an absorption coefficient of 0.9 will often exceed 80°C, and the temperature of metal gutters with an absorption coefficient of 0.1 will often exceed 60°C.

TABLE 1.1
COEFFICIENTS OF THERMAL EXPANSION

Base metal	Coefficient of thermal expansion K^{-1}
Aluminium	24×10^{-6}
Copper	17×10^{-6}
Steel	12×10^{-6}
Stainless steel	17×10^{-6}
Zinc	26×10^{-6}

1.6.2 Expansion joints. Expansion joints shall be incorporated in gutter runs as follows:

(a) Gutter runs with fixed ends shall incorporate an expansion joint if the length of the run exceeds that which would cause a free expansion of greater than 20 mm.

(b) Gutter runs with a free end shall incorporate an expansion joint if the length of the run exceeds that which would cause a free expansion of greater than 40 mm.

NOTE: It is accepted that at least half of the free expansion will be restrained by the gutter fittings.

Where expansion joints are required, the adjacent gutter lengths may be fitted with stop ends and separated by a gap of 25 mm. The gap between the stop ends should be bridged by a suitable saddle flashing.

NOTE: A guide to the maximum lengths of gutters between expansion joints is given in Table 1.2 based on maximum temperature differentials expected for aged materials exposed at major population centres.

1.7 AVOIDANCE OF CONTACT BETWEEN INCOMPATIBLE MATERIALS. To avoid any misunderstanding between an academic treatment of incompatible materials and the information contained in Table 1.3, it should be pointed out that the classifications are based on the premise that the area of a metal rainwater product is relatively large in comparison with that of its accessory or fastener material.