

Australian Standard™

**Ductwork for air-handling systems in  
buildings**

This Australian Standard was prepared by Committee ME-062, Ventilation and Airconditioning. It was approved on behalf of the Council of Standards Australia on 1 March 2002.

This Standard was published on 5 April 2002.

---

The following are represented on Committee ME-062:

Air-conditioning and Refrigeration Equipment Manufacturers Association of Australia  
Australasian Fire Authorities Council  
Australian Building Codes Board  
Australian Chamber of Commerce and Industry  
Australian Industry Group  
Australian Institute of Building Surveyors  
Australian Institute of Refrigeration Air-conditioning and Heating  
Chartered Institution of Building Services Engineers  
Department of Contract and Management Services, W.A.  
FPA Australia  
Institute of Refrigeration Heating and Airconditioning Engineers of New Zealand  
Institution of Engineers Australia  
National Environmental Health Forum  
Plastics and Chemicals Industries Association  
Property Council of Australia  
Thermal Insulation Contractors Association of Australia

---

### **Keeping Standards up-to-date**

Standards are living documents which reflect progress in science, technology and systems. To maintain their currency, all Standards are periodically reviewed, and new editions are published. Between editions, amendments may be issued. Standards may also be withdrawn. It is important that readers assure themselves they are using a current Standard, which should include any amendments which may have been published since the Standard was purchased.

Detailed information about Standards can be found by visiting the Standards Web Shop at [www.standards.com.au](http://www.standards.com.au) and looking up the relevant Standard in the on-line catalogue.

Alternatively, the printed Catalogue provides information current at 1 January each year, and the monthly magazine, *The Global Standard*, has a full listing of revisions and amendments published each month.

Australian Standards™ and other products and services developed by Standards Australia are published and distributed under contract by SAI Global, which operates the Standards Web Shop.

We also welcome suggestions for improvement in our Standards, and especially encourage readers to notify us immediately of any apparent inaccuracies or ambiguities. Contact us via email at [mail@standards.org.au](mailto:mail@standards.org.au), or write to the Chief Executive, Standards Australia International Ltd, GPO Box 5420, Sydney, NSW 2001.

---

*This Standard was issued in draft form for comment as DR 00102.*

Australian Standard™

**Ductwork for air-handling systems in  
buildings**

Original as AS 4254—1995.  
Second edition 2002.  
Reissue incorporating Amendment No. 1 (September 2002).  
Reissue incorporating Amendment No. 2 (October 2004).

**COPYRIGHT**

© Standards Australia International

All rights are reserved. No part of this work may be reproduced or copied in any form or by any means, electronic or mechanical, including photocopying, without the written permission of the publisher.

Published by Standards Australia International Ltd GPO Box 5420, Sydney, NSW 2001, Australia

ISBN 0 7337 4416 8

## PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee ME-062, Mechanical Ventilation and Airconditioning.

*This Standard incorporates Amendment No. 1 (September 2002) and No. 2 (October 2004). The changes required by the Amendments are indicated in the text by a marginal bar and amendment number against the clause, note, table, figure or part thereof affected.*

In the preparation of this Standard, consideration was given to a number of publications and relevant Standards. This Standard follows a number of requirements set out in the Sheet Metal and Air Conditioning Contractors National Association's (SMACNA) HVAC Duct Construction Standards for metal and flexible ducts (2nd edition), but with the requirements adapted to the products of local Australian industries.

The objective of this Standard is to provide standardized requirements for the manufacture and installation of ducts and associated equipment for the use of designers, manufacturers and installers of air-handling systems for buildings.

The approach to using SMACNA as the basis for an Australian Standard was strongly influenced by—

- (a) the extensive long-term background of SMACNA, which led this document to be regarded as well developed; and
- (b) the use of SMACNA in Australia over a considerable period as the basis for duct construction.

Assistance gained from SMACNA is hereby acknowledged.

The main changes from the 1995 edition are summarized as follows:

- (i) Amendments Nos 1 and 2 are incorporated.
- (ii) Clause 1.8 has been changed from bare metal thickness to total coated thickness.
- (iii) Leakage testing has been clarified in Clause 2.2.5.
- (iv) Tables 2.4(c) and 2.4(d) have been expanded to include 1000 Pa.
- (v) Clause 2.7.2 on insulation for rigid ducts has been modified to provide for both internal and external insulation, to allow (a) and (b) tests to be combined and to require UL 181 tests are carried out on a 300 × 300 mm duct.
- (vi) New requirements for subfloor flexible subducts are added in Clause 2.8.5(g).
- (vii) New requirements for radius bends for flexible ducts are added in Clause 2.8.5(h).
- (viii) Typical connection details for ceiling diffusers, grilles, registers and diffuser plenums are added as Figures 3.4, 3.5 and 3.6.
- (ix) A pro forma flexible duct report summary has been included.

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.

Statements expressed in mandatory terms in notes to tables and figures are deemed to be requirements of this Standard.

## CONTENTS

	<i>Page</i>
SECTION 1 SCOPE AND GENERAL	
1.1 SCOPE .....	4
1.2 NEW DESIGNS AND INNOVATIONS .....	4
1.3 APPLICATION .....	4
1.4 REFERENCED DOCUMENTS .....	4
1.5 DEFINITIONS .....	5
1.6 GENERAL REQUIREMENTS .....	6
1.7 STATIC PRESSURE CLASSIFICATION .....	9
1.8 GALVANIZED STEEL THICKNESS .....	9
1.9 TESTING .....	10
SECTION 2 DUCT CONSTRUCTION AND INSTALLATION	
2.1 DUCT WORK .....	11
2.2 DUCT SEALING .....	12
2.3 RECTANGULAR DUCT REINFORCEMENT .....	15
2.4 ROUND DUCT CONSTRUCTION .....	48
2.5 OVAL DUCT CONSTRUCTION .....	57
2.6 HANGERS AND SUPPORT SYSTEMS .....	59
2.7 DUCT LINERS AND INSULATION .....	67
2.8 FLEXIBLE DUCTWORK .....	69
SECTION 3 EXTERNAL EQUIPMENT INSTALLATION	
3.1 GENERAL .....	75
3.2 ROOF PENETRATIONS .....	75
3.3 CONNECTION TO EQUIPMENT .....	75
3.4 SEALING OF EXTERNAL DUCTWORK .....	75
SECTION 4 FUNCTIONAL CRITERIA	
4.1 DEFLECTION .....	82
4.2 MODELS FOR FUNCTIONAL STANDARDS .....	82
APPENDICES	
A PROCEDURE FOR RATING DUCT CONSTRUCTION METHODS RELATIVE TO THE CONSTRUCTION TABLES .....	84
B 'J' AND 'I' REINFORCEMENTS RELATED TO 'EI' VALUES .....	86
C ALLOWABLE LOADS FOR TRAPEZE ANGLES .....	87
D WEIGHTS AND AREAS OF RECTANGULAR GALVANIZED STEEL DUCTS .....	89
E WEIGHTS AND AREAS OF CIRCULAR GALVANIZED STEEL DUCTS .....	90
F FLEXIBLE DUCT REPORT SUMMARY .....	91

## STANDARDS AUSTRALIA

**Australian Standard**  
**Ductwork for air-handling systems in buildings**

## SECTION 1 SCOPE AND GENERAL

**1.1 SCOPE**

This Standard specifies the performance, materials, construction and installation of ductwork for air-handling systems in buildings.

**1.2 NEW DESIGNS AND INNOVATIONS**

Any alternative materials, designs, methods of assembly, and procedures that do not comply with specific requirements of this Standard, or are not mentioned in it but give equivalent results to those specified, are not necessarily prohibited.

NOTE: For methods of assessing that alternative materials and construction methods comply with the requirements imposed by the functional criteria, see Appendix A.

**1.3 APPLICATION**

A1, A2

**1.3.1 General**

This Standard applies to ductwork for air-handling systems designed in accordance with the requirements of AS/NZS 1668.1 and AS 1668.2.

**1.3.2 'Not applicable'****1.4 REFERENCED DOCUMENTS**

The following documents are referenced in this Standard:

AS

1397	Steel sheet and strip—Hot-dipped zinc-coated or aluminium/zinc coated
1449	Wrought alloy steels—Stainless and heat-resisting steel plate, sheet and strip
1530	Methods for fire tests on building materials, components and structures
1530.1	Part 1: Combustibility test for materials
1530.2	Part 2: Test for flammability of materials
1530.3	Part 3: Simultaneous determination of ignitability, flame propagation, heat release and smoke release
1530.4	Part 4: Fire-resistance tests of elements of building construction
1622	Fire dampers
1682.1	Part 1: Specification
1682.2	Part 2: Installation
2338	Preferred dimensions of wrought metal products
3679	Structural steel
3679.1	Part 1: Hot-rolled bars and sections
4508	Thermal resistance of insulation for ductwork used in building airconditioning