AS 4254.1—2012

Australian Standard®

Ductwork for air-handling systems in buildings

Part 1: Flexible duct

This Australian Standard® was prepared by Committee ME-062, Ventilation and Air Conditioning. It was approved on behalf of the Council of Standards Australia on 18 May 2012. This Standard was published on 8 June 2012.

The following are represented on Committee ME-062:

- Air Conditioning and Mechanical Contractors Association
- Australasian Fire and Emergency Service Authorities Council
- Australian Building Codes Board
- Australian Institute of Refrigeration Air Conditioning and Heating
- Chartered Institution of Building Services Engineers
- Consumer Electronics Suppliers Association
- Department of Health and Human Services, Tas.
- Engineers Australia
- Facility Management Association of Australia
- NSW Health Department
- Plastics and Chemicals Industries Association
- Plumbing Industry Commission

This Standard was issued in draft form for comment as DR AS 4254.1.

Standards Australia wishes to acknowledge the participation of the expert individuals that contributed to the development of this Standard through their representation on the Committee and through the public comment period.

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Australian Standard®

Ductwork for air-handling systems in buildings

Part 1: Flexible duct

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PREFACE

This Standard was prepared by the Australian members of Joint Standards Australia/Standards New Zealand Committee ME-062, Ventilation and Air Conditioning, to supersede, in part, AS 4254—2002, *Ductwork for air-handling systems in buildings*, due to industry recognized inefficiencies with the installation and quality of flexible duct used in Australia.

After consultation with stakeholders in both countries, Standards Australia and Standards New Zealand decided to develop this Standard as an Australian Standard rather than an Australian/New Zealand Standard.

Independent studies in both Australia and the USA have estimated thermal energy losses in the vicinity of 20% to 40% in flexible duct systems due to ineffective air and vapour sealing, poor installation practices and insulation being thermally deficient for the application into which it is installed.

The current NCC requires different thermal ratings for insulation used on flexible duct, depending on the climate zone and the application it is installed into. This, in conjunction with the increased energy efficiency requirements for new constructions, along with rising costs of energy is driving the requirement for more efficient flexible duct systems.

This Standard is Part 1 of a series on ductwork for air-handling systems, as follows:

AS	
4254	Ductwork for air-handling systems in buildings
4254.1	Part 1: Flexible duct
4254.2	Part 2: Rigid ductwork

The main changes from the 2002 edition of AS 4254 are summarized as follows:

(a) Definition for ‘flexible duct system’ has been added.

(b) Flexible Duct Compliance Report Summary (FDCRS) has been modified and has become mandatory. Copies of original NATA test reports referenced in the FDCRS shall be provided upon request.

(c) Requirements for flexible duct in wet areas, such as bathrooms, toilets and laundries, have been modified.

(d) Requirements for applying duct tape to provide total air and vapour seal have been modified.

(e) Requirements for validity period for test results have been added.

(f) Mandatory requirements for labelling of flexible duct have been added.

(g) Requirements for installation have been modified.

(h) Requirements for hanger support and load distribution systems have been modified.

(i) Layout has been restructured.

The term ‘normative’ has been used in this Standard to define the application of the appendix to which it applies. A ‘normative’ appendix is an integral part of a Standard.

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STANDARDS AUSTRALIA

Australian Standard
Ductwork for air-handling systems in buildings

Part 1: Flexible duct

SECTION 1 SCOPE AND GENERAL

1.1 SCOPE

This Standard specifies requirements for materials, construction and installation, including some aspects of performance, for flexible duct for air-handling systems in buildings and facilities. It covers—

(a) dimensional stability (deformation and deflection) under positive or negative pressure applications and static loads;

(b) leakage under positive or negative pressure;

(c) support; and

(d) fire hazard requirements.

This Standard does not cover the following:

(i) Noise generation and transmission.

(ii) Exposure to damage from—

  (A) transportation and handling;

  (B) weather and temperature extremes;

  (C) flexure cycle;

  (D) chemical corrosion; and

  (E) other in-service conditions specific to the installation.

(iii) Impact loading, such as—

  (A) fire;

  (B) earthquake;

  (C) sudden stoppage of airflow; and

  (E) resistance to airflow.

1.2 OBJECTIVE

The objective of this Standard is to provide standardized requirements for the testing, manufacture and installation of flexible ducts and associated equipment. It is intended for use by specifiers, manufacturers, regulatory authorities and installers of air-handling systems for buildings.

1.3 NORMATIVE REFERENCES

The following normative documents are referred to in this Standard:

AS
1530 Methods for fire tests on building materials, components and structures
1530.4 Part 4: Fire-resistance test of elements of construction

AS/NZS
1530 Methods for fire tests on building materials, components and structures
1530.3 Part 3: Simultaneous determination of ignitability, flame propagation, heat release and smoke release

4859 Materials for the thermal insulation of buildings
4859.1 Part 1: General criteria and technical provisions

ABCB
NCC National Construction Code

UL 181 Factory made air ducts and air connectors

1.4 DEFINITIONS

For the purpose of this Standard, the definitions below apply.

1.4.1 Air terminal device

A device through which air is discharged, exhausted or introduced, including, but not limited to, the adaptor of a grille, diffuser, outlet, chilled beam or VAV box and to which flexible duct is attached.

1.4.2 Approved and approval

Approved by or the approval of the regulatory authority concerned.

1.4.3 Drawband

A banding system for providing mechanical fixing of a flexible duct to an air terminal device, such as—

(a) cable ties;

(b) worm drive hose clamps;

(c) metal or plastic packaging binders tensioned with a proprietary device; and

(d) other banding systems having the same durability and tensioning capacity.

1.4.4 Fire-isolated

Separated by fire-resistant construction.

1.4.5 Fire-resistance level (FRL)

The grading periods in minutes determined in accordance with AS 1530.4 for—

(a) structural adequacy;

(b) integrity; and

(c) insulation,

expressed in that order.

1.4.6 Flexible duct system

The final installed assembly, either an insulated flexible duct (Clause 1.4.7) or uninsulated flexible duct (see Clause 1.4.18).

1.4.7 Insulated flexible duct

Flexible duct insulated with thermal material and encapsulated in an airtight jacket/sleeve.

1.4.8 Insulation

The thermal material that provides an R value to a flexible duct core.

1.4.9 Jacket/Sleeve

An airtight, vapour-tight and UV-stabilized enclosure which encapsulates the insulating material around the flexible duct core and holds the complete composite insulated flexible duct system together.

1.4.10 May

Indicates—

(a) a course of action permissible within the limits of the Standard; or

(b) the existence of an option.

1.4.11 Regulatory authority

An authority having statutory powers to control design, enforce compliance, construction, installation, operation or testing of flexible duct/air-handling systems in buildings.

1.4.12 Required

Required by any government act, regulation, by-law or statutory rule, or by any regulatory authority.

NOTE: Fire insurance underwriters and other bodies may have requirements in excess of those required by regulatory authorities.

1.4.13 Sealant

See ‘sealing media’.

1.4.14 Sealing agent

See ‘sealing media’.

1.4.15 Sealing media

Mastics and adhesive tapes used to prevent air and vapour leakage.

1.4.16 Shall

Indicates that a statement is mandatory.

1.4.17 Should

Indicates a recommendation.

1.4.18 Uninsulated flexible duct

Flexible airtight duct core with no thermal material or R value.

1.5 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, would need to be assessed by the appropriate regulatory authority.

1.6 TESTING

If either insulated or uninsulated flexible duct is required to be subjected to fire and mechanical tests or thermal tests, all such testing shall be carried out by a registered NATA testing laboratory as defined in the National Construction Code. Samples submitted for prototype testing shall be identical to manufactured product supplied to market under the fire, mechanical and thermal test certificates. In order for supplied manufactured product to be identified and compared with supplied test certificates, the certificates shall include the following minimum product data:

(a) Manufacturer's name and product's recognized trade name.

(b) Information required by the 'Flexible Duct Compliance Report Summary' (see Clause 2.9 and Appendix A).

Testing authorities shall keep records of adhesive type, coat weight and all flame retardants used in the adhesives for all facings and lining materials of a composite nature that are bonded together with fire-retardant adhesives during inner core and/or sleeve manufacture.

A product shall comply with all the requirements of this Standard before compliance can be claimed.

SECTION 2 CONSTRUCTION AND INSTALLATION

2.1 FLEXIBLE DUCT

2.1.1 General

The construction and installation of flexible duct shall comply with this Section.

2.1.2 Wet area exhaust flexible duct

Mechanical exhaust ventilation flexible duct serving bathrooms, toilets, shower areas or service areas dedicated purely for hydraulic and wet area ventilation services, and is located within those areas, is not required to comply with the requirements of Clauses 2.3.1(a) and 2.4.

2.2 FLEXIBLE DUCT SEALING

2.2.1 General

The sealing requirements in this Standard do not contain provisions for—

(a) resistance to chemical attack;

(b) dielectric isolation;

(c) containment of atomic radiation or service in other safety-related construction;

(d) electrical grounding;

(e) maintaining leakage integrity at pressures in excess of the duct classification herein;

(f) being buried underground below the water table;

(g) submersion in liquid;

(h) withstanding continuous vibration visible to the naked eye; and

(i) creating closure in portions of the building structure used as ducts (e.g. ceiling plenums, shafts and pressurized compartments).

2.2.2 Sealing media

The following applies to sealing media used to seal flexible duct:

(a) Sealing media shall be non-toxic under service conditions.

(b) All sealing media shall be resistant to oil and water, after curing.

NOTE: Where special considerations are required, as in the pharmaceutical industry, the specifier may need to specify the type of sealing media to be used.

2.2.3 Air sealing

The following applies to air sealing of flexible duct:

(a) *Mastics*—When used on flexible duct, mastics shall provide a primary air seal between the flex duct core and the air terminal device.

(b) *Adhesive tapes*—When used on flexible duct, adhesive tapes shall provide a primary air seal between the flex duct core and the air terminal device. When applied as shown in Figure 2.5.1(B), adhesive tapes shall provide a permanent air seal when adhering a flexible duct's inner core to an air terminal device.

Where mastics and adhesive tapes are used in combination, mastics shall be compatible with the adhesive tapes to ensure their bond strength is not decreased.

Adhesive tapes shall not be used on their own as a substitute for mechanical fixing.

2.2.4 Vapour sealing by adhesive tapes

When adhesive tapes are used for vapour sealing, as shown in Figure 2.5.1(C), they shall provide a permanent vapour seal when adhered to a flexible duct's outer jacket/sleeve.

2.2.5 Mechanical fixing

A drawband/banding system shall be applied over the top of the air sealing media to provide a permanent primary mechanical fix and a secondary air seal as shown in Figure 2.5.1(B)(d).

NOTE: An additional drawband may be applied over the top of the vapour seal to provide additional mechanical fixing as shown in Figure 2.5.1(A)(f).

2.2.6 Surface preparation

Surfaces to receive tapes and/or sealants/mastics shall be adequately cleaned and shall be free from all contaminants including oil, dust, dirt, rust, moisture and other surface contaminants that could inhibit bonding.

2.2.7 Leakage

An insulated flexible duct's outer jacket/sleeve shall be airtight.

When flexible duct is installed uninsulated, it shall be airtight.

2.3 CONSTRUCTION

2.3.1 General

Flexible duct shall be constructed in accordance with either of the following methods:

(a) *Metal*—Metal flexible duct shall comprise either—

  (i) corrugated duct, helically wound with lockseam capable of being bent or set by hand without spring-back and without deforming the circular section; or

  (ii) single or multiple layers of strip formed into corrugations and in helical or annular form, without an obvious seam or joint. Strip thickness shall be not less than 0.127 mm.

(b) *Reinforced fabric*—Reinforced fabric flexible duct shall comprise tough, flexible, puncture- and tear-resistant material liner and airtight outer jacket/sleeve incorporating a reinforcing former to retain circular section and permit flexibility without minimal spring-back when formed to the required shape.

Where a flexible duct carries air that contains free moisture, only corrosion-resistant duct materials shall be exposed to this air.

2.4 TEST CRITERIA

2.4.1 General

All insulated and uninsulated flexible duct shall be tested in accordance with UL 181 and AS/NZS 1530.3 for the mechanical and fire performance requirements of Clauses 2.4.2 and 2.4.3. All tests shall be carried out on 300 mm internal diameter flexible duct. All tests shall be carried out on the flexible duct system, i.e. the insulated or uninsulated assembled final product, as opposed to individual layers. Samples submitted for testing shall be identical to manufactured product supplied to market under the fire, mechanical and thermal test certificates.

2.4.2 Mechanical performance

All insulated and uninsulated flexible duct shall be tested in accordance with UL 181 for the following mechanical properties:

(a) *Mould growth and humidity*.

(b) *Temperature*—The low temperature test shall be carried out at −10°C and the high temperature test at 78°C for both interior and exterior surfaces. High temperature tests shall be carried out for a minimum period of seven days.

(c) *Puncture*.

(d) *Static load.*

(e) *Impact*—The impact test does not apply to metal duct as defined in Clause 2.3.

(f) *Pressure*—The pressure test shall be carried out at 1000 Pa.

(g) *Collapse*—The collapse test shall be carried out at 200 Pa.

(h) *Tension*.

Where an uninsulated flexible duct (flexible duct core) passes the pressure, collapse, impact and tension tests, it need not be retested as an insulated flexible duct for these tests only, provided an identical flexible duct core construction is used.

2.4.3 Fire performance

The tests for fire performance are applicable to flexible duct only, not joining materials.

All insulated and uninsulated flexible duct shall be tested for fire performance as follows:

(a) The flexible duct system, tested in accordance with AS/NZS 1530.3, shall have a smoke developed index not greater than '3' and spread of flame index not greater than '0'.

(b) The flexible duct system shall pass the UL 181 burning test. The UL 181 burning test shall be carried out with the following qualifications:

  (i) Gas shall be propane with a fuel content of approximately 93 MJ/m^3.

  (ii) The Bunsen burner shall have a 9.5 ±0.1 mm inside diameter.

  (iii) Fuel/Air mixture shall be such that a half blue/half yellow flame is produced.

  (iv) The flame height shall be approximately 63 mm and half of the flame shall impinge on the duct.

  (v) The sample shall be fully extended, uncompressed and conditioned for 24 h at 20 ±2°C and 65 ±5% RH.

  (vi) Ambient conditions in the laboratory shall be between 10°C and 30°C, and 15% and 80% RH.

2.5 INSTALLATION

2.5.1 General

In buildings of Classes 4 to 9 inclusive, as defined in the National Construction Code, flexible duct shall only be used for final run-out to air terminal device and be a single length of 6 m maximum. No intermediate joins are permitted.

In buildings of Classes 1 to 3 inclusive, and buildings of Class 10, as defined in the National Construction Code, flexible duct shall be installed using not more than two lengths of up to 6 m each of any one duct diameter in a given duct run between air terminal devices. All in-line connections of two flexible ducts the same diameter shall use a joiner. Refer to Clause 2.5.2(d).

NOTE: To minimize pressure loss within the system in buildings of Classes 1 to 3 inclusive, and buildings of Class 10, an alternative to using not more than two lengths of up to 6 m each of any one duct diameter in a given duct run between air terminal devices is to oversize the flexible duct by one diameter larger than the specified diameter in a given duct run.

2.5.2 Connections

Connections in flexible ductwork shall comply with the following:

(a) The flexible duct shall be cut to length to comply with Clause 2.5.3(j) when less than a full length is required. Where insulated, the flexible duct's jacket/sleeve and insulation shall be folded back to expose at least 100 mm of flexible duct core as shown in Figure 2.5.1(A)(d).

(b) Collars on air terminal devices used to connect to flexible duct shall be a minimum of 70 mm in length with a raised bead or kliplock/flexible duct retention system, located a minimum of 10 mm behind the leading edge to be connected to flexible duct as shown in Figure 2.5.1(A)(a).

(c) Where starting collars are attached to rigid duct, the connection shall be sealed with sealing media to prevent air leakage.

(d) Duct joiners used for connecting two sections of flexible duct shall be a minimum of 140 mm in length with a raised bead or kliplock/flexible duct retention system, located a minimum of 10 mm behind each leading edge to be connected to flexible duct.

(e) Collars on air terminal devices and duct joiners shall be inserted a minimum of 40 mm into flexible duct before air sealing and mechanical fixing as shown in Figures 2.5.1(A)(e) and 2.5.2(B).

(f) Air sealing:

  (i) Where duct tape is used as a sealing media, it shall be a minimum 0.15 mm thick and 48 mm wide. The flexible duct core shall be adhered to a collar on an air terminal device by duct tape with a minimum of three overlapping, tensioned, crease-free wraps. Each layer of duct tape shall overlap the previous layer by 40% to 60% of the tape width.

  (ii) Where duct tape is used, it shall provide a total air seal between the duct core and the collar on an air terminal device or between each end of the duct core connecting to each end of a duct joiner. See Figure 2.5.1(B)(a), (b), (c).

(g) Mechanical fixing:

  (i) *Circular collars*—Circular flexible duct core shall be fastened permanently to circular collars on air terminal devices by means of a drawband/banding system located over the top of the air seal, behind the collar or duct joiner's bead or kliplock retention system. Examples: Figures 2.5.1(B)(d) and 2.5.1(A)(e).

  (ii) *Oval collars*—Oval flexible duct core shall be fastened permanently to oval collars on air terminal devices with corrosion-resistant self-tapping screws and 25 mm diameter washers at maximum of 75 mm centres located behind the collar or duct joiner's bead or kliplock/flexible duct retention system. To provide an air seal, adhesive tape shall be applied over the top of mechanical fixing on oval collars.

(h) *Vapour sealing*—The flexible duct's insulation and outer jacket/sleeve shall be pulled over the completed air seal and mechanical fixing and then a minimum of three overlapping, tensioned wraps of duct tape shall be applied to provide a total vapour seal. Each layer of duct tape shall overlap the previous layer by 40% to 60% of the tape width. See Figure 2.5.1(C).

(i) *Insulation continuity*—Insulation of flexible duct shall be installed to abut adjoining external insulation or metal facing of rigid duct with internal insulation.

2.5.3 Hangers, support and load distribution systems

Flexible ducts shall be supported as follows:

(a) At manufacturer's recommended intervals but at no greater distance than 1.5 m (see Figure 2.5.2(A)).

(b) The maximum permissible sag between supports shall be 40 mm/m of support spacing (see Figure 2.5.2(A)).

(c) Flexible duct shall extend straight for a minimum of 100 mm from a connection to an air terminal device before any change of direction, as shown in Figure 2.5.2(B)(a).

(d) Hanger or saddle material in contact with the flexible duct shall be a minimum width of 25 mm. A semi-rigid, fire-resistant, load-distributing support material shall be a minimum width of 75 mm, shall be in contact with the flexible duct for at least a quarter of its circumference, and shall be placed between the flexible duct and hanger/saddle material to spread the flexible duct weight. The load distribution support system shall prevent or minimize the following (see Figure 2.5.2(C)):

  (i) Chaffing between flexible duct and support/hanger.

  (ii) Flexible duct sagging.

  (iii) Flexible duct shape distortion.

  (iv) The compression of insulation to the point where thermal bridging could occur.

  (v) Any sharp edges shall be trimmed to prevent flexible duct puncture.

(e) Hangers shall be adequately attached to the building structure.

(f) Air terminal devices and branch take-offs connected to flexible duct shall be supported independently of the flexible duct.

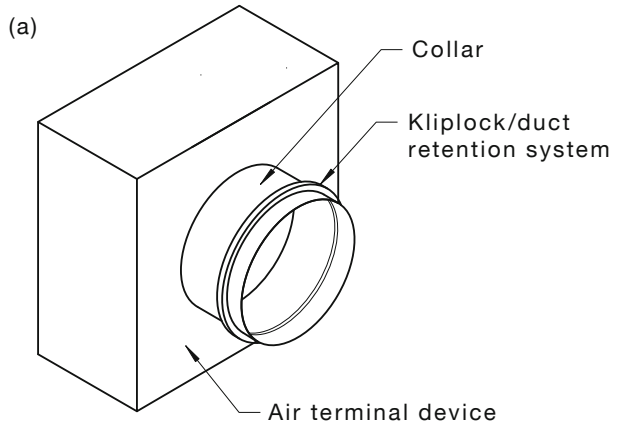
(g) Flexible duct installed in subfloor situations shall be supported such that no part of the flexible duct shall be in contact with the ground.

(h) Where flexible ducts are required to penetrate non-fire-rated walls or partitions, penetration sleeves with the same internal diameter of the outside diameter of an insulated duct's outer sleeve or outside diameter of an uninsulated duct's inner core shall be permanently fixed and sealed in the wall or partition. Penetration sleeves shall be 0.6 mm thick galvanized sheet metal, and have flexible duct running uninhibited and uncompressed inside the penetration sleeve throughout the length of the penetration.

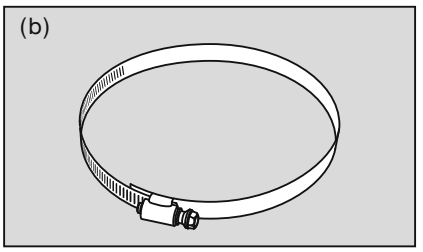
(i) Flexible ducts shall be installed with a bend radius to duct diameter ratio of 1 to 1, as a minimum, as shown in Figure 2.5.2(D).

(j) Flexible duct shall be fully extended when installed. All excess flexible duct or flexible duct left in a compressed state shall be removed from the system so as not to affect designed airflows and/or pressures. Excess flexible duct shall not be installed such as to allow for possible future relocation of air terminal devices.

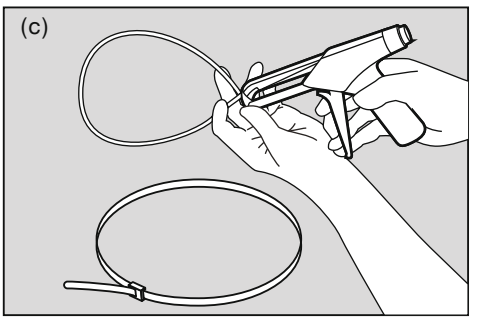
  NOTE: Examples of above are shown in Figure 2.5.2(E).



NOTE: Kliplock/duct retention system as described in 2.5.2(b) is in essence a raised area on the collar that provides a fastening point for the drawband to pull up against so the duct can't slip off the end of the collar.



Metal duct clamp



Nonmetallic mechanical fastener

Diagrams (b) and (c) are two versions of drawband/banding systems for mechanical fixing of flexible duct to collars as described in Clause 2.5.2(g)(i).

FIGURE 2.5.1(A) (in part) DRAWBAND/BANDING SYSTEMS

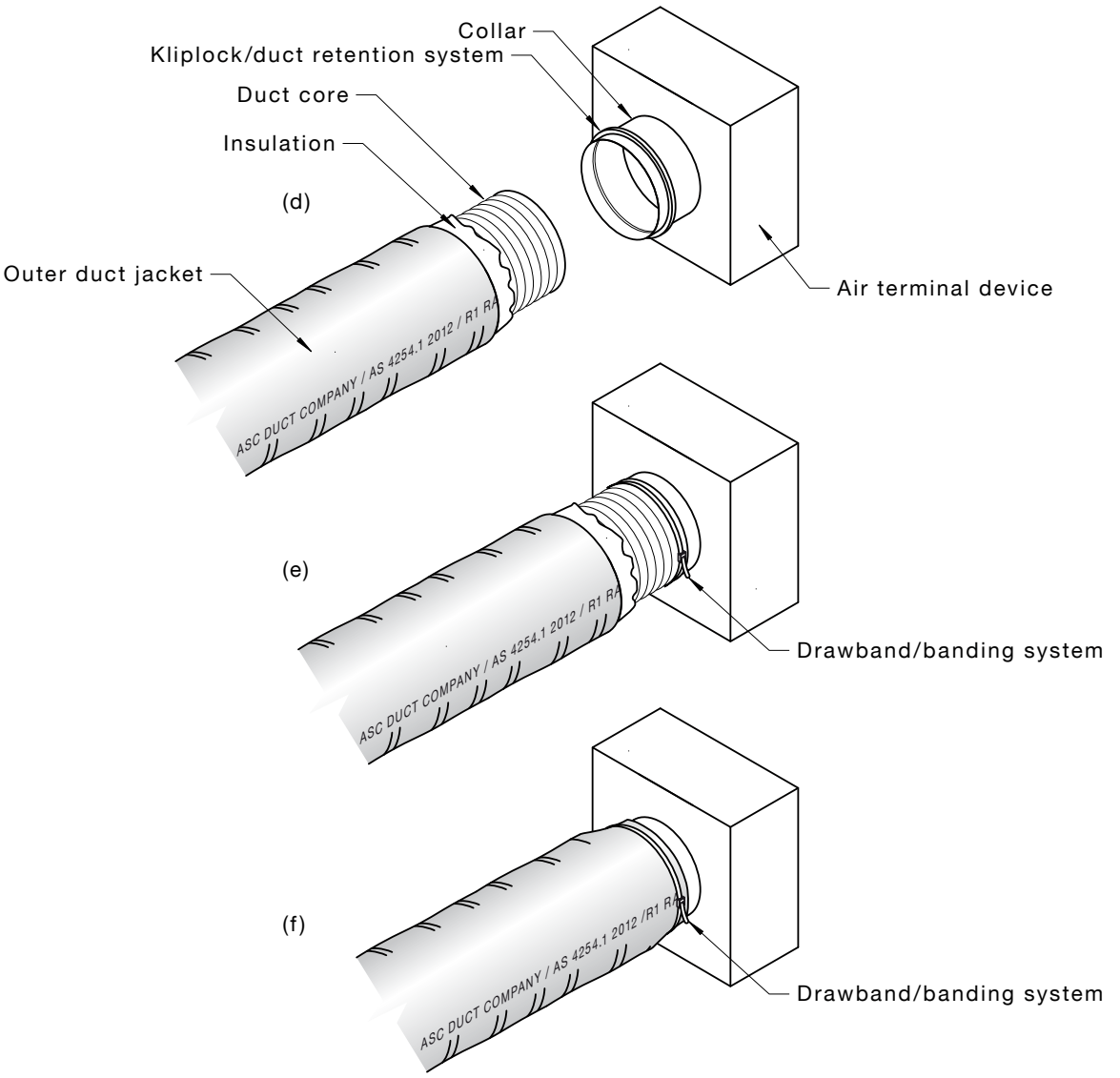
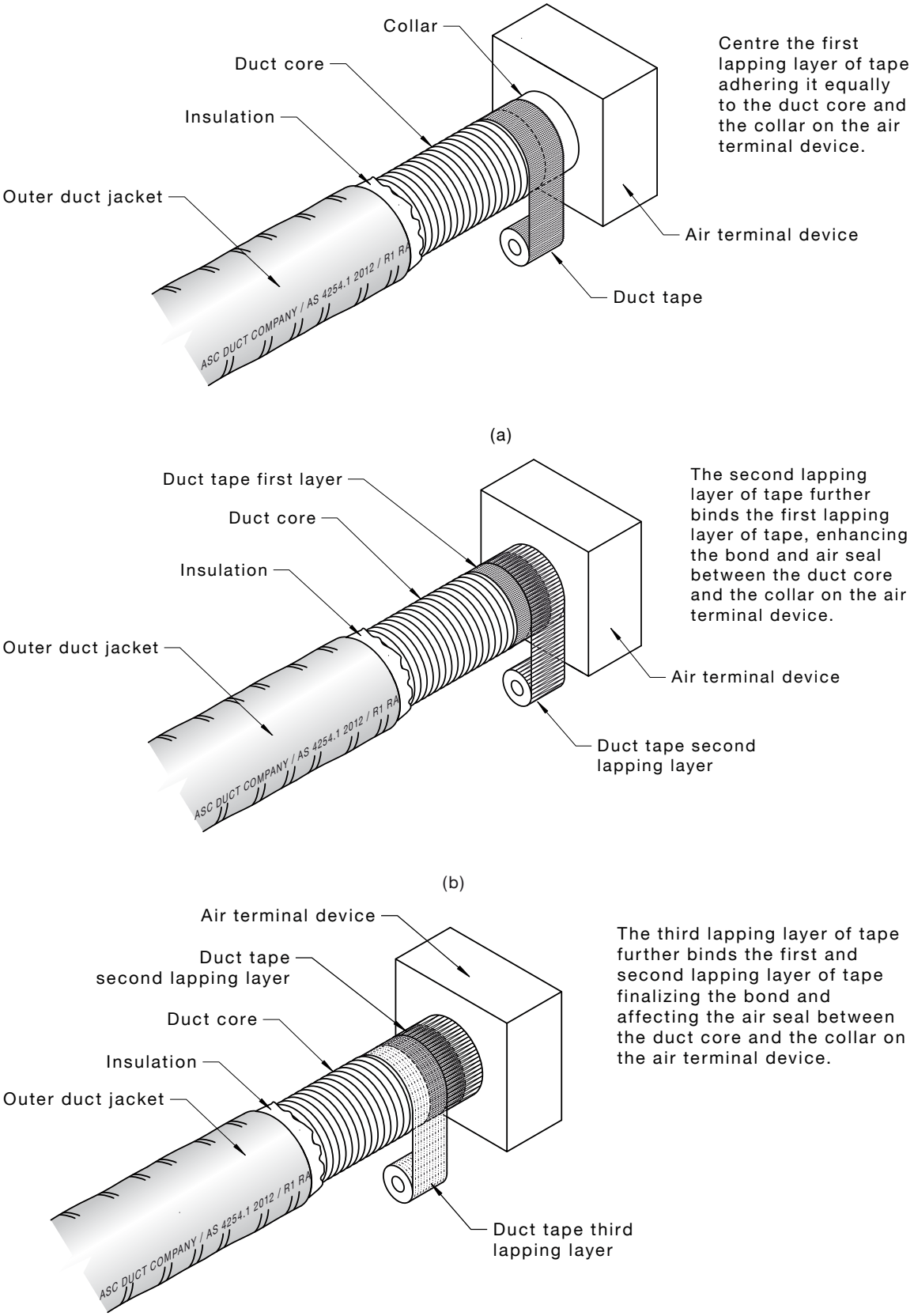
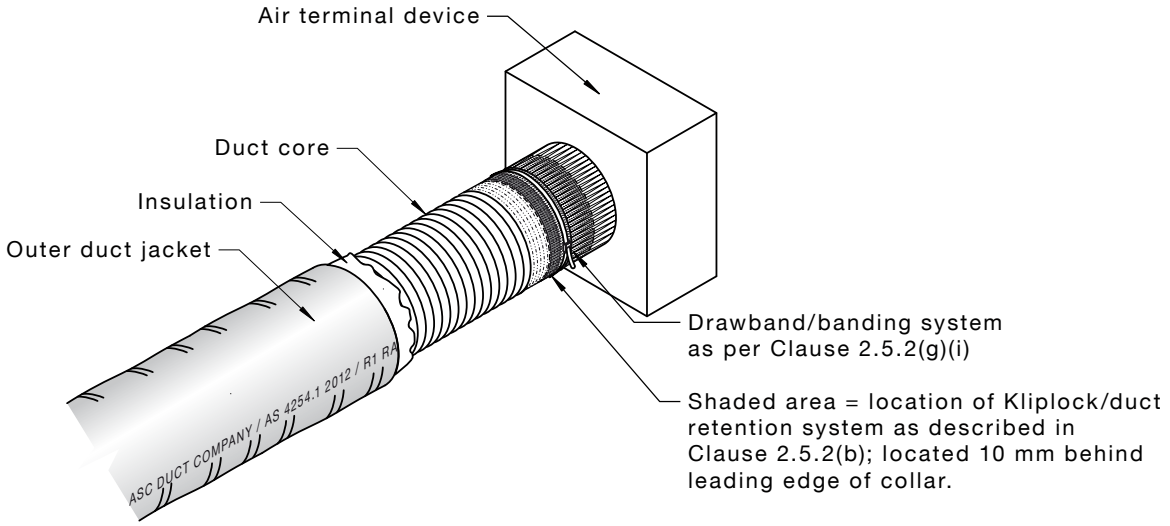


FIGURE 2.5.1(A) (in part) DRAWBAND/BANDING SYSTEMS



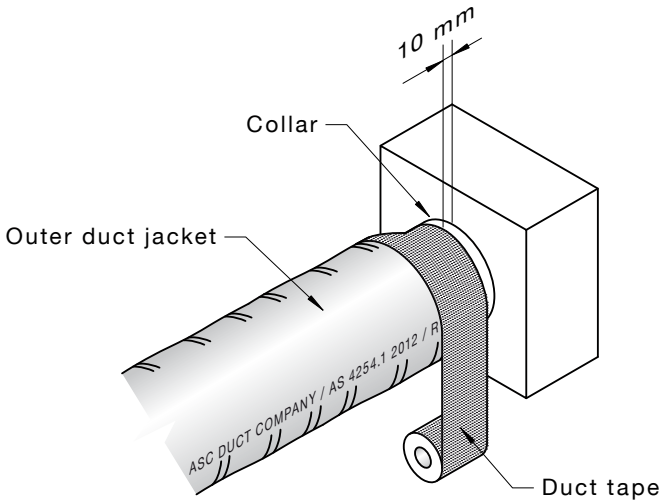
NOTE: At least three lapping layers of tape are required to affect a total air seal on a connection between a duct core and the collar on an air terminal device. Additional layers should be applied.

FIGURE 2.5.1(B) (in part) AIR SEALING DUCT CORE TO AN AIR TERMINAL DEVICE



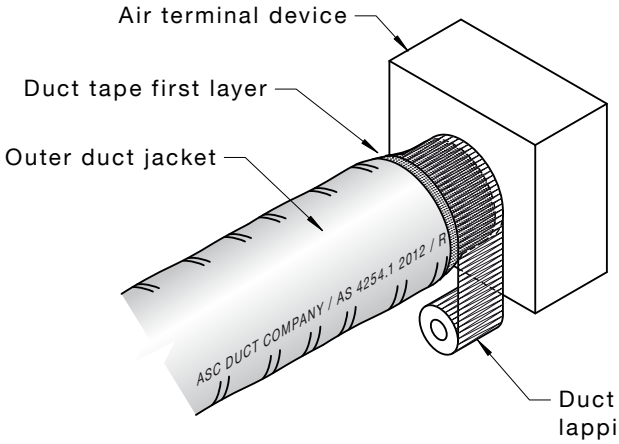
(d)

FIGURE 2.5.1(B) (in part) AIR SEALING DUCT CORE TO AN AIR TERMINAL DEVICE



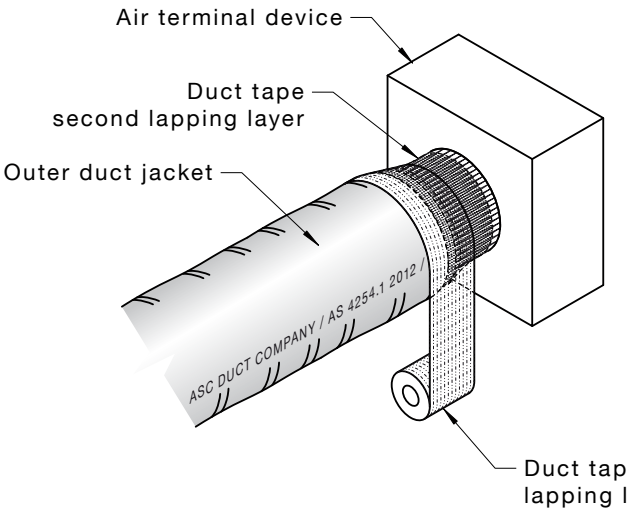
Apply the first lapping layer of tape on the outer duct jacket/sleeve 10 mm in from the body of the air terminal device.

(a)



Apply the second lapping layer of tape so that it further binds on the first lapping layer of tape whilst simultaneously abutting the body of the air terminal device, enhancing the first lapping layer's bond and providing further vapour seal to the outer duct jacket/sleeve.

(b)



The third lapping layer of tape further binds the first and second lapping layers of tape, finalizing the bond and affecting the total vapour seal between the outer duct jacket/sleeve and the air terminal device.

NOTE: At least three lapping layers of tape are required to affect a total vapour seal between the outer duct jacket sleeve and the body of an air terminal device. Additional layers should be applied.

(c)

FIGURE 2.5.1(C) VAPOUR SEALING OUTER DUCT JACKET/SLEEVE TO AN AIR TERMINAL DEVICE

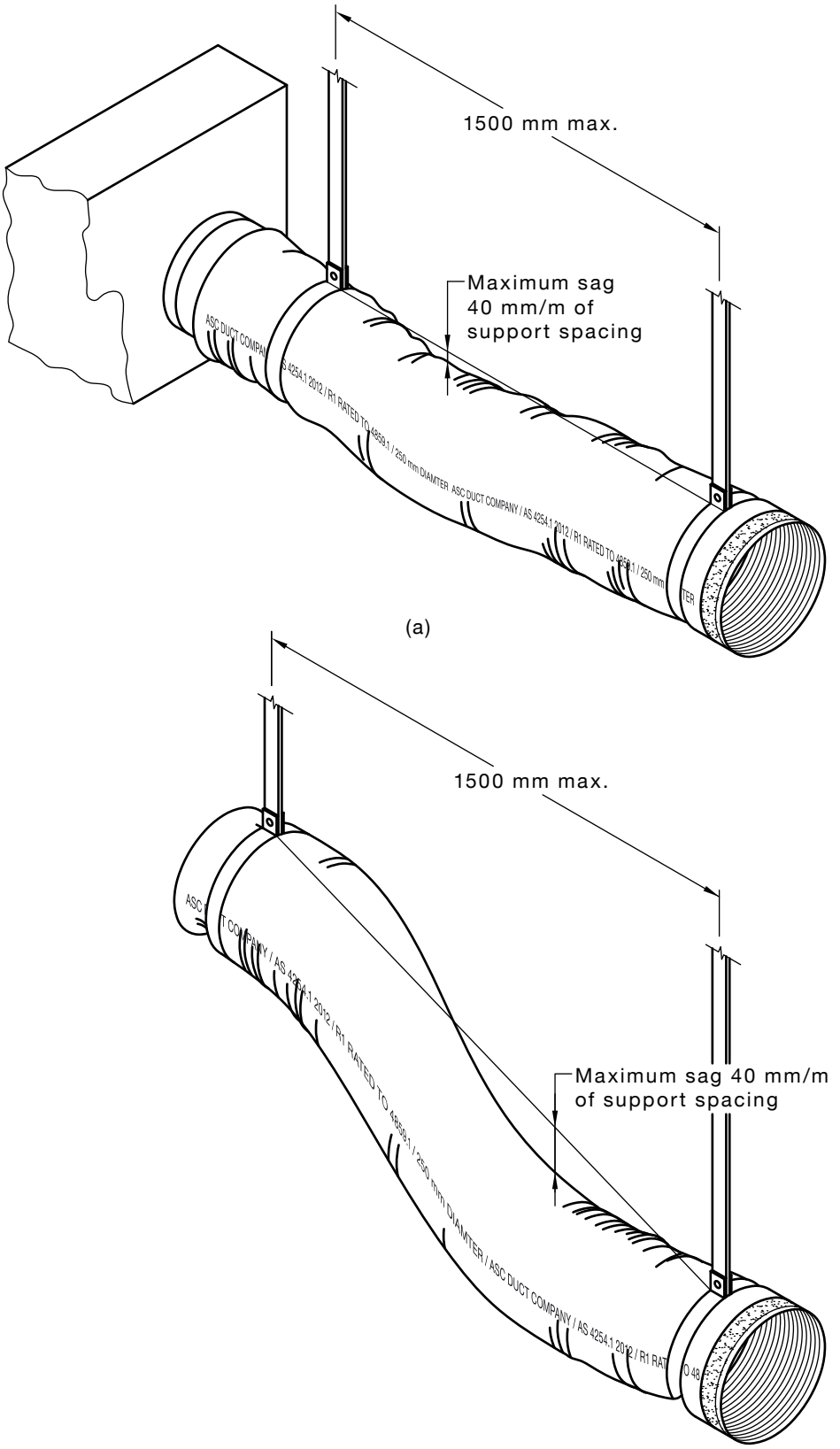
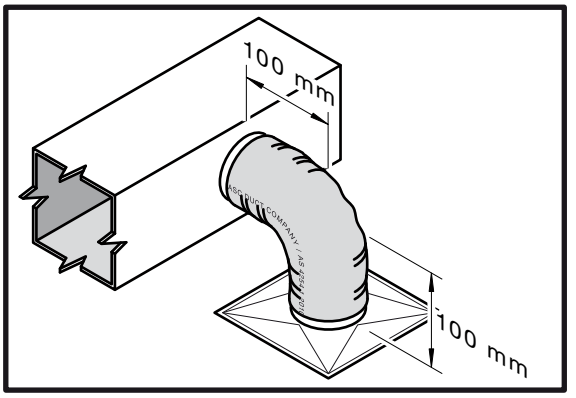
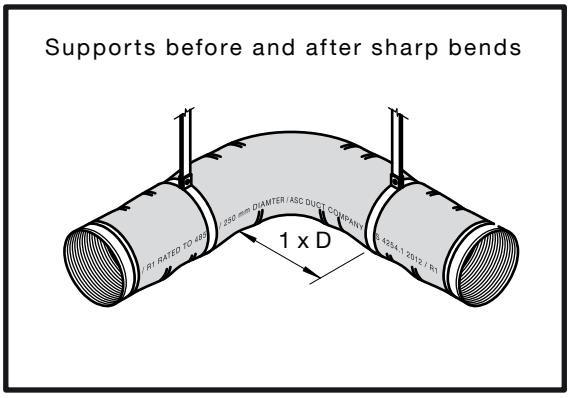


FIGURE 2.5.2(A) FLEXIBLE DUCT INSTALLATION—HANGING

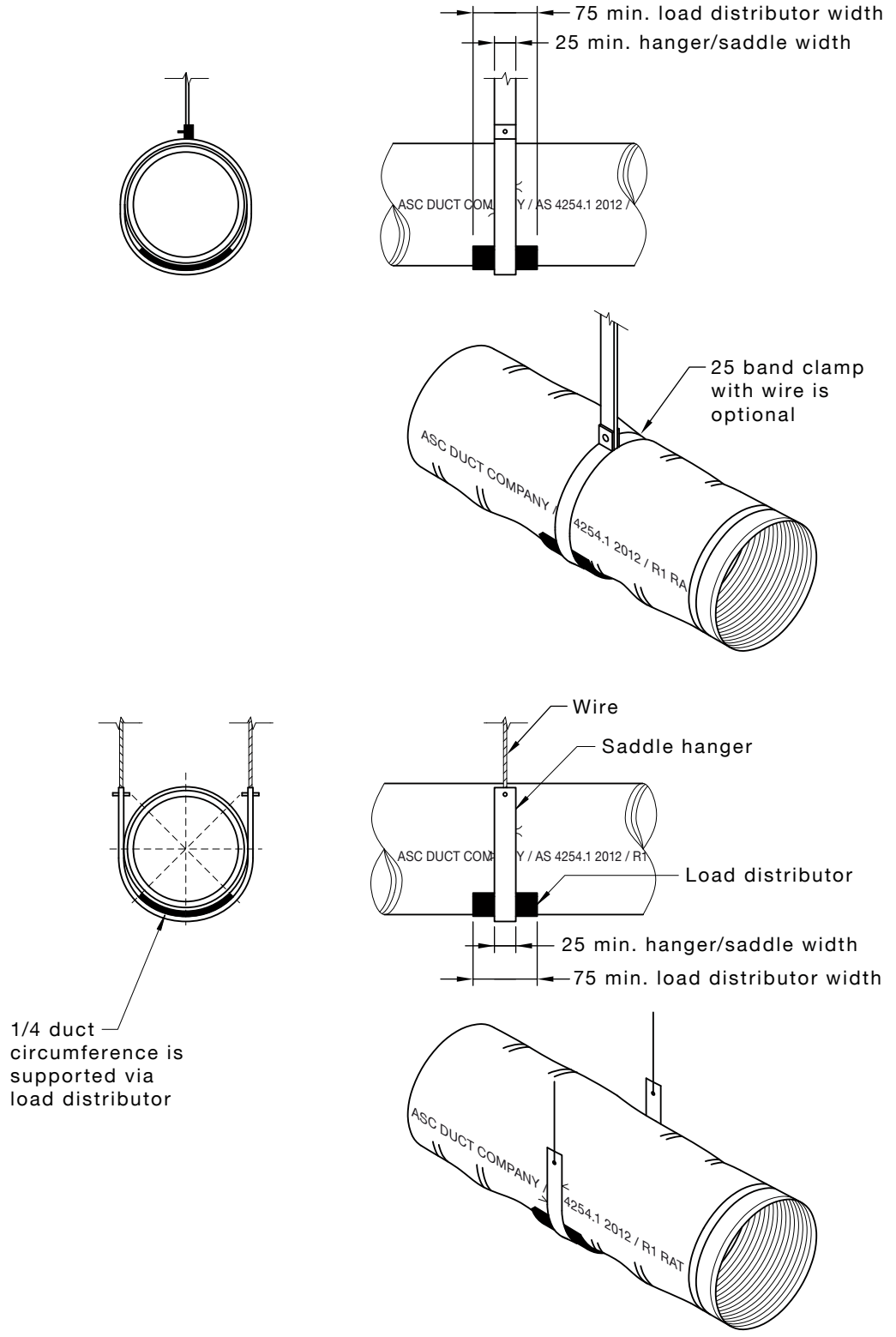


(a)



(b)

FIGURE 2.5.2(B) FLEXIBLE DUCT INSTALLATION



DIMENSIONS IN MILLIMETRES

FIGURE 2.5.2(C) HANGING SADDLE AND LOAD DISTRIBUTION SUPPORT SYSTEMS

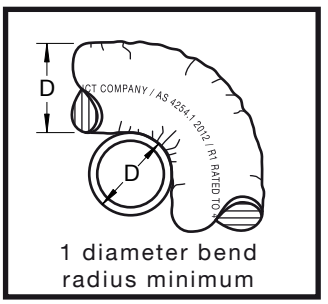
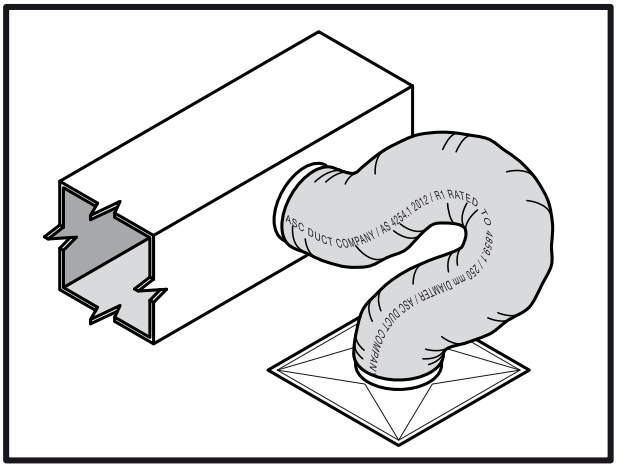


FIGURE 2.5.2(D) FLEXIBLE DUCT INSTALLATION—RADIUS BENDS

(a)



(b)

FIGURE 2.5.2(E) FLEXIBLE DUCT INSTALLATION—EXAMPLES OF NONCONFORMANCE

2.6 THERMAL INSULATION USED ON FLEXIBLE DUCT

The insulation of flexible duct shall be achieved by integrating the insulation material into the construction of the flexible duct (i.e. the flexible duct system).

To determine the flexible duct's R value, only the insulation material shall be thermally tested as low density fibrous insulation as per AS/NZS 4859.1:2002, Clause 2.3.2(c) and Table 2.1 (as amended by Amd. 1 (2006)). The insulation material shall not be tested as a formed shape as described in AS/NZS 4859.1:2002, Clause 2.3.2(a).

2.7 LABELLING OF FLEXIBLE DUCT

Labelling of the outer jacket/sleeve of all insulated flexible duct shall comply with the following:

(a) Labelling shall—

(i) be repeated along with the total length of the duct at 1000 mm intervals;

(ii) be legible for the flexible duct's service life; and

(iii) have characters at least 10 mm high.

NOTE: Spiral labelling of the outer jacket/sleeve is permitted as long as it complies with Clause 2.7.

(b) The label on the outer jacket/sleeve of all insulated flexible ductwork shall include the following information:

(i) Name of manufacturer.

(ii) Compliance with AS 4254.1.

(iii) The R value of the flexible duct.

NOTE: For an example of labelling requirements, see Figure 2.7.

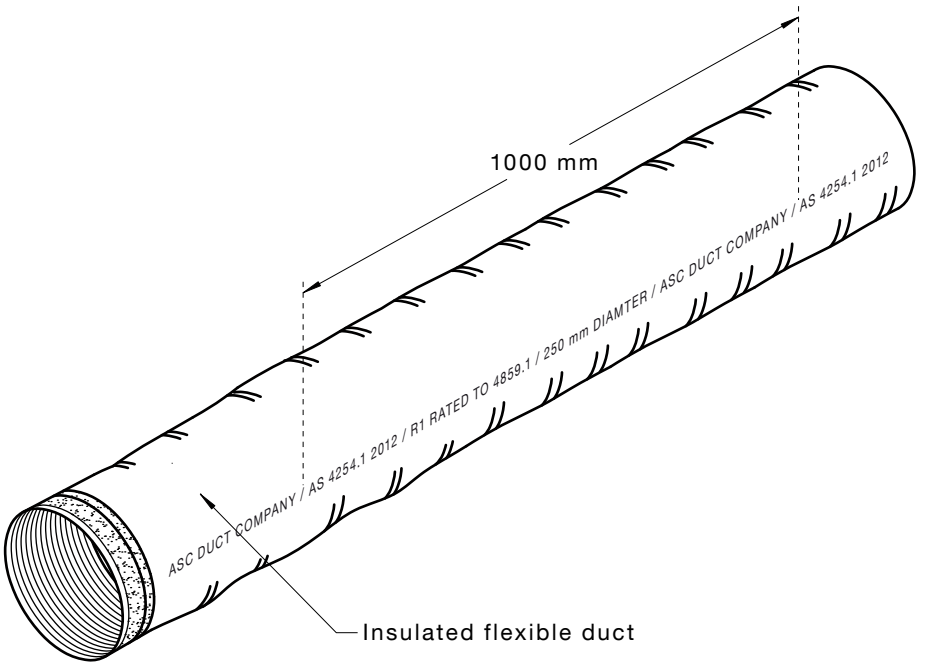


FIGURE 2.7 FLEXIBLE DUCT LABELLING

2.8 VALIDITY PERIOD FOR TEST RESULTS

For insulated and uninsulated flexible duct tested to this Standard, flexible duct that has no change in raw material and/or component supplier and/or formulation and/or design, the test results shall be valid for a maximum period of ten years from the date of NATA certified laboratory test.

Any changes made by the flexible duct manufacturer to raw material and/or component supplier and/or formulation and/or design shall invalidate the test results, and retesting shall be required.

2.9 FLEXIBLE DUCT COMPLIANCE REPORT SUMMARY

All manufacturers and suppliers of flexible duct shall supply the Flexible Duct Compliance Report Summary to substantiate compliance with this Standard upon request. The Flexible Duct Compliance Report Summary shall comply with Appendix A.

A separate Flexible Duct Compliance Report Summary shall be used for each different branded product line, but not for each different thermally-rated product that utilizes the same type of insulation material within each product line.

APPENDIX A

FLEXIBLE DUCT COMPLIANCE REPORT SUMMARY

(Normative)

This report certifies that the below product complies with AS 4254.1 and that the certificates for tests listed below have been issued within the last ten years.

FLEXIBLE DUCT COMPLIANCE REPORT SUMMARY—AS 4254.1

The tested flexible duct recognized trade name is: .....

Company: .....

Name: .....

Address: .....

Phone: .....Fax: .....

Email: .....

Company ACN (ABN): .....

Test	Test description	Registered testing authority	Pass/Fail	Report no.	Report date
AS/NZS 1530.3	Radiant heat panel				
UL 181	0°, 45°, 90° burn				
UL 181	Mould and humidity				
UL 181	Low temperature				
UL 181	High temperature				
UL 181	Puncture				
UL 181	Static load				
UL 181	Impact				
UL 181	Pressure				
UL 181	Collapse				
UL 181	Tension				

FLEXIBLE DUCT MANUFACTURER'S/SUPPLIER'S DECLARATION

I (full name).....

of (company).....

in my position of .....

declare that the information contained in this Flexible Duct Report Summary is true and correct. This information can be substantiated in full, upon request, by supplying copies of the original NATA certified laboratory test reports.

(Signature).....

(Date).....

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