



Stainless steel tubes and tube fittings for food processing and hygienic applications

Part 3: Butt weld tube fittings



AS 1528.3:2019

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- Australian Chamber of Commerce and Industry
- Australian Food Engineering Association
- Australian Industry Group
- Australian Stainless Steel Development Association
- Dairy Australia
- Winery Engineering Association

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Part 3: Butt weld tube fittings

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Preface

This Standard was prepared by the Standards Australia Committee FT-027, Stainless Steel Tubes and Tube Fittings for Food Processing and Hygienic Applications, to supersede AS 1528.3—2001, *Tubes (stainless steel) and tube fittings for the food industry, Part 3: Butt weld tube fittings*.

The objective of this Standard is to specify dimensional, material and hygienic requirements for butt weld tubular fittings used in tube lines for food processing and hygienic applications.

This is Part 3 of a series of Standards for stainless steel tubes and tube fittings for food processing and hygienic applications. The Standards in the series are as follows:

AS 1528.1, *Stainless steel tubes and tube fittings for food processing and hygienic applications, Part 1: Tubes*

AS 1528.2, *Stainless steel tubes and tube fittings for food processing and hygienic applications, Part 2: Screwed tube couplings*

AS 1528.3, *Stainless steel tubes and tube fittings for food processing and hygienic applications, Part 3: Butt weld tube fittings* (this Standard)

AS 1528.4, *Stainless steel tubes and tube fittings for food processing and hygienic applications, Part 4: Clamp tube fittings*

The revision of the AS 1528 series closely aligns with other national and international Standards applicable to stainless steel tube and tube fittings for hygienic applications, while retaining a number of requirements that were identified in the prefaces to the 2001 editions as lacking in ASTM and ISO Standards.

ISO, European and other national Standards were reviewed and found not suitable for current Australian requirements.

The major changes to this Standard in this revision include the following:

- (a) The title of the Standard was changed to include “hygienic applications” in recognition of a broader application than simply the food processing industry.
- (b) Common internal surface finish requirements for all parts of the Standard.
- (c) Closer alignment of tolerances with International, European and US-based Standards.
- (d) Expansion of the diameter range and inclusion of wall thicknesses common to various tube diameters.
- (e) Addition of fittings now standard for the intended applications.

The term “informative” is used in Standards to define the application of the appendix to which it applies. An “informative” appendix is only for information and guidance.

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Australian Standard®

Stainless steel tubes and tube fittings for food processing and hygienic applications

Part 3: Butt weld tube fittings

1 Scope

This Standard specifies dimensional, material and hygienic requirements for butt weld tubular fittings including bends, tees, reducers, y-sections and crosses, for incorporation in tube lines for food processing and hygienic applications.

The fittings in this Standard are intended to be incorporated in tube lines either by being welded directly to tube ends (as specified in AS 1528.1) or by welding or expansion to the screwed tube fittings specified in AS 1528.2 and clamp tube fittings in AS 1528.4.

NOTE Information to be supplied for purchase is given in [Appendix A](#).

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document:

AS 1528.1, *Stainless steel tubes and tube fittings for food processing and hygienic applications, Part 1: Tubes*

AS 1528.2, *Stainless steel tubes and tube fittings for food processing and hygienic applications, Part 2: Screwed tube couplings*

AS 1528.4, *Stainless steel tubes and tube fittings for food processing and hygienic applications, Part 4: Clamp tube fittings*

AS/NZS 1554.6, *Structural steel welding, Part 6: Welding stainless steels for structural purposes*

ISO 4288, *Geometrical Product Specifications (GPS) — Surface texture: Profile method — Rules and procedures for the assessment of surface texture*

ASTM A240M, *Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet and Strip for Pressure Vessels and for General Applications*

ASTM A269M, *Standard Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service*

AWS D18.1M, *Specification for Welding of Austenitic Stainless Steel Tube and Pipe Systems in Sanitary (Hygienic) Applications*

EN 10204, *Metallic products — Types of inspection documents*

3 Terms and definitions

No terms and definitions are listed in this document.

4 Symbols

Symbol	Description
<i>A</i>	= projected length of 45° bend
<i>B</i>	= branch dimension of swept tees

Symbol	Description
C	= outlet length of pulled fitting
CP	= control portion for measurement of tolerances
D	= outside diameter of equal fitting
E	= outside diameter of smaller end of reducing fitting
F	= outside diameter of larger end of reducing fitting
H	= overall height of fitting
H_1	= length of end straight section of reducer
L	= defining length dimension of fitting
L_1	= length including straight-end extension
L_2	= straight-end extension length
L_3	= defining length of equal radius tee
L_4	= outlet length of reducing tee and reducing cross
L_5	= outlet minor dimension of 45° tee
L_6	= outlet branch overall length of 45° tee
L_7	= Y-piece centre-to-centre dimension
L_8	= Y-piece point-to-point dimension
N	= squareness tolerance, face to tangent
O	= squareness tolerance, face to face
P	= squareness tolerance, off plane
R	= centre-line bend radius
r	= radius of branch junction of radius tee
t	= wall thickness, measured at the fitting end
T	= tangent section of fittings for measurement of tolerances
t_E	= reducer wall thickness, measured at the smaller end
t_F	= reducer wall thickness, measured at the larger end

5 Working pressure

The tube fitting components shall be capable of withstanding a non-shock maximum working pressure of 10 bar at temperatures from -20 °C to 100 °C, subject to the engineering requirements of the specific application.

6 Materials

6.1 Fittings

Fittings shall be made from austenitic stainless steel that conforms with the chemical composition and mechanical property requirements of the relevant grade in AS 1528.1, ASTM A240M or ASTM A269M. The steel used shall be a weldable grade.

Where fittings are manufactured from tube, the tube shall be in accordance with AS 1528.1.

6.2 Filler rods

Filler rods used in manufacture shall be those listed as pre-qualified in AS/NZS 1554.6 for the relevant parent metal.

7 90°, 45° and 180° tube bends

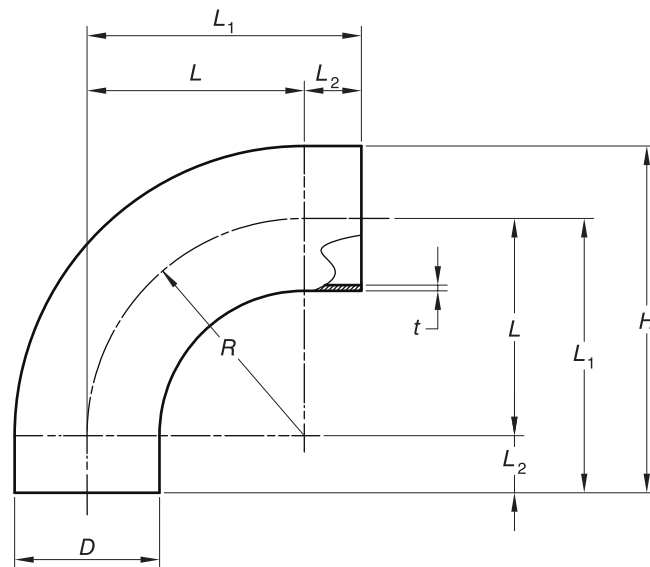
The dimensions of 90°, 45° and 180° tube bends shall be in accordance with [Table 1](#) and as shown in [Figures 1\(A\)](#), [1\(B\)](#) and [1\(C\)](#).

Table 1 — Dimensions of 90°, 45° and 180° tube bends

Dimensions in millimetres

Nominal size <i>D</i>	Dimensions (refer to Figures 1(A) , 1(B) and 1(C))					
	<i>L</i>	<i>L</i> ₁	<i>L</i> ₂	<i>H</i>	<i>A</i>	<i>t</i>
12.70	19.05	49.05	30.0	55.40	97.9	1.60
19.05	28.58	58.58	30.0	68.11	110.6	1.60
25.40	38.10	68.10	30.0	80.80	123.3	1.60 or 2.00
31.75	47.63	77.63	30.0	93.51	136.0	1.60 or 2.00
38.10	57.15	87.15	30.0	106.20	148.7	1.60 or 2.00
50.80	76.20	106.20	30.0	131.60	174.1	1.60 or 2.00
63.50	95.25	125.25	30.0	157.00	199.5	1.60 or 2.00
76.20	114.30	144.30	30.0	182.40	224.9	1.60 or 2.00
101.60	152.40	182.40	30.0	233.20	275.7	1.60 or 2.00
127.00	190.50	230.50	40.0	294.00	350.6	1.60 or 2.00
152.40	228.60	268.60	40.0	344.80	401.4	1.60 or 2.00
203.20	304.80	344.80	40.0	446.40	503.0	2.00 or 2.50
254.00	381.00	421.00	40.0	548.00	604.6	2.00, 2.50 or 3.00
304.80	457.20	497.20	40.0	649.60	706.2	2.00, 2.50 or 3.00

Standard bends are long radius where the bend centre-line radius (CLR) *R* is equal to length *L* and is nominally 1.5 times the tube diameter.



NOTE 1 Standard bends are supplied with straight-end extensions *L*₂.

NOTE 2 Bends conforming to this Standard have centre-line radius *R* equal to *L*.

Figure 1(A) — 90° tube bend