ASME A112.18.2-2005/CSA B125.2-05

Plumbing waste fittings

The American Society of Mechanical Engineers

CANADIAN STANDARDS ASSOCIATION

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CSA Standards Update Service

ASME A112.18.2-2005/CSA B125.2-05
June 2005

Title: *Plumbing waste fittings*
Pagination: 37 pages (xiv preliminary and 23 text), each dated **June 2005**

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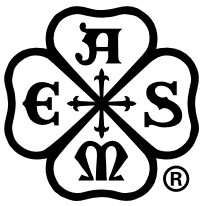
Plumbing waste fittings



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The American Society of Mechanical Engineers (ASME)
Three Park Avenue
New York, NY 10016-5990
USA
www.asme.org

ISBN 0-7918-2983-9

The 2005 edition of this Standard is being issued with an automatic addenda subscription service. The use of addenda allows revisions made in response to public review comments or committee actions to be published as necessary.

Published in June 2005 by Canadian Standards Association
A not-for-profit private sector organization
5060 Spectrum Way, Suite 100
Mississauga, Ontario, Canada
L4W 5N6
1-800-463-6727 • 416-747-4044
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ISBN 1-55436-875-8
Technical Editor: Abraham I. Murra

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In Memoriam

This Standard is dedicated to the memory of Patrick J. Higgins, whose vision and commitment to standards activities in both Canada and the United States were an inspiration in the development of this harmonized Standard.

Preface

This is the first edition of ASME A112.18.2/CSA B125.2, *Plumbing waste fittings.*

This joint Standard was developed in response to an industry request for a Standard for testing plumbing waste fittings that would be acceptable in both Canada and the United States. Its coverage is restricted to plumbing waste fittings. Plumbing supply fittings located between the supply line stop and the terminal fitting are covered by ASME A112.18.1/CSA B125.1, *Plumbing supply fittings.* Devices not covered by this Standard or by ASME A112.18.1/CSA B125.1, e.g., temperature actuated in-line mixing valves and flexible connectors under continuous pressure, are covered by CSA B125.3, *Plumbing fittings.*

This Standard replaces ASME A112.18.2-2002, *Plumbing Fixture Waste Fittings,* and, together with ASME A112.18.1/CSA B125.1 and CSA B125.3, replaces CAN/CSA-B125-01, *Plumbing Fittings*.

The concept of harmonization for plumbing fittings arose in the early 1990s, when a free trade agreement between Canada, Mexico, and the United States began to be discussed. Standards development organizations (SDOs) were at the forefront of these discussions and an opportunity soon arose for those SDOs involved in setting requirements for plumbing products to establish a process for harmonization. However, the effort to develop a trinational Standard stalled until 2001, when ASME and CSA decided to develop a binational Standard for plumbing fixture fittings. Harmonization activities were undertaken by a Joint Harmonization Task Group (JHTG), in which the ASME and CSA plumbing fitting committees were equally represented. The responsibility for procedural matters and final approval of technical content was assumed by committees and teams at higher levels within each SDO. Initially, the JHTG's philosophy was to draft a Standard reflecting existing requirements in the applicable ASME and CSA Standards. This seemed a reasonable task, given that ASME and CSA had already been trying for many years to harmonize the requirements in their plumbing fitting Standards in response to constant requests for revision. There were only a few tests in the applicable ASME Standard that did not appear in its CSA counterpart, and vice versa (corrosion, swing spout strength, and intermittent shock, to name three). However, once the JHTG began to meet, its members realized that there was room for improvement in how both Standards dealt with current products and technologies. It was therefore agreed that the new Standard would not only harmonize the requirements of both existing Standards but also improve on them. The design requirements of this Standard, however, are generally similar to those of the Standards it replaces, which is understandable considering that plumbing waste fittings perform basically the same functions now that they did when the Standards being replaced were first developed.

This Standard was prepared by the ASME/CSA Joint Harmonization Task Group on Plumbing Fittings, under the jurisdiction of ASME Standards Committee A112 on Plumbing Materials and Equipment and the CSA Technical Committee on Plumbing Fittings. The CSA Technical Committee operates under the jurisdiction of the CSA Strategic Steering Committee on Plumbing Products and Materials. This Standard has been formally approved by ASME Standards Committee A112 and the CSA Technical Committee. ASME A112.18.2-2005 was approved as an American National Standard by the American National Standards Institute on February 14, 2005. CSA B125.2 will be submitted to the Standards Council of Canada for approval as a National Standard of Canada.

June 2005

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ASME A112.18.2-2005/CSA B125.2-05
Plumbing waste fittings

1 Scope

1.1
This Standard covers plumbing waste fittings of sizes NPS-2 and smaller.

1.2
Plumbing supply fittings are covered by ASME A112.18.1/CSA B125.1.

1.3
Other devices, e.g., temperature-actuated in-line mixing valves and flexible connectors under continuous pressure, are covered by CSA B125.3 or other plumbing product Standards.

1.4
This Standard does not apply to pipes and tubes or pipe and tube fittings.

1.5
In this Standard, "shall" is used to express a requirement, i.e., a provision that the user is obliged to satisfy in order to comply with the standard; "should" is used to express a recommendation or that which is advised but not required; and "may" is used to express an option or that which is permissible within the limits of the standard. Notes accompanying clauses do not include requirements or alternative requirements. The purpose of a note accompanying a clause is to separate from the text explanatory or informative material. Notes to tables and figures are considered part of the table or figure and may be written as requirements.

1.6
The values stated in either SI (metric) or yard/pound units are to be regarded as the standard. SI units are the units of record in Canada.

In this Standard, the yard/pound units are shown in parentheses. The values stated in each measurement system are equivalent in application; however, each system is to be used independently. Combining values from the two measurement systems can result in non-conformance with this Standard.

All references to gallons are to US gallons.

For information on the conversion criteria used in this Standard, see Annex A.

2 Reference publications

2.1 ASME and CSA publications
This Standard refers to the following publications, and where such reference is made, it shall be to the edition listed below, including all amendments published thereto.

ASME International (American Society of Mechanical Engineers)
A112.18.1-2005/CSA B125.1-05
Plumbing Supply Fittings

B1.20.1-1983 (R2001)
Pipe Threads, General Purpose, Inch

B16.23-2002
Cast Copper Alloy Solder Joint Drainage Fittings: DWV

B16.29-2001
Wrought Copper and Wrought Copper Alloy Solder Joint Drainage Fittings — DWV

CSA (Canadian Standards Association)
ASME A112.18.1-2005/CSA B125.1-05
Plumbing supply fittings

B125.3-05
Plumbing fittings

CAN/CSA-B181.1-02 (part of CAN/CSA-B1800-02, *Plastic Nonpressure Pipe Compendium*)
ABS drain, waste, and vent pipe and pipe fittings

CAN/CSA-B181.2-02 (part of CAN/CSA-B1800-02, *Plastic Nonpressure Pipe Compendium*)
PVC drain, waste, and vent pipe and pipe fittings

CAN/CSA-B602-99
Mechanical couplings for drain, waste, and vent pipe and sewer pipe

2.2 Other publications

This Standard refers to the following publications, and where such reference is made, it shall be to the edition listed below, including all amendments thereto.

ASTM International (American Society for Testing and Materials)
A 48/A 48M-03
Standard Specification for Gray Iron Castings

A 536-84 (1999) e1
Standard Specification for Ductile Iron Castings

B 16/B 16M-00
Standard Specification for Free-Cutting Brass Rod, Bar and Shapes for Use in Screw Machines

B 117-03
Standard Practice for Operating Salt Spray (Fog) Apparatus

D 1784-03
Standard Specification for Rigid Poly(Vinyl Chloride) (PVC) Compounds and Chlorinated Poly(Vinyl Chloride) (CPVC) Compounds

D 2661-02
Standard Specification for Acrylonitrile-Butadiene-Styrene (ABS) Schedule 40 Plastic Drain, Waste, and Vent Pipe and Fittings

D 2665-04
Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Drain, Waste, and Vent Pipe and Fittings

D 3965-99
Standard Specification for Rigid Acrylonitrile-Butadiene-Styrene (ABS) Materials for Pipe and Fittings

D 4101-03
Standard Specification for Polypropylene Injection and Extrusion Materials

F 628-01
Standard Specification for Acrylonitrile-Butadiene-Styrene (ABS) Schedule 40 Plastic Drain, Waste, and Vent Pipe With a Cellular Core

F 891-00 e1
Standard Specification for Coextruded Poly(Vinyl Chloride) (PVC) Plastic Pipe With a Cellular Core

F 1498-00
Standard Specification for Taper Pipe Threads 60° for Thermoplastic Pipe and Fittings

3 Definitions and abbreviations

3.1 Definitions

The following definitions apply in this Standard:

Centre outlet — a lavatory waste fitting without an overflow opening.

Continuous waste — a drain connection for multiple compartments of a fixture or fixtures connected to a common trap or for connecting other fixtures to a common trap.

Diversion tee — a component of a continuous waste assembly consisting of a tee fitting and an integral element that directs the flow downward to the outlet of the tee.

Fixture waste fitting — any part of a waste system from a plumbing fixture to, and including, a fixture trap outlet or trap wall adapter.

Patent overflow — a lavatory waste fitting incorporating an overflow opening.

Significant surface — an exposed surface that, if blemished, spoils the appearance or affects the performance of a fitting.

Slip joint — an adjustable tubing connection that consists of a compression nut and compression washer and is designed to fit a threaded adapter fitting or a standard taper pipe thread.

Strainer — a device designed to prevent debris from entering a drainage system.

Strainer basket — a removable component of a sink strainer assembly, designed to collect debris.

Strainer body — the fixed, exposed component of a sink strainer assembly connected to the fixture that accommodates the strainer basket.

Strainer shell — the unexposed component of a sink strainer assembly that connects the strainer body to the fixture that accommodates the strainer basket.

Strainer sleeve — the unexposed component of a sink strainer assembly that connects the assembly to the fixture waste connection.

Standard tools — tools that are normally carried by plumbers for installing and maintaining plumbing (e.g., screwdrivers, key wrenches, flat-jawed wrenches, and pliers).

Trap — a fitting that provides, when installed in a properly vented system, a liquid seal that prevents the back passage of gas without affecting the flow of sewage or waste water through the system.

Trap seal — the vertical depth of a liquid that a trap retains, measured from the trap weir (the lowest point in the cross-section of the horizontal waterway at the trap exit) and the top of the tube at the lowest point of its bend. See Figure 1.

Trap wall adapter — a part of the waste system that is used to connect a trap outlet to a building drainage system. See Figure 4.

Twin waste elbow — a type of continuous waste fitting that diverts waste from two horizontal branches in the same plane to a vertical outlet. See Figure 6.

3.2 Abbreviations

The following abbreviations apply in this Standard:

ASA — American Standards Association
ABS — acrylonitrile-butadiene-styrene
DWV — drain, waste, and vent
NC — National Coarse
NPS — Nominal Pipe Size
NPSM — National Pipe Straight Mechanical
NPT — National Pipe Tapered
OD — outside diameter
PP — polypropylene
PVC — polyvinyl chloride

4 General requirements

4.1 Materials

4.1.1

The requirements specified in Clauses 4.1.2 to 4.1.8 shall apply only to wetted components that are part of the drainage envelope.

Note: *The drainage envelope includes traps, tailpieces, trap wall adapters, diversion tees, twin waste elbows, overflow elbows, drain elbows, and strainer bodies. Parts that are not considered part of the drainage envelope include pop-up stoppers, overflow plates, coupling nuts, strainer baskets and sleeves, and lift rods. The requirements of Clause 4.1 are not intended to prevent the use of alternative materials for components that are not part of the drainage envelope.*

4.1.2

Waste fittings and waste fitting components shall be made from materials that comply with the requirements of this Standard.

4.1.3

The materials for plastic tubular waste fittings shall be acrylonitrile-butadiene-styrene (ABS), polypropylene (PP), or polyvinyl chloride (PVC) and shall comply with or exceed one or more of the following cell classifications:

(a) unreinforced PP:
  (i) to cell class PP0110B55140 in ASTM D 4101; or
  (ii) to cell class 55230 or 75250 in Table B of ASTM D 4101;
(b) reinforced PP: to cell class PP0105G20A33350 in ASTM D 4101;
(c) ABS material for tubes: to cell class 42222 in ASTM D 3965;

(d) ABS material for fittings and mechanical joints: to cell class 20211 in ASTM D 3965; or
(e) PVC: to cell class 12454 or 14333 in ASTM D 1784.

4.1.4
Materials for ABS or PVC DWV plastic pipe and pipe fittings shall comply with one of the following Standards:
(a) ASTM D 2661;
(b) ASTM D 2665;
(c) ASTM F 628;
(d) ASTM F 891;
(e) CAN/CSA-B181.1; or
(f) CAN/CSA-B181.2.

4.1.5
Copper alloys shall have a minimum copper content of 56% by weight.

4.1.6
Cast iron shall comply with the requirements of class 25 of ASTM A 48/A 48M.

4.1.7
Ductile iron shall comply with the requirements of grades 60-40-18 or 60-45-12 of ASTM A 536.

4.1.8
Stainless steel alloys shall be of the 300 or 400 series.

4.2 Installation

4.2.1 Connection to waste system
Waste fittings shall be provided with means to connect to a type of trap or waste system in common use.

4.2.2 Protection of finish
Provision shall be made to enable waste fittings to be connected and mounted without marring the finish or otherwise damaging the fitting or the surface on which it is to be mounted.

4.2.3 Fixture seal
Provision shall be made for a method of establishing a seal between a waste fitting and the fixture to which it is fastened.

4.3 Threads

4.3.1 DWV plastic pipe and fittings
Taper threads used on plastic tubular waste fittings complying with Clause 4.1.3, and on ABS or PVC DWV plastic pipe and pipe fittings complying with Clause 4.1.4, shall
(a) be moulded;
(b) comply with ASTM F 1498; and
(c) be a minimum of 2.5 threads long, with a minimum of one thread engagement.

4.3.2 Metallic pipes and fittings
Threads used on pipe and fittings manufactured from metallic base materials shall comply with ASME B1.20.1.

4.3.3 Compression and union nuts
Threads for compression and union nuts shall be a minimum of 2.5 threads long, with a minimum of one thread engagement. The threads shall be NPSM threads. The thread form shall comply with Table 6 of ASME B1.20.1.

4.3.4 Tapped bosses
Tapped bosses for threaded tubing shall have 1-1/4 or 1-1/2 × 27 or 28 threads per inch ASA 60° thread and shall be at least 2.5 threads long.

4.4 Solder connections
The dimensions of solder joint ends for connection to copper tube or copper tube fittings (except factory-assembled parts) shall comply with ASME B16.23 or B16.29.

4.5 Replacement parts

4.5.1 Use of standard tools
Repair and maintenance of waste fittings shall be accomplished with the use of standard tools.

4.5.2 Replacement part design
Joints that have to be taken apart to replace worn parts after the fitting is installed shall be designed so that disassembly and replacement are possible without damaging or marring the fitting or any significant surface on which the fitting is installed.

4.6 Dimensions

4.6.1 Outlet size

4.6.1.1 Lavatory and bidet waste fittings
Lavatory and bidet waste fittings shall be provided with a minimum 1-1/4 in nominal OD outlet.

4.6.1.2 Sink, shower, bathtub, laundry tub, and bar sink waste fittings
Sink, shower, bathtub, laundry tub, and bar sink waste fittings shall be provided with a minimum 1-1/2 in nominal OD outlet.

4.6.2 Slip joints
The inside diameter of slip joints shall fit with tubing of the same nominal size. Slip joints located on the inlet side of a trap shall be at least 13 mm (0.5 in) above the trap weir. See Figure 1.

4.6.3 Wall thickness

4.6.3.1 Metal tube and tubular fittings
When measured on a straight portion of the part, the wall thickness of metal tube and tubular fittings shall be at least the following:

(a) brass or copper:
  (i) 0.73 mm (0.029 in) unthreaded;
  (ii) 0.83 mm (0.032 in) threaded by cutting; and
  (iii) 0.40 mm (0.016 in) for corrugated tubing; and

(b) stainless steel:
  (i) 0.30 mm (0.012 in) unthreaded; and
  (ii) 0.83 mm (0.032 in) threaded by cutting.

4.6.3.2 Plastic tube and tubular fittings

The wall thickness of plastic tube and tubular fittings shall be at least 1.58 mm (0.062 in).

Note: *This requirement does not apply to tapered or bevelled edges.*

4.6.4 Sink strainer assemblies

4.6.4.1

Components of sink strainer assemblies made of stainless steel or brass shall include a body, a basket, and, if applicable, a sleeve, and shall have the following minimum thicknesses, measured before forming:

(a) body: 0.56 mm (0.022 in);
(b) basket: 0.38 mm (0.015 in); and
(c) sleeve: 0.38 mm (0.015 in).

4.6.4.2

The gap between the strainer basket and the body shall be not greater than 5 mm (0.2 in). The depth of the strainer basket shall be such that, in the open position, the lip does not project above the body flange. Holes in the strainer basket shall be not greater than 5 mm (0.2 in) in the minor dimension.

4.6.4.3

The strainer body thread shall be made to accommodate a nut with a 1-1/2–11-1/2 NPSM thread that complies with ASME B1.20.1. See Figure 2.

4.6.4.4

Tailpieces incorporating an adapter for a dishwasher hose connection shall comply with Figure 3.

4.6.5 Traps

4.6.5.1

Fixture traps shall have a minimum trap seal of 50 mm (2.0 in). See Figure 1.

4.6.5.2

A cleanout plug shall not reduce the waterway through the trap and shall have no projections that could cause accumulation of debris or other matter in the trap. The plug shall be threaded, and the thread may be tapered or straight.

4.6.6 Mechanical stoppers

4.6.6.1

The movable parts in a mechanical stopper shall be accessible without disconnecting the body from the fixture.

4.6.6.2

Seals between the linkage and the body of a mechanical stopper shall be designed to allow repacking or replacement.

4.6.7 Elastomeric fittings

4.6.7.1 Materials

Elastomeric waste fittings shall comply with the material requirements of CSA B602.

4.6.7.2 Parts
The wall thickness of elastomeric tubular parts shall be at least 2.0 mm (0.079 in).

4.6.8 Tubing stops
Tubing stops in diversion tees, other tees, and twin waste elbows shall be integral and designed in such a way that the insert tubing shall not obstruct the flow. See Figures 5 to 8.

4.6.9 Subdrains for built-up shower pans

4.6.9.1 Crown and collar material
A 24 gauge corrosion-resistant crown and/or collar or a brass ring 6 mm (0.25 in) thick shall be placed between the strainer and the cast iron bodies in subdrains for built-up shower pans. See Figure 10.

4.6.9.2 Obstructions
No obstructions shall be permitted in the caulking area.

4.6.9.3 Weep holes
Cast iron bodies shall have at least three weep holes, each with a minimum diameter of 6 mm (0.25 in). Weep holes shall be located above the clamping ring.

4.6.9.4 Clamping bolts and fasteners
Clamping bolts and fasteners shall be made of 300 series stainless steel or copper alloy that complies with ASTM B 16/B 16M. At least three bolts per drain shall be provided.

Clamping bolts and fasteners for cast iron or copper alloy drains shall be a minimum of 5/16 in NC (7.9 mm), with a minimum thread length of 13 mm (0.50 in).

Clamping bolts and fasteners for plastic drains shall be a minimum of 1/4 in NC (6.4 mm), with a minimum thread length of 19 mm (0.75 in).

5 Performance requirements and test methods

5.1 General

5.1.1 Preconditioning
Before testing, specimens shall be conditioned at ambient laboratory conditions for at least 12 h.

5.1.2 Installation for testing
For test purposes, each specimen shall be installed in accordance with the manufacturer's instructions.

5.1.3 Testing sequence

5.1.3.1 General
In addition to the other applicable tests and requirements specified in this Standard, two fittings shall
(a) be selected at random from a lot of five production fittings;
(b) be subjected to the test sequence specified in Clauses 5.1.3.2 and 5.1.3.3; and
(c) meet the requirements specified in Clauses 5.2 to 5.11.

5.1.3.2 Specimen 1
One of the two specimens described in Clause 5.1.3.1 shall be subjected to the following test sequence:
(a) thermal cycling (see Clause 5.3);
(b) minimum flow rate (see Clause 5.8);

(c) thread torque strength (see Clause 5.9.1); and
(d) hydrostatic pressure (see Clause 5.9.2).

5.1.3.3 Specimen 2

The second of the two specimens described in Clause 5.1.3.1 shall be subjected to the following test sequence:
(a) seals leakage (see Clause 5.11);
(b) life cycle (see Clause 5.10);
(c) seals leakage (see Clause 5.11); and
(d) load (shower drain) (see Clause 5.5).

Note: *In this test sequence, the seals leakage test is performed twice.*

5.1.3.4 Remaining specimens

The three remaining fittings from the lot of five production fittings described in Clause 5.1.3.1 shall be used for the remaining tests specified in this Standard.

5.2 Corrosion

5.2.1 Performance requirements

5.2.1.1

When tested in accordance with Clause 5.2.2, functional metallic parts shall not exhibit corrosion that would adversely affect the functioning of the fitting or the disassembly and reassembly of the components. Disassembly and reassembly of the functional metallic parts shall be accomplished without any damage to the components or the fitting on completion of the test procedure specified in Clause 5.2.2.

5.2.1.2

After undergoing the test specified in Clause 5.2.2, the specimen described in Clause 5.2.2.1 shall meet the requirements specified in Clause 5.11.1.1 or 5.11.2.1, as applicable.

5.2.1.3

When tested in accordance with Clause 5.2.2, the specimen described in Clause 5.2.2.1 shall be capable of being
(a) disassembled with standard tools to enable access to all serviceable parts without damage to the specimen; and
(b) reassembled with standard tools without damage to the specimen.

5.2.2 Test procedure

5.2.2.1

Fittings shall be tested using a 5% salt solution for 96 h in accordance with ASTM B 117. The specimen selected for the corrosion test shall be tested as received from the manufacturer and shall not have been subjected to any other test.

5.2.2.2

The specimen shall be assembled in accordance with the manufacturer's instructions, including the use of any mounting hardware specified by the manufacturer.

5.2.2.3

The specimen shall be hung in the corrosion chamber in a position as similar as possible to the position it would be in when installed. If multiple specimens are being tested, no specimen shall be suspended above another specimen.

5.2.2.4
Immediately after the 96 h exposure period, the corrosion chamber shall be opened and the specimen shall be rinsed under running deionized water not warmer than 38 °C (100°F) and immediately dried for a minimum of 24 h at ambient laboratory conditions before inspection or attempts to disassemble. The specimen shall not be rubbed during rinsing or drying or before being examined.

5.3 Thermal cycling

5.3.1 Performance requirements
Waste fittings shall show no signs of cracking, leaking, or deformation when tested in accordance with Clause 5.3.2.

5.3.2 Test procedure

5.3.2.1 Bath, shower, drinking fountain, and lavatory waste fittings
The thermal cycling test for bath, shower, drinking fountain, and lavatory waste fittings shall be conducted as follows:
(a) Install the specimen in accordance with the manufacturer's instructions.
(b) Subject the specimen to a water flow of 7.5 ± 0.8 L/min (2.0 ± 0.2 gpm) at 60 ± 2 °C (140 ± 3°F) for 1.5 min, followed immediately by a water flow at 21 ± 2 °C (70 ± 3°F) for 1.5 min.
(c) Continue the test for six more cycles without pausing between cycles.

5.3.2.2 Other waste fittings
The thermal cycling test for waste fittings other than those specified in Clause 5.3.2.1 shall be conducted as follows:
(a) Install the specimen in accordance with the manufacturer's instructions.
(b) Subject the specimen to a water flow of 7.5 ± 0.8 L/min (2.0 ± 0.2 gpm) at 82 ± 2 °C (180 ± 3°F) for 1.5 min, followed immediately by a water flow at 21 ± 2 °C (70 ± 3°F) for 1.5 min.
(c) Continue the test for six more cycles without pausing between cycles.

5.4 Coatings
Coatings shall meet the requirements of Clause 5.2 of ASME A112.18.1/CSA B125.1.

5.5 Shower drain strainers

5.5.1 Performance requirements
When tested in accordance with Clause 5.5.2, shower drain strainers shall not crack or deflect more than 3% of the largest transverse dimension with the load in place.

5.5.2 Load test procedure
The load test for shower drain strainers shall be conducted as follows:
(a) Mount the specimen on the body of the drain.
(b) Apply a uniformly distributed load of 1.3 kN (300 lbf) for 2 min to a 50 mm (2.0 in) diameter plate placed in the centre of the specimen.

5.6 Sink strainer assemblies

5.6.1 Performance requirements
The plastic components of sink strainer assemblies shall meet the requirements of Clauses 5.6.2 to 5.6.4.

5.6.2 Hot oil exposure

5.6.2.1 Performance requirements

When tested in accordance with Clause 5.6.2.2, the exposed components of a sink strainer shall show no change in surface texture due to cracking, crazing, blistering, or delamination, and no permanent discoloration.

Discoloration that can be removed by abrading the surface and repolishing to a maximum depth of 0.15 mm (0.006 in) shall be acceptable.

5.6.2.2 Test procedure

The hot oil exposure test shall be conducted as follows:

(a) Use cooking oil with a smoke point greater than 240 °C (464°F) (e.g., safflower, sunflower, or soybean oil).
(b) Install the specimen in the sink as it would be installed in normal service, with the outlet closed.
(c) Preheat the oil to 230 ± 5 °C (446 ± 9°F).
(d) Pour 750 ± 50 mL (0.20 ± 0.01 gal) of preheated oil onto the exposed surface of the specimen.
(e) Allow the oil to stand in the sink at ambient conditions for 30 ± 5 min, then drain.
(f) Check the surface for defects as follows:
    (i) thoroughly degrease the surface of the specimen using household detergent;
    (ii) apply water-soluble ink or dye of contrasting colour to the entire area to be inspected;
    (iii) after 30 min, rinse with fresh water and wipe dry; and
    (iv) examine the surface for changes in texture and permanent discoloration.

Note: *Safety clothing and eye protection should be worn when conducting this test.*

5.6.3 Water absorption

5.6.3.1 Performance requirements

No specimen shall absorb water in excess of 0.50% by mass in 24 h when tested in accordance with Clause 5.6.3.2.

5.6.3.2 Test procedure

The water absorption test shall be conducted as follows:

(a) Use specimens (one each) of any plastic strainer component that will be exposed to water.
(b) Condition the specimens for 24 h in an oven at 50 ± 3 °C (122 ± 5°F).
(c) Cool the specimens in a desiccator.
(d) Weigh the specimens immediately after cooling to ambient room temperature.
(e) Place the specimens in distilled water at 23 ± 1 °C (73 ± 2°F) for 24 h, with the specimens entirely immersed and resting on an edge.
(f) At the end of the 24 h, remove the specimens from the water, one at a time.
(g) Wipe off all surface water with a dry cloth.
(h) Weigh the specimens within 30 s of removal from the water.
(i) Calculate the percentage increase in mass to the nearest 0.01%.

5.6.4 Point impact

5.6.4.1 Performance requirements

The strainer assembly shall not crack when tested in accordance with Clause 5.6.4.2.

5.6.4.2 Test procedure

The point impact test shall be conducted as follows:

(a) Install the specimen in a kitchen sink as it would be installed in normal service.

(b) Drop a 38 mm (1.5 in) diameter steel ball weighing 230 g (0.5 lb) from a height of 600 mm (24 in) so that it strikes the upper flat rim surface of the strainer body.
(c) Drop a 38 mm (1.5 in) diameter steel ball weighing 230 g (0.5 lb) from a height of 600 mm (24 in) so that it strikes
    (i) another location on the rim surface; and
    (ii) a location on the strainer basket.

5.7 Body and clamping rings of subdrains for built-up shower pans

When tested in accordance with Clause 5.11.2.1, the body and clamping rings of subdrains for built-up shower pans shall provide a watertight joint when installed in accordance with the manufacturer's instructions.

5.8 Minimum flow rate

5.8.1 Performance requirements

The minimum flow rate for a waste fitting with all of its component parts installed shall be 27 L/min (7.0 gpm) when a sustained water head of 150 mm (6.0 in) is applied above the inlet and the outlet is open to the atmosphere.

5.8.2 Test procedure

The minimum flow rate test shall be conducted using water at 10 ± 6 °C (50 ± 10°F). Each inlet of a multiple-inlet fitting shall be tested separately.

Note: *This test is not applicable to the overflow, condensate, and branch of the tailpiece connection components of waste fitting assemblies.*

5.9 Strength

5.9.1 Thread torque strength

5.9.1.1 Performance requirements

Field-assembled threaded connections of union joints, slip joints, and gasketed joints shall not show any evidence of stripping, cracking, or thread damage when tested in accordance with Clause 5.9.1.2 and shall show no evidence of leakage when tested in accordance with Clause 5.11. Any evidence of damage or leakage shall constitute a failure.

5.9.1.2 Procedure

The test shall be conducted as follows:
(a) Subject the joint(s) to a torque of 20 N•m (15 ft•lbf).
(b) Disassemble the joint(s).
(c) Examine the joint(s) for evidence of stripping, cracking, or thread damage. If no such evidence is found, proceed with Item (d).
(d) Reassemble and retighten the joint(s) with a torque of 20 N•m (15 ft•lbf).
(e) Test the joint(s) in accordance with Clause 5.11 and check for leaks.

5.9.2 Hydrostatic pressure

5.9.2.1 Performance requirements

The drainage envelope parts of waste fittings shall show no signs of leakage, cracking, or permanent deformation when tested in accordance with Clause 5.9.2.2.

5.9.2.2 Procedure

The hydrostatic pressure test shall be conducted using water at 10 ± 6 °C (50 ± 10°F). Waste fittings shall be assembled in accordance with the manufacturer's instructions and subjected to a hydrostatic pressure of 34 kPa (5.0 psi) for at least 5 min.

5.10 Life cycle

5.10.1 Performance requirements

During and after the test described in Clause 5.10.2, waste fittings shall continue to function as they did at the beginning of the test and shall not develop any defects that might adversely affect their serviceability. In addition, they shall meet the requirements of Clause 5.11.

5.10.2 Test procedure

Waste fittings incorporating moving or potentially wearing parts shall be life cycle tested for 10 000 cycles. The speed of the life cycle test apparatus shall be adjusted to a minimum of 600 cycles per hour. The fitting shall be cycled without water.

Note: *If the design of a device is such that 600 cycles per hour cannot be attained, a more suitable cycle rate specified by the manufacturer may be used.*

5.11 Seals leakage

5.11.1 Waste fittings for drainage flow control

5.11.1.1 Performance requirements

The seals of waste fittings used to control drainage flow shall not leak more than 63 mL/min (1.0 gph) when tested in accordance with Clause 5.11.1.2.

5.11.1.2 Test procedure

The seals leakage test for waste fittings for drainage flow control shall be conducted as follows:

(a) Install the specimen in accordance with the manufacturer's instructions.
(b) Subject the specimen to the static pressure of a 150 mm (6.0 in) column of water at 10 ± 6 °C (50 ± 10°F).
(c) Measure the leakage rate over a period of 5 min.

5.11.2 Other waste fittings

5.11.2.1 Performance requirements

The seals of waste fittings other than waste fittings for drainage flow control shall not leak when tested in accordance with Clause 5.11.2.2.

5.11.2.2 Test procedures

5.11.2.2.1 Pop-up assemblies

The joint in a pop-up assembly at the entry of the assembly's operating rod into the drain body shall be subjected for 5 min to the static pressure of a 150 mm (6.0 in) column of water at 10 ± 6 °C (50 ± 10°F) above the entry to the drain with the drain open and the outlet plugged. See Figure 11.

5.11.2.2.2 Overflow gaskets

Overflow gaskets and seals shall not leak when subjected to the static pressure of a 150 mm (6.0 in) column of water at 10 ± 6 °C (50 ± 10°F) above the midpoint of the inlet opening for 5 min. See Figure 9.

5.11.2.2.3 Other seals

Except as specified in Clauses 5.11.2.2.1 and 5.11.2.2.2, seals used in waste fittings shall be subjected to the static pressure of a 500 mm (20.0 in) column of water at 10 ± 6 °C (50 ± 10°F) for 5 min.

6 Markings

6.1 General

Plumbing waste fittings complying with this Standard shall be marked with the manufacturer's recognized name, trademark, or other mark or, in the case of private labelling, the name, trademark, or other mark of the customer for whom the fitting was manufactured.

The marking shall be accomplished by use of a permanent mark or by placing a permanent label on the product.

Markings shall be visible after installation.

6.2 Packaging

Packages shall be marked with the manufacturer's recognized name, trademark, or other mark as well as the model number or, in the case of private labelling, the name, trademark, or other mark of the customer for whom the fitting was manufactured as well as the model number.

6.3 Instructions for elastomeric waste fittings

Installation instructions shall be provided for elastomeric waste fittings and shall describe the methods for properly aligning the fittings.

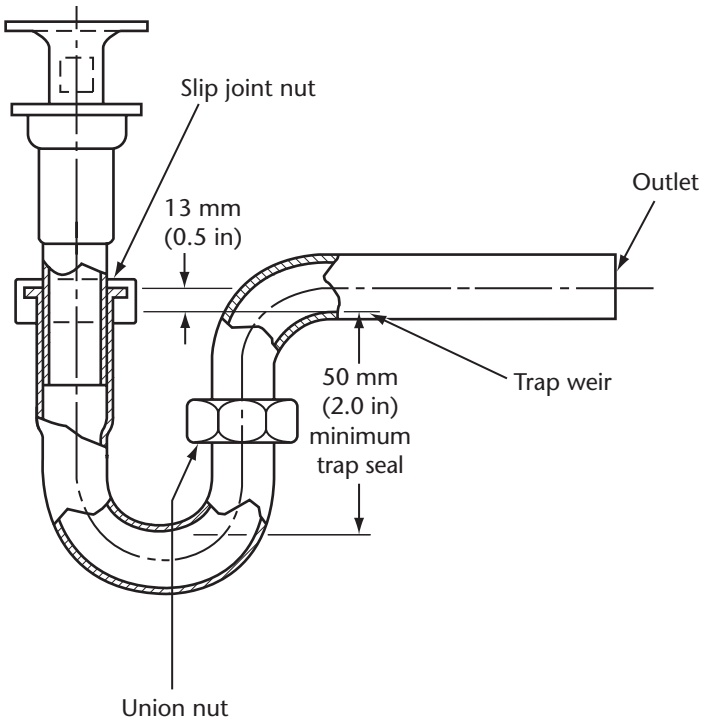


Figure 1
Sink and lavatory waste, trap, centre outlet, and patent overflow fittings
(See the definition of "Trap seal" in Clause 3 and Clauses 4.6.2 and 4.6.5.1.)

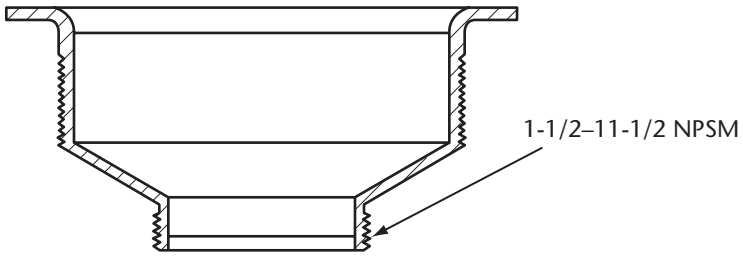


Figure 2
Sink strainer
(See Clause 4.6.4.3.)

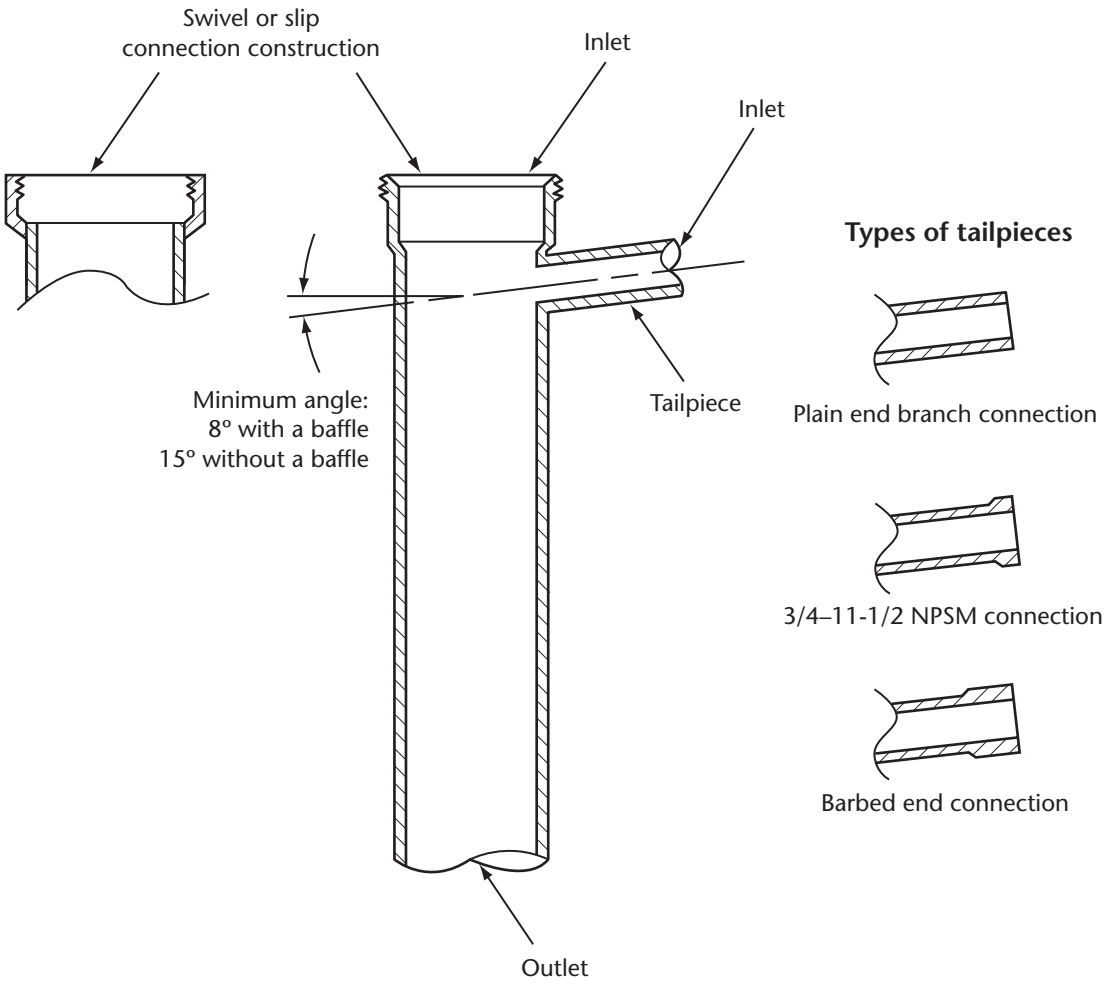


Figure 3
Sink strainer tailpiece
(See Clause 4.6.4.4.)

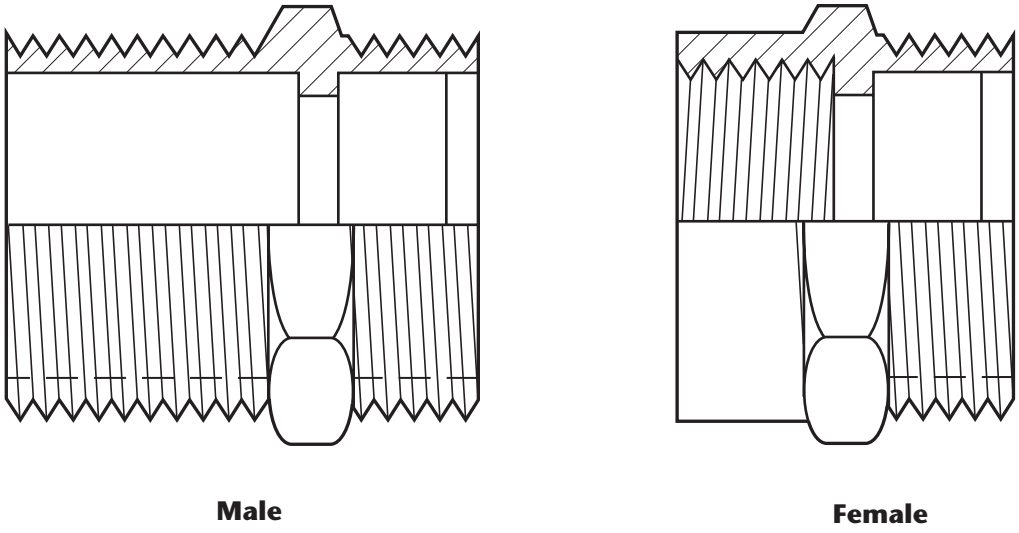


Figure 4
Trap wall adapter
(See the definition of "Trap wall adapter" in Clause 3.)

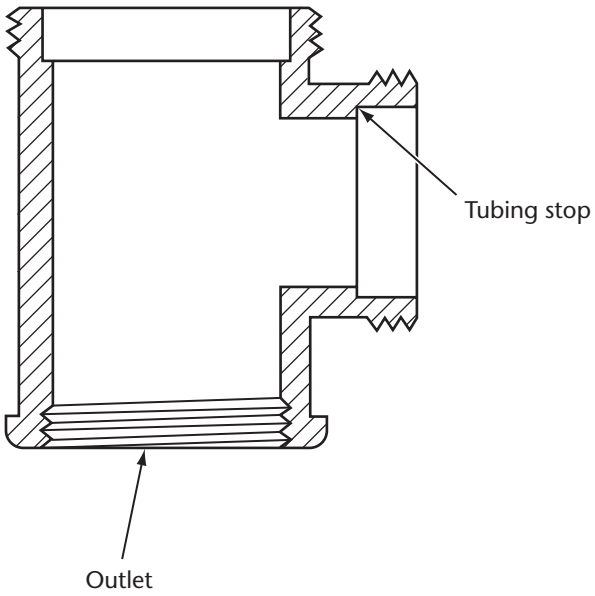


Figure 5
Tee
(See Clause 4.6.8.)

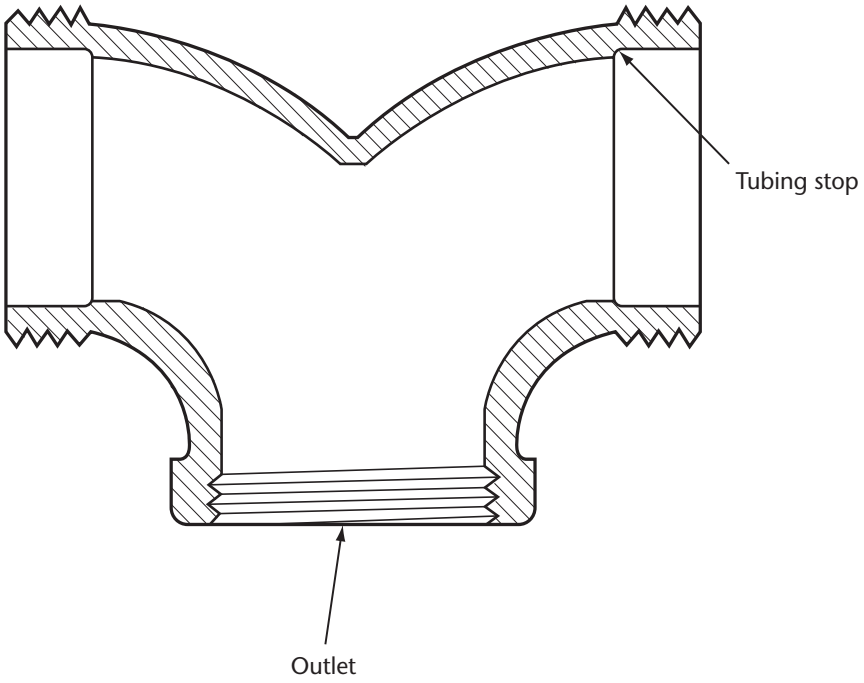


Figure 6
Twin waste elbow
(See the definition of "Twin waste elbow" in Clause 3 and Clause 4.6.8.)

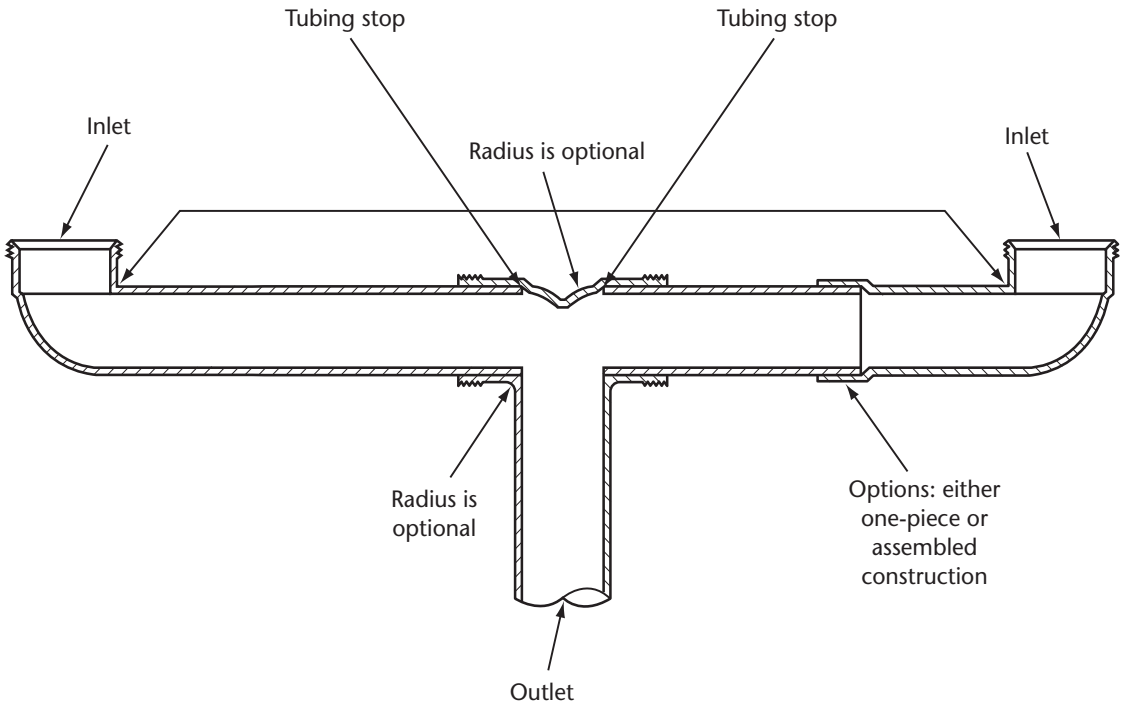


Figure 7
Centre outlet — Continuous waste
(See Clause 4.6.8.)

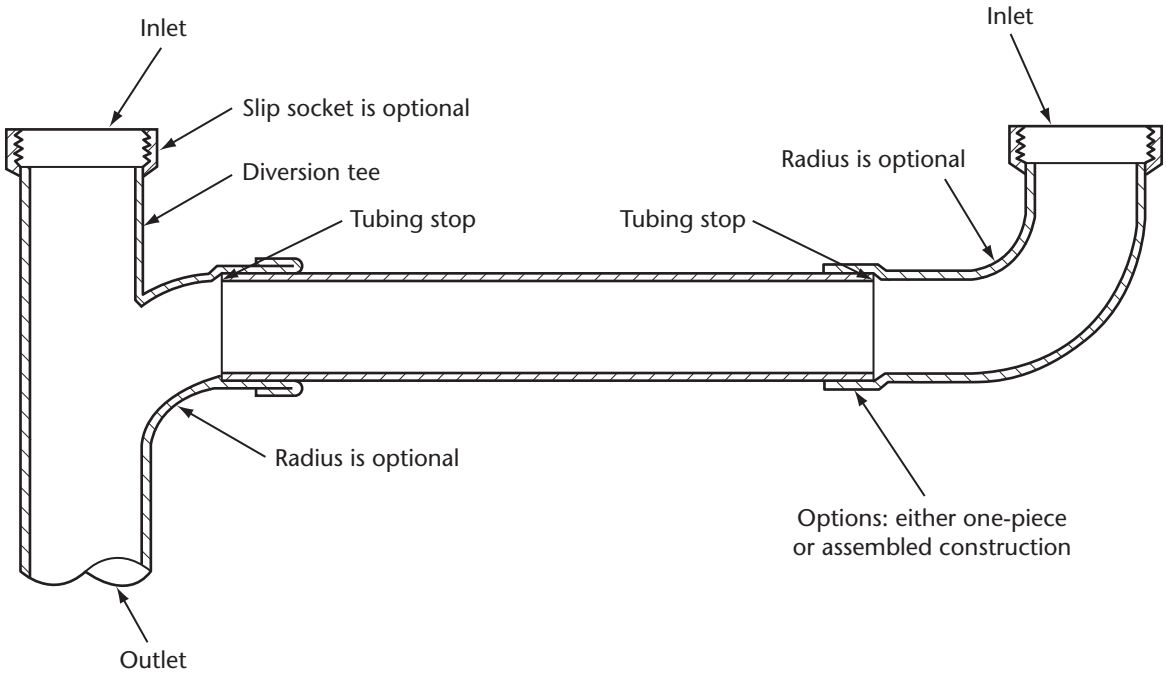
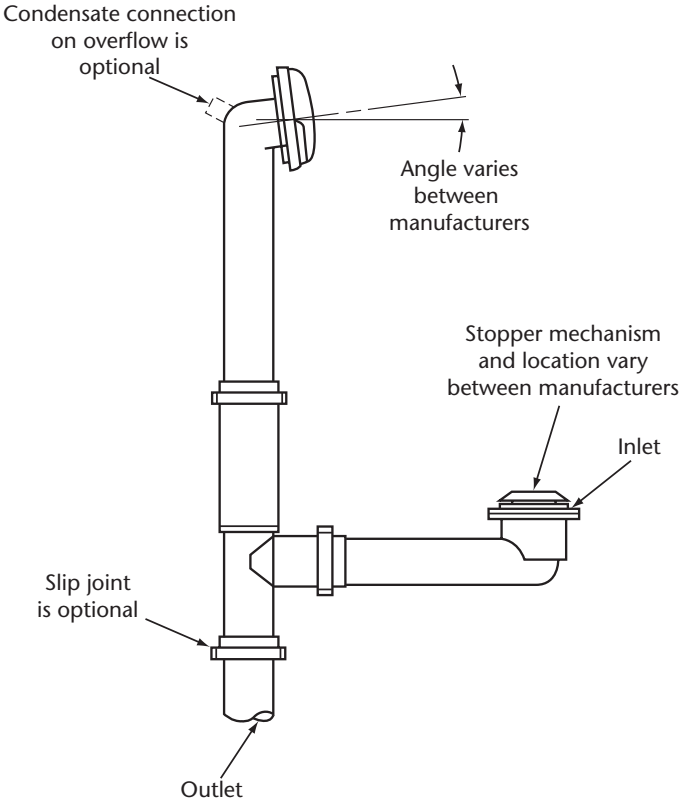
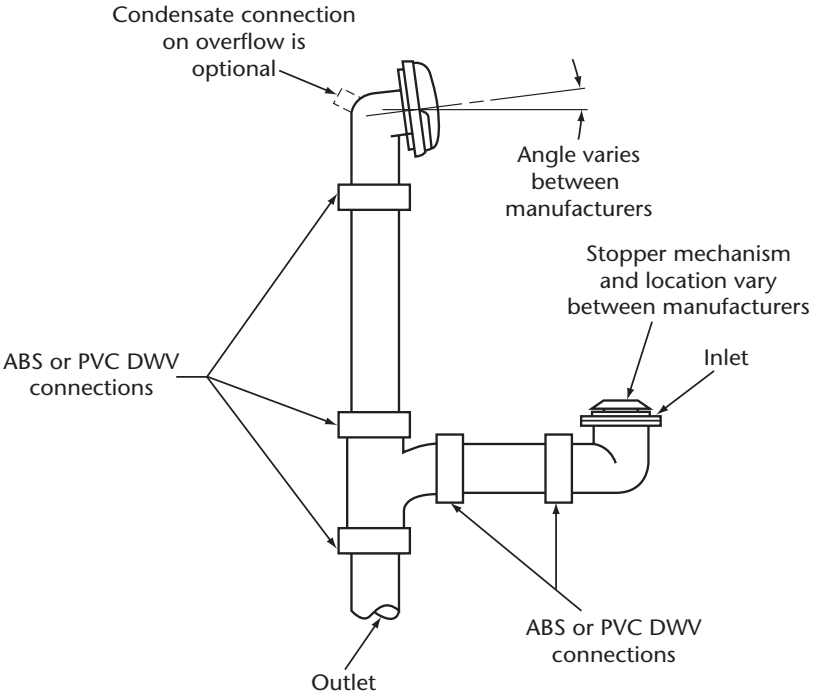


Figure 8
End outlet — Continuous waste
(See Clause 4.6.8.)



(a) Tubular waste and overflow



(b) DWV waste and overflow

Figure 9
Waste and overflow

(See Clause 5.11.2.2.2.)

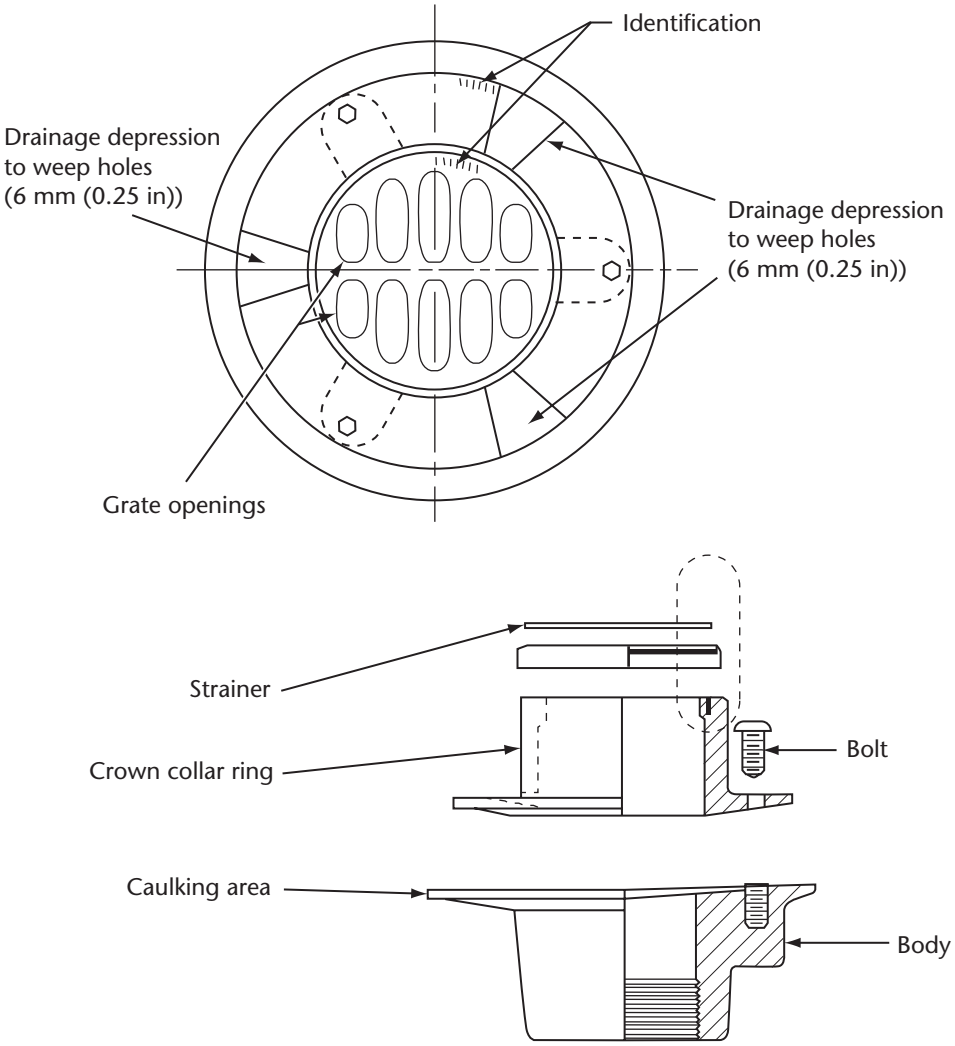


Figure 10
Typical subdrain for built-up shower pans
(See Clause 4.6.9.1.)

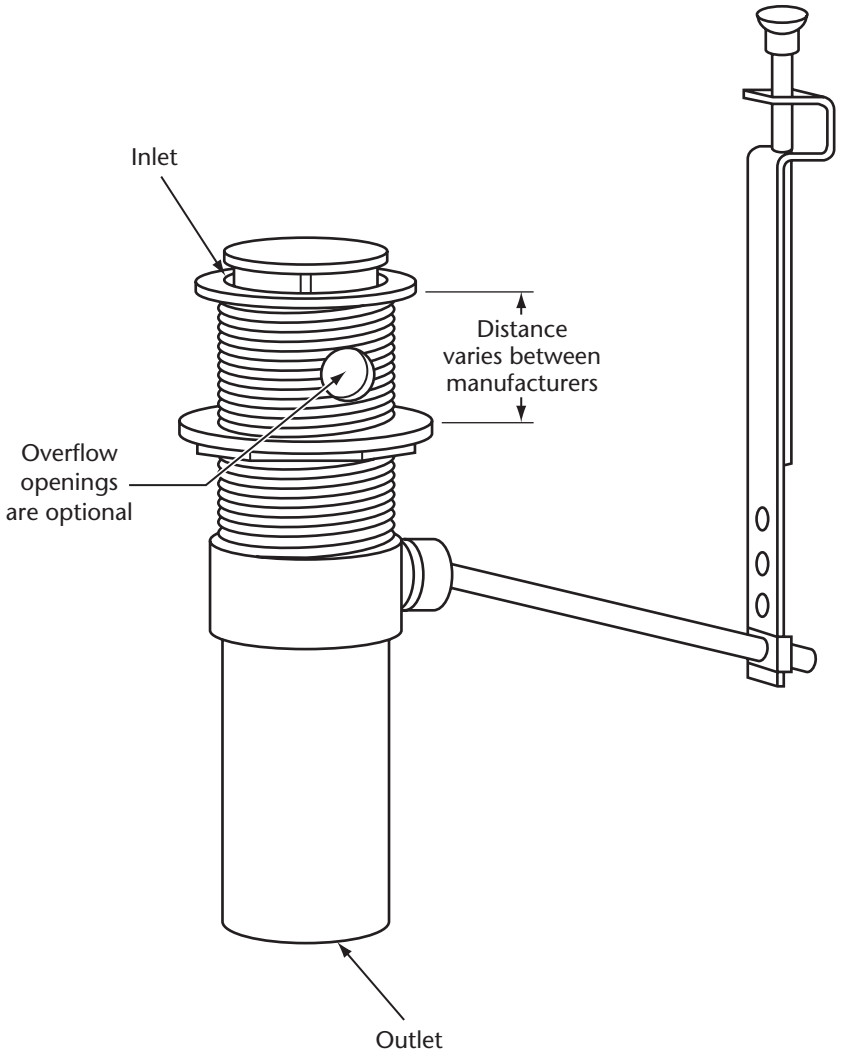


Figure 11
Typical lavatory pop-up drain
(See Clause 5.11.2.2.1.)

Annex A (informative)
Unit conversion criteria

Note: *This Annex is not a mandatory part of this Standard.*

A.1

The following conversion rules are used in this Standard:

(a) Zeros to the left of the first non-zero digit are not significant.
(b) If the number is greater than 1, all zeros to the right of the decimal point are significant.
(c) In multiplication and division, the original number with the smallest number of significant digits determines the number of significant digits in the product or quotient.
(d) If an exact constant is used (e.g., 3 ft = 1 yd), it does not affect the number of significant digits in the calculated value.
(e) If inexact constants are used (e.g., π = 3.1416), the constant with at least one more significant digit than the smallest number of significant digits in the original data is used.

A.2

The following rounding rules are used in this Standard:

(a) The digits that follow the last significant digit are dropped if the first digit is less than 5.
(b) If the first digit dropped is greater than 5, the preceding digit is increased by 1.
(c) If the first digit dropped is 5 and there are non-zero digits following the 5, the preceding digit is increased by 1.
(d) If the first digit dropped is 5 and there are only zeros following the 5, the digit is rounded to the even number (e.g., for three significant digits, 1.655000 becomes 1.66, 1.625000 becomes 1.62).
(e) For maximums and minimums, rounding is performed within the range of the maximum and minimum values in a way that does not violate the original limits.

Proposition de modification

N'hésitez pas à nous faire part de vos suggestions et de vos commentaires. Au moment de soumettre des propositions de modification aux normes CSA et autres publications CSA prière de fournir les renseignements demandés ci-dessous et de formuler les propositions sur une feuille volante. Il est recommandé d'inclure

- le numéro de la norme/publication
- le numéro de l'article, du tableau ou de la figure visé
- la formulation proposée
- la raison de cette modification.

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- wording of the proposed change
- rationale for the change.

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ISBN 0-7918-2983-9 (ASME)
ISBN 1-55436-875-8 (CSA)