# Draft

## Australian Standard

Public Comment is invited for:

DR AS 5215:2022, Passive Grease Arrestors

During their development process, Australian Standards are available in draft form during the public consultation period to allow any interests concerned with the application of the proposed Standard to review the draft and submit their comments.

This draft is liable to alteration. It is not to be regarded as an Australian Standard until finally issued as such by Standards Australia.

Upon successful conclusion of the Public Comment period it is proposed to publish this Standard as AS 5215:202X.

# Preface

This document was prepared by the Standards Australia Committee WS-042, Passive Grease Traps.

The objective of this document is to specify a consistent Australian approach to the design, manufacture, selection and use of passive grease arrestors.

The terms “normative” and “informative” are used in Standards to define the application of the appendices to which they apply. A “normative” appendix is an integral part of a Standard, whereas an “informative” appendix is only for information and guidance.

# Contents

NOTES

# Australian Standard®

# Passive Grease Arrestors

## Section 1 Scope and general



### 1.1 Scope

This document specifies definitions, materials of construction, principles of design, making, testing, sizing and maintenance requirements for passive grease arrestors.

This document applies to grease arrestors intended for use in the separation of —

(a) food solids;

(b) fat; and

(c) oil and grease of vegetable and animal origin from wastewater via means of gravity and buoyancy.

This document does not apply to the following:

(i) The removal of chemically or mechanically emulsified or dissolved oil and grease.

(ii) Industrial food production or processing, or domestic wastewater.

(iii) Active or mechanical grease arrestors.

(iv) The separation of petroleum hydrocarbons or oils and greases of mineral origin (e.g. fuel, oils and lubricating greases).

(v) The treatment of wastewater exclusively containing stable emulsions of greases and oils (e.g. whey or dairy).

(vi) The use of bacteria, enzymes or any other biological means as an adjunct to passive grease arrestors.

### 1.2 Application

This document is intended to provide a consistent Australian approach to the design, manufacture, selection and use of passive grease arrestors.

It is expected to be used by —

(a) manufacturers to design and demonstrate the qualities of their product;

(b) hydraulic consultants, plumbers and engineers to select and size appropriate appliances for use;

(c) owners and occupiers of premises that generate greasy wastewater to meet their responsibilities with respect to grease arrestors; and

(d) water authorities to establish clear, consistent and efficient requirements for the protection of sewerage conveyancing and wastewater treatment systems from the negative effects of fat, oil and grease (FOG), and solids accumulation.

### 1.3 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.

NOTE Documents referenced for informative purposes are listed in the Bibliography.

AS 1657, *Fixed platforms, walkways, stairways and ladders—Design, construction and installation*

AS 3996, *Access covers and grates*

AS/NZS 1546.1, *On-site domestic wastewater treatment units, Part 1: Septic tanks*

AS/NZS 2845.1, *Water supply—Backflow prevention devices, Part 1: Materials, design and performance requirements*

AS/NZS 3500.1, *Plumbing and drainage, Part 1: Water services*

AS/NZS 3500.2, *Plumbing and drainage, Part 2: Sanitary plumbing and drainage*

AS/NZS 4766, *Rotationally moulded buried, partially buried and non-buried storage tanks for water and chemicals*

AS ISO/IEC 17025, *General requirements for the competence of testing and calibration laboratories*

ISO 3506-1, *Fasteners — Mechanical properties of corrosion-resistant stainless steel fasteners — Part 1: Bolts, screws and studs with specified grades and property classes*

ASTM A240/A240M-15, *Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications*

*Standard Methods for the Examination of Water and Wastewater*, 2018, APHA (American Public Health Association), AWWA (American Water Works Association) and WEF (Water Environment Federation)

## 1.4 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

NOTE ISO and IEC maintain terminological databases for use in standardization at the following addresses:

IEC Electropedia: available at https://www.electropedia.org/

ISO Online browsing platform: available at https://www.iso.org/obp

**1.4.1**
**above-ground grease arrestor**
**above-ground arrestor**
passive grease arrestor where the body of the arrestor is not encased by any soil, bedding or backfilling material

**1.4.2**
**arrestor volume**
volume of a grease arrestor measured as the number of litres contained below the operational water level

**1.4.3**
**chamber vent**
**induct vent**
vent allowing air to enter the arrestor chamber

**1.4.4**
**coating**
**lining**
protective layer on an arrestor component

**1.4.5**
**competent person**
person who has acquired, through education, training, qualification or experience, or a combination of these, the knowledge and skill enabling that person to perform the task required

**1.4.6**
**dedicated room**
room or enclosure that isolates the grease arrestor from other activities in a building's interior

Note 1 to entry: Clause 7.1.3 outlines dedicated room requirements.

**1.4.7**
**educt vent**
vent allowing air to exit from the drain

**1.4.8**
**fat, oil and grease**
**FOG**
substances of a vegetable origin, animal origin or both, with a density less than 0.95 g/cm$^3$ which are partially or totally insoluble in water and saponifiable

**1.4.9**
**finished floor level**
**FFL**
final level or position of the finished floor, including any tiles or linings

**1.4.10**
**fittings**
small component on or attached to an arrestor, including inlets, outlets, vents, baffles and surge control devices

**1.4.11**
**fixture unit**
**FU**
dimensionless unit of measure, based on the rate of discharge, time of operation and frequency of a fixture's use, that expresses the hydraulic load imposed by that fixture on the sanitary plumbing installation

**1.4.12**
**grease arrestor**
**passive grease arrestor**
device intended to be installed in a premises' trade waste drainage system to intercept FOG and solids from wastewater discharges, using only the forces of gravity and buoyancy to achieve separation

Note 1 to entry: Passive grease arrestors are also known as gravity grease interceptors, grease separators or grease traps.

**1.4.13**
**influent**
wastewater containing grease, with the exception of wastewater containing faeces (sanitary wastewater), which enters the grease arrestor

**1.4.14**
**in-ground arrestor**
passive grease arrestor where the body of the arrestor is fully encased by soil, bedding or backfilling material

**1.4.15**
**load classification**
classification of load capacity

Note 1 to entry: Load classification is assessed in accordance with AS 3996, and applicable to access covers within this document.

**1.4.16**
**may**
indicates the existence of an option

**1.4.17**
**nominal size**
commonly available sizes in which arrestors are manufactured

Note 1 to entry: Nominal size is measured by volume in litres.

**1.4.18**
**operational depth**
depth of wastewater in the grease arrestor measured as the maximum depth of the arrestor to the operational water level

**1.4.19**
**operational water level**
design operating level of wastewater within the arrestor

**1.4.20**
**overflow relief gully**
**ORG**
relief point in the drainage system of every property that is intended to provide relief in the event of sewerage surcharge

Note 1 to entry: Specific requirements for ORGs are set out in AS/NZS 3500.2.

**1.4.21**
**qualified professional engineer**
engineer who has a relevant degree and is experienced in the design of structural products and applications utilizing polymer plastic materials and computerized finite element analysis (FEA) programs, and has Certified Practicing Engineer (CPEng) status with either the Institution of Engineers, Australia or Engineering NZ or an equivalent registration with a similarly recognized professional body

Note 1 to entry: For partially buried and buried tanks, appropriate experience in the field of geotechnical engineering is necessary, or consultation with an appropriately qualified geotechnical engineer should be undertaken.

**1.4.22**
**relevant authority**
agency authorized by legislation or regulation to issue determinations, orders, or other instructions in respect of any subject covered by this document

**1.4.23**
**retained FOG and solids**
separated FOG and solids for pump-out, treatment and disposal as part of arrestor maintenance

**1.4.24**
**riser**
**extension**
structure used to bring the access or inspection cover to the finished floor level (FFL)

**1.4.25**
**shall**
indicates that a statement is mandatory

**1.4.26**
**shared grease arrestor**
grease arrestor that is shared between two or more businesses

**1.4.27**
**should**
indicates a recommendation

**1.4.28**
**solids**
solid materials with a specific gravity of greater than 1 g/cm$^3$

**1.4.29**
**total fall**
vertical difference between the inlet and outlet inverts

**1.4.30**
**trade waste sampling point**
integrated part of the grease arrestor or form of pipework connected immediately to the outlet of the arrestor where samples can be taken of the pre-treated wastewater discharged from the arrestor

**1.4.31**
**type test**
testing performed to prove that the material or product conforms to the requirements of the relevant standard

**1.4.32**
**vent**
pipe provided to limit pressure fluctuations within the trap and encourage the passage of gasses

## 1.5 Abbreviations and acronyms

| | |
|---|---|
| APHA | American Public Health Association |
| ASCE/SEI | American Society of Civil Engineers/Structural Engineering Institute |
| ASTM | American Standard Test Method |
| AWWA | American Water and Wastewater Association |
| DN | Nominal diameter |
| FFL | Finished floor level |
| FOG | Fat, oil and grease |
| FU | Fixture unit |
| GNA | Geometric nonlinear analysis solver |
| ORG | Overflow relief gully |
| PCA | Plumbing Code of Australia |
| TOG | Total oil and grease |
| WEF | Water and Environment Fund |

## 1.6 Limitations and restrictions

The following substances shall not be discharged to a grease arrestor:

(a) Wastewater containing faeces or other sanitary waste.

(b) Any flammable or explosive solid, liquid or gaseous substance, including light liquids, solvents, fuels, or oil and greases of mineral origin.

(c) Contaminants other than solids, FOG (all of food origin) in concentrations greater than the sewer acceptance criteria of the relevant authority.

# Section 2 Requirements

## 2.1 General

Passive grease arrestors and associated fittings shall —

(a) be constructed of durable materials;

(b) be watertight;

(c) have smooth internal surfaces; and

(d) be capable of withstanding loads imposed during transport, installation, handling, maintenance and service.

## 2.2 Serviceable life

Passive grease arrestors and their associated components shall have a design serviceable life of 20 years. The design serviceable life shall be determined in accordance with finite element analysis (FEA) in accordance with Clause 2.5.1.1.

The design serviceable life of an arrestor shall account for the service environment and the decrease in physical properties of materials resulting from environmental effects including the following:

(a) Wastewater contaminants.

(b) Corrosion.

(c) Water absorption.

(d) Repeated servicing.

(e) Thermal expansion and contraction.

(f) Fatigue.

(g) Traffic loads.

(h) Degradation from ultraviolet radiation.

(i) Abrasion and wear.

## 2.3 Drawings and documentation

Drawings and supporting documentation for grease arrestors shall be sourced from the manufacturer.

The following information shall be included in drawings and documented:

(a) Materiality.

(b) Dimensions.

(c) Capacities.

(d) Other information necessary to demonstrate conformance to this document.

Supporting documentation, including structural design calculations, shall be checked by a qualified professional engineer.

## 2.4 Design requirements

### 2.4.1 General

A grease arrestor shall be designed —

(a) to separate FOG and solids from wastewater by gravity, with no mechanical or biological treatment;

(b) to allow the flow through the separator to be uniform; and

(c) with a minimum operational depth of 500 mm.

Grease arrestors should be designed to minimize risk to the health and safety of a competent person tasked with their installation and maintenance.

### 2.4.2 Other considerations

The design and intended installation arrangements of a grease arrestor shall not prevent the installation of a platform and steps in accordance with Clause 7.6.

Designs should allow for full servicing of the arrestor anticipating the potential vertical clearance limitation outlined in Clause 7.5.

### 2.4.3 Accessibility

#### 2.4.3.1 General

Grease arrestor designs shall provide access for —

(a) the complete removal of retained and residual FOG, wastewater and solids using a semi-rigid vacuum hose;

(b) cleaning;

(c) the maintenance of internal components; and

(d) the replacement of any removable internal components.

#### 2.4.3.2 Access openings

A grease arrestor's access openings shall allow for full servicing of all internal components. Access openings shall not be less than 450 mm in diameter.

#### 2.4.3.3 Access covers

##### 2.4.3.3.1 General

A finished floor level (FFL) can be of solid ground or of a mezzanine platform structure. For the purposes of this document, both are regarded as trafficable areas.

Wherever practicable, access covers should be designed to be easily removable.

##### 2.4.3.3.2 Access covers in trafficable areas

Access covers for trafficable areas shall have lifting keyholes positioned no greater than 35 mm from the edge of the access cover.

Sealed access covers and frames that conform to the marking, design, and load classification requirements of AS 3996 shall be fitted to grease arrestors located in trafficable areas.

#### 2.4.3.3.3 *Access covers in non-trafficable areas*

Non-trafficable access covers shall be fitted onto above-ground grease arrestors.

Non-trafficable access covers fitted onto above-ground grease arrestors shall —

(a) conform to AS 3996:2019 Clause 3.2.2.4;

(b) be gas strut hinged, threaded or clamped into a fixed position; and

(c) not be fixed into position with screws or bolts.

#### 2.4.3.3.4 Watertight access covers

Watertight access covers that have been tested in accordance with AS 3996:2019 Appendix E requirements shall be fitted to grease arrestors.

### 2.4.4 Watertightness

Grease arrestors shall be watertight and tested in accordance with —

(a) AS/NZS 1546.1:2008 Appendix G; or

(b) AS 4766:2020 Appendix D.

### 2.4.5 Venting

#### 2.4.5.1 General

Grease arrestor installations shall be vented to atmosphere.

Plumbing and termination of vents connected to a grease arrestor shall be in accordance with AS/NZS 3500.2.

#### 2.4.5.2 Design requirements

Arrestor vents shall be minimum DN100. Connections shall be compatible with Australian Standard certified pipe fittings.

Vent connection provisions should be fitted by the manufacturer.

The invert of the induct vent shall be —

(a) installed a minimum 70 mm above the grease arrestor operating level and allow for minimum cover in accordance with AS/NZS 3500.2; and

(b) located in the wall of the outlet end of the grease arrestor.

Vent connections that have alternatively been installed on either side wall of the arrestor shall be as close as practicable to the arrestor's outlet end wall.

Partitions shall not impede ventilation.

NOTE See Clause 7.7.4 for details on venting installation.

### 2.4.6 Air space

Grease arrestor bodies shall have at least 10 % clear air volume above the operational water level, excluding risers.

### 2.4.7 Inlet and outlet design

#### 2.4.7.1 Sizing and connections

Grease arrestor inlets and outlets shall —

(a) be the same size and DN100 minimum;

(b) have connections compatible with Australian Standard certified pipe fittings; and

(c) be located at opposite ends of the grease arrestor.

#### 2.4.7.2 Total fall through arrestor

Total fall through the grease arrestor shall be a minimum of 70 mm. The fall shall prevent back-up of wastewater into the upstream drainage at the arrestor's nominal peak flow rate.

#### 2.4.7.3 Baffles and partitions

Baffles and partitions shall extend 150 mm above and at least 150 mm below the operational water level of the grease arrestor.

### 2.4.8 Risers

Risers shall only be fitted to grease arrestors that have been designed and tested in accordance with Clause 2.5.3.

Risers fitted to grease arrestors shall be —

(a) equivalent to the grease arrestor in —

  (i) design;

  (ii) manufacture; and

  (iii) structural integrity.

(b) watertight in accordance with AS/NZS 1546.1:2008 Clause 2.4.8 and 2.4.9; and

(c) fitted and made tight against ingress in accordance with manufacturer instructions.

NOTE Product specifications sourced from the manufacturer may provide specific instructions regarding the installation of risers.

Risers shall not exceed the maximum depth outlined in Clause 7.3.

### 2.4.9 Oil and grease storage capacity

Passive grease arrestors shall have an oil and grease storage capacity of at least 15 % of its operating volume.

### 2.4.10 Solids storage capacity

Passive grease arrestors shall have a solids storage capacity of at least 15 % of its operating volume.

## 2.5 Structural design

### 2.5.1 In-ground grease arrestors

#### 2.5.1.1 General

The structural integrity of an in-ground grease arrestor shall be designed by a qualified professional engineer using FEA and take into account —

(a) structural integrity during handling, transport and installation;

(b) hydrostatic uplift;

(c) lateral loads, inclusive of any risers; and

(d) top loads.

All analysis conducted shall be undertaken using a geometric nonlinear analysis solver (GNA).

The structural analysis of all types of in-ground grease arrestors shall be conducted using the septic tank load case combinations in accordance with AS/NZS 4766:2020 Clause 5.2.4.

#### 2.5.1.2 Acceptance limits

Acceptance limits of rotomolded plastics for strength and deflection shall be in accordance with AS/NZS 4766.

For acceptance limits of other materials, material testing shall be carried out, with relevant design factors used.

#### 2.5.1.3 Technical documentation

The maximum installation depth a grease arrestor has been designed and tested for shall be stated in supporting technical documentation.

NOTE This may be provided by the manufacturer of a grease arrestor in their product specifications.

### 2.5.2 Above-ground grease arrestors

#### 2.5.2.1 General

The structural integrity of an above-ground grease arrestor shall be designed by a qualified professional engineer using FEA and take into account the following:

(a) Integrity during handling, transport and installation.

(b) Hydrostatic pressure from the stored liquid.

(c) Environmental loads such as —

  (i) wind loads in accordance with AS/NZS 1170.2;

  (ii) snow loads in accordance with AS/NZS 1170.3; and

  (iii) earthquake loads in accordance with ASCE/SEI 7-1 and AS/NZS 1170.4.

All analysis conducted shall be undertaken using a GNA.

The structural analysis of all types of above-ground grease arrestors shall be conducted using the load case combinations in accordance with AS/NZS 4766:2020 Clause 4.4.

#### 2.5.2.2 Acceptance limits

Acceptance limits of rotomolded plastics for strength and deflection shall be in accordance with AS/NZS 4766.

For acceptance limits of other materials, material testing shall be carried out, with relevant design factors used.

### 2.5.3 Grease arrestors with a riser

The design, manufacture and structural integrity of a grease arrestor fitted with a riser shall be tested at the maximum depth the riser adds, in accordance with —

(a) AS/NZS 1546.1:2008 Appendix G; or

(b) AS/NZS 4766:2020 Appendix D.

# Section 3 Materials and manufacture

## 3.1 Materials

Grease arrestors and associated components shall be made of materials that conform to the material requirements of AS/NZS 1546.1. This includes some or all of the following:

(a) Unreinforced concrete.

(b) Fibre or steel reinforced concrete.

(c) Glass fibre reinforced plastic.

(d) Plastic.

(e) Polymeric materials.

(f) Stainless steel.

NOTE This document does not prevent the use of other materials, methods of design or construction not specifically referred to, provided the requirements and intentions of this document are met.

Materials that are fit for use shall be able to withstand, but are not limited to —

(i) the physical and chemical characteristics of the wastewater to be treated;

(ii) the temperature of the influent wastewater;

(iii) resistance to ambient temperature range of 0 to 50 °C; and

(iv) the possibility of chemical attach from acidic soils.

## 3.2 Coatings and linings

### 3.2.1 General

Coatings and linings may be applied on all surfaces of a grease arrestor as an added protective barrier against influent and ground conditions.

Considerations when choosing a coating or lining that is to be applied to a grease arrestor shall include, but is not limited to the following:

(a) The suitability and durability of the lining adhesive or coating adhesive specific to grease arrestor applications.

(b) The application methods for the coating or lining.

(c) If damaged, whether the coating or lining can be repaired without any adverse effects to the structural integrity and functionality of the grease arrestor.

### 3.2.2 Technical documentation

Technical documentation containing the following information shall be sourced from the supplier of the coating or lining:

(a) The adhesive and durability characteristics of the coatings or lining when used in specified applications.

(b) The correct method of application of the material supplied.

(c) The possibility means and limitations of a repair to the coating.

#### 3.2.3 Application and curing

Coatings and linings shall be applied by a competent person in accordance with the product application and curing specifications.

### 3.3 Fasteners

Fasteners used to manufacture and assemble a grease arrestor shall be made of —

(a) grade 316 stainless steel in accordance with ISO 3506-1; or

(b) a durable material of an equivalent grade that is resistant to the service environment.

Inaccessible fasteners that are irreplaceable shall be effective for the serviceable life of the arrestor.

### 3.4 Manufacture

The processes involved in the manufacture or construction of grease arrestors shall conform to the requirements outlined in AS/NZS 1546.1.

### 3.5 Testing

Material tests, type testing and batch release testing shall be carried out in accordance with the relevant Standards referred to in this document.

The following shall be in tested in accordance with AS/NZS 1546.1:

(a) Unreinforced concrete.

(b) Fibre or steel reinforced concrete.

(c) Glass fibre reinforced plastic.

(d) Non-rotomoulded plastic.

(e) Non-rotomoulded polymeric materials.

Rotomoulded plastic and polymeric materials shall be tested in accordance with AS/NZS 4766.

Stainless steel sheet shall not be less than 2 mm thick and grade 304 conforming to ASTM A240/A240M-15.

# Section 4 Functional performance

## 4.1 General

Grease arrestors shall meet the performance criteria related to —

(a) hydraulic retention time (see Clause 4.2); and

(b) operational solids and TOG discharge concentrations (see Clause 8.1).

The performance requirements for passive grease arrestors shall be consistent with the sizing methodology outlined in Clause 6.3.3.

## 4.2 Performance — Hydraulic retention time

### 4.2.1 Requirement

An arrestor shall achieve a hydraulic retention time of ≥ 20 min at its nominal peak flow rate (L/s).

### 4.2.2 Deemed peak flow rate

The hydraulic retention time of a grease arrestor designed, manufactured, installed and maintained in accordance with this document, is deemed to be:

$$\text{Nominal peak flow rate (L/s)} = \frac{\text{Arrestor volume (L)}}{\text{Hydraulic retention time (s)}}$$

where:

Hydraulic retention time(s) = 1 200 s

EXAMPLE An arrestor has an operation volume of 3 000 L.

$$\text{Arrestor peak flow rate (s)} = \frac{3000\text{L}}{1200\text{s}} = 2.5\text{L/s}$$

Nominal peak flow rate for this arrestor (consistent with the methodology in Section 6 is 2.5 L/s.

# Section 5 Marking

## 5.1 Conformance plate

### 5.1.1 General

Once fully installed, grease arrestors shall be affixed with a conformance plate located on the highest part of the arrestor body and visible to service personnel.

For installations incorporating a riser, the conformance plate or a copy of the conformance plate should be installed where visible to service personnel.

### 5.1.2 Information on plate

The conformance plate shall have the following information, marked clearly and permanently:

(a) AS 5215.

(b) Manufacturer's name or trademark.

(c) Part or model number.

(d) Arrestor volume in litres.

(e) Maximum grease storage depth in mm.

(f) Maximum solids storage depth in mm.

(g) Month and year of manufacture.

EXAMPLE Sample marking for a grease arrestor conforming to AS 5215.

**AS 5215, *Passive grease arrestors***

Manufacturer's name and trademark

| | |
|---|---|
| Model/Part No.: | Number |
| Arrestor volume: | L |
| Maximum grease storage depth: | mm |
| Maximum storage depth: | mm |
| Month of manufacture: | 06/21 |

## 5.2 Markings on body of arrestor

The following shall be clearly marked on the body of the grease arrestor:

(a) Model number or product identifier.

(b) Dry weight in kg.

(c) Lifting points.

(d) Any special instructions.

(e) Inlet.

(f) Outlet.

(g) Vent.

### 5.3 Marking on covers

Covers of in-ground arrestors shall be clearly and permanently marked “grease arrestor” or similar (e.g. grease trap, grease separator).

# Section 6 Sizing and selection

## 6.1 General

The size of a grease arrestor shall be determined via the following:

(a) The flow characteristics of the wastewater to be pre-treated.

(b) The grease arrestor is able to achieve a minimum hydraulic retention time of 20 min at peak flow in accordance with Clause 4.2.2.

NOTE This approximates to an average peak hourly flow of 60 min, reflecting general Australian practice.

## 6.2 Sizing flow rate

Sizing flow rates shall be determined by —

(a) the fixture unit-based method in Appendix A; or

(b) on direct or indirect metering by a relevant authority.

NOTE In many cases, the size of a grease arrestor needs to be estimated before fixtures and the flow characteristics at a premise can be measured. Hence, a method of estimation is needed. Where direct or indirect metering is used to determine true flow characteristics, a relevant authority may use the metering data to size an arrestor in accordance with this document.

## 6.3 Sizing arrestors

### 6.3.1 General

The sizing methodology outlined in Appendix A is applicable to wastewater arising from food service businesses and smaller food manufacturers.

Where the wastewater to be pre-treated arises from other business types, or is known to contain unusually high levels of TOG, a competent person able to select an appropriately sized grease arrestor should —

(a) characterize the source wastewater contaminants; and

(b) consider increasing the frequency of servicing (see Clause 8.2.1.3).

Where discharge flow rates require an arrestor larger than 5 000 L (with a peak flow rate greater than 4.2 L/s), active pre-treatment devices should be considered as an alternative.

### 6.3.2 Nominal size of arrestor

The size of a grease arrestor shall be referenced by its operational volume, measured in litres.

### 6.3.3 Sizing methodology

#### 6.3.3.1 General

Grease arrestors shall be sized in accordance with the sizing methodology set out in Appendix A.

#### 6.3.3.2 Sizing where fixtures are unknown

Grease arrestors installed before fixtures can be determined shall be sized to match the maximum fixture unit capacity of the inlet drainage, calculated in accordance with AS/NZS 3500.2, taking into account the inlet drainage diameter and fall.

NOTE Typical Australian arrestors have a drainage diameter of 100 mm and a fall of 1:60, indicating a maximum drainage flow rate of 165 FU.

#### 6.3.3.3 Shared grease arrestors

The size of shared grease arrestors shall be determined in accordance with Appendix A and take into account all connected fixtures.

# Section 7 Installation

## 7.1 Location of grease arrestors

### 7.1.1 General

Grease arrestors shall be located —

(a) close to the source of wastewater;

(b) in the open wherever practical; or

(c) in an internal location that conforms to Clause 7.1.3.

All grease arrestor locations shall provide unobstructed access for service and maintenance personnel and equipment, including waste transportation vehicles.

Grease arrestors shall not be located —

(i) in unventilated rooms;

(ii) in areas and locations that obstruct access to the grease arrestor trade waste sampling point; and

(iii) in areas or rooms dedicated to the storage, preparation or consumption of food.

Grease arrestors should not be situated near habitable buildings, operable windows and air intake vents. They should also not be situated on roads, in active car parking bays or in gardens.

### 7.1.2 External locations

Grease arrestors in external locations shall be installed in areas that —

(a) are free from obstruction to maintenance and monitoring;

(b) do not obstruct fire access; and

(c) do not create potential trip hazards.

Grease arrestors and associated sampling points should be installed in an area secure from vandalism, damage by vehicular traffic and an ingress of rainwater.

### 7.1.3 Internal locations

#### 7.1.3.1 General

Arrestors in internal locations shall be installed in ventilated areas

Where arrestors are located internally in a ventilated room, the room shall be atmospherically separated from the rest of the building. The room shall be ventilated to open air above the roof level by means of either —

(a) mechanical ventilation; or

(b) two vent pipes no less than DN 100 located as far as practical diagonally opposite each other — one at high level and one at low level.

#### 7.1.3.2 Floor drains in internal locations

Where floor wastes are necessary, the floor wastes shall drain to the grease arrestor.

NOTE This applies to in-ground and above-ground grease arrestor installations.

#### 7.1.3.3 Spill containment

Above-ground grease arrestors shall be installed with provisions to contain a spill from the arrestor equivalent to the arrestor volume.

### 7.1.4 Hose tap and backflow prevention device

A hose tap fitted with a backflow prevention device shall be provided within 5 m of a grease arrestor.

The backflow prevention device fitted to the hose tap shall —

(a) be selected in accordance with AS/NZS 3500.1; and

(b) conform to AS/NZS 2845.1.

## 7.2 Surface under or adjacent to arrestor

### 7.2.1 Structural integrity

The surface floor supporting a grease arrestor shall —

(a) ensure the arrestor is supported at the correct operational level;

(b) be capable of supporting the weight of the arrestor when in service; and

(c) be designed for a service life equivalent to that of the arrestor.

The surface adjacent to all covers of in-ground grease arrestors shall be —

(i) of concrete or other durable pavement sufficiently hard to allow effective use of hydraulic or manual lid opening equipment;

(ii) no less than twice the largest dimension of the installed cover, measured along the length of the arrestor;

(iii) finished to the top of the cover to allow safe opening of covers; and

(iv) designed for a service life equivalent to that of the arrestor.

NOTE Examples of (i), (ii), and (iii) are provided in Figure 1, 2 and 3.

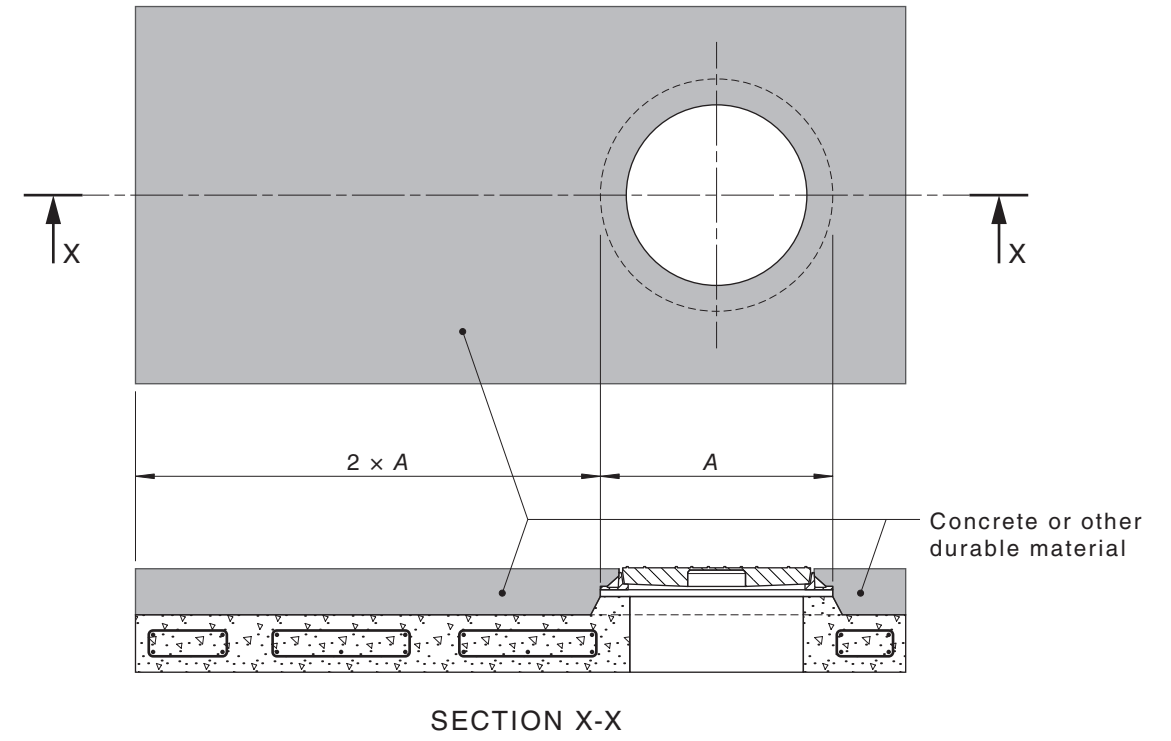


**Figure 1 — Example 1 — Surface adjacent to in-ground arrestor covers**

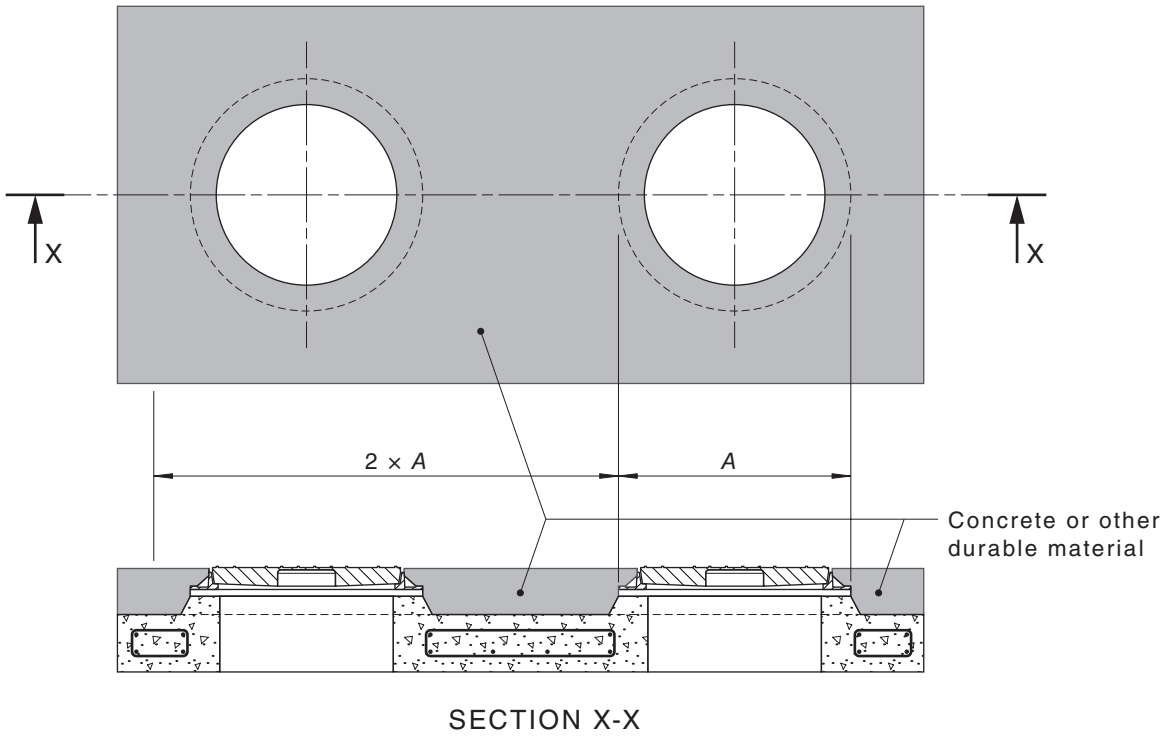


**Figure 2 — Example 2 — Surface adjacent to in-ground arrestor covers**

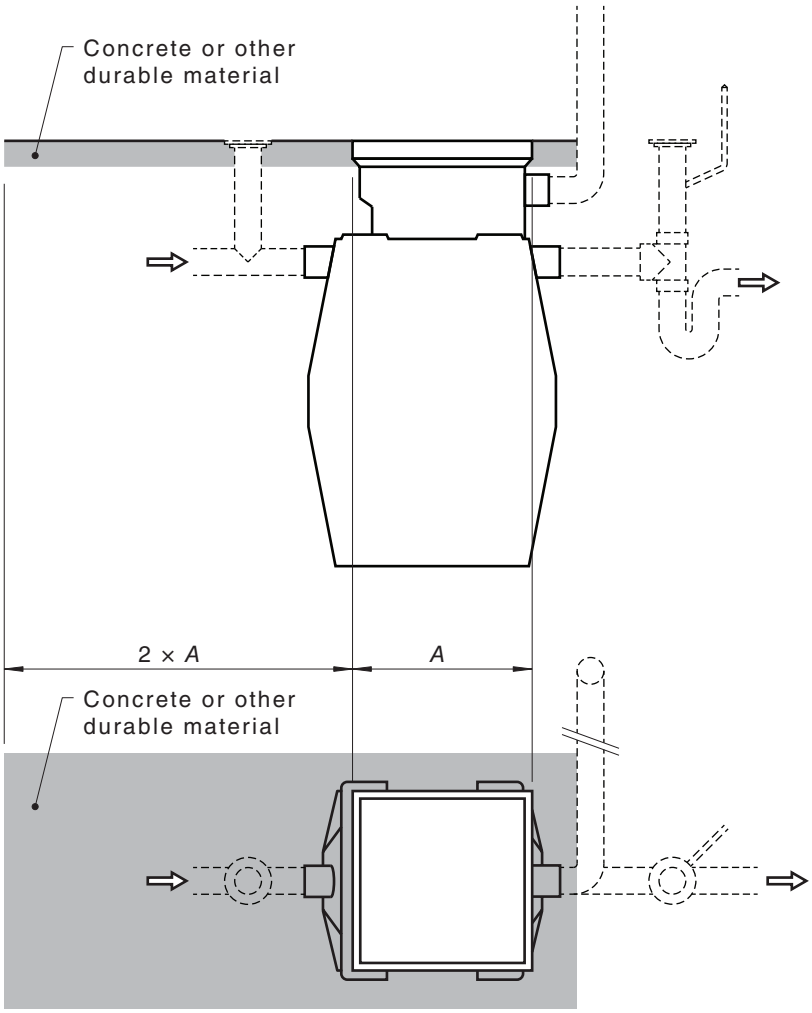


**Figure 3 — Example 3 — Surface adjacent to in-ground arrestor covers**

## 7.3 Installation depth

The installed depth of an arrestor inclusive of riser shall be a maximum of 3 m.

NOTE Installed depth is measured from the deepest part of the arrestor chamber to the FFL.

## 7.4 Product and installation information

Grease arrestors shall be supplied with the following product information and installation instructions:

(a) That the grease arrestor be installed in accordance with this document.

(b) The weight of the arrestor when empty and at operational water level.

(c) The method of safe handing, transport, and lifting — including description of safe lifting points.

(d) The maximum depth of cover for which the arrestor is designed.

(e) The method for fitting components such as inlets, outlets, filters vents, lids and baffles.

(f) The choice of material and method of backfilling.

(g) The maintenance and cleanout instructions.

(h) The health and safety information.

## 7.5 Minimum vertical clearance

The minimum vertical clearance above the top access cover of an installed grease arrestor shall be —

(a) a minimum of 1 m for above-ground installations; and

(b) equal to the depth of the grease arrestor, and not less than 1 m for in-ground installations.

NOTE All installations should provide vertical clearance equal to the depth of the arrestor where possible.

## 7.6 Platforms and steps

All above-ground grease arrestor installations higher than 1.2 m, shall be installed with an access that is in accordance with AS 1657.

NOTE Arrestor height is measured from floor level to the top of the arrestor's access cover.

## 7.7 Plumbing requirements

### 7.7.1 General

All plumbing work associated with the installation of grease arrestors shall be in accordance with AS/NZS 3500.1 and AS/NZS 3500.2.

NOTE The Plumbing Code of Australia specifies requirements for plumbing work relevant to the installation of grease arrestors.

Plumbing materials shall be compatible with wastewater arising from food service and food manufacturing businesses, including the potential for low pH, elevated temperature, corrosive contaminants, solids and FOG.

### 7.7.2 Connections to and from an arrestor

Drainage upstream of the separator should be laid at a minimum gradient of 1:60 to prevent an accumulation of grease.

NOTE In circumstances where the distance between the source fixtures and the arrestor exceeds 10 m, or is exposed to low temperatures, the use of insulation, lagging, heat traces or a hot flush system should be considered to minimize FOG accumulation in the upstream drainage.

The connected plumbing shall not rely on the grease arrestor for structural support.

### 7.7.3 Pumped flow to an arrestor

Where wastewater is pumped to a grease arrestor, the drainage shall be gravity fed for at least 1 m at a grade not greater than 1:60 before entering the arrestor.

The volumetric flow rate of the pump shall not exceed the nominal peak flow rate of the arrestor.

### 7.7.4 Installation of venting

#### 7.7.4.1 General

All grease arrestor installations shall have two DN100 vents open to the atmosphere for cross ventilation, including —

(a) an induct vent directly connected to the grease arrestor chamber; and

(b) an educt vent installed at the end of the drainage line connected to the grease arrestor.

Vent pipes shall be of high-level type.

An induct vent may be of the low-level type if it conforms to AS/NZS 3500.

#### 7.7.4.2 Requirements

When installed, plumbing and termination vents connected to the arrestor shall be in accordance with AS/NZS 3500.2. That includes meeting the following conditions:

(a) Induct and upstream vents shall not be interconnected.

(b) Air admittance valves shall not be used to vent grease arrestors

NOTE Air admittance valves on branch lines draining to grease arrestors are permitted if installed in accordance with AS/NZS 3500.2.

(c) Vents from arrestor chambers shall not be interconnected to another venting system such as relief, cross, stack or drainage vents.

Vents serving the same application may combine with each other.

Vents from grease arrestors may interconnect into other grease arrestor vents, or be extended independently or to atmosphere.

Chamber induct vents may be combined above the overflow levels of the highest fixture connected to the grease arrestor.

#### 7.7.4.3 Arrestors located in dedicated rooms

All vent pipes connected to a room dedicated to a grease arrestor installation shall be separate and distinct from other vents installed in connection with any sewerage.

### 7.7.5 Reflux valves

A reflux valve should be installed on the drainage if the difference in levels between the surface of the arrestor and the top of the overflow relief gully (ORG) is less than 150 mm (see Figure 4).

Where a reflux valve is installed on the outlet of an arrestor, it shall be located as far away as practicable from the outlet.

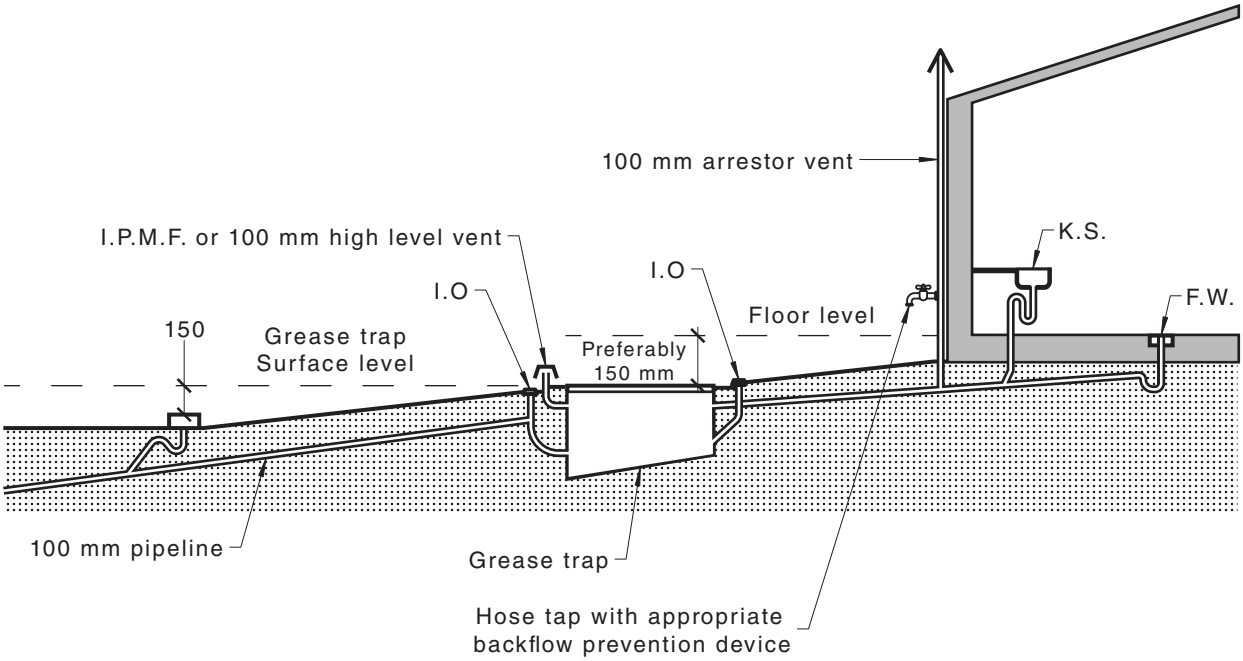


**Figure 4 — Preferred drainage layout for a grease arrestor installation**

### 7.7.6 Fixed suction lines

Fixed suction lines shall terminate with a —

(a) camlock fitting not greater than 80 mm;

(b) ball valve adjacent to the grease arrestor; and

(c) where the waste transporter locates their vehicle.

Fixed suction lines shall not connect into a grease arrestor.

NOTE The entire suction line can be less than the diameter of the camlock fitting if, upon consideration by a competent person, an advantage can be gained from a reduced suction line diameter.

### 7.7.7 Trade waste sampling point

All grease arrestors shall be installed with room for a trade waste sampling point (TWSP).

The design of the TWSP shall be the responsibility of a relevant authority.

Urban water utilities may require a TWSP of a specified design.

# Section 8 Operational performance and maintenance

## 8.1 Operational performance — Oil and grease discharge

### 8.1.1 General

When sampled and tested in accordance with the methods outlined in Clause 4.2, a grease arrestor operating within the scope of this document shall achieve the following:

(a) For non-emulsified total oil and grease — an operational (*in situ*) discharge concentration not greater than 200 mg/L.

(b) For suspended solids — an operational (*in situ*) discharge concentration not greater than 600 mg/L.

### 8.1.2 Conformance sampling

Grease arrestor discharge samples (grab or composite) shall be collected from the TWSP in accordance with AS 5667.1 and AS 5667.10.

NOTE Due to the variety and constraints of TWSPs, this document does not provide prescriptive sampling procedures. A relevant authority should take steps to ensure sampling arrangements conform to this document to provide a representative discharge sample.

### 8.1.3 Conformance testing

To conform to Clause 8.1.1, discharge contaminant concentrations rates shall be determined from a representative grab or composite samples taken from the TWSP and analysed by a laboratory using the following test methods:

(a) Method 5520 (Oil and Grease) from *Standard Methods for the Examination of Water and Wastewater (APHA, AWWA, WEF)*, 2018.

(b) Method 2540 D (Total Suspended Solids) from *Standard Methods for the Examination of Water and Wastewater (APHA, AWWA, WEF)*, 2018.

Laboratories that perform the test outlined in this document shall meet the requirements of AS ISO/IEC 17025.

NOTE Failure of *in situ* conformance tests may result from poor housekeeping, overloading of the arrestor, inadequate servicing, component failure, poor installation or arrestor design. A relevant authority may carry out an investigation to determine the cause of any non-conformance with this document.

## 8.2 Servicing

### 8.2.1 General

#### 8.2.1.1 Avoidance of overloading

Grease arrestors shall be serviced to ensure the aggregate volume of FOG and solids do not exceed the maximum containment capacity of the grease arrestor.

#### 8.2.1.2 Servicing frequency

Grease arrestors should be serviced by the complete evacuation method at least once every 13 weeks.

A relevant authority may approve a decrease in service frequency if monitoring indicates that FOG and solids levels consistently conform to Clause 8.2.1.1 at the time of servicing.

Once an optimal servicing frequency has been determined, regular servicing at that interval shall be carried out to maintain the removal efficiency of the grease arrestor.

#### 8.2.1.3 Servicing frequency for undersized grease arrestors

The sizing methodology outlined in Clause 6.3.3 shall be used to determine whether an installed and functioning grease arrestor is undersized.

An undersized grease arrestor currently in service may still be used by proportionately increasing the servicing frequency in accordance with Table 1.

**Table 1 — Service frequency for undersized grease arrestors**

| Installed arrestor capacity as % of required arrestor capacity | Service frequency (weeks) |
|---|---|
| 50 to 60 % | 4 |
| > 60 to 70 % | 6 |
| > 70 % and < 100 % | 8 |
| Outside of the ranges above | Arrestor to be replaced with an appropriately sized arrestor in accordance with Clause 6.3.3. |

EXAMPLE Determining required service frequency for an undersized grease arrestor.

Using the sizing method outlined in Clause 6.3.3, a food service business with an installed 2 000 L grease arrestor is shown to require a 3 000 L arrestor. Therefore, the installed grease arrestor is deemed to be undersized.

The following steps can determine service frequency for the undersized grease arrestor:

(a) Calculate the installed arrestor capacity as a percentage of the required capacity using the following equation:

$$\text{Installed arrestor capacity as \% of required capacity} = \left(\frac{a}{b}\right)\times 100$$

$$= \left(\frac{2000}{3000}\right)\times 100$$

$$= 67\ \%$$

where:

$a$ = the installed arrestor capacity

$b$ = the required arrestor capacity

(b) Determine servicing frequency by referring to Table A.2.

By reference to Table 1, the grease arrestor needs to be serviced every six weeks.

## 8.3 Maintenance procedure

### 8.3.1 General

The servicing of a grease arrestor shall involve the following:

(a) Removal of all arrested substances.

(b) Internal cleaning of the arrestor chamber.

(c) Removal of the cleaning water.

(d) Inspection of arrestor components.

Grease arrestors shall be serviced regularly to ensure proper function (see Clauses 8.2.1.2 and 8.2.1.3).

### 8.3.2 Inspection

During each service, grease arrestors shall be visually inspected while empty to check the inlet, outlet, and vent ports are clean and clear of obstructions.

Internal components and fittings (e.g. baffles and seals) shall also be inspected to check their structural integrity.

Damaged components shall be replaced or reported to a relevant authority so that the grease arrestor continues to perform.

### 8.3.3 Post-servicing

Upon completion of servicing —

(a) any seals shall be properly reinstalled; and

(b) access covers shall be securely reinstated.

### 8.3.4 Disposal of regulated wastes

Retained FOG and solids removed from a grease arrestor shall be disposed of in accordance with regulated trackable waste rules and regulations as set by a relevant authority.

Retained FOG and solids shall not be discharged into the sewerage system, stormwater system, waterways or other unauthorized places.

# Appendix A
(normative)

# Passive grease arrestor sizing methodology



## A.1 Scope

This appendix outlines the fixture unit-based sizing methodology for estimating the required size of grease arrestors needed for installation.

## A.2 Principle

The methodology is based on the fixture unit ratings and corresponding peak flow rates outlined in AS 3500.2. It is reliant on assigning fixture unit ratings to all fixtures that drain to the grease arrestor.

In some instances it may not be possible to assign a fixture unit rating to a certain fixture. If that is the case, the methodology allows for the manufacturer's specified peak flow rate for a fixture to be used to determine the additional arrestor volume required.

If a specified peak flow rate cannot be determined or cannot be sourced from the manufacturer, the default peak flow rates provided in Table A.2 may be used to calculate the additional arrestor volume required.

## A.3 Method

The fixture unit-based sizing method shall be as follows:

(a) Identify all fixture units that drain to the grease arrestor.

(b) Assign a fixture unit rating to each fixture unit listed in AS/NZS 3500.2:2021 Table 6.3(A) and calculate the sum of the fixture unit ratings.

(c) Convert the sum of the fixture unit ratings into a peak flow rate using Figure A.1 or Figure A.2.

(d) For each fixture unit that cannot be assigned a fixture unit rating, identify the specified peak flow rate for the fixture and calculate, in litres, the amount of water the fixture will use for a period of 20 min (see example).

NOTE 1 If no peak water use rate is specified by the manufacturer, the default peak flow rates for fixtures provided in Table A.2 of this appendix may be used.

NOTE 2 It should be determined whether the specified peak water use rate is continuous or intermittent (see example).

(e) Calculate the grease arrestor volume required using the following:

$$\text{Arrestor volume required (L)} = \left(a \times 1200\right) + b$$

where:

$a$ = sum of fixture unit ratings converted into a peak flow rate, expressed in litres per second.

$b$ = the water use of unlisted fixture units for a period of 20 min, expressed in litres.

1 200 = 20 min, expressed in seconds.

(f) Select an arrestor with the required arrestor volume. Where the calculated arrestor volume is between nominal sizes, the larger size shall be selected.

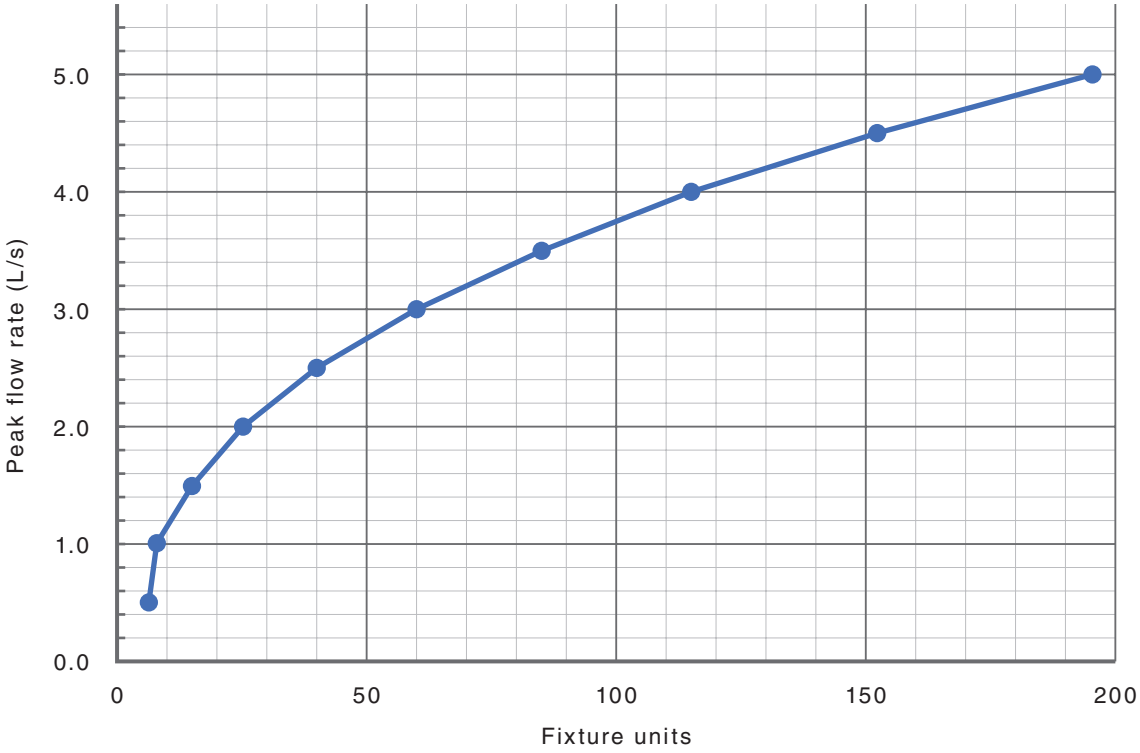


**Figure A.1 — Peak flow (L/s) versus fixture units**

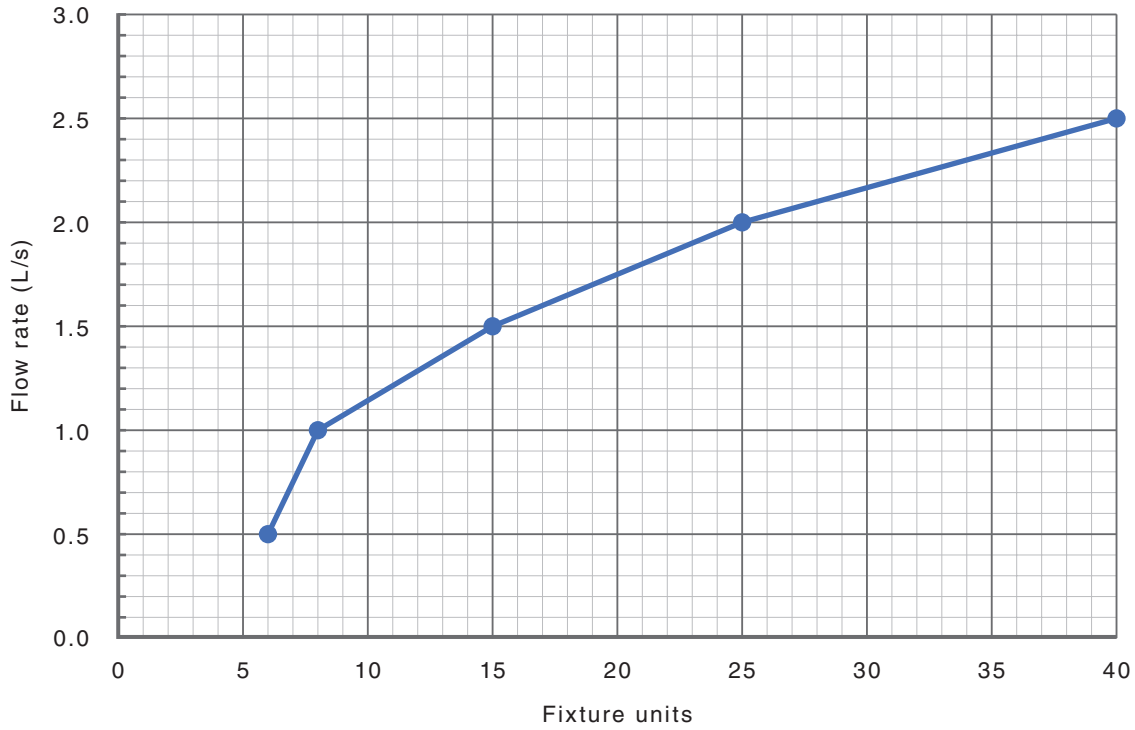


**Figure A.2 — Flow (L/s) versus fixture units — Expanded view (0-40 FU)**

EXAMPLE A grease arrestor can be sized as follows:

(i) Identify all fixture units that drain to the grease arrestor.

A food service business proposes to connect to the following fixtures to their grease arrestor:

(A) 1 hand basin.

(B) 2 double sinks.

(C) 1 cleaner's sink.

(D) 1 bain-marie.

(E) 1 tunnel dishwasher.

(F) 4 floor drains.

(ii) Assign a fixture unit rating to each fixture unit outlined in AS/NZS 3500.2:2021 Table 6.3(A) and calculate the sum of the fixture unit ratings (see Table A.1).

**Table A.1 — Example of table for calculating sum of fixture units**

| Identified fixture units | Listed FUs[a] | No. of fixtures | Equivalent FUs[b] |
|---|---|---|---|
| Basin | 1 | 1 | 1 |
| Double sink | 3 | 2 | 6 |
| Cleaner's sink | 1 | 1 | 1 |
| Bain-marie | 1 | 1 | 1 |
| Floor drains[c] | 0 | 4 | 0 |
| Tunnel dishwashing machine | Not listed in AS 3500.2:2021 Table 6.3(A) | 1 | N/A (see next step) |

| Identified fixture units | Listed FUs[a] | No. of fixtures | Equivalent FUs[b] |
|---|---|---|---|
| **Sum of the fixture unit ratings** | | | 9 |

[a] Listed in AS 3500.2:2021 Table 6.3(A)

[b] Use unit values only

[c] For floor drains, use only the fixtures connected in accordance with AS/NZS 3500.2

(iii) Convert the sum of the fixture unit ratings to a peak flow rate using Figure A.1 or Figure A.2.

Using Figure A.2, 9 FU = 1.1 L/s.

For each fixture unit that cannot be assigned a fixture unit rating —

(1) identify the specified peak water use for the fixture; and

(2) calculate the peak water use of the fixture unit for a period of 20 min.

The tunnel dishwasher machine is unlisted in AS/NZS 3500. Therefore, identify the specified peak water use for the fixture and calculate the peak water use of the fixture unit for a period of 20 min.

| Identified fixture units with no fixture unit ratings | Listed FUs | No. of fixtures | Peak water use in L/s[a] |
|---|---|---|---|
| Tunnel dishwashing machine | Not listed in Table 6.3(A) of AS 3500.2:2021 | 1 | 0.08 L/s |

[a] As sourced from and specified by the manufacturer or using Table A.2.

20 min at 0.08 L/s continuous = 0.08 L/s × 1 200 s = 96 L.

(iv) Calculate the required arrestor volume.

Arrestor volume required = (1.1 L/s × 1 200 s) + 96 L = 1 416 L

(v) Select an arrestor with the required arrestor volume. Where the calculated arrestor volume is in between nominal sizes, select the larger size.

The required arrestor volume, as determined in item (iv) is 1 416 L. As the required volume is in between nominal sizes, select the next largest nominal volume, which would be 1 500 L.

Size of the arrestor needed is 1 500 L.

**Table A.2 — Default unlisted fixture flow rates**

| Fixture type | Abbreviation | Water use (L/hour) | Water use (L/s) | Water use (L/20 min)[a] |
|---|---|---|---|---|
| Combination oven | | 150 | 0.042 | 50 |
| Dishwashing machine (commercial) | DWM | | | |
| Undercounter type | | 80 | 0.022 | 30 |
| Stationary door or hood type | | 260 | 0.072 | 90 |
| Conveyor — Rack or flight type | | 490 | 0.136 | 160 |
| Glass-washing machine (commercial) | GWM | 110 | 0.031 | 40 |
| Wok burner | | | | |
| Traditional (per burner) | | 200 | 0.055 | 70 |
| Waterless (per burner) | | 20 | 0.006 | 10 |

[a] Use rounded numbers in this column

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