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Passive grease arrestors



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- Association of Rotational Moulders Australasia
- Australian Building Codes Board
- Australian Local Government Association
- Australian Wastewater Treatment Association
- Better Regulation Division (Fair Trading, Safework NSW, Testsafe)
- Consult Australia
- Hydraulic Consultants Association Australasia
- Master Plumbers Association of NSW
- Master Plumbers Australia and New Zealand
- Plumbing Products Industry Group
- TAFE NSW
- University of Technology Sydney
- Water Services Association of Australia

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Passive grease arrestors

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Preface

This Interim Standard was prepared by the Standards Australia Committee WS-042, Passive Grease Arrestors.

This Interim Standard will have a currency of two years from its date of publication. At the conclusion of that period it will be superseded by another document, confirmed as an interim Standard in its present form for a further two year period or withdrawn.

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.

Standards Australia welcomes comments on this Interim Standard. Please contact Standards Australia at success@standards.org.au for a copy of the commenting template and return the completed form to the same email address. Standards Australia Committee WS-042 will review comments received.

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Passive grease arrestors

Section 1 Scope and general

1.1 Scope

This document specifies definitions, materials of construction, principles of design, marking, 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) settleable solids; and
- (c) fat, oil and grease of plant and animal origin from wastewater via means of gravity and buoyancy.

This document does not apply to the following:

- (i) Domestic wastewater.
- (ii) Active or mechanical grease arrestors.
- (iii) The removal of chemically or mechanically emulsified or dissolved oil and grease.
- (iv) Industrial food production or processing (except at the discretion of a relevant authority).
- (v) The separation of petroleum hydrocarbons or oils and greases of mineral origin (e.g. fuel, oils and lubricating greases).
- (vi) The treatment of wastewater exclusively containing stable emulsions of greases and oils (e.g. whey or dairy).
- (vii) 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 grease arrestors for use;
- (c) owners and occupiers of premises that generate greasy wastewater to meet their responsibilities with respect to grease arrestors; and
- (d) relevant authorities to establish clear, consistent and efficient requirements for the protection of sewerage conveyancing systems and sewerage 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 1170.2, *Structural design actions, Part 2: Wind actions*

AS/NZS 1170.3, *Structural design actions, Part 3: Snow and ice actions*

AS/NZS 1170.4, *Structural design actions, Part 4: Earthquake actions*

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 4766:2020, *Rotationally moulded buried, partially buried and non-buried storage tanks for water and chemicals*

AS/NZS 5667.1, *Water quality—Sampling, Part 1: Guidance on the design of sampling programs, sampling techniques and the preservation and handling of samples*

AS/NZS 5667.10, *Water quality—Sampling Part 10: Guidance on sampling of waste waters*

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*

ASCE/SEI 7, *Minimum Design Loads and Associated Criteria for Buildings and Other Structures*

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**active pre-treatment device****active grease arrestor**

device that uses hydromechanical separation, interior baffling and air entrainment barriers, whether in combination or independently, to separate and retain oil and grease and solids from wastewater

1.4.3**arrestor depth****installation depth**

measurement from the deepest part of the arrestor to the finished floor level (FFL)

1.4.4**arrestor volume**

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

1.4.5**coating****lining**

protective layer on an arrestor component

1.4.6**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

1.4.7**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.

1.4.8**discharge****effluent**

treated water discharged from the grease arrestor outlet to the downstream drainage

1.4.9**downstream vent**

drainage vent located on, or connected to, a drain discharging to a boundary trap

Note 1 to entry: See [Appendix B](#) for diagrammatic examples of downstream vents.

1.4.10**fat, oil and grease****FOG**

substances of a vegetable origin, animal origin or both, with a density less than 0.95 g/cm³ which are partially or totally insoluble in water

1.4.11**finished floor level****FFL**

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

1.4.12**fittings**

small component on or attached to an arrestor, not limited to but including inlets, outlets, vents, baffles, surge control devices and filters

1.4.13**grease arrestor****passive grease arrestor**

device designed 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 food and oil interceptors, gravity grease interceptors, grease separators or grease traps.

Note 2 to entry: In addition to the inlet liquid waste line plumbing pipework and the arrestor body itself, any plumbing pipework connected between the arrestor body's liquid waste outlet and inclusive of the TWSP is described as a passive grease arrestor (see [Appendix B](#) for diagrammatic examples).

1.4.14**in-ground grease arrestor**

passive grease arrestor where the body of the arrestor is fully encased by soil, bedding or backfilling material

1.4.15**in-situ**

situated in its place of operation

1.4.16**induct pipe mica flap****IPMF**

flap commonly used for an external low-level vent or induct vent on trade waste or sewage drainage systems (and which may not be made of mica)

1.4.17**influent**

wastewater containing food, fats, oil and grease, with the exception of wastewater containing faeces (sanitary wastewater), which enters the grease arrestor

1.4.18**load classification**

classification of load bearing capacity

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

1.4.19**may**

indicates the existence of an option

1.4.20**metering**

measurement of water or wastewater volume or flow rate with a measuring instrument (e.g. a meter)

1.4.21**nominal size**

commonly available sizes in which arrestors are manufactured

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

1.4.22**operational depth**

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

1.4.23**operational water level**

design operating level of wastewater within the arrestor

1.4.24
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.

1.4.25
upstream vent

vent installed adjacent to the upper end of a drain

Note 1 to entry: See [Appendix B](#) for diagrammatic examples of upstream vents.

1.4.26
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 arrestors, appropriate experience in the field of geotechnical engineering is necessary, or consultation with an appropriately qualified geotechnical engineer should be undertaken.

1.4.27
relevant authority

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

1.4.28
retained FOG and solids

separated FOG and solids within a grease arrestor for pump-out, treatment and disposal as part of arrestor maintenance

1.4.29
riser
extension

structure used to bring the access or inspection cover to the finished floor level (FFL)

1.4.30
service
servicing

cleaning of a grease arrestor by a liquid waste contractor at a standard and frequency specified by a relevant authority

Note 1 to entry: Servicing also incorporates the maintenance and inspection of internal components and replacement of any removable internal components by a licensed tradesperson [see Item [2.4.3.1](#) (c) and (d)].

1.4.31
sewer acceptance criteria
trade waste acceptance limits

contaminant limits documented by relevant authorities to describe wastewater quality that is fit for discharge to sewer

1.4.32
shall

indicates that a statement is mandatory

1.4.33**shared grease arrestor**

grease arrestor that is shared between two or more businesses or premises

1.4.34**should**

indicates a recommendation

1.4.35**solids****settleable solids**

solid materials with a specific gravity of greater than 1 g/cm³

1.4.36**total fall**

vertical difference between the inlet and outlet inverts

1.4.37**total oil and grease****TOG**

sum of organic substances in wastewater recoverable by procedures set out in Standard Methods (or procedures authorized by a relevant authority) and includes, but is not limited to, hydrocarbons, esters, fats, oils, waxes, and high-molecular weight carboxylic acids

1.4.38**trade waste sampling point****TWSP**

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

1.4.39**type test**

testing performed to prove that the material or product conforms to the requirements of the relevant standard

1.4.40**upstream vent**

vent installed adjacent to the upper end of a drain

1.4.41**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
DU	Discharge unit
FFL	Finished floor level
FOG	Fat, oil and grease

GNA	Geometric nonlinear analysis solver
IPMF	Induct pipe mica flap
ORG	Overflow relief gully
PCA	Plumbing Code of Australia
PGA	Passive Grease Arrestor
TOG	Total oil and grease
TWSP	Trade waste sample point
WEF	Water and Environment Fund

NOTE Standard Plumbing Code of Australia abbreviations are used to describe fixtures.

1.6 Limitations and restrictions

The following shall not be discharged to a grease arrestor:

- (a) Wastewater containing faeces or other sanitary waste.
- (b) Discrete or predominantly discrete oil in concentrations greater than expected in food service wastewater.
- (c) Any dangerous goods, flammable or explosive solid, liquid or gaseous substance, including light liquids, solvents, fuels, or oil and greases of mineral origin.
- (d) Contaminants other than solids, FOG (all of food origin) in concentrations greater than the sewer acceptance criteria of a 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 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) Degradation from ultraviolet radiation.
- (h) Abrasion and wear.
- (i) Vertical, lateral and live loads.

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 manufacturers' drawings:

- (a) Manufacturer.
- (b) Drawing revision and date.
- (c) Make and model number.
- (d) Material of construction.
- (e) Dimensions.
- (f) Capacities.
- (g) 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 achieve the required separation and retention of settleable solids, fat, oil and grease from wastewater within an influent temperature range 10 °C to 80 °C;
- (c) to allow the flow through the separator to be uniform; and
- (d) with a minimum operational depth of 500 mm.

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

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) servicing;
- (c) the maintenance and inspection 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.

Clear access openings for persons and equipment shall be in accordance with AS 3996:2019 Clause 3.3.1.

2.4.3.3 Access covers

2.4.3.3.1 General

An 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 and safely removable by one person.

A grease arrestor's access openings shall allow for full servicing of all internal components and cleaning of internal surfaces.

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.

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.

Access covers shall be fitted with lifting keyholes that meet the requirements of AS 3996.

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/NZS 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 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 body 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.

2.4.8 Baffles and partitions

Where included in a grease arrestor design, baffles and partitions shall extend 150 mm above and at least 150 mm below the operational water level of the grease arrestor.

The design shall ensure ventilation is not impeded by the baffles.

2.4.9 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 Clauses 2.4.8 and 2.4.9; and
- (c) fitted and made watertight 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](#).