

# Commercial Food Preparation and Service (Currently under review)

## Trade Waste Guideline

Issued 27/02/2015

**This guideline is currently under review. The grease arrestor' sizing calculations are to be used as a guide only. The Trade Waste & Networks Branch will stipulate the grease arrestors size until the review is concluded.**

### INTRODUCTION

Wastewaters from business activities such as meal preparation and dish washing contain oil/grease and suspended solids at concentrations or quantities greater than a typical household. This material can generate foul odours and build up in sewer pipes, restricting flows and causing blockages. Appropriate management practices at each site are therefore necessary. This guideline applies to, but is not restricted to the following activities;

- Restaurants
- Cafes
- School/college training kitchens
- Take away food shops
- Coffee shops
- Cafeterias/canteens
- Bakeries/pizza shops
- Clubs and community centres
- Delicatessens/Supermarkets
- Child minding centres
- Hotels, Motels, Hostels
- Function centres
- Hospital & nursing home kitchens
- Ice cream parlours
- Caterers

### IMPORTANT NOTE

SA Water's requirements for businesses with higher contaminant loads and waste water volumes, (e.g. where the grease arrestor sizing calculation exceeds 12,000 litres) may be significantly different. Some examples are **large multi-tenant food courts, food manufacturing/processing businesses, wholesalers, etc.** These operators should seek advice from the Trade Waste Branch regarding their particular circumstances. [Trade Waste Dissolved Air Flotation \(DAF\) Guideline](#) contains additional information.

## WASTEWATER MANAGEMENT STRATEGY

A good strategy for managing wastewater from commercial food preparation and service areas will avoid problems such as odours, and minimise pre-treatment equipment installation and ongoing maintenance costs. It is a combination of good work practices in the work areas and well maintained pre-treatment equipment of the correct type(s) and size(s).

### ***Step 1 – Understand the inputs to the wastewater stream***

A variety of activities and locations within the work area contribute to the wastewater stream. Understanding each process might lead to ways of minimising waste at source and will make it easier to plan good work procedures and provide appropriate pre-treatment devices.

### ***Step 2 – Apply good work practices***

Training staff and providing the facilities that allow them to easily do the right thing are important. Poor work practices can lead to waste management problems and add to operating costs. Wastewater pre-treatment devices are not a “catch-all” and can fail if overwhelmed. Here are some hints that can help to minimise the chance of a failure occurring.

- Sinks are for wash water, not rubbish. Spoiled food and scraps from preparation or used customer plates should be scraped into a bin before washing up.
- Never pour waste cooking oil down the sink. Set this aside for recycling. Store waste cooking oil in a bunded area, so that it cannot accidentally enter sewer or stormwater drains.
- Contact details for licensed waste contractors who collect waste oil and food scraps for recycling can be found in the Yellow Pages or internet sites such as <http://businessrecycling.com.au/about/background.cfm>.
- Turn off taps when not in use.
- Avoid using running water to thaw frozen food.
- Wait for a full load before using the dishwasher.
- Sweep or mop the floor instead of hosing it down.

### ***Step 3 – Install and maintain appropriate pre-treatment devices.***

Almost all sites in this category are required to install and maintain adequate pre-treatment devices. These reduce contaminant levels in wastewater from kitchens, sculleries, bin wash areas etc. before it is safe for discharge to sewer.

All discharges in this category likely to contain significant levels of suspended solids require effective screening or settling device(s).

All discharges in this category likely to contain significant levels of oil/grease require a grease arrestor.

For many sites, a combination of devices, such as screening to remove larger suspended solids, followed by a grease arrestor is preferred.

SA Water specifies minimum pre-treatment requirements and servicing frequency as a condition in the discharge permit issued to each customer.

### **Hints for sites where a grease arrestor is installed**

Keep wastewater **volumes and flow rates** to within its design capacity. Avoid rapid discharges of large volumes of wastewater. Otherwise wastes could be flushed into and block sewer pipes.

Minimise wastewater **temperature**. High temperatures make separation of oil/grease difficult and promote odours. The maximum allowed to sewer from the site is 38 degrees C.

Minimise **solids and oil/grease** going to the arrestor. Service calls for cleaning the grease arrestor are expensive, compared to good work practices and upstream screening devices that divert or capture the bulk of solids.

Choose a **quick breaking detergent**. These release emulsified oil/grease and dirt soon after discharge, allowing them to effectively separate in the arrestor. Avoid using caustic soda. Emulsions will not separate effectively in an arrestor, but can break down further downstream and choke sewer pipes.

Using **biological additives** in arrestors is not an alternative to regular servicing, but may help the operation of the pre-treatment system in some instances. Only those additives approved by the Trade Waste Branch may be used, and only in the specific applications for which approval was granted.

### **TO REMOVE LARGE SOLIDS**

The screening requirements incorporates a fixed secondary strainer with a max 2mm hole size for silt traps/ strainers with basket – in floor, sink or trough.

- Waste strainer basket (maximum 2mm holes) installed at the sink outlet.
- Floor waste fittings with a water seal in the work area are fitted with a strainer basket (maximum 2mm holes).
- Waste waters discharging from sink outlets to a floor waste fitting with a water seal discharge over a fitted strainer basket (maximum 2mm holes).
- Strainer baskets are emptied into solid waste bin daily or more often to avoid blockage and odours.

### **TO REMOVE OIL/GREASE AND TO MODERATE TEMPERATURE**

For operations in this category, a conventional underflow grease arrestor is the default choice for lowering oil/grease and fine suspended solids concentrations in wastewater before discharge. SA Water may authorise the use of alternative devices in situations where it is unreasonable to install a conventional underflow arrestor.

A **grease arrestor** (sometimes called a grease trap or interceptor) is basically a “flow-through box” plumbed into the drain from the food preparation area. Inflow and outflow connections are located so that the arrestor retains a certain volume of waste water at all times. Fresh wastewater enters one end, displacing some of the contained wastewater to sewer via the outlet at the other end. Baffles and other design features minimise turbulence in the arrestor, to enhance its effectiveness. Arrestors can be installed above or below ground level, as required.

Arrestors rely on the different specific gravities of oil/grease, water and suspended solids. Oil/grease floats to the top, solids settle to the bottom and the cleaned wastewater overflows to sewer.

This takes time, so matching arrestor capacity to wastewater flow rate is an important consideration. **Generally, the minimum retention time in a conventional underflow arrestor is one hour at peak usage times.**

Only grease arrestors listed in the [Approved Basic Trade Waste Pre-treatment Products Fact Sheet](#) shall be used. The best choice of arrestor type, design and size will vary depending on the nature of the application. Some designs have additional features that reduce servicing frequency or regulate flow rate, or will fit into a more restricted space.

## ARRESTOR MAINTENANCE

Accumulated oil/grease and settled solids reduce the arrestor's "working volume". That shortens the wastewater residence time which eventually results in contaminant carryover downstream. Periodic removal of accumulated wastes is necessary to maintain its effectiveness.

The permit holder must ensure the effective operation of each unit i.e. ongoing removal of grease and solids (sometimes called "pump-out") and if applicable, cleaning of bio-filter, servicing mechanical skimmers or other components etc. by a qualified technician in accordance with the manufacturer's specifications.

The Trade Waste Branch will set a maintenance schedule, to ensure correct operation of the grease arrestor. It can vary from fortnightly to annually, depending on waste accumulation rate and other factors. This will be reviewed as part of routine compliance audit inspections.

In a conventional underflow grease arrestor, the maximum build up of wastes shall not exceed

- **100mm** of oil/grease and/or solids accumulation in the **last chamber**, or
- **200mm** of oil/grease and/or solids accumulation in the **first chamber** of two-chamber arrestors, or
- **300mm** of oil/grease and/or solids accumulation in the **first chamber** of three-chamber arrestors.

Accumulated wastes are removed by a Licensed Liquid Waste Contractor of the permit holder's choice. They are listed in Yellow Pages under "Grease Trap Cleaning Services". When pumping out the grease arrestor, the entire contents must be removed, including scraping down material adhering to the vertical surfaces.

## ESTIMATING APPROPRIATE GREASE ARRESTOR SIZE

Appropriate sizing of grease arrestors is necessary to satisfy a number of needs, such as providing adequate retention time to allow separation of grease/oil and suspended solids, reducing outgoing water temperature and having adequate holding capacity for separated materials – to minimise service frequency. A range of factors influences arrestor performance, making it difficult to arrive at a simple "formula" that will work in all situations. The following calculation methods are **for guidance only** and apply to conventional underflow grease arrestor designs. Operators should seek further advice from a suitably qualified consultant or the Trade Waste Branch.

### Method 1 – Peak hourly flow (CURRENTLY UNDER REVIEW)

Add the flow ratings for all fixtures feeding the arrestor. This gives the minimum arrestor size needed to satisfy the one hour retention requirement. Choose the nearest (equal to or larger) available arrestor size.

Fixture	Litres per hour	Fixture	Litres per hour
Bain Marie	50	Sink - single bowl	200
Bin wash area	200	Sink - double bowl	300
Dishwasher commercial/domestic	500	Sink - pot, single	300
Dishwasher - tunnel	1000	Sink – pot, double	400
Floor waste	50	Sink – cleaner’s	50
Hand basin	50	Steamer/steam oven	100
Rinse sink	300	Wok table	100 per burner

### Method 2 – number of meals per day (CURRENTLY UNDER REVIEW)

This method estimates contaminant accumulation in the arrestor, to minimise service (pump-out) calls. For this method, average daily number of meals should be used.

Meals per day	Recommended arrestor size
Up to 70	1000 Litres
71 to 200	1800 Litres
201 to 400	2400 Litres
401 to 600	5000 Litres
Over 600, or multi-tenant food court	Contact the trade Waste Branch. DAF or similar devices may be required

Where calculations are made by both methods, the larger calculated arrestor size is used.

## GREASE ARRESTOR SIZING RULES

While the two calculation methods are a good indication, SA Water generally applies the following rules when approving installation of grease arrestors – based on experience gained at many comparable businesses;

- Arrestors have a minimum hydraulic capacity equivalent to discharges from one hour of peak use. Additional capacity may be required to moderate high temperatures or for other reasons.
- The minimum capacity for any arrestor is **1000 litres**
- Specific minimum capacities for certain activities are;
  - **1000 litres** – School canteens, small coffee shops
  - **1800 litres** – Cooking of Asian food, Rotisserie/BBQ chickens
  - **2400 litres** – Fast food chain outlet
  - **5000 litres** – Large dine-in or fast food operations with high throughput of meals.

- Where new developments are constructed without knowing the type of future food preparation/service tenancies, SA Water will usually specify a minimum arrestor capacity of **2400 litres** for each of these tenancies.
- In situations where SA Water's sewerage system is particularly vulnerable to non-compliant discharges, a larger than normal grease arrestor may be specified.

## SHARED GREASE ARRESTORS

SA Water allows discharges to a shared grease arrestor by multiple tenancies in food courts and similar situations, providing the following conditions are met;

- Arrestor sizing is the sum of the pre-treatment requirements for the individual dischargers.
- Each business discharging wastewater to a shared grease arrestor must have a trade waste discharge permit. Individual dischargers are responsible for maintaining acceptable work practices and controls of their raw wastewater quality and quantity.
- The property owner or the owner's designated agent (such as the shopping centre manager) also holds a trade waste discharge permit. This permit holder is responsible for the operation and maintenance of the shared grease arrestor.

## FOOD WASTE DISPOSAL UNITS

In non-domestic applications, these units (sometimes called garbage grinders) must discharge to sewer via a grease arrestor. Hourly water flow through these units should be included in the calculations for Method 1.

The additional load of material contained in this discharge typically requires an increased arrestor size, to safely accommodate larger amounts of grease/oil and settled solid material between service (pump out) calls by the licensed liquid waste contractor.

Similarly, the use of **potato peelers** can also add a significant load to the arrestor and consideration of arrestor holding capacity is necessary in such circumstances.

In addition to Methods 1 and 2, arrestor selection includes an estimation of the amount of material discharged from food waste disposal units, based on the envisaged usage pattern.

As an approximate indication, the following quantities of material can be safely held in regular underflow grease arrestors before requiring servicing.

Arrestor Size	Maximum Total Grease/Oil & Solids
1000 Litres	220 kg
1800 Litres	280 kg
2400 Litres	360 kg
5000 Litres	740 kg

Where the food waste disposal unit is heavily used, it may be preferable to install a settling pit prior to the grease arrestor. This captures the bulk of the solids, allowing a grease arrestor of normal size to complete pre-treatment. This two-stage approach can significantly reduce operating costs.



## COVERS

- Grease arrestor covers must be suitable for the expected weight loadings e.g. galvanised checker plate covers for pedestrian traffic and “Gatic” style covers for vehicular traffic.
- Covers must be removable to allow full access for servicing and maintenance and be appropriately sized to allow safe removal by one person. For example, large checker plate covers should be divided into smaller segments, and “Gatic” style covers should have 600mm circular inspection covers. Handles or lifting holes are necessary.
- Gas-tight covers are required for indoor systems to contain odours and may be necessary for outdoor installations.
- Where 600mm diameter gas-tight inspection covers are fitted a minimum of 600mm vertical clearance between the underside of the cover and the static water level in the arrestor is necessary to facilitate routine servicing.
- Rectangular “Gatic” style covers shall have integrally cast portholes of 230mm diameter positioned over both the inlet and outlet of the arrestor.

## VENTING OF ARRESTORS

Vents are required for all grease arrestors to:

- remove odorous gasses from within the arrestor
- create air movement between the induct vent and the upstream vent
- reduce condensation within the arrestor
- assist in the maintenance of water seals in gully traps

### Design/Installation

- Where the internal baffles would otherwise seal the chambers within the arrestor, baffles have ventilation holes above the static water level to allow free movement of air.
- An induct vent of not less than DN80 is connected to the outlet chamber of the arrestor. A DN80 or larger high level upstream vent (fitted with a wind driven turbine ventilator) is connected to the uppermost end of the drainage system gravitating to the arrestor.
- Induct and upstream vents cannot be interconnected.
- The sealed gully breather vent may be interconnected with the induct vent 300mm above the lowest fixture connected to the arrestor.
- Vents from arrestors and trade waste drains are extended to above roof level. However, where this is impractical, an Air Admittance Valve (AAV) may be used for a branch vent, provided the valve is made of material that is fit for the purpose and an appropriately maintained to ensure efficient operation.
- The overt of the vent pipe is to be installed as high as possible in the wall of the outlet end of the sealed arrestor (see Figure 1). Alternatively the vent can be installed on either side wall of the sealed arrestor but must be against the outlet end wall of the arrestor.
- Variations to the above requirements (including installations where increments are to be fitted between the arrestor and ground level) are subject to authorisation by SA Water.

## OTHER MATTERS

- For stand-alone dischargers, a sampling point shall be installed (min. 100mm I O R) and brought to the surface adjacent the inlet of the pre-treatment device, being a grease arrestor, settling pit or neutraliser.
- Where multiple trade waste dischargers are connected to a communal pre-treatment device, being a grease arrestor, settling pit or neutraliser, a sampling point shall be installed - min. 100mm surfaced inspection opening (SIO) - and located immediately outside the building line of each tenancy or internally at each tenancy, prior to discharging to the main drain.
- The grease arrestors shall be located to facilitate servicing and maintenance operations and be accessible for inspection. This includes adequate clearance space above and around the arrestor.
- An appropriate backflow prevention device must be fitted to taps/hoses in the vicinity, which might be used for washing an arrestor. Water hoses must never be immersed in the arrestor's contents.

## MORE INFORMATION

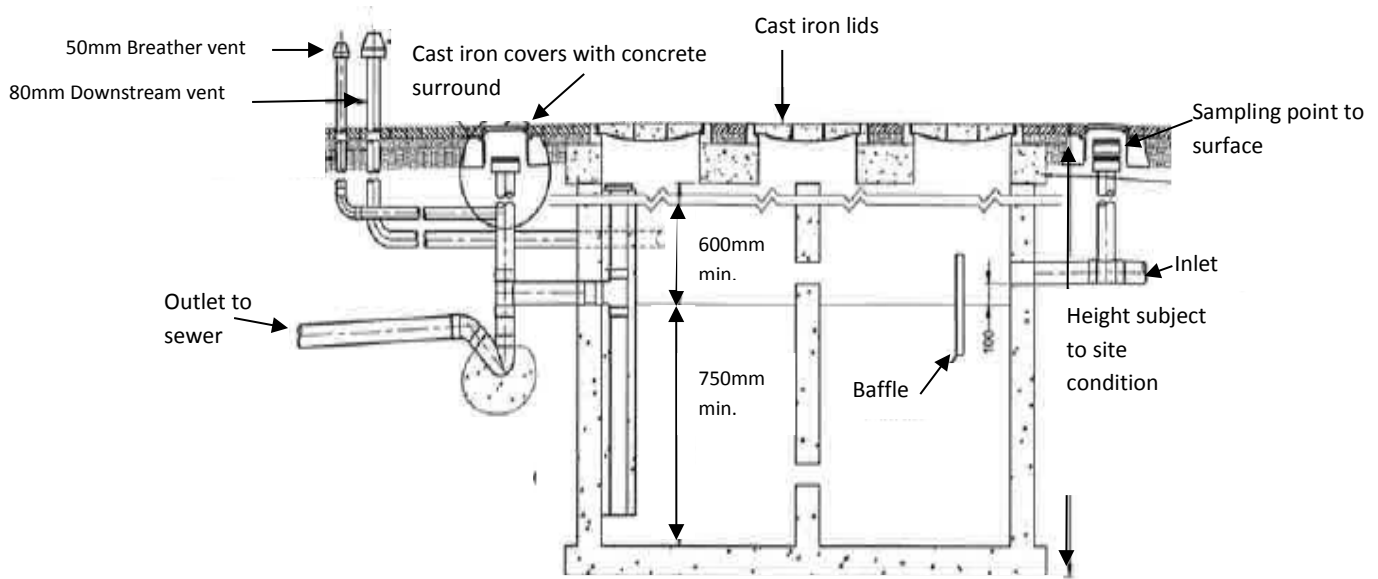
Mains Water Protection (ASNZS3500 – 2003 Part 1)

[Restricted Wastewater Acceptance Standards](#)

UNDER REVIEW



**Figure 1: Typical Grease Arrester when breather vent is required**



UNDER