Grease arrestors

'Passive" grease interceptors are the default technology used for pre-treatmnet of food type business waste. "Active" type grease interceptors are only permitted by WRC upstream of a "Passive" type grease arrester.

A "Passive" grease arrestor is an above-ground or in-ground tank that provides sufficient retention time to allow the reduction of the wastewater temperature and the separation of fats, oils, and grease (FOG) from the kitchen wastewater. The arrestor should also have an adequate capacity to retain solids and fat/grease layers between pump-outs.

Risk assessment

A number of factors contribute to the overall risk assessment for a particular food business. The following factors need to be considered when selecting an appropriate size for a passive grease arrestor:

- whether the food is prepared and cooked on-site or prepared off-site
- the proportion of eat-in versus takeaway sales (i.e., reusable tableware versus disposable containers/cutlery)
- type of food prepared and/or served (e.g., food with high fat content, such as fried food, barbequed meat, etc.)
- the proportion of high-temperature water in the waste stream (e.g., generated by dishwashers, combi-ovens, wet woks)
- peak flow rate
- hours of operation.

The following sections describe the procedures for the assessment of food-based risk (FBR) and temperature risk level (TRL).

Food-based risk assessment process

Table F1 and Table F2 indicate the food-based risk (FBR) levels based on type, method of preparation and serving practices of food.

Table F1. Characteristics of food-based risk categories

Risk Category	Low Risk Activity	Medium Risk Activity	High Risk Activity
Food Preparation Risk (FPR)	No Cooking Raw Whole Foods[1] Pre-packaged Foods Assembling raw food or food preparation elsewhere Low food waste to sewer	Steaming, Boiling, microwaving, grilling low fat and low-oil foods Baking[2] Butchery or Delicatessen Moderate food waste to sewer	Barbequing, frying, deep frying, grilling, roasting meat Poultry cookers/combi ovens High food waste to sewer
Food Serving Risk (FSR)	Predominantly takeaway	Both eat in and takeaway in similar proportions	Predominantly eat in

1 Excludes butchery, which is included in Medium risk.

2 Separately consider preparation of contents included in baked goods.

Where the food preparation risk (FPR) and food serving risk (FSR) fall into different risk categories, the food-based risk is assessed by considering the cumulative effect

Table F2. Determination of food-based risk (FBR)

Food Preparation Risk (FPR) Food Serving Risk (FSR)	Low FPR	Medium FPR	High FPR
Low FSR	Low FBR	Medium FBR	Medium FBR
Medium FSR	Medium FBR	Medium FBR	High FBR
High FSR	Medium FBR	High FBR	High FBR

Temperature risk level assessment process

The temperature risk is associated with the discharge from appliances generating high-temperature wastewater, such as combi-ovens, dishwashers and wet woks. The temperature risk level (TRL) is considered to be low if the discharge volume from such appliances is less than 50% of the total liquid trade waste discharge, and to be high if the discharge from these appliances is 50% or more.

Overall risk level

The overall risk is assessed by combining the food-based risk (FBR) with the temperature risk level (TRL).

Table F3. Determination of overall risk level

Food Based Risk (FBR) Temperature Risk Level (TRL)	Low FBR	Medium FBR	High FBR
Low TRL High Temp waste <50% of total liquid trade waste volume	**Low**	**Medium**	**High**
High TRL High Temp waste >50% of total liquid trade waste volume	**Medium**	**High**	**High**

Note: If overall risk level is low, a passive grease arrestor may not be required.

Recommended methods for passive grease arrestor size determination

The recommended methods for estimating a grease arrestor capacity are listed below in the order of preference.

1. Flow rates applicable to various fixtures connected to the arrestor
2. Seating or meals capacity (or number of beds, where applicable)
3. An average water consumption

The above approach is consistent with the National Guideline for Managing Food, Fat, Oils and Grease from Food Premises, October 2018 developed by WSAA. Irrespective of the size calculated by using the above three methods, the minimum capacity required for a passive grease arrestor is 1,000Litres.

Wastewater with high concentration of detergents and of high temperature may have an adverse impact on grease arrestor performance. The temperature of wastewater in a grease arrestor to which large commercial dishwashers are connected may reach 70–90˚C and interfere with the separation of oils/fats.

Note:

The method for passive grease arrestor sizing may not be suitable for premises generating large volumes of high-temperature wastewater, operating for long hours and/or having a high turnover.

The discharger needs to demonstrate that a grease arrestor has been sized to consistently keep the effluent temperature below 38˚C. In such cases, it is recommended that a hydraulic specialist be engaged to determine the appropriate size.

Sizing based on fixture rating

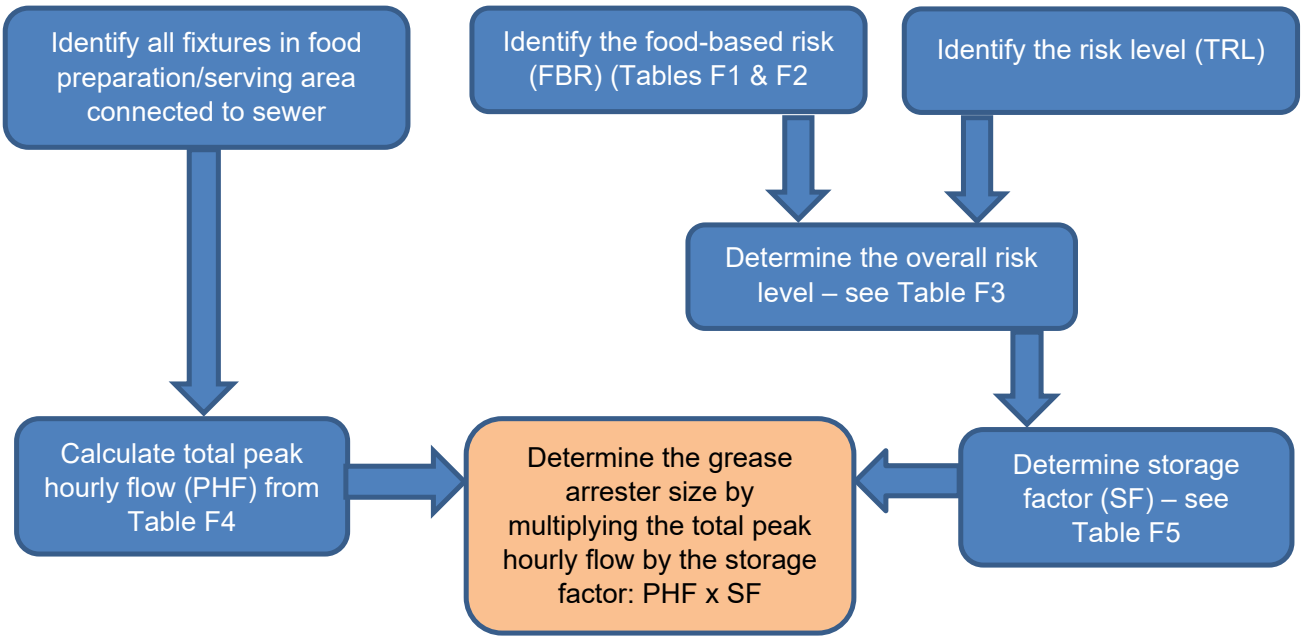
(This information is adapted from the National Guideline for Managing Food, Fats, Oils and Grease from Food Premises, October 2018, WSAA)

The sizing of a grease arrestor using the peak flow rate of fixtures (fixture rating) is the preferred method of calculating grease arrestor capacity.

To function effectively, a passive grease arrestor must have:

- minimum clear volume to provide sufficient detention time to cool down the wastewater and to maintain effective separation of fat, oil and grease at the peak flow rate. The minimum clear volume is calculated from hourly flow rates applicable to various kitchen fixtures as indicated in Table F4
- additional volume to store fat, oil and grease that accumulates between cleanout events. This is referred to as a storage factor, which is determined by the overall risk level. Refer to Table F3 and Table F5 to identify the overall risk level and the storage factor.

Figure F1. Procedure for sizing a Passive Grease Arrester by fixture rating



Determination of peak hourly flow from fixtures (PHF)

Table F4 provides peak flow rates for various kitchen appliances and fixtures.

The peak hourly flow (PHF) volume from fixtures is calculated by adding the peak flow (L/hr) for individual fixtures connected to a grease arrestor. If a fixture is not listed in Table F4, PHF can be determined from the manufacturer's specification.

Table F4. Determination of a peak flow from fixtures

Fixture	Peak flow L/h
Baine Marie	Maximum capacity of apparatus (min. 50)
Bratt Pan[1]	100
Cleaners Sink	50
Combi Oven	Manufacturers peak flow rate
Under bench dishwasher	100
Commercial Dishwasher (door or hood)	300-500
Commercial Dishwasher (conveyor)	Manufacturers peak flow rate
Floor waste outlets[2]	50
Noodle/Pasta Cooker	100
Pot Sink	150[3]
Sink - single	75[3]
Sink - double	150
Steam cooker[3]	100
Wok – traditional (per burner)	200/burner
Wok – waterless (per burner)	30/burner
Kettle	100
Tundish - Condensate	3

1 Where units are fixed and washed in place.

2 If multiple floor waste outlets are located in food preparation area, apply a factor of 1/3 to the peak flow.

3 The peak flow rates in Table F4 take into account that not all the fixtures are used at the same time. A factor of 1/3 has already been applied to the expected hourly peak flow from these appliances, where appropriate.

Storage Factor (SF)

The overall risk level identified previously (refer to Table F3) is required for the determination of an appropriate storage factor (Refer to Table F5)

Table F5. Storage Factor (SF)

	Overall Risk - Medium	Overall Risk - High
Storage Factor (SF)	1.5	2

Grease Arrester Capacity

The required size of the grease arrester is calculated by multiplying peak hour flow (PHF) and storage factor (SF)

Capacity of the arrester = PHF x SF

Examples of sizing of a grease arrester based on fixtures

Example 1: A restaurant serves fried food, using deep frying, grilling etc.

Step 1 – Identify all fixtures

The restaurant has the following fixtures

- 1 x Dishwasher = 300L/hour
- 1 x Single Sink = 75L/hour
- 1 x Double Sink = 150L/hour
- 1 x Pot Sink = 150L/hour
- 1 x Hand Basin = 50L/hour
- 1 x Cleaners Sink = 50L/hour

Step 2 – Calculate the total volume from fixtures

PHR = 300 + 75 + 150 + 150 + 50 + 50 = 775 L/h

Step 3 – Identify the food-based risk using Table F1 and Table F2

As the restaurant prepares fried and grilled food, the FPR is High. The restaurant is eat in, therefore the food service risk **(FSR)** is **High**

Using Table F2, the food based risk **(FBR)** is **High**

Step 4 – Identify the Temperature risk (TRL)

As the restaurant has only one dishwasher, the TRL is **Low**

Step 5 – Determine the overall risk level

Using Table F3, the overall risk level is **High**

Step 6 – Determine the Storage Factor (SF)

From Table F5, the storage factor is 2

Step 7 – Determine the grease arrester capacity

Multiply the PHR from step 2 by the storage factor from step 6: 775 x 2 = 1,550 Litres

Example 2: A café serves, grilled and some fried food, tea/coffee with bakery items baked off site. The café is open for breakfast and lunch (7 hours per day). Food is served both to takeaway and eat in.

Step 1 – Identify all fixtures

The restaurant has the following fixtures

- 1 x Dishwasher = 100L/hour
- 1 x Single Sink = 75 x 2 = 150L/hour
- 1 x steam cooker = 100L/hour
- 1 x Hand Basin = 50L/hour
- 1 x Cleaners Sink = 50L/hour

Step 2 – Calculate the total volume from fixtures

PHR = 100 + 150 + 100 + 50 + 50 = 450 L/h

Step 3 – Identify the food-based risk (FBR)

The café serves low fat food and purchases baked goods, therefore the **FPR** is **Medium.**

The café serves both takeaway and eat-in food, therefore, the **FSR** from table F1 is **Medium**

The **FBR** from Table F2 is **Medium**

Step 4 – Identify the Temperature risk (TRL)

The TRL is **Low**

Step 5 – Determine the overall risk level

The overall food-based risk from Table F3 is **Medium**

Step 6 – Determine the Storage Factor (SF)

From Table F5, the storage factor is 1.5

Step 7 – Determine the grease arrester capacity

Multiply the PHR from step 1 by the storage factor from step 6

450 x 1.5 = 675 L

The required capacity of a grease arrester is 1,000L (minimum capacity allowed by WRC