

## Grease Interceptor Sizing Criteria

How to Determine the Size of an Exterior, In-ground Grease Interceptor Using the Manning Formula:

The formula for calculating grease interceptor sizing is:

$Gallons\ of\ interceptor = [[(1) = \text{GPM/fixture (derived from Manning formula)} \times (2) = \text{total \# fixture ratings of grease-laden waste streams}] + (3) \text{ direct flow from a dishwasher, can wash, mop sink (in GPM)}] \times (4) = 24 \text{ minute retention time}$

*Components of equation =*

1. **GPM/fixture** – This is derived from the Manning Formula. It takes into account the slope, roughness of the pipe (plastic) used, and pipe diameter size. When applying the Manning Formula, we arrive at the drainage rates of various pipe diameter sizes:

0.5 inch pipe diameter = 0.8 GPM/fixture  
1.0 inch pipe diameter = 5.0 GPM/fixture  
1.5 inch pipe diameter = 15 GPM/fixture  
2.0 inch pipe diameter = 33 GPM/fixture  
2.5 inch pipe diameter = 59 GPM/fixture  
3.0 inch pipe diameter = 93 GPM/fixture

2. **Fixture Ratings of Grease-Laden Waste Streams:** Fixtures that have more grease in their waste stream received higher values while less grease corresponds to a lower value. The table is shown below:

**Table of Common Commercial Kitchen Fixtures and their Corresponding Rating (each):**

2, 3, or 4 compartment pot sink = 1.0  
1 or 2 compartment meat prep sink = 0.75  
Pre-rinse sink = 0.5  
1 or 2 compartment vegetable prep sink = 0.25

3. **Direct Flow from Dishwasher, Can Wash, and Mop Sink:** Use the following gpm values: Dishwasher = 10 gpm, can wash and mop sink = 6 gpm.
4. **Twenty-four minute retention time:** Engineers have determined that when applying several criteria to determine proper grease (animal and vegetable lipids) separation (using Stoke's Law, specific gravity of lipids, etc.), a twenty-four minute retention time is required.

**Example #1:** A restaurant has the following fixtures in their kitchen:

- (1) 3-compartment pot sink, 1.5 inch waste drain
- 1 pre-rinse sink, 1.5 inch waste drain
- (1) 1-compartment meat prep sink, 1.5 inch waste drain
- (1) 1-compartment vegetable prep sink, 1.5 inch waste drain
- (1) can wash (use 6 gpm)

Using the formula to size exterior grease interceptors, we get:

Gallons needed for grease interceptor

$$\begin{aligned} &= [15 \text{ GPM} \times [1 + 0.5 + 0.75 + 0.25] + 6 \text{ GPM}] \times 24 \text{ minutes} \\ &= [15 \text{ GPM} \times 2.50] + 6 \text{ GPM} \times 24 \text{ minutes} \\ &= [37.5 \text{ GPM} + 6 \text{ GPM}] \times 24 \text{ minutes} \\ &= 43.5 \text{ GPM} \times 24 \text{ minutes} \\ &= 1,044 \text{ gallons} \quad \textbf{\underline{Use 1,000 gallon interceptor size}} \end{aligned}$$

**Example #2:** A restaurant has the following fixtures:

- (1) 3 Compartment Pot Sink, 2.0 inch waste drain
- (1) 1 Compartment Prep Sink (Meat), 1.5 inch waste drain
- (1) 1 Compartment Prep Sink (Vegetable), 1.5 inch waste drain
- (1) Pre-rinse Sink, 2.0 inch waste drain
- (1) Dishwasher (use 10 gpm)
- (1) Mop Sink, 3 inch waste drain (use 6 gpm)

GPM x Grease Factor

33 x 1.0	= 33.00 gpm
15 x 0.75	= 11.25 gpm
15 x 0.25	= 3.75 gpm
33 x 0.5	= 16.50 gpm
	10.00 gpm
	<u>6.00 gpm</u>
Total	80.50 gpm

Using the formula to size exterior grease interceptors, we get:

$$80.50 \text{ gpm} \times 24 \text{ minutes} = 1,932 \text{ gallons} \quad \textbf{\underline{Use 2,000 gallon interceptor size}}$$