TOWN OF AMHERST GREASE INTERCEPTOR SIZING CRITERIA

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 $= \big[[$**(1)** $=$ GPM/fixture (derived from Manning formula) x **(2)** $=$ total # fixture ratings of grease-laden waste streams] $+$ **(3)** direct flow from a dishwasher, can wash, mop sink (in GPM)]$\big]$ x **(4)** $=$ 30 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. **Thirty 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 thirty minute retention time is required.

5. **Peak Flow Ratio (PFR):** A peak flow adjustment is employed as a constant to reflect a ratio of an 8 hour business day over a 24 hour time frame (8 hours/24 hours = 1/3 peak flow ratio).

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
$=[[15 \text{ GPM x } [1 + 0.5 + 0.75 + 0.25] + 6 \text{ GPM}]$ x 30 minutes
$=[[15 \text{ GPM x } 2.50] + 6 \text{ GPM}]$ x 30 minutes
$=[37.5 \text{ GPM} + 6 \text{ GPM}]$ x 30 minutes
$=43.5 \text{GPM}$ x 30 minutes
$=1,350$ gallons x 1/3 PFR $= 450$ gallons   ***Use 500 gallon interceptor size***

- **Example #2:** A restaurant has the following fixtures:
- GPM x Grease Factor
- (1) 3 Compartment Pot Sink, 2.0 inch waste drain   33 x 1.0 = 33.00 gpm
- (1) 1 Compartment Prep Sink (Meat), 1.5 inch waste drain   15 x 0.75 = 11.25 gpm
- (1) 1 Compartment Prep Sink (Vegetable), 1.5 inch waste drain   15 x 0.25 = 3.75 gpm
- (1) Pre-rinse Sink, 2.0 inch waste drain   33 x 0.5 = 16.50 gpm
- (1) Dishwasher (use 10 gpm)   10.00 gpm
- (1) Mop Sink, 3 inch waste drain (use 6 gpm)   6.00 gpm
- Total   80.50 gpm

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

80.50 gpm x 30 minutes = 2,415 gallons x 1/3 PFR = 805 ***Use 1,000 gallon interceptor size***