

## It's Not Easy Being Green

Traci Ismert

### A Big Dirty Secret How greasy is your wastewater?

Municipalities around the country require restaurants to use preventive measures to keep harmful fats, oils and grease (FOG) from being discharged to the collection system. This is typically accomplished by using a grease interceptor and best management practices (BMPs) in the kitchen.

Do you know the sizes and types of the grease interceptors your restaurants use? Do you know how much grease they can hold? With grease interceptors often buried underground, they can be out of sight and out of mind. If maintenance is left to a vendor, you may have virtually no interaction with your grease interceptors until there is a failure. While grease may not be your favorite thing to think about, learning about your grease interceptor can help you maximize maintenance dollars and minimize preventable fines and surcharges, as well as problems such as back-ups and overflows.

All grease interceptors have a maximum grease-holding capacity. Once that maximum capacity is reached, FOG can make its way into the collection system and wreak havoc. To ensure that does not happen, determine an accurate pump-out schedule so that the interceptor is maintained only when necessary, but before exceeding the maximum rated capacity.

### The Problem with the System

Municipalities and facility managers share a common goal: Both want well-performing grease interceptors installed that provide acceptable pump-out frequencies. However, many of the guidelines found in plumbing and pretreatment codes do not provide you with the tools necessary to reach this goal. Instead of sizing the grease interceptor for expected grease output, they are generally sized by flow rate in gallons per minute (GPM). Even retention-time sizing methods are flow based; they require identifying the flow rate first and then multiplying it by a retention time in minutes, which results in the final interceptor volume size in liquid gallons.

The problem with these sizing methods is that the amount of flow to the grease interceptor is not indicative of how much grease is present in the waste stream. Using flow-rate sizing alone does little to help you determine when your grease interceptor will be full. Think of a sandwich shop that has the same kitchen fixtures as a restaurant serving fried chicken. The flow rate might be the same, but the grease waste is much different. This is why it makes more sense to determine a restaurant's expected grease output when sizing a grease interceptor rather than sizing by flow rate alone.

### The Grease Production Sizing Method

The grease production values in the chart on the next page were developed using independent research reports, such as The Brown Grease Study by Kennedy Jenks, as well as feedback from municipal pretreatment officials and pumping contractors and actual grease production data from 21 food service establishments (FSE).

These values assume all kitchen fixtures are connected to the grease interceptor. The chart is organized by menu type with a permeal grease production value assigned for each classification. The "no flatware" and "with flatware" designations differentiate FSEs serving meals on disposable wares versus washable flatware. There is a 30-percent increase to the grease-production values when flatware will be returned to the kitchen and washed.

It is important to remember that the grease production values should be used as a guideline or a starting place only. Actual grease values for your restaurant will vary based on the number of kitchen fixtures tied into the grease waste line, as well as the quality of BMPs in your kitchens. The point is not to be perfect, but rather to provide an estimated grease production number that will allow you to optimize the maintenance cycle for your restaurants.

To estimate how much grease your restaurant produces daily, determine which classification most closely fits your menu. Then, multiply the grease production value by the average number of meals served daily at your restaurant.

For example, if your restaurant serves fried chicken on disposable flatware and the average number of daily customers is 300, then when you multiply 300 customers times 0.035 pounds of grease per meal, you find that 10.5 pounds of grease is your estimated daily accumulation. That's about 315 pounds of grease produced per month, or a whopping 945 pounds per quarter.

### Determining Maximum Capacity

Major plumbing codes, like the Uniform Plumbing Code and International Plumbing Code, identify two types of grease interceptors: hydromechanical grease interceptors (HGI) and gravity grease interceptors (GGI).

HGIs are tested for performance at various flow rates in accordance with a grease interceptor standard, such as PDI-G101 or ASME A112.14.3. Once tested, a hydromechanical grease interceptor will have a third-party certified grease storage capacity. Normally, certified HGIs will have twice as much capacity in grease pounds as the interceptor's certified flow rate. This information is required to be on the label attached to the interceptor. Some innovative manufacturers have developed interceptor technologies with significantly higher storage capacities that offer much longer potential pump-out frequencies. To fully understand the actual grease storage capacity of the HGI, ask the manufacturer for a copy of their test report.

GGIs are not tested for performance; instead, the flow rate from the kitchen fixtures is used as a variable in a calculation that aims to provide a 30- or 60-minute retention time for wastewater inside the tank. Since performance and separation efficiency remain untested, those numbers are relatively unknown, so many municipalities use the 25-percent rule to determine when the interceptor is full. This rule deems that the GGI is full when 25 percent of its capacity is made up of grease and solids. So, if you have a 1,000-gallon GGI, then 25 percent of 1,000 gallons is 250 gallons. That means it would be full once you have collected 250 gallons of grease and solids.

While HGIs have certified capacities that can be known, GGIs do not. In order to apply the grease-production sizing method to your gravity interceptor, you need to know how to convert liquid gallons into grease pounds. Here's how you do it: A GGI is considered full when 25 percent of its liquid capacity is made up of grease and solids, according to the 25-percent rule. Normally a GGI will have comparable quantities of both FOG and solids when it is full—around 50 percent of each—which in a 1,000-gallon GGI would be 125 gallons each of FOG and solids. Next, we need to account for the difference in specific gravity between water (8.3 pounds per gallon) and the type of FOG present in your interceptor. If you have mostly lard-based FOG, then take 8.3 times 0.875, which equals 7.26 pounds per gallon. Finally, just multiply the amount of FOG in liquid gallons times the weight of the FOG in pounds per gallon. For a 1,000-gallon GGI, that would be 125 gallons times 7.26 pounds per gallon, or 907.5 pounds of FOG.

Now you have all the tools you need, so give it a try. Find out if your interceptor is on the right maintenance cycle or make adjustments as necessary with your vendor. If you are currently paying surcharges, use this process to right-size your maintenance cycle and get your waste stream back in compliance. If it is time to replace your grease interceptor, this formula can help you and your contractor select the correct size replacement. The grease-production sizing method is a powerful tool that can give you the confidence you need to ensure you are maximizing your interceptor maintenance dollars.

Traci Ismert, CRFP, is a Corporate Accounts Manager for Schier Products. She specializes in collaborating with plumbing and sewer authorities on behalf of national brand restaurants to promote the use of right-sized lifetime guaranteed grease interceptors.