



Considerations When Selecting a Grease Interceptor

By Brian Tubaugh

There seems to be a lot more talk about grease these days. Numerous local water quality authorities have launched campaigns to clean up the water consumers are dumping into municipal pipelines. A feeling of responsibility for the environment has been growing in the general public. Businesses of every size are being tasked with “reducing their footprint” on society by containing and handling their waste on-site. Changes, options and advancements in grease interception and removal continue to grow.

The problems caused by grease in sewer systems are well documented. Blockages can cause cleanup, repair or replacement costing in the millions of dollars. The obligation to properly contain grease is being pushed back to the source — the restaurants and establishments that produce it. Those who refuse to comply are being hit with penalties and fines, as local enforcement authorities increase inspection efforts.

The solution is to equip an establishment with a suitable grease interceptor and to make sure the operators understand their role in grease containment. Limitations, needs and circumstances vary by site, so where do you start when selecting an interceptor for a project? Below are some points to consider that will get you well on your way to specifying, recommending or installing the right solution.

Types (hydro-mechanical vs. gravity)

A basic principle behind grease separation in an inter-



Pictured above: Clean Water Outlet — An actual installation with cover removed. Separated grease on the left and clean water exiting outlet on the right. **Below, right:** Interceptor with sensing and alarm device.

ceptor is that FOG (fats, oils, and grease) from a kitchen is “lighter” than water. It weighs about 1 lb. less per gallon.

Interceptors that use only this property difference for separation are known as gravity types. The grease-laden water must be given enough time in non-turbulent conditions for separation to occur. To accomplish this, gravity-type units must hold a very large volume and usually must have multiple chambers. They are typically installed underground, outside the establishment walls and are accessed for cleaning through manhole covers at ground level. Gravity-type units are identified by their holding volume in gallons.

The other category of interceptors is known as hydro-mechanical. These units increase separation performance through the use of flow control, air intake and baffles, which markedly decreases the time necessary to separate.

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Separated Grease Layer: Grease interceptor with side view window — lab test grease media.

This engineered approach allows hydro-mechanical units to be much smaller than their gravity-type counterparts for the same application. Two performance standards, PDI-G101 (Plumbing & Drainage Institute) and ASME A112.4.3, are widely used to test hydro-mechanical units and to ensure proper function at specified flow rates.

Both types usually incorporate a trapleg-style configuration at the outlet end so that, as new wastewater enters the inlet, the cleanest water near the bottom of the unit is pushed up and out to the pipe. Gravity-type units are traditionally too big to put inside the building and are direct-buried outside. If the walls of this unit are compromised due to loading, earth movement or material deterioration, the grease can seep directly into the ground. Hydro-mechanical units are typically much smaller and, therefore, can be installed inside the building and closer to the grease sources. Being indoors also reduces compromising risks, and the building itself acts a second layer of protection for the surrounding environment.

Location ... location ... location

The two key considerations here are the distance from the fixture(s) being served by the interceptor and accessibility.

Recall the sewer system blockages mentioned earlier. This was a length of pipe from grease-supplying establishments to a water treatment facility. The pipe inside a building from fixtures such as floor sinks, prep sinks and rinse sinks to the grease interceptor is like a miniature version of a sewer system pipe. The longer it is, the greater the risk that grease will congeal and cause a blockage. As a general rule, keep the interceptor as close to the fixtures being served as possible. If long runs are necessary, plan in periodic cleanouts for easy access later.

Accessibility is very important. All grease interceptors will need some human interaction. Even units with a grease removal device (GRD) need to be completely cleaned out periodically. Inevitably, waste that is heavier than water will enter the unit. If this is not removed, it will build up to the point of blocking the outlet and causing backups to the

fixtures. Allow clearances for cover and baffle removal, access for cleaning tools such as a vacuum hose and line of sight into the unit to be sure the job was done right. Some units may include other components such as supplemental strainer baskets or GRD components, which need to be considered for future removal.

Maintenance

Every interceptor needs regular maintenance to perform as advertised. If the grease is never removed, the unit will eventually fail and pass grease downstream. As the grease separates to the top, it is actually building a layer downwards from the static water level inside the unit. As this layer thickness increases, it is decreasing the effective separation volume, which means it takes less time for incoming, grease-laden water to get to the outlet.

A lack of maintenance by facility personnel is commonly caused by, what we like to call “magic-box-in-the-corner” syndrome. Some people do not know that they have an interceptor in their restaurant; many others know it’s there, but are more than happy to leave it alone until it is too late. When sinks are backing up and the odor is unbearable, it is much too late. Some restaurants have even had to close for



Interceptor with grease removal device.

a day, losing business, which could have been avoided with a regular maintenance schedule.

Unfortunately, some of this misunderstanding or lack of knowledge is due to the typically high turnover rate in employees for these types of businesses. This only supports the need for an established regular maintenance schedule that, like so many other tasks in a food service establishment, becomes habit.

Sizing and solids

Sizing of an interceptor can be, and has been, done more than one way. There are even some antiquated codes still using a formula that considers hours of operation in a day, number of seats in the restaurant and proximity to a major highway to size a unit. Sizing by fixture units may also be somewhat risky as this method includes a factor of probability that a fixture is being used. So what happens in peri-

ods of peak flow? Is the interceptor large enough to effectively separate grease during these periods?

Sizing by maximum anticipated flow rate seems to be the soundest method, which fits well with hydro-mechanical units that are performance tested and rated by flowrate. This may be easier than expected at first thought. Sources are available that provide tables showing maximum flowrate in "horizontal" gravity flow pipes for different slopes and pipe diameters. The plumbing system engineer has sized a pipe capable of taking wastewater away from fixtures, which also happens to be the pipe leading to the interceptor.

The size of a hydro-mechanical interceptor can be determined simply by knowing the pipe size and slope and then referencing a flow table for maximum flow (full bore). Even if the pipe was sized using fixture units, a pipe diameter is selected to flow only about $\frac{1}{2}$ full, so periods of peak flow can still be handled, and the interceptor will be correctly sized to handle those flows.

Solids are typically food particles and can float or sink once inside an interceptor. The horrible odors associated with non-maintained grease interceptors can usually be traced back to decaying solids. It is best to keep as many solids out of a grease interceptor as possible. Good solutions are to install a solids interceptor just upstream of the grease interceptor and to establish business practices of wiping dirty plates into a garbage can before washing and using strainers in sink outlets.

Advancements

The principle of grease separation resulting in an upper layer of grease inside an interceptor still holds true for the advancements discussed below. As is common with innovation, the industry has tried to answer historical issues associated with grease containment. Cleaning out a grease interceptor is usually not the most desired job in a facility, and the issues previously discussed regarding personnel turnover and lack of maintenance are all problems worth being solved.

Because an interceptor is a neatly sealed box that no one really wants

to open unless needed, it would be beneficial for the box to tell you when the grease needs to be removed. Plumbing & Drainage Institute (PDI) has recently released standard PDI-G102, which establishes performance requirements for sensing and alarm devices. These devices sense the level of the grease layer inside the unit and transmit an audible and visual signal to alert personnel that it is time to remove the grease. This eliminates the need to open the unit to check the grease layer thickness and avoids having to clean the unit more often than is actually needed.

There are also grease removal devices available. These units are sometimes misleadingly referred to as automatic units. A standard for grease removal devices is ASME A112.14.4. The removal of grease is automatic, but periodic maintenance to clean and remove solids is still necessary. Based on a timer setting

or grease layer thickness sensor, the top layer of separated grease is removed to an external container without removing the cover. Some of these units may require a small opening in the interceptor shell to get the grease out, which is a concern to some regarding possible odors. Also, methods of grease removal are different; some perform better than others regarding those floating solids.

These are some things to consider before specifying or installing a grease interceptor, but I imagine some topics are missing. There are many sources for more information, including reputable manufacturers who would be happy to help you select the right product for your next project. Spending a little time planning and considering factors will pay dividends for you, your customers and the environment, for years to come. ■

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