

EQUIPMENT COMPARISON

The three types of grease capturing equipment all have their strengths and weaknesses. Gravity grease interceptors require the least maintenance, traps are the least expensive, and GRDs have the best removal rates and FOG quality. A comparison of the three types of equipment was conducted based on six criteria: price, size, effectiveness, FOG quality, maintenance, and reliability. The results are summarized in Table 1 using a rating scale from 1 to 5, where 1 is the most attractive, and 5 is the least desirable.

QUALITY	INTERCEPTOR	TRAP	GRD
Price	5	1	3
Size	5	1	1
Effectiveness	1	4	2
FOG Quality	5	3	1
Maintenance	1	5	2
Parts Replacement	1	2	4
OVERALL	3	2.67	2.17

Based on the table, GRDs are the best device. They can be easily installed, and are effective with reasonable maintenance. However, GRDs have an operational learning curve, and often require some on-the-job training after installation to ensure proper maintenance and that the device is working properly. FSEs should also be aware of and prepared for possible parts failure; a dysfunctional GRD is just a very expensive trap.

GREASE CAPTURING EQUIPMENT SUPPLIERS

Grease Trap and Interceptor Manufacturers

- Zurn Industries, LLC**
www.zurn.com

Josam Company
www.josam.com

Schier Products
www.schierproducts.com
- MIFAB, Inc.**
www.mifab.com

Jay R. Smith
www.jrsmith.com

Green Turtle
www.greenturtletech.com

Automatic Grease Removal Device Manufactureres

- Goslyn**
www.goslyn.net

Highland Tank
www.highlandtank.com

International GRD
www.internationalgrd.com
- Josam**
www.josam.com

Jay R. Smith
www.jrsmith.com

Thermaco
www.northstar-environmental.com

This is not a complete list of companies available for services. Additional company names can be obtained by referring to the Internet, telephone directories or other resources. This list is provided for informational purposes only and for the convenience of food service establishments (FSEs) in San Francisco and should not be taken as an endorsement by the San Francisco Public Utilities Commission or the City and County of San Francisco. FSEs or their plumbing contractors should check with the Department of Building Inspection to ensure that any proposed equipment installation complies with the plumbing code.

Fats, Oils and Grease (FOG) Control Ordinance

GREASE CAPTURING EQUIPMENT



DESCRIPTION OF OPERATION

The most common and inexpensive method of separation of fats, oils and grease (FOG) generated by food service establishments (FSEs) from water is gravity settling. Since FOG is immiscible in water and has a density 10 – 20% less than water, the two substances will separate naturally if left unmixed: the FOG will float to the surface and the water will settle to the bottom. The two phases can then be extracted as separate streams. **The three types of grease capturing equipment – grease interceptors, grease traps and automatic grease removal devices (GRDs) all utilize this separation method.**

Grease Interceptors

Grease Interceptors (Figure 1) are large retention tanks that are installed below ground. The latest edition of the Uniform Plumbing Code defines them as “gravity grease interceptors” (GGIs), as the force of gravity separates the FOG by density. Interceptors have a volume typically greater than 300 gallons. Rising to the top of the interceptor, the FOG is trapped while the water underneath passes through the interceptor. Solids in the waste stream typically settle to the bottom of the interceptor. The FOG and solids are pumped out through access ports at the top of the interceptor by professional grease haulers.

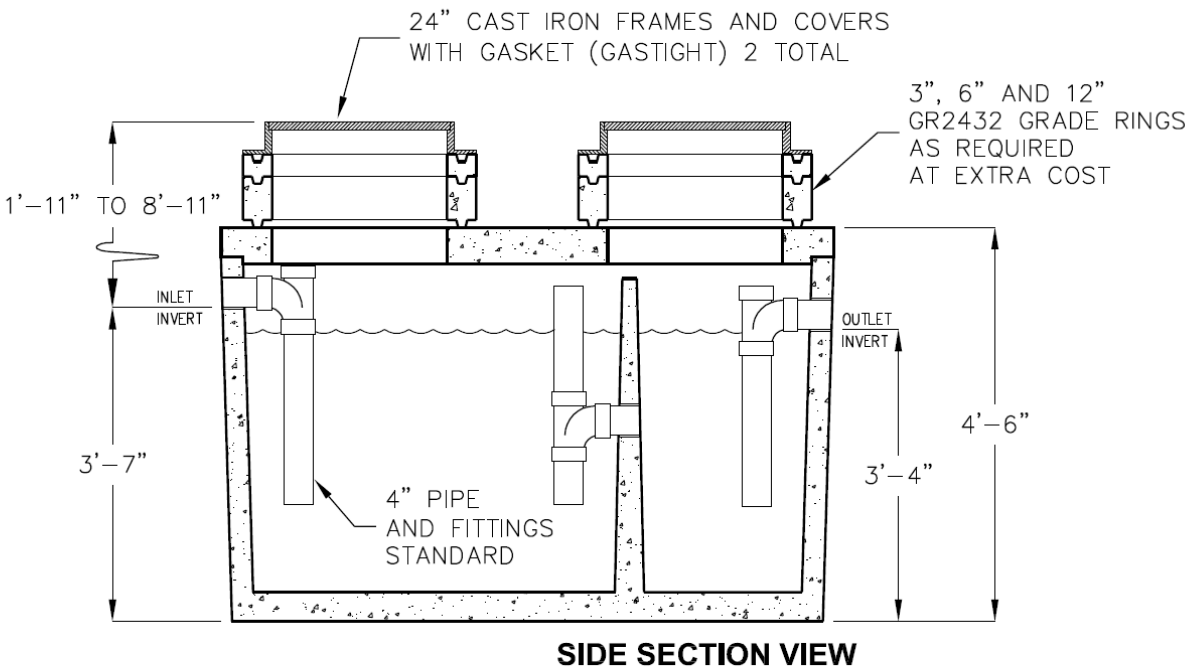


Figure 1. A typical design for an interceptor. Source: Jenson Precast

Grease Traps

Grease traps (Figure 2) are small retention tanks that are installed above ground. The latest edition of the Uniform Plumbing Code defines them as “hydromechanical grease interceptors” (HGI), as fluid mechanical properties are utilized in addition to gravity separation. Trap sizes are defined by their flow rate instead of their volume, and typically range from 20 – 50 gallons per minutes for FSE use. The trap’s primary method of FOG separation is the same as the interceptor, allowing the FOG to float up to the surface while the water passes through. However, an additional technique is also used to increase separation rates: the influent flow is vented, allowing air to mix with the moving FOG-laden water. Upon entering the trap, the air bubbles to the top of the trap; this upward velocity carries FOG to the top of the trap faster than the regular passive separation would. Solids in the waste stream typically settle to the bottom of the trap. The FOG and solids are removed by hand and either disposed of or placed in drums to be hauled away.

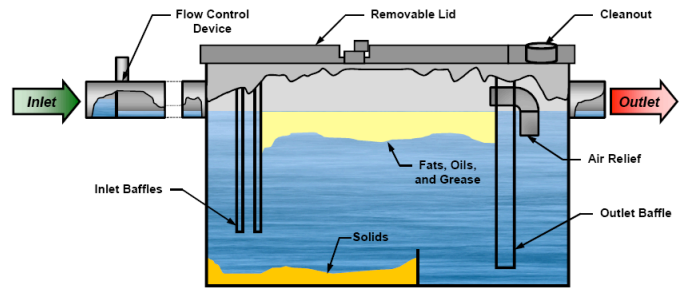


Figure 2. A typical design for a trap. Source: Bay Area Pollution Prevention Group

Automatic Grease Removal Devices

Automatic grease removal devices (Figures 3 & 4) are traps equipped with a mechanism that removes the FOG from the trap after it has separated from the water. Automatic grease removal devices (GRDs) are sized similarly to traps, though rarely larger than 125 gpm. A solids separation basket filters out solids from the waste stream at the inlet. The FOG separates from the water as in a trap, and collects at the top of the GRD. Periodically, the grease removing mechanism of

the GRD will be activated, either manually or by an automatic timer. A heating element warms the FOG to liquefy any congealed grease. An oleophilic (“oil loving”) surface, usually a spinning wheel, disc or conveyor belt, is passed through the FOG layer. The oleophilic surface utilizes the chemical differences between FOG and water, adsorbing FOG but not water. The FOG is brought up out of the liquid, where wiper blades skim the FOG off the oleophilic surface and direct it towards a container. When filled, the container is poured into a large drum to be picked up by grease haulers. The solids collected in the basket are discarded.

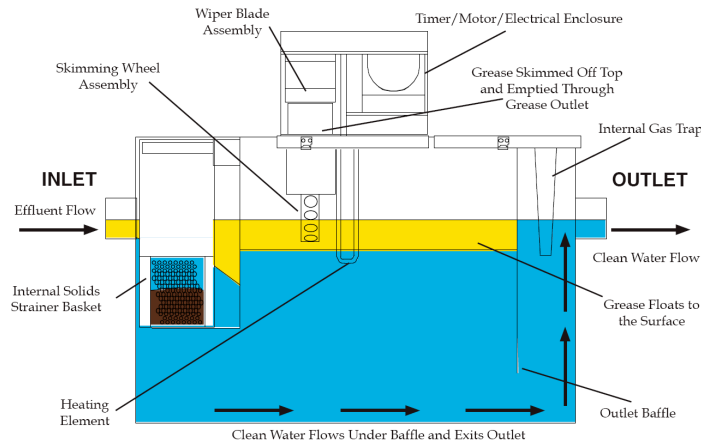


Figure 3. A typical design for an automatic grease removal device. Source: Thermaco, Inc.



Figure 4. Example of an installed automatic grease removal device. Source: The Wastewater Solutions Update

MAINTENANCE REQUIREMENTS

Grease capturing equipment devices are effective at FOG separation so long as they are adequately maintained. Separation rates for these devices can be expected to decrease if maintenance is ignored. Devices can even fail, plugging the line or causing a spill if completely disregarded for long periods of time. The selection of a FOG separation device should be based on the degree to which the FSE’s staff is willing or able to perform routine cleaning and FOG removal.

Grease Interceptors (GGIs)

Grease Interceptors (GGIs) require little and infrequent maintenance by FSE staff. The pumping and cleaning of interceptors is performed by professional grease haulers. Haulers can clean interceptors on a pre-set schedule or on an as-needed basis. Pumping frequency usually ranges from once a week to once a quarter. Clogged lines are often an indication that the interceptor should be serviced more often. The “25 Percent Rule” requires interceptor servicing when the interceptor is 25% filled with FOG and solids.

Grease Traps (HGIs)

Grease Traps (HGIs) require frequent maintenance by the FSE staff or a pumping contractor. HGIs should be cleaned before the floating FOG and settled solids accumulation exceeds 25% of the HGI’s overall capacity. In order to prevent this,

daily to weekly cleaning of the HGI by FSE staff or a pumping contractor may be required to ensure proper operation. If performed by FSE staff, solids and FOG should be dewatered (e.g., mixed with kitty litter) and discarded in the trash. It is good practice for FSEs to include trap cleaning as part of its end-of-day or end-of-week overall cleaning procedure. If traps are ignored, FOG will build up inside the trap until only a small section remains open. At that point, FOG-laden wastewater will simply pass through the trap as if it were just another section of pipe. Total maintenance is about an hour per week.

Automatic Grease Removal Devices

Automatic grease removal devices (GRDs) require frequent but minor maintenance by the FSE staff; “automatic” does not mean “self-sufficient.” Distributors often provide some training to familiarize FSE staff with GRD operation and maintenance. Routine maintenance required by facilities on a daily basis is typically limited to emptying the solids filter basket. This practice can encourage Best Management Practices among the FSE staff, as they realize that scraping food from cookware and dishware before washing results in less accumulation and odor of solids they must dispose of from the GRD after washing. The FOG collection container must be emptied when full, typically once a day. Wiper blades should be checked weekly and any incidental buildup should be removed. Total maintenance time is about one to two hours per month.



Figure 5. Example of a trap being cleaned by a contractor. Source: Bay Area Pollution Prevention Group