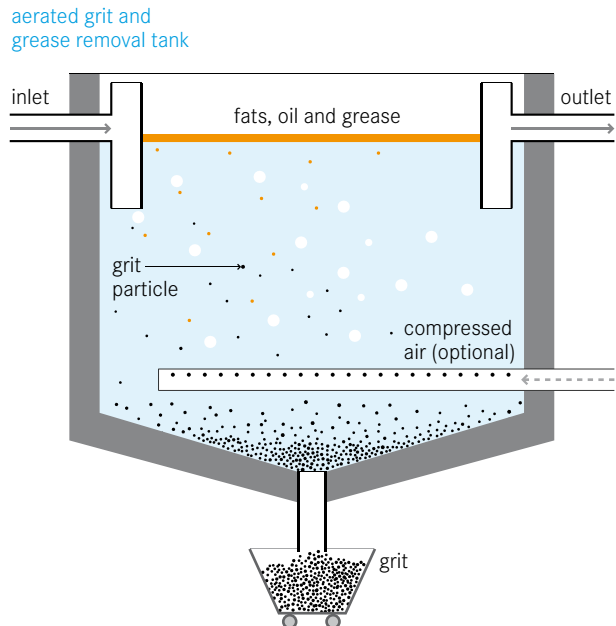
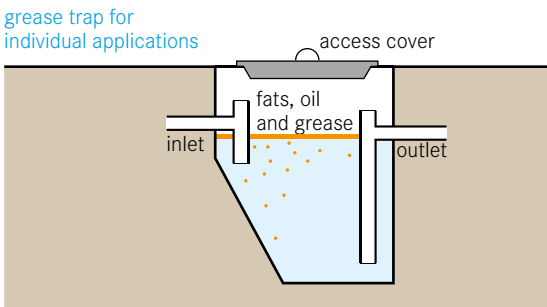
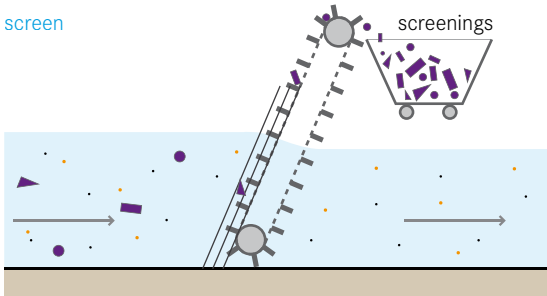


Application Level: <input type="checkbox"/> Household <input checked="" type="checkbox"/> Neighbourhood <input checked="" type="checkbox"/> City	Management Level: <input type="checkbox"/> Household <input checked="" type="checkbox"/> Shared <input checked="" type="checkbox"/> Public	Inputs: Blackwater Brownwater Greywater Sludge
		Outputs: Blackwater Brownwater Greywater Sludge Pre-Treatment Products



Pre-treatment is the preliminary removal of wastewater or sludge constituents, such as oil, grease, and various solids (e.g., sand, fibres and trash). Built before a Conveyance or Treatment technology, pre-treatment units can retard the accumulation of solids and minimize subsequent blockages. They can also help reduce abrasion of mechanical parts and extend the life of the sanitation infrastructure.

Oil, grease, sand and suspended solids can impair transport and/or treatment efficiency through clogging and wear. Therefore, prevention and early removal of these substances is crucial for the durability of a treatment system. Pre-treatment technologies use physical removal mechanisms, such as screening, flotation, settling and filtration.

Behavioural and technical source control measures at the household or building level can reduce pollution loads and keep pre-treatment requirements low. For example, solid waste and cooking oil should be collected separately and not disposed of in sanitation systems. Equipping sinks, showers and the like with appropriate screens, filters and water seals can prevent solids from

entering the system. Sewer inspection chambers should always be closed with manhole covers to prevent extraneous material from entering the sewer.

Grease Trap The goal of the grease trap is to trap oil and grease so that it can be easily collected and removed. Grease traps are chambers made out of brickwork, concrete or plastic, with an odour-tight cover. Baffles or tees at the inlet and outlet prevent turbulence at the water surface and separate floating components from the effluent. A grease trap can either be located directly under the sink, or, for larger amounts of oil and grease, a bigger grease interceptor can be installed outdoors. An under-the-sink grease trap is relatively low cost, but must be cleaned frequently (once a week to once a month), whereas a larger grease interceptor has a higher capital cost, but is designed to be pumped out every 6 to 12 months. If designed to be large enough, grease traps can also remove grit and other settleable solids through sedimentation, similar to Septic Tanks (S.9).

Screen Screening aims to prevent coarse solids, such as plastics, rags and other trash, from entering a sewer

age system or treatment plant. Solids get trapped by inclined screens or bar racks. The spacing between the bars usually is 15 to 40 mm, depending on cleaning patterns. Screens can be cleaned by hand or mechanically raked. The latter allows for a more frequent solids removal and, correspondingly, a smaller design.

Grit Chamber Where subsequent treatment technologies could be hindered or damaged by the presence of sand, grit chambers (or sand traps) allow for the removal of heavy inorganic fractions by settling. There are three general types of grit chambers: horizontal-flow, aerated, or vortex chambers. All of these designs allow heavy grit particles to settle out, while lighter, principally organic particles remain in suspension.

Appropriateness Grease traps should be applied where considerable amounts of oil and grease are discharged. They can be installed at single households, restaurants or industrial sites. Grease removal is especially important where there is an immediate risk of clogging (e.g., a constructed wetland for the treatment of greywater).

Screening is essential where solid waste may enter a sewer system, as well as at the entrance of treatment plants. Trash traps, e.g., mesh boxes, can also be applied at strategic locations like market drains.

A grit chamber helps prevent sand deposits and abrasion in wastewater treatment plants, particularly, where roads are not paved and/or stormwater may enter the sewer system.

As laundries release high amounts of fabric fibres and particles with their wastewater, they should be equipped with lint trap devices.

Health Aspects/Acceptance The removal of solids and grease from pre-treatment technologies is not pleasant and, if households or community members are responsible for doing this, it may not be done regularly. Hiring professionals to do the removal may be the best option though it is costly. The people involved in the cleaning may come in contact with pathogens or toxic substances; therefore, adequately protecting oneself with safety clothes, i.e., boots and gloves, is essential.

Operation & Maintenance All pre-treatment facilities must be regularly monitored and cleaned to ensure proper functioning. If the maintenance frequency is too low, strong odours can result from the degradation of the accumulated material. Insufficiently maintained pre-treatment units can eventually lead to the failure of downstream elements of a sanitation system.

The pre-treatment products should be disposed of as solid waste in an environmentally sound way. In the case of grease, it may be used for energy production (e.g., biodiesel or co-digestion), or recycled for re-use.

Pros & Cons

- + Relatively low capital and operating costs
- + Reduced risk of impairing subsequent Conveyance and/or Treatment technologies
- + Higher lifetime and durability of sanitation hardware
- Frequent maintenance required
- The removal of solids and grease is not pleasant

References & Further Reading

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