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GUIDE – WASTEWATER TREATMENT SYSTEMS

Wastewater Treatment Systems

The daily input of raw sewage from toilets, wash-hand basins, showers, kitchen-sinks and washing-machines is purified by sedimentation and biological aeration processes within the wastewater treatment system.

The treated effluent in the final chamber is then pumped to the percolation area, where it infiltrates into the ground or via a subsoil gravel-bed.

Regular de-sludging of primary chamber

In order to allow the wastewater treatment system to operate correctly, regular de-sludging of the primary chamber is required to remove the accumulation of sedimented solids. The intervals are determined by the available volume within the primary chamber and the amount of raw sewage input from the facility.

The treatment system supplier/manufacturer should be able to provide further information on required de-sludging intervals.

Failure to implement regular de-sludging directly affects the composition of the treated effluent and can cause system component-failure as well as blockages and contamination of the percolation area.

No alien-objects down the toilet !

Non-dissolving alien objects (e.g. sanitary wipes) should not be disposed via the toilet but be placed into the normal household waste-bin. The introduction of alien-objects to the wastewater treatment system can impede system functionality.

Food rests should also not be discharged towards the wastewater treatment system. This can impact system functionality and may attract rodents.

Maintenance

Maintenance or repair-work to the wastewater treatment system should be conducted by qualified personnel only. Due to the dangers (e.g. foul gases) involved, it is advisable to perform any works at the wastewater treatment system in the company of another adult.

An annual service by a qualified service-technician is recommended to ensure the wastewater treatment system is operating properly.

What to do if the submersible pump in the final effluent chamber fails on a reoccurring basis?

Re-occurring pump failures at a remote wastewater treatment system can have numerous causes.

As it is neither practical nor feasible to merely renew the pump without identifying the actual cause of the pump failure, the below check-list may be of assistance to determine unfavourable site conditions prompting pre-mature wear- & tear of the submersible pump.

A. Effluent Composition

In a functional wastewater treatment system the effluent in the final chamber is clear and free from solids.

Excessive use of chemical cleaning-agents in the household can impact the biological treatment process.

Visible effluent deterioration may indicate higher contamination levels of the effluent, which can affect the pump seals and subsequent percolation area. Alien-objects such as non-dissolving wipes can accumulate around the pump sieve ; insufficient water-intake & motor-cooling > heat-damage to pump seals & motor.

- Assess treatment system functionality, de-sludging intervals & eradicate introduction of non-dissolving alien-objects & high input of chemicals from household

B. Pump Switching-Cycles

Frequent switching of the pump should be avoided ; max. 15x cycles/hour

The number of switching-cycles of the pump is determined by the volume of liquid passing through the wastewater system and the volume within the final effluent chamber.

The size of the effluent chamber cannot be altered easily. Small chamber dimensions will inevitably cause a higher number of pump switching-cycles.

The volume entering the treatment system is significantly higher at installations where surface water from drains and gutters is also connected. Surface water should normally not be introduced to the wastewater treatment system ! This does not only impact the biological treatment process but also causes higher pump switching-cycles, especially during periods with prolonged precipitation.

Continuous excessively high pump switching-cycles can lead to over-heating of the pump-capacitor.

C. Electrical supply

The electric supply cable to the treatment system should have a sufficiently sized cable-core in relation to overall cable-length & electric consumption. The electric consumption of the pump and other electrical appliances on the same power supply cable (from main distribution) have to be considered.

An insufficiently-sized cable can lead to damage of the pump-capacitor and pump motor.

On receipt of site conditions a recommendation of the cable core-size is available.

D. Pumping distance to percolation area & pipe size

The pumping distance to the percolation area and pipe size installed should allow the pump to operate on its performance curve.

At installations, where the percolation area is located further away from the final effluent chamber, it may be necessary to select a stronger pump.

Calculations on the effective pumping height (pumping head + pressure-loss) and recommended pump size to be used are available on request !