

## Press release

### BIBKO® INFRA<sup>TEC</sup> – Fines separation improves process water quality Reduction of settleable solids during recycling of sewer debris

Sewer debris is the mineral fraction from public sewage systems, gully sludge and sand trap material. The following AVV numbers apply here.

AVV 19 08 02 - sand trap residues

AVV 20 03 06 - Waste from sewer cleaning



Sewer debris

In order to recycle sewer cleaning waste, it is fed into a wet-mechanical treatment process. The recycling process has the following objectives:

1. Preparation of the material so that the mineral components can ideally be reused again
2. Reduction of landfill costs through improved classification values for material that cannot be recycled even after the recycling process
3. Reduction of disposal costs through volume reduction

The process water resulting from the wet-mechanical treatment can be discharged after analysis and approval by the lower water authority. However, the requirements and limit values for settleable substances must be complied with.

### Settleable substances: The problem

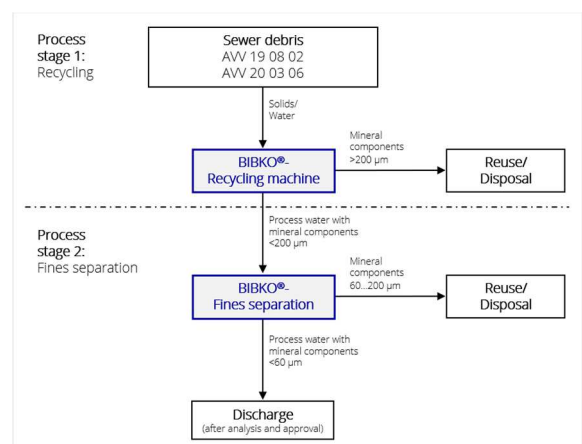
Discharge of wastewater with a high proportion of settleable solids leads to a reduction in the cleaning performance of wastewater treatment plants. Large amounts of grit, for example, can exceed the cleaning capacity of grit separators and primary clarifiers. In addition, there is a risk that high proportions of settleable solids will be deposited in the sewer pipe systems and clog them.



Emptying process suction/rinsing

### BIBKO® INFRA<sup>TEC</sup> - Recycling solution

For the recycling of sewer debris with integrated reduction of settleable solids, BIBKO®, business unit INFRA<sup>TEC</sup>, offers a recycling solution consisting of two process stages:



BIBKO® INFRA<sup>TEC</sup> - Solution (schematic)

The solution consists of the following machine components:

1. BIBKO® recycling machine  
for the separation of mineral components  
>200 µm
2. BIBKO® fines separation  
for the separation of mineral components  
in the range of 60...200 µm.

### Process stage 1: BIBKO®-Recycling machine

In process stage 1, the sewer debris is first fed into the pre-washing chamber of the BIBKO® recycling machine. This chamber contains a water bath. A rotating spiral conveys the sewer debris through the water bath and segregates it. At the same time, water flows through the chamber in countercurrent. The mineral components <200 µm are washed out and fed together with the excess process water to the BIBKO® fines separator.

The value of 200 µm represents the separation cut. The separation cut (d50) indicates the smallest grain diameter of which at least 50% can still be removed from the water bath. The remaining 50% with a grain diameter of 200 µm, as well as smaller grain diameters, are sent with the process water for fine particle separation.

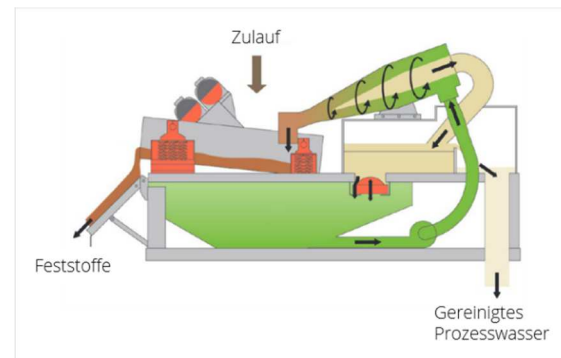
The mineral components >200 µm are removed from the pre-wash chamber by a bucket elevator and fed into the main wash chamber. There, the main washing process takes place, in which the sewer debris is again mechanically conveyed through a water bath. In order to achieve optimum washing results, water also flows through the chamber in countercurrent. A second bucket elevator removes the washed material from the main washing chamber and feeds it to the screw conveyor. The material is dewatered via this conveyor and conveyed into the material box.



Recycled material - Sand fraction

### Prozess stage 2: BIBKO®-Fines separation

From the BIBKO® recycling system, the process water is fed to the BIBKO® fines separator.



BIBKO®-Fines separator (schematic)

The process water first reaches the coarse screen of the fines separation. There, the remaining particles >200 µm are separated and transported to the material box (container).

The pre-cleaned process water flowing through the coarse screen is collected in the fine particle separation tank, sucked off by the cyclone pump and pumped into the cyclone. The centrifugal forces occurring in the cyclone cause a separation into the thickened suspension flowing out at the bottom and the ripened process water flowing out at the top.

The thickened suspension from the cyclone underflow reaches the fine screen, moves upwards on the upwardly positioned screen surface due to the oscillating movement and is dewatered. While the separated water runs back into the tank, the dewatered fines are transported into the material box (container).

After this process step, the process water still contains fines with a particle size  $\leq 60 \mu\text{m}$ . After analysis and release, the process water can be discharged.

### Discharge criteria

The most important criterion for the discharge of the process water is the concentration of settleable solids in the process water.

In addition to the proportion of settleable substances, the other substances and constituents contained in the process water are also important for the release. These vary in quantity and concentration depending on the sampling location.

The assessment of the process water required for the release is carried out in cooperation with the lower water authority.



BIBKO®-Fines separation (in operation)

### Fines content still too high - and now?

If the proportion of fines in the process water is still too high for discharge due to a high proportion of fines  $< 60 \mu\text{m}$ , the two-stage process described above can be supplemented by a third process stage.

This process stage consists of a chamber filter press. The chamber filter press is a discontinuously operating pressure filter for separating a water-solid mixture (process water).

The actual filtration process is performed by a filter plate pack with filter cloths. The process water to be filtered is pumped through the plate pack by a diaphragm pump. While the solid components are retained on the filter cloth, the filtered process water flows through the filter cloth. This water can then be discharged.



BIBKO®-Chamber filter press

After completion of the filtration cycle, the filter press opens. The fine particles, pressed to form compact filter cakes, are ejected.



Filter cake

## Conclusion

The combination of BIBKO® recycling machine and BIBKO® fines separation provides a recycling solution with the following objectives:

- Reduction of the disposal volume
- Recycling of the mineral components for reuse or more cost-effective disposal
- Removal of the settleable substances contained in the process water to enable discharge into the public sewer system.

These objectives save money and lead to a short payback time of the investment in a **BIBKO® INFRA7EC** recycling solution.