Press release

BIBKO® INFRA*TEC* - Recycling machine as a 1. stage of a chemical-physical treatment plant

Separation of mineral components and impurities

Chemical-physical treatment plants (CP plants) are used to treat liquid and water-containing waste that must not be discharged into the public sewer system. For this purpose, waste contaminated with oils, fats, organic pollutants or heavy metals is cleaned in a multi-stage process. The treatment concept is designed in such a way that the pollutants are separated by chemical-physical reactions, collected and concentrated for environmentally sound disposal or recycling in solid or liquid form. The treated wastewater can then be discharged into the public sewer system.
In addition to environmentally sound disposal and recycling, a CP plant also aims to make sustainable use of raw materials in the sense of a closed-loop economy.

Discharge of a truck at a recycling machine

Impurities/ Mineral components

Before the actual chemical-physical treatment in the CP plant, contaminants (branches, leaves, floating material) and mineral components (sand) must be separated from the waste. As the 1. process stage of the CP plant, this can be done using a BIBKO® INFRA*TEC* - Recycling machine.

Receiving hopper for waste

The separation of impurities and mineral components takes place in a two-stage process.

- Process stage 1:
  Separation of impurities from liquid phase
- Process stage 2:
  Separation of mineral components from solid-liquid phase

The following description refers to waste from oil separators.

Process stage 1: Liquid phase

To separate the impurities, the liquid phase (e.g. oil-water mixture) from the truck is first fed to a helix screen. For this purpose, a hose is connected between the truck outlet and the helix screen and the liquid phase is drained off.

Function Helix screen

The liquid phase first flows through a perforated screen zone in the helix screen. Impurities are retained at the screen. The fill level is detected by a sensor in the inlet area of the screen zone.

When the switch-on point is reached, the shaftless spiral clears the screenings from the screen basket, transports them into the pressing and dewatering zone and discharges them into a container.

Helix screen with container

The screening zone is cleaned during the clearing process by the special brush attached to the spiral.
The press basket is cleaned by an external spray pipe positioned in the press zone jacket. A container flushing system with a rotating container cleaning nozzle ensures cleaning of the screen container in the feed area as soon as the feed process is completed.

Screening material from helix screen

While the remaining liquid phase (oil-water mixture) flows into the BIBKO® INFRA*TEC* - Recycling machine for the separation of the contained mineral components, the screenings (impurities) are fed into the incineration process.

Recycling machine

Process stage 2: Solid-liquid-phase

After the liquid phase has been drained from the truck in process stage 1, the oil-water-solid mixture remaining in the truck vessel is fed via the feed hopper into the BIBKO® INFRA*TEC* - Recycling machine in process stage 2.
In the recycling machine, the material enters the washing chamber. This contains a liquid bath. A rotating spiral conveys the material through the liquid bath and segregates it. Excess oil-water mixture is discharged from the recycling machine and fed to the CP plant via a pump sump.

Mineral components from recycling machine

The mineral components (oil-solid mixture) are removed from the washing chamber via a bucket elevator and fed into a container. This material is then also fed into the incineration process.

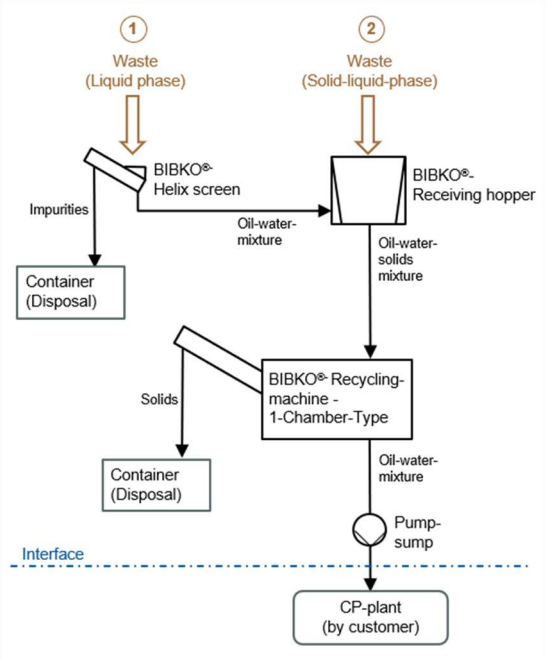
Further process sequence CP plant

After the impurities and mineral components have been separated, the oil-water mixture is subsequently treated. This treatment is carried out in batches in closed reaction tanks by chemical-physical processes (newtralisation, acid cleavage, oxidation and/or precipitation). The resulting sludge containing pollutants is dewatered (e.g. chamber filter press).
The treated wastewater is analysed before being discharged into the public sewer system.

Process diagram

BIBKO® INFRA*TEC* - Recycling machine

The following diagram shows the process as the 1. process stage of the CP plant.



Process diagram

Summary

The core component of the process described above is the BIBKO® INFRA-*TEC* - Recycling machine. Through the wet-mechanical process, the mineral components of the waste are segregated and separated in the machine.

The differences in density of the individual components are utilised (solids - water - oil), so that after the recycling process only very small quantities of mineral components with small grain sizes are contained in the oil-water mixture from the recycling machine.
In combination with the helix screen for the separation of impurities, the system represents an economical 1. process stage of a chemical-physical treatment plant (CP plant).