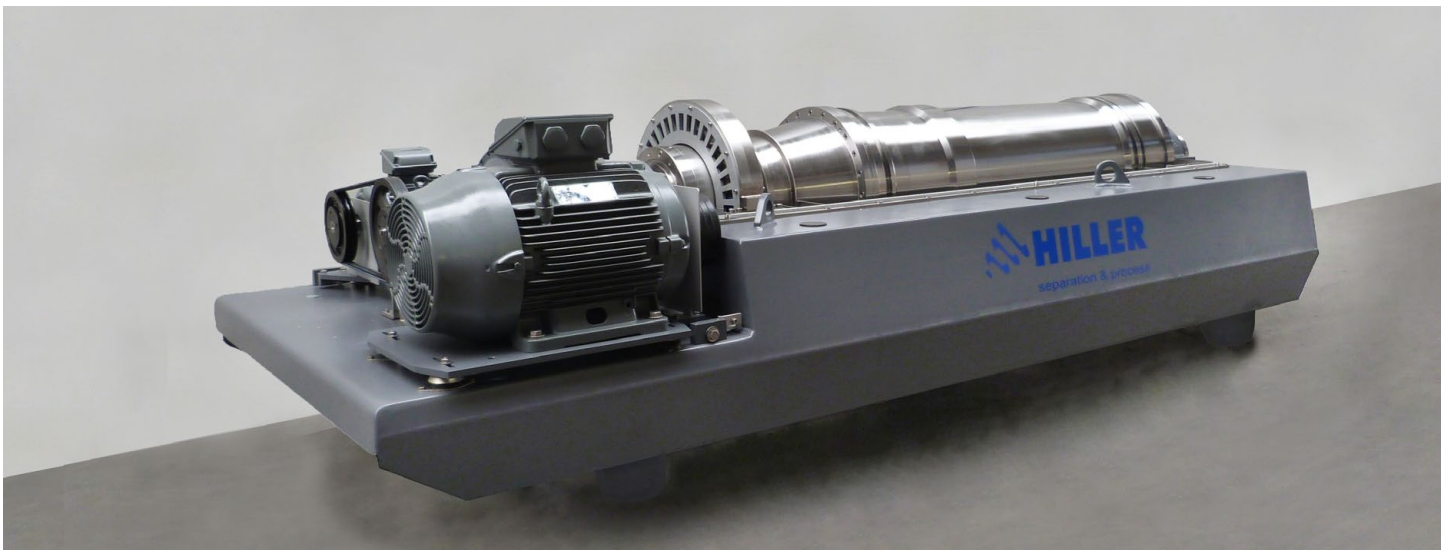


DECANTER CENTRIFUGES & PLANTS FOR SOLID/LIQUID SEPARATION



HILLER DECANTERS FOR THICKENING AND DISINTEGRATION

General process concept

To achieve an ideal consistency in the raw or mixed sludge prior to the digestion, as a general rule the excess sludge is mechanically thickened before mixing with the primary sludge. The excess sludge thickening reduces the amount of sludge fed to the digestion tank. This yields considerable energy savings and better use of the digestion system, as well as longer retention times in the digestion process. This results in further reduced digested sludge quantities as well as improved dewatering properties thereof.

GOALS:

- achieve an ideal consistency in raw/mixed sludge prior to the digestion
- reduce the sludge volume fed to the digestion tank
- better use of the digestion tank and therefore longer retention time in the digestion tank
- increase in the maximum possible discharge DS during the digested sludge dewatering

HILLER decanter for thickening

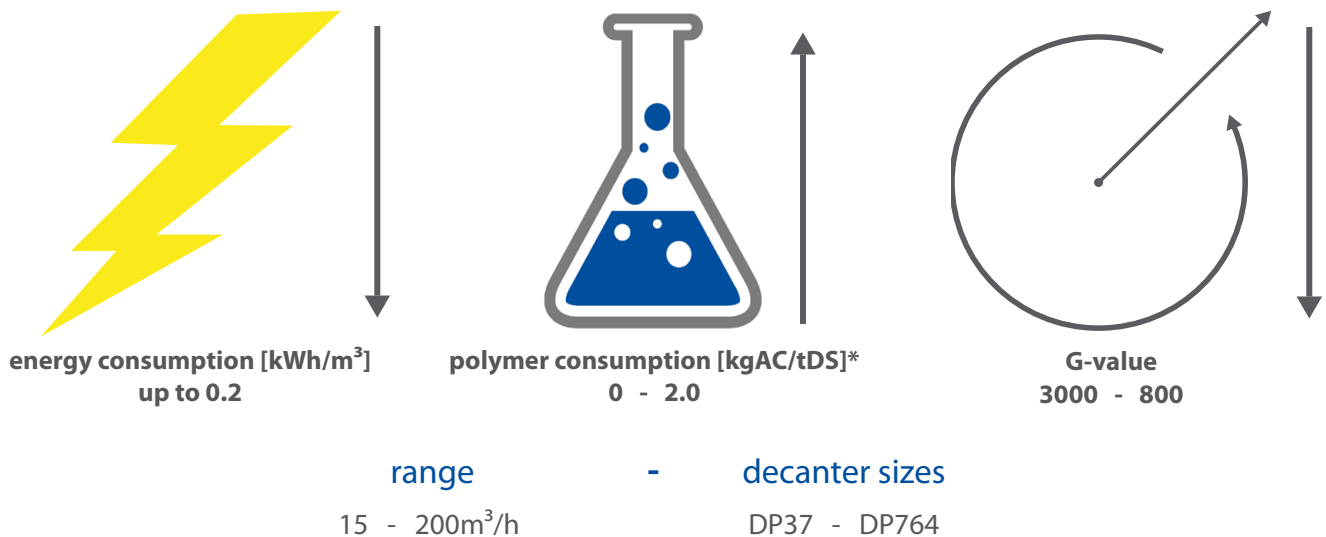
Decanters for thickening are not designed according to the classical counter current principle, but according to the direct current principle. Thanks to this design, the suspension passes through the entire length of the centrifugal chamber in the direction of the discharge. The centrate water runs through channels in the direction of the weir openings. The result is a very long clarification section and thus minimal or no polymer as well as achieving the highest separation efficiencies.



ADVANTAGES OF THICKENING WITH THE HILLER „DECATHICK“ DECANTERS COMPARED TO OTHER THICKENING SYSTEMS:

- vapour-proof design
- operation without polymer dosing possible
- starch polymers and chitosan can be used as supporting agents
- minimum energy consumption ($\sim 0,2 \text{ kW/m}^3$)
- no intermediate flushing cycles required for continuous operation - No water consumption during operation
- no filter cleaning required
- fully automatic operation due to feed concentration measurement in conjunction with HILLER SEE-Control pro
- process values largely independent of sludge index
- infinitely variable degree of thickening, up to the viscosity limit with regard to pumpability
- optionally expandable with HILLER lysate technology for sludge disintegration

SIMPLIFIED REPRESENTATION OF THE RECIPROCAL RELATIONSHIP BETWEEN INFLUENCING FACTORS:



* kgAC/tDS = kg active content per ton dry substance

HILLER LYSAT TECHNOLOGY

HILLER THICKENING DECANTERS CAN BE OPERATED WITH AN ADDITIONALLY INSTALLED LYSING DEVICE

The approach of determining economic and procedural advantages for further sludge treatment by means of a disintegration process is not new. Various physical or chemical solution approaches are all aimed at the following objectives:

ADVANTAGES OF THE HILLER LYSAT TECHNOLOGY:

- viscosity reduction and better pumping properties at high thickening degrees
- cell disruption increase resulting in an increased degradation of the organic share
- gas yield increase
- improved dewatering behaviour

MECHANICAL CONSTRUCTION:

The lysate device consists of a labyrinth with a lysing chamber fitted with window openings. Fork blades attached to the centrifuge bowl rotate through the lysing chamber and are protected against wear by tungsten carbide plates.

Thickened excess sludge is ejected at high speeds from the centrifuge discharge openings and flows through the lysing chamber in the axial direction. A simple, on site disassembly of the lysate device enables a quick change to a conventional thickening decanter.

OPERATION:

The HILLER lysate device is attached in the area of the sludge discharge openings **and uses the existing kinetic bowl energy**. The additional power consumption of 0.2 to 0.5 kW/m³ can therefore be kept correspondingly low.

The disintegration effects in the thickened waste activated sludge (WAS) are mainly caused by impact and shear forces generated by the knife blades rotating at high circumferential velocity in the labyrinth and the lysing chamber. The WAS disintegration is carried out in the full flow of the thick sludge that has entered the lysate device; **no lysate enters the separated centrate water**.

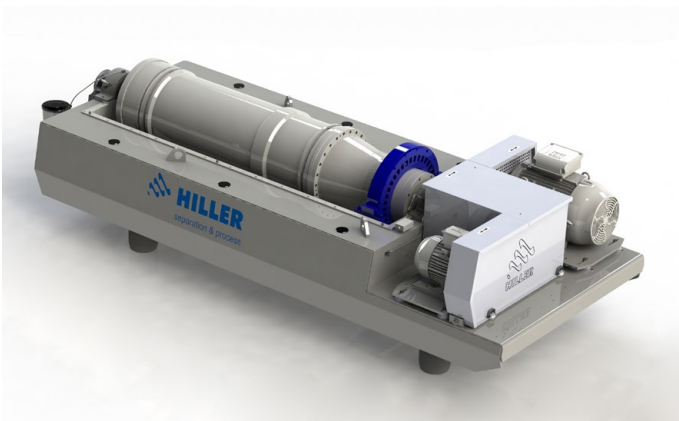
NO FURTHER PLANT TECHNOLOGY REQUIRED:

Apart from the lysate device, no further facility or system technology is required.

Equipping a HILLER thickening centrifuge with a lysate device therefore combines the following processes:

- WAS thickening
- WAS disintegration
- WAS liquefaction (change in viscosity of the thickened WAS)

As a manufacturer of high-performance centrifuges in this application segment, HILLER GmbH can demonstrate a specific advantage in terms of experience through its own references. The design and process engineering know-how are firmly anchored within the company.



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