



**HAARSLEV™**

Processing Technology

# **BIOSOLIDS FLASH COOLER**

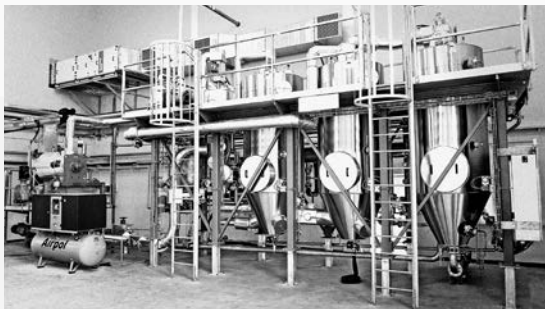
Product brochure



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# BIOSOLIDS FLASH COOLER



**For continuous cooling of biosolids from thermal hydrolysis processes, for guaranteed compliance with temperature requirements in anaerobic digesters.**

## **BENEFITS**

- Guaranteed operator-specified temperatures for biosolids flows into digester tanks – even during hot weather, and regardless of seasonal fluctuations.
- Exceptional reliability, providing good support for 24/7 biosolids/sludge treatment operations.
- The biosolids never come into contact with heat exchanger surfaces, eliminates all scaling, abrasion and fouling problems and resulting in very low maintenance costs.
- No need to pump hot biosolids through heat exchangers – flows are driven by simple differential pressure.
- Good opportunities for thermal energy recovery, reducing costs as well as environmental impacts.

The Haarslev Biosolids Flash Cooler provides an effective, reliable way to cool biosolids following the thermal hydrolysis processes. Operators or automated control systems determine the exact temperature outputs needed to maintain a constant digester temperature. This system guarantees the temperature inputs you need – regardless of season or ambient temperatures. The flash cooler also deals with adding dilution water to adjust the level of dry solids before the digester.

The Haarslev Biosolids Flash Cooler system combines a vacuum flash cooler tank and a vapor-to-water condenser, exploiting a pressure differential and the power of thermodynamics to instantly reduce the temperature of your sludge flow to the boiling point at that specific lower pressure – normally from 105°C to approx. 55°C.

The system does the same job as space-hogging traditional tube-in-tube heat exchangers, but with more modern, energy-efficient equipment and technology that eliminates fouling problems and makes it possible to recover the thermal energy (cooling water at 50–60°C) for other uses. Because there is no direct contact with heat exchanger surfaces, fouling and abrasion problems are eliminated and the system is almost maintenance-free.

A key feature of this system lies in the steam explosion, which also helps disrupt cell walls and degrade polymers in the biosolids, with significant benefits for viscosity and conversion in your anaerobic digester.



## WHERE YOU CAN USE IT

- Existing biosolids/sludge treatment plants with a thermal hydrolysis installation that have to replace or update current equipment, or want to reduce operating and maintenance costs
- New thermal hydrolysis plants and other installations where there is a need for cooled, controlled-temperature inputs of sludge.

## HOW IT WORKS

- 1 From Thermal Hydrolysis system
- 2 Constant low pressure in the cooler causes water in the biosolids to boil and evaporate, creating a steam explosion
- 3 Cooler separates the flash steam from the cooled sludge
- 4 High-thermal-efficiency shell-and-tube heat exchanger as condenser, with hot vapor on the tube side and the cooling media (water) on the shell side
- 5 Vapor/steam from the steam explosion condenses to water in the condenser, creating the vacuum in the cooler
- 6 Condensate transferred back to the sludge in the cooler
- 7 Cooled sludge automatically diluted with water, based on dry solids requirements in the digester
- 8 Water-ring vacuum pump removes any non-condensable gases from the sludge



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## PROCESS IS POTENTIAL

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