

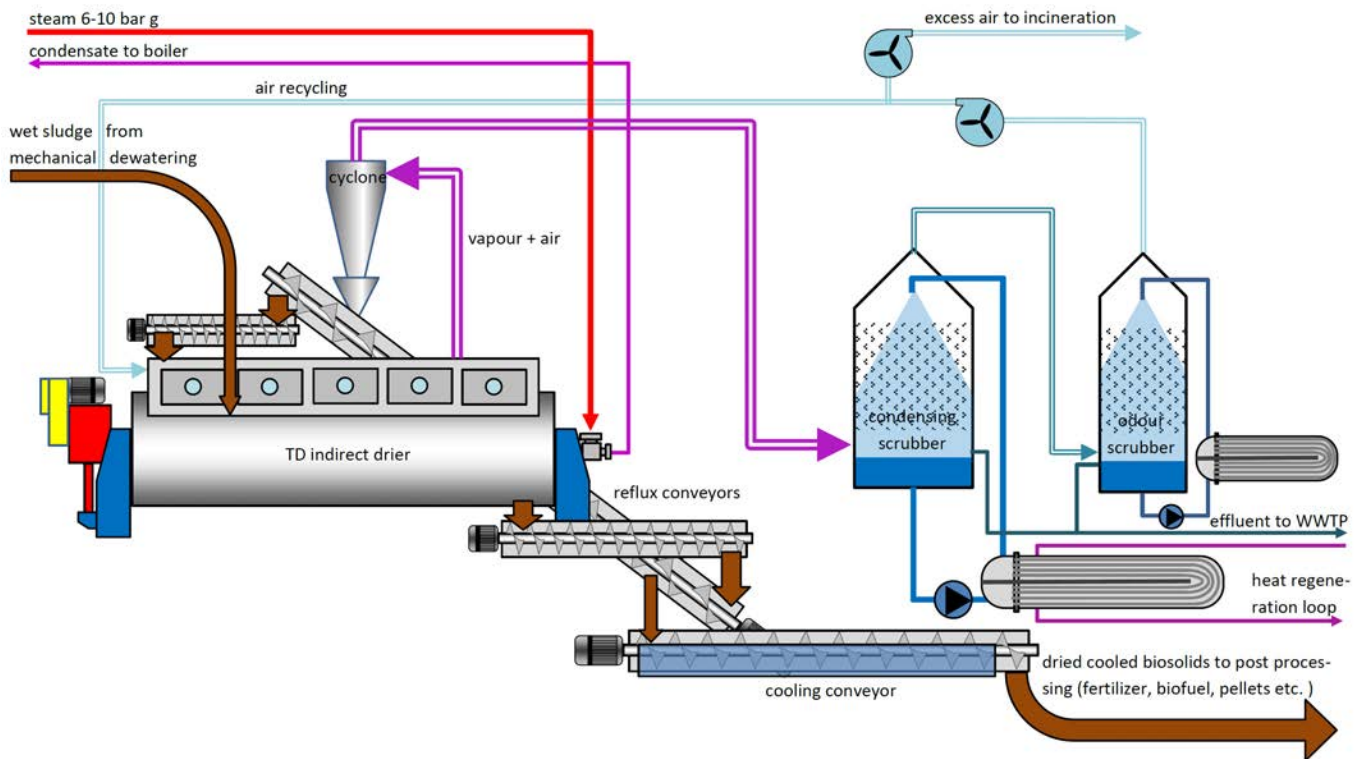
INDIRECT BIOSOLIDS DRYING



The Fjell Indirect Biosolids Drying Process:

- ✓ Highest possible explosion safety
- ✓ Lowest possible energy consumption
- ✓ Full control of odour emissions
- ✓ Zero microbiological activity in product
- ✓ Low noise process
- ✓ Fully automatic plant operation
- ✓ Rigid equipment design and correct material selection for maximum equipment lifetime

Process Flowsheet Fjell Indirect Biosolids Drying Process



Process Features

The process is based on the rigid **Fjell Turbo Disc Drier** designed for heating by steam (6-10 bar), hot water or thermal oil. Energy consumption is typically 750 kW thermal energy and 50 kW electric power per ton evaporated. The wet sludge from the mechanical dewatering plant is pumped into the drier, where it is mixed with a portion recycled dried solids to moisture content below the glue formation limit. This is necessary to avoid excessive load, tear and wear on the machinery. The mixture is efficiently heated to the boiling point by the large heat surface available inside the disc drier, and vapour is mixed with an air stream and sucked out from the vapour dome. Oxygen level is kept below explosion limit, but in addition the drier has explosion reliefs installed as an extra precaution. The vapour is cleaned and condensed in a cyclone and two stage condensing and odour scrubber system. The latent heat in the vapour is regenerated in an indirect cooling loop

and can be re-used in the water treatment plant. The small amount of excessive air (200-400 Nm³ per ton evaporated) is removed from the process and typically incinerate in the steam boiler.

Reference Installations

- TD225, IVAR, Stavanger – Norway, 2002 (2 ton per hour evaporation capacity)
- 2xTD225, A.L.S.I., Monza - Italia, 2005 (4 ton per hour evaporation capacity)
- 2xTD450, Biosolidar, Makkah – Saudi Arabia, 2006 (9 ton per hour evaporation capacity)
- TD330; Shizuoka Yuka, Shizuoka – Japan, 2011 (3 ton per hour evaporation capacity)
- TD330; , IVAR, Stavanger – Norway, 2014 (3 ton per hour evaporation capacity)