

## Stable steam consistency to heat recovery boosts profitability

*A TCT-2300 provides a stable flow of steam from the TMP refiners to the heat recovery unit at Stora Enso Magazine Paper, Kvarnsveden mill. In other words, the instrument has improved the availability of the recovery unit, a factor that has in turn kept its contribution to Kvarnsveden's overall economy stable.*

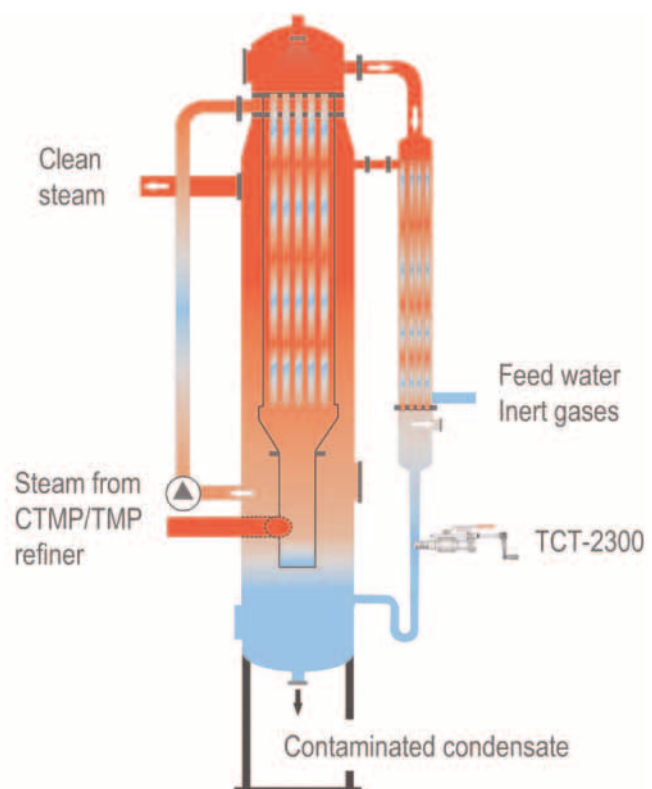
A heat recovery unit plays an essential role in the operating economy of TMP and CTMP mills. At Kvarnsveden mill about 50% of the refining energy can be recovered in the form of clean steam.

This means that almost 50% of the steam used in the papermaking process is produced from energy generated in the refiners. The other half of the energy for steam production at Kvarnsveden is from fuel boilers. Without steam from the refiners, electrical energy from the grid would have to be purchased to meet the mill's steam requirements.

Stora Enso Magazine Paper, Kvarnsveden mill produces about one million tonnes of newsprint, improved newsprint and uncoated magazine paper from TMP and groundwood pulp on four paper machines. The mill is one of the largest in the world in its product area.

"The production of publication papers obviously requires pulp. In the TMP refiners, the mechanical refining energy is converted into heat, which generates steam from the dilution water and from the moisture contained in the wood."

- Variation of fiber consistency 20-1500 mg/l
- When consistency exceeds a preset limit, dilution water is added



## Steam recovery

“So in essence, the steam recovered from the TMP refiners is gratis, the by-product of the refining process, which as everyone in the business knows, requires a lot of electrical energy that often is purchased from the grid.”

“There was a time when electrical energy was relatively cheap and therefore it wasn’t so necessary to find as many ways as possible to reduce or compensate for these costs. But in today’s world of ever increasing energy costs and environmental consciousness, anything that can be done to help reduce these costs is welcome,” says Gunnar Westling, a systems engineer at the mill.

Steam leaving the refiners passes through a separator that separates the steam from the fibers before it enters the heat recovery unit, which employs falling film evaporation technology to condense it against vaporizing clean steam.

However, even the best separators cannot remove all of the fibers. Therefore, a heat recovery unit for TMP steam must be capable of handling steam that contains fibers. Figure 1 shows the main components of a typical heat recovery unit.

## Zero fiber content an impossible target

“Although the heat recovery unit can tolerate steam containing fibers, our target is to reduce the amount of them in the steam flow to as close to zero as possible. Too many fibers foul the tubes in the unit. Fouled tubes reduce the efficiency of the process and in the worst instance plug the tubes, stopping the process.”

“Given the extent to which the heat recovery unit plays in the operating economy of our mill, inefficient steam production or total stop is costly,” says Johan Berglund, control technician.

At Kvarnsveden consistency measurement of the condensate in the heat recovery unit reveals the fiber content in the steam flow. The assumption is that the amount of fibers in the condensate is representative of the amount in the steam flow. The TCT-2300 is the instrument Kvarnsveden uses to get this job done.

“We have found that the TCT gives us very reliable measurement in a difficult environment. Not only is the steam flow very hot, but also the consistency the instrument measures is very low, less than 0.1%.”

## High availability boosts profitability



“Our set point in this application is a little unusual as it is the point at which the TCT starts measuring, or 0.1%. We’ve found this way of operating works and contributes to a stable flow of steam from the refiners to the heat recovery unit. In other words, the TCT has improved the availability of the unit, a factor that has in turn kept its contribution to Kvarnsveden’s overall economy stable,” says Mr. Westling.

“Given the extent to which the heat recovery unit plays in the operating economy of our mill, inefficient steam production or total stop is costly,” say Gunnar Westling, left, and Johan Berglund.