

Greater demands calls for action

In 2011 Stafsjö was faced with a request from a worldwide known OEM supplier with strong foundation within the Pulp and Paper Industry. They wanted a technically fast and reliable valve capable of operating within a broad range of pressures, pulp concentrations and temperatures. The development team at Stafsjö got down to work and the story of the 20 bar/300 psi rated HX began.

– We have experienced this development during many years: the production volume at pulp and paper mills across the globe are increased, new mills are being built capable of achieving new record production volumes and old plants are being converted or upgraded. As a knife gate valve supplier Stafsjö represents a part of a great machinery equipment, but rather than let the grass grow under our feet we want to support further development within the sector with product solutions to realize new efficiency and production goals, says Oskar Rüdow, Product and Engineering Manager at Stafsjö.

Stafsjö works in close collaboration with its customers to maximize customer benefit. During the course of 2011, the team at Stafsjö developed a prototype that following a large number of in-house test runs, was transferred to OEM suppliers' own test facility for more advanced endurance tests.

– It was a great feeling when the prototype tests proved successful. The development took off thereafter. To date, we have supplied the high pressure HX in sizes ranging

from DN 200 all the way up to DN 900 in stainless steel and also in high alloy materials such as SMO 254, titanium and duplex, says Oskar.

The potential area of use has increased over time. Now the valve is also used within other areas and sectors that Stafsjö had not initially anticipated. But it is within the pulp and paper sector where the application scope of HX is at its greatest – now and most likely also in the future.

The Stafsjö HX knife gate valve ensures batch digester isolation during pulp stock production

In chemical pulping, some fiber lines operate with a continuous cooking process while others operate in batch cooking.

In the batch cooking process, the wood chips and cooking liquor are heated with steam under high pressure. Once the cooking process is completed, the digester is emptied through a blow valve at the digester bottom, and onward to a blow tank. During blowdown, the process equipment is subjected to high velocity, pressure, abrasion and temperature, as well as severe vibration. The batch digesters discharge to a common header, which is connected to a blow tank further downstream. When one digester is out of service for blow valve repair or other maintenance, the chemical pulp mill normally shuts down all digesters in series to ensure the work can be carried out safely. This results in a major loss of pulp production.

The solution

HX field of applications

Maintenance block and bypass isolation valve in cooking plant
Isolation valve after washing and before oxygen treatment
Isolation valve in bleaching area
Pulp tower isolations
Pulp concentrations 0-18%
Pressure range up to 20 bar/300 psi

Stafsjö's severe service HX valve has successfully been installed as a maintenance block for complete isolation in batch digester clusters. The HX valves are placed downstream of the blow valve, but before the common pipe or header leading to the blow tank. During regular batch cooking process, Stafsjö's HX valves are locked open. When a digester needs to be shut down for maintenance or inspection, the HX is closed and locked, allowing that particular digester to be depressurized and the blow valve removed, or blow down piping disengaged, while the rest of the digesters continues to process pulp as normal. Stafsjö's HX provides 100 % bi-directional isolation, to prevent any back flow reaching the shut-down area. Downtime is minimized, maintenance work can be performed safely and the production levels can remain steady because the other digesters can continue to feed the mill with pulp stock while the one digester is being maintained. The Stafsjö HX valve is built to withstand the unique pressure, temperature, chemical, abrasion and vibration extremes associated with this application.



20 bar/300 psi rated HX batch digester version

Valve body

Solid and reinforced two piece version, precision manufactured in cast stainless steel EN 1.4408. The body is locked by stainless steel A4 antivibration hardware. No welds.

Gate

Extra thick through-going and polished gate in duplex stainless steel EN 1.4462

Retainer rings

Strong precision machined duplex stainless steel EN 1.4470

Seats

Extra wide and thick carbon fibre reinforced PTFE seats to hold up against chemical attacks and high temperatures.

Gland box sealing system

Stafsjö's TwinPack braids and dual reinforced PTFE scrapers ensure no media reaches surrounding environment. The increased body and gate thickness makes the gland box sealing system steady and reliable at high pressure loads.

Top works

Super duty all stainless steel with lockouts and oversized actuator.