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## **Vertical screw-thickener – new dewatering technology in the stock preparation**

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Thickening of pulp suspensions from low to high consistency is a normal stock preparation process and usually requires the installation of a pre-thickener (e.g. disc filter or drum thickener), followed by a press (e.g. screw press). So eliminating the need for a pre-thickener not only means having one less equipment unit in the process, but also enables reduced filtrate quantities as well as smaller tank volumes, pumps and pipe diameters. Thus, a press that can dewater pulps directly from low (3%) to high consistency (> 20%) is a great benefit.

At low feed consistencies, the conventional screw presses often used in such applications have certain limitations that result in reduced throughput and lower discharge dryness. A conventional, horizontal screw press dewateres pulp suspensions by means of a rotating screw that tapers to increase the dewatering pressure on the pulp. Due to the height difference between the top and bottom of the dewatering screen, hydrostatic pressure builds up in proportion to the diameter of the press and creates uneven filtrate flow around the screen circumference (higher filtrate flow at the bottom of the screen basket compared to the top). The Vertical Screw Thickener (VST) overcomes these limitations.

The VST is a conventional screw press with a vertical design. The pulp is fed in from the top and compressed and dewatered as it moves downwards. In a vertical configuration, gravity has various positive effects: automatic and consistent refilling of pulp into the area between the screw flights, even distribution of the suspension around the entire circumference of the screen basket and guaranteed 100% filling level.

The VST prototype has been operating at the ANDRITZ pilot plant in Austria since 2015. Tests with various types of pulp have confirmed that all pulps (kraft pulps, DIP and OCC recycled fibers, and mechanical pulp) can be dewatered with the VST, also under different operating conditions. When compared with a traditional screw press, the VST demonstrated a 25% increase in throughput with the same discharge consistency. Besides the high dewatering efficiency, the Vertical Screw Thickener requires only a small space thanks to the vertical configuration and thus is perfectly suitable for subsequent installation in existing processes and buildings with limited space available.

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