

EVOLUTION OF THE ANDRITZ DD-WASHER

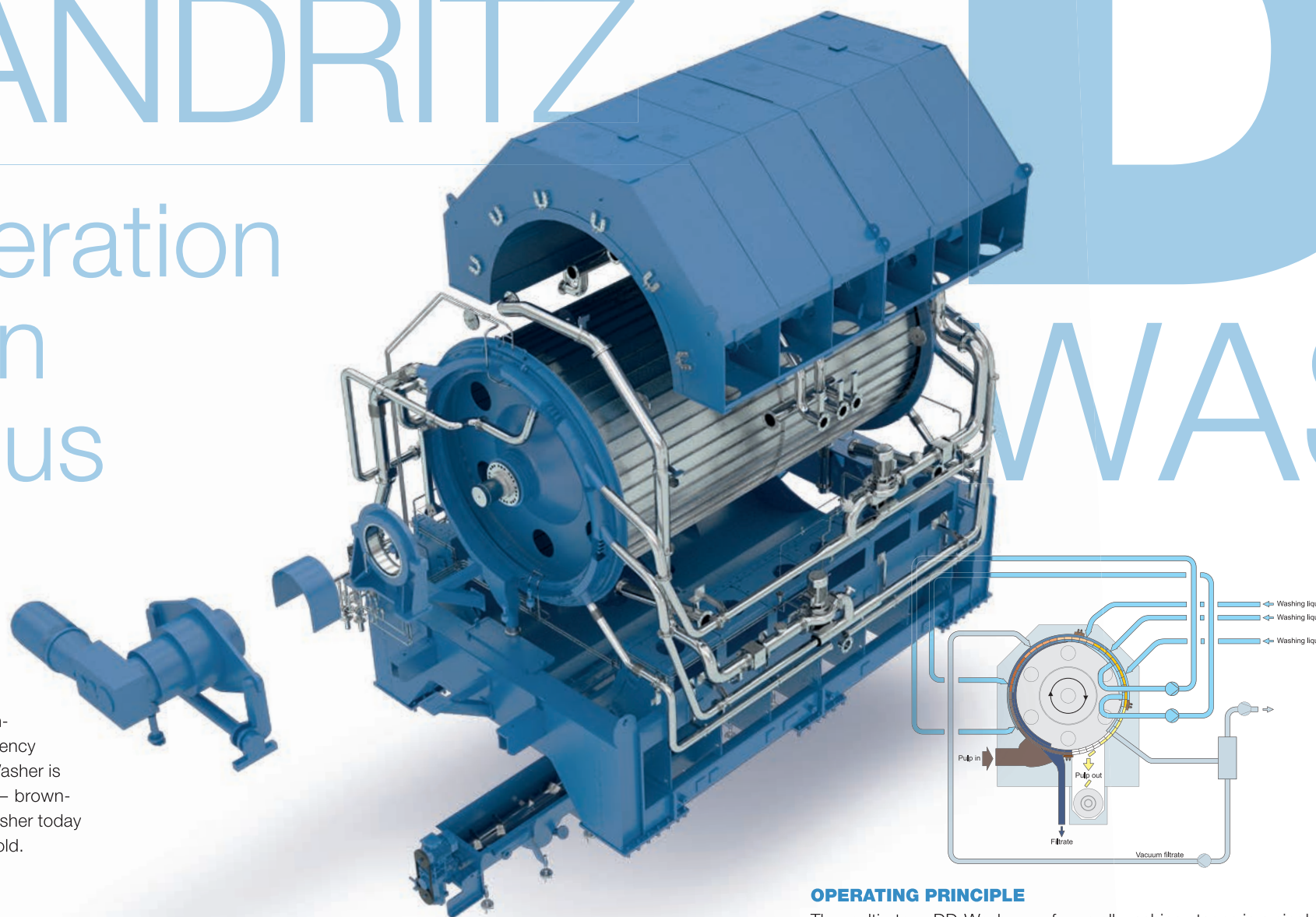
Each generation better than the previous

The DD-Washer was introduced in the early 1980s when the first commercial-scale unit went into production in a kraft pulp mill in Finland. Today, five generations later, every kraft pulp mill in Finland has ordered at least one DD-Washer (the latest order is for Stora Enso's Kemi mill) – and the washer has achieved global acceptance. With more than 340 installations in 24 countries, the multi-stage washing efficiency and extremely high production throughput of the DD-Washer is clearly preferred for all fiberline washing applications – brown-stock, post-oxygen, and bleaching. The largest DD-Washer today has almost 150 times the capacity of the first washer sold.

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"The design of the DD-Washer has been perfected through evolution, not revolution. The newest generation features improvements in pulp and filtrate hydraulics to increase throughput by about 20%."

PASI IMMONEN
Manager Washers and Filters
ANDRITZ Fiber Technologies



BENEFITS:

- Multiple washing stages on a single drum
- Compact design
- Extremely high washing efficiency
- Extremely energy efficient
- Fractionated filtrates to conserve water
- Retains fiber qualities: less fiber damage when no mechanical pressing
- Fast start-up and high availability
- Production throughput up to 6,250 t/d in a single unit

OPERATING PRINCIPLE

The multi-stage DD-Washer performs all washing stages in a single rotating drum and roughly at the same consistency without dilution. The housing around the multi-stage drum is divided into various washing zones. Pulp slurry at low (3-6%) or medium (8-10%) consistencies is pumped into the feed zone, where it is dewatered to form a porous pulp cake. The washing is done via displacement (i.e., the wash water displaces the cooking liquor or bleaching chemicals in the pulp). A key design feature of the DD is that at each washing stage, the pulp is washed counter-currently with the filtrate that has been fractionated from the succeeding stage. This lowers overall water consumption and results in more complete displacement.

CLEAR ADVANTAGES OF DISPLACEMENT WASHING

In the early days, almost all mills had vacuum drum filter washers. The main disadvantage was the amount of serial equipment to reach a certain wash result and a limited process temperature. Following this, wash presses were introduced. The main disadvantage

was the requirement to dilute and then mechanically press the pulp several times to reach a desired high consistency. The DD-Washer performs all washing stages in a single rotating drum and roughly at the same consistency without dilution. Since there is no mechanical pressing during washing, the DD-Washer is extremely gentle, retaining all the bulk, stiffness, and strength of the original fibers.

OPTIMIZING THE CAKE HEIGHT

Much of the work in the fifth generation DD-Washer was focused on optimizing the height of the pulp cake to achieve improved drainage and efficient displacement washing. For drainage, the thinner the pulp cake the better. However, if the cake is too thin, the advantages of displacement washing technology are lost. Fifth generation DD-Washers are tuned to produce a cake of 35-40 mm in brownstock applications and 40-50 mm in bleaching installations, depending on process conditions. This boosts throughput while maintaining high washing efficiency.