

Prime in stock preparation

THE NEXT GENERATION IN SCREENING AND FRACTIONATION

Well-known with over 5,400 pressure screens installed in numerous stock preparation lines worldwide, ANDRITZ presents the latest evolution in screening – the *PrimeScreen X*. The innovative design of the new screen builds on the successes of the widely valued *ModuScreen* family, but offers innovative key benefits. The improvements in energy efficiency, screening performance, and maintainability are significant.

According to Sampo Köyljäärvi, Global Product Manager for RCF screening and flotation systems at ANDRITZ, “Focusing on customers’ needs and market demands whilst benefitting from our long-term know-how in screening, the *PrimeScreen X* passed through all stages of product development – from the initial engineering design to prototyping and two years of mill testing – in most demanding OCC applications.”

MAIN FEATURES OF THE *PrimeSCREEN X*

The main design improvements of the new screen include:

Top-feed stock inlet. The design uses gravity to quickly remove heavy contaminants.

With this top-down design, abrasive contaminants, that cause wear to the rotor and screen basket, are not forced to flow slowly upwards through the entire screen. Top-down also improves the removal of light rejects, preventing their accumulation in the feed area and extending the life of wearing components.

PrimeRotor and foils for increased efficiency and lower power consumption.

The screen can be equipped with the new *PrimeRotor*, which improves screening efficiency and reduces energy consumption by up to 25%. The *PrimeRotor* foils are interchangeable with any other ANDRITZ foils and the rotor could be installed in any screen type available on the market.

Easier maintenance. Changing baskets and rotors is time-consuming work. The *PrimeScreen X* uses a uniquely designed drive flange to connect the rotor to the hub, so maintenance or replacement is quick and easy. The innovative clamping system to fix the screen basket in place allows faster screen basket changes.

Optimized screen basket height-to-diameter ratios.

The *PrimeScreen X* is designed so that the optimized screen basket height-to-diameter ratios meet the requirements of different furnishes and applications. This helps to reduce the thickening factors and leads to better control of fiber loss as well as reduced potential for plugging.

RESULTS FROM THE FIRST INSTALLATION

After extensive internal testing in ANDRITZ’s stock preparation pilot plant, the first commercial installation of a *PrimeScreen X50* was as a primary coarse screen in a 1,350 bdmt/d OCC line.

The *PrimeScreen X50* was installed in parallel to an existing conventional screen from another supplier and began operating at full production from the start, using the same rotor tip speed, flows, and consistency settings that were in place for the existing screen.

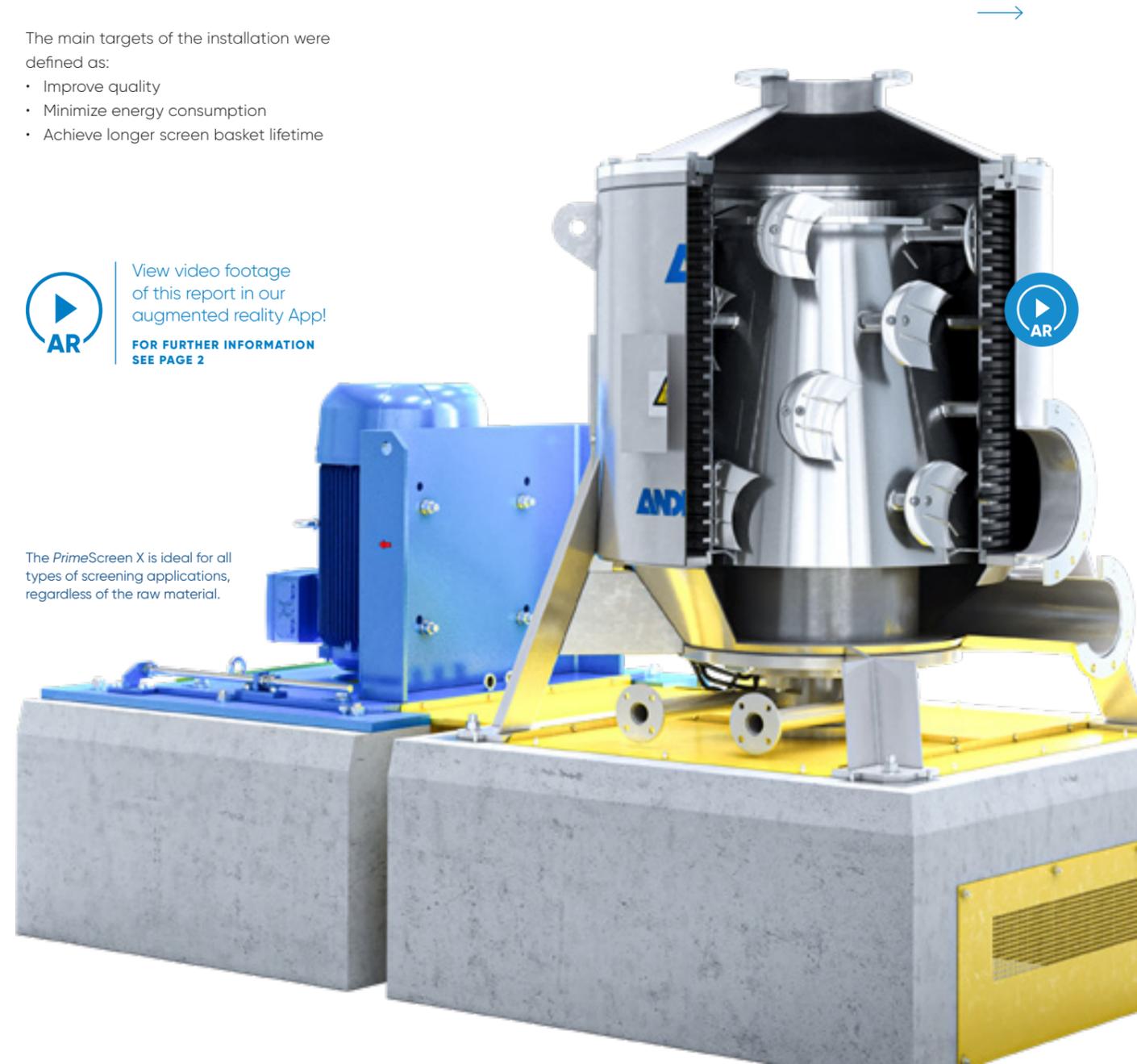
The rated capacity of the *X50* was 705 bdmt/d. First samples from the *PrimeScreen X* compared to the competitor’s unit are shown in Table 1.

The main targets of the installation were defined as:

- Improve quality
- Minimize energy consumption
- Achieve longer screen basket lifetime



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The *PrimeScreen X* is ideal for all types of screening applications, regardless of the raw material.

PrimeSCREEN X			
	FLOW (l/min)	CONSISTENCY (%)	MASS (t/d)
INLET	15,073	3.25	705.4
ACCEPT	14,059	3.11	629.6
REJECT	1,515	4.50	98.2

COMPETITOR			
	FLOW (l/min)	CONSISTENCY (%)	MASS (t/d)
INLET	15,962	3.20	735.5
ACCEPT	14,346	2.88	595.0
REJECT	1,615	4.70	109.3

Table 1: First samples from the *PrimeScreen X* compared to a competitor’s screen (screens running in parallel).

The competitor's screen that was replaced had 250 kW installed power and operated at ~69% load (Table 2). The PrimeScreen X had 132 kW installed power and operated at ~78% load. This reduced energy consumption by 40% (from 173 to 103 kW) compared to the existing competitor's screen.

The screen rotor in the PrimeScreen X was an ANDRITZ LR design, the screen basket an ANDRITZ Rejector type (0.6 mm slot), that actually had 21% less open area than the Rejector basket in the existing conventional screen. Even with this constraint, the PrimeScreen X operated with 5.5% higher capacity and much better screening efficiency – especially for stickies removal (77.5% stickies reduction with the PrimeScreen X vs. 56.4% with the existing screen). Side-by-side comparative data for the two screens is provided in Table 3.

For this mill's coarse screening process, the average screen basket lifetime in the

existing screen was 6–8 months. When the PrimeScreen X was opened up for inspection during a shutdown, 10 months after installation, the slot widths and profiles were excellent. The underside of the rotor was also exceptionally clean. Since that initial inspection, the mill continued to run the screen basket in the PrimeScreen X for 22 months before changing it.

CONCLUSION

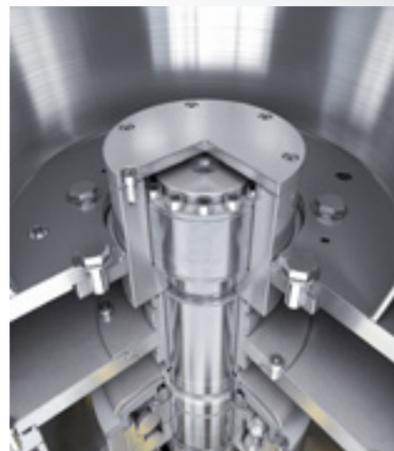
The PrimeScreen X is the natural evolution of the ModuScreen pressure screen family. The targets for this development were to improve both the energy and screening efficiency, while making the unit easier to maintain.

The PrimeScreen X is exceptional for all screening applications – brown and white grades, recycled or virgin, including coarse, fine, broke, thick stock, and fractionation duties.

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PrimeRotor – new rotor and foil design



Streamlined rotor attachment



Clamped screen basket design

PrimeSCREEN X			
INSTALLED MOTOR (kW)	MOTOR LOAD (%)	POWER CONSUMPTION (kW)	SPECIFIC ENERGY CONSUMPTION (kWh/t)
132	78	103	3.50

COMPETITOR'S SCREEN			
INSTALLED MOTOR (kW)	MOTOR LOAD (%)	POWER CONSUMPTION (kW)	SPECIFIC ENERGY CONSUMPTION (kWh/t)
250	69	173	5.63

Table 2: Motor data

PrimeSCREEN X					
	REJECT RATE (%)	STICKIES (mm ² /kg)	STICKIES REDUCTION (%)	SOMERVILLE RESIDUAL (%)	SOMERVILLE REDUCTION (%)
INLET	-	81,364.3	-	6.92	-
ACCEPT	-	18,328.4	77.5	0.9	87.0
REJECT	13.9	-	-	-	-

COMPETITOR'S SCREEN					
	REJECT RATE (%)	STICKIES (mm ² /kg)	STICKIES REDUCTION (%)	SOMERVILLE RESIDUAL (%)	SOMERVILLE REDUCTION (%)
INLET	-	61,430.5	-	6.28	-
ACCEPT	-	26,775.9	56.4	1.62	74.2
REJECT	14.9	-	-	-	-

Table 3: Side-by-side performance data for PrimeScreen X vs. competitive screen (screens running in parallel).