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Supplier's presentation

Can I improve the efficiency of my batch centrifuge when it is time to replace the basket?

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ANDRITZ has developed a new range of replacement batch centrifuge baskets that can offer shorter cycle times, increased retention of sugar crystal per cycle, dryer sugar and long-life wedge-wire inner screens in a lighter, long-life basket. Here, I share details of the benefits identified during recent live trials.

At the request of a customer ANDRITZ Fiedler has developed a replacement batch centrifuge basket (Figure 1) that can offer the following benefits:

- Reduced weight;
- Higher open area;
- Reduced cycle times;
- Increased sugar-crystal retention;
- Dryer sugar crystals;
- Increased life-time and safety of the inner screens and outer centrifugal basket.

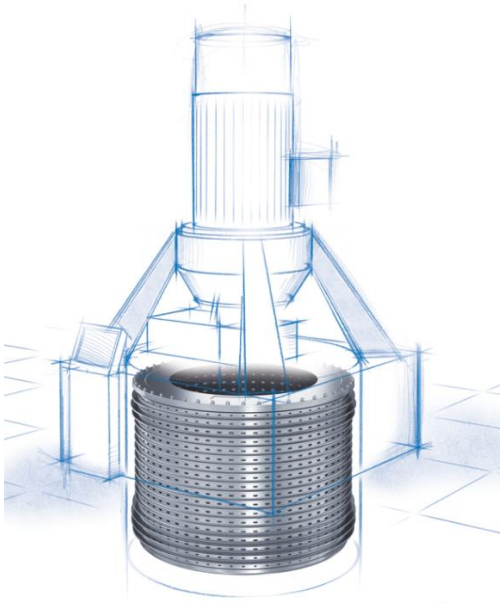


Figure 1. ANDRITZ Fiedler replacement batch centrifuge basket.

Current technology (Figures 2-4) uses:

- A working screen usually with punched screens, 0.5 mm thick and perforated with round holes of diameter 0.55 mm, or with oblong holes 4 mm by 0.35 mm;
- Open area between 15 & 20%;
- A backing screen with 'bridge-perforations' 6.5 mm thick of woven-wire mesh;
- An outer basket, 20 mm thick, with round holes of diameter 6.5 mm OA 0.5-1 %;
- Stress-peak during process > 500 MPa.

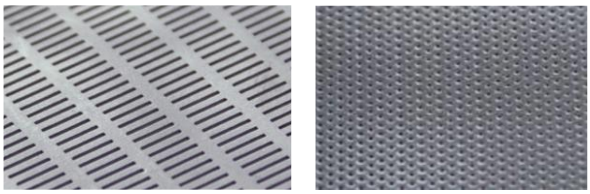
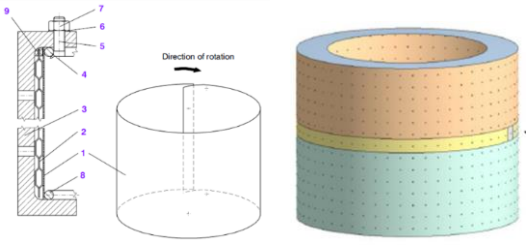


Figure 2. Current screen designs.

Figure 3. Current working screen.



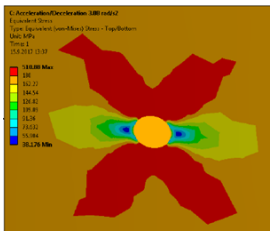


Figure 4. Current outer basket

The new design of the batch centrifuge offer the following features:

- A working screen made of wedge wire (Figure 5):
  - Life-time several times higher;
  - Higher sugar-crystal retention;
  - Higher dewatering – shorter cycle times;
  - Open area 40%.
- A backing screen made of wedge wire:
  - Open area 60%.
- An outer basket (Figure 6) made of duplex material:
  - Long life-time;
  - High rating for safety (TÜV inspected and approved);
  - Open area 7%;
  - Higher dewatering – shorter cycle times;
  - Oval cut-outs for lower stress peaks;
  - Stress peak during process maximum 235 MPa.

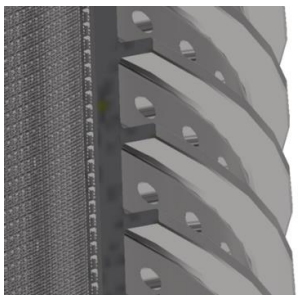


Figure 5. New working screen.

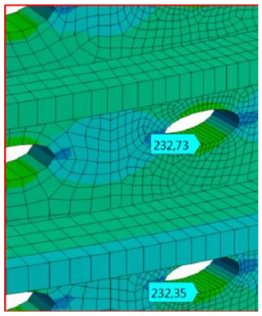


Figure 6. New outer basket.

Figure 7 shows the design in more detail and Figure 8 shows the assembly in a refinery.

Outer with rings and oval holes.

Wedge wire inner screen.

Assembled screens.

Working screen.

Figure 7. The new design in detail.

Figure 8. Assembly in a refinery.

Field trials showed:

Design	Cycle time (s)	Cycles/h	Cycles/year	Increased capacity (%)
Old design (OEM)	138-140	26	212,160	
New design (Andritz)	127-129	28-29	~230,000	8-10

Overall, this has led to:

- 18000 extra cycles per year due to shorter cycle time;
- 6% increase in sugar retention (75 kg per batch);
- Reduction in sugar moisture % of 0.305 to 0.152.

The significant increase in open area of the inner working screens and the outer basket, combined with the oval holes and support rings, has generated a substantial improvement in process efficiency.

The basket is designed to operate safely at 100 seconds per cycle, but the drive train was not robust enough to allow cycling at this rate. Improvements to the drive train will ensure further improvements in the process.