

C-bar Vertecs ...a proven new screening technology

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Development of a new screen basket

Your presenter

VOITH



Axel Dreyer

Global Prod. Manager

Screening Wear Parts

VOITH

Education:

Process Engineer / MBA

Previous Professions:

Since 2000 @ Voith Paper Germany

- R&D – Deinking
- Project Management
- Product Management
- Technical Sales Manager
- Application PM-Rebuilds

Contact:

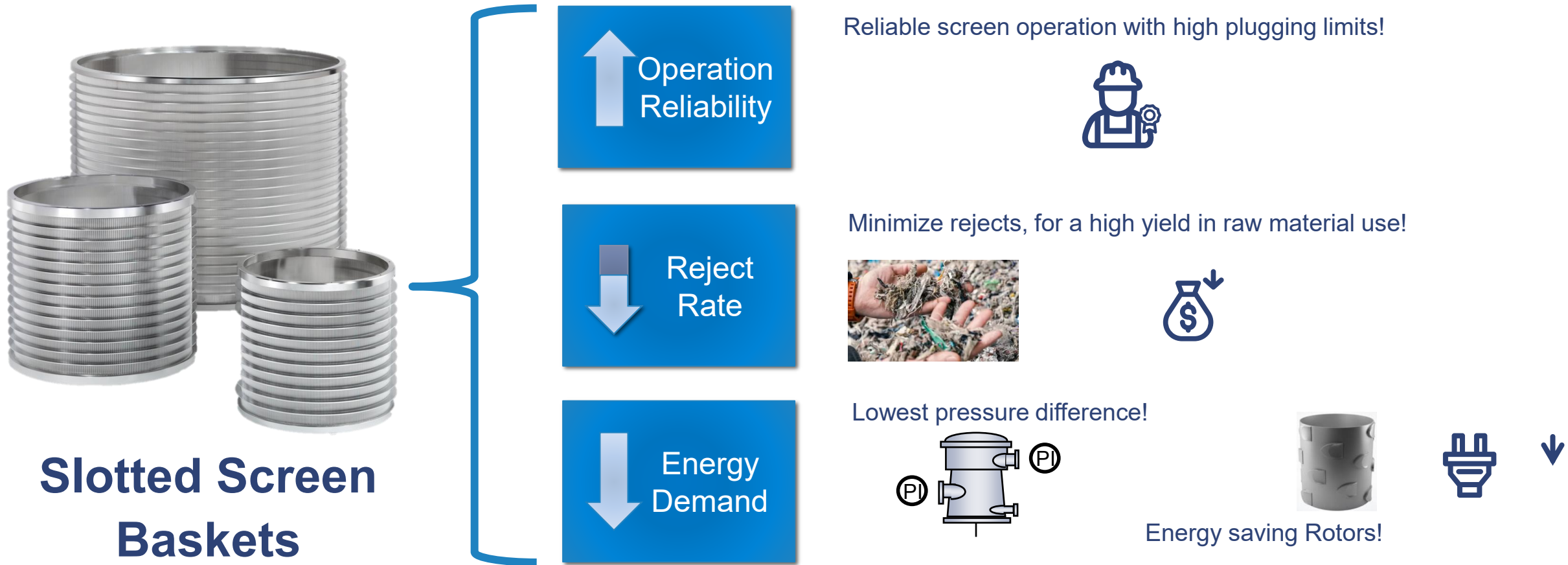
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Screening Technology 1/2

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Requirements & Main Targets of successful screening



Screening Technology 2/2

Requirements & Main Targets of successful screening

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Slotted Screen Baskets

↑
Sticky
Removal

Higher Operation Reliability / Less down time & breaks



lower chemical demand

↑
Dirt Spec
Removal



final paper cleanliness

↑
Life-Time

- Wear reduction
- A stable slot size during the whole lifetime combined with frequent basket inspections allows re-chromability!



Slotted profile baskets

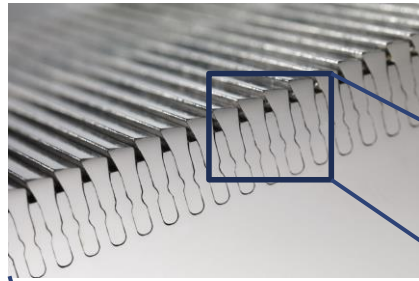
Product Design Feature of C-bar profiles from Voith

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Overlapping profile

constant and stable slot width during a long life-time
insures stable high-performance screening



profile head

slot

channel
after slot

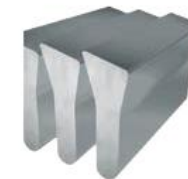
profile

profile foot

slotted basket

Different bar designs

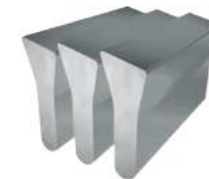
C-bar profiles



2,5 bars

C-bar L

Specific application,
e.g., extremely long fibers



3 bars

C-bar S

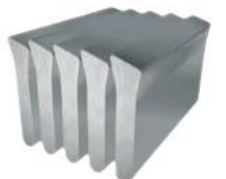
Proven standard
for long fibers



4 bars

C-bar Q

Proven standard
for all paper grades



5 bars

C-bar R

Especially for
highest through-
put rates or
fractioning

SYSTEMATIC APPROACH DEVELOP A NEW SCREEN BASKET

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Target:

At least 20% more throughput at same screening technology!



Operation
Reliability

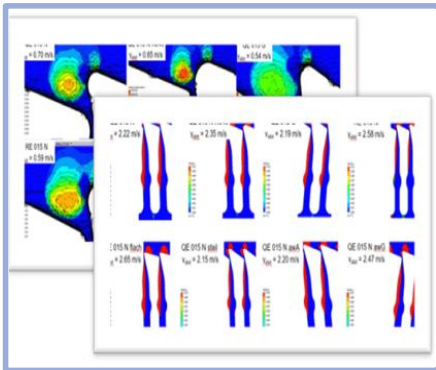


Sticky
Removal

SYSTEMATIC APPROACH DEVELOP A NEW SCREEN BASKET

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STEP 1



- ➔ Simulation with Fluid Dynamics

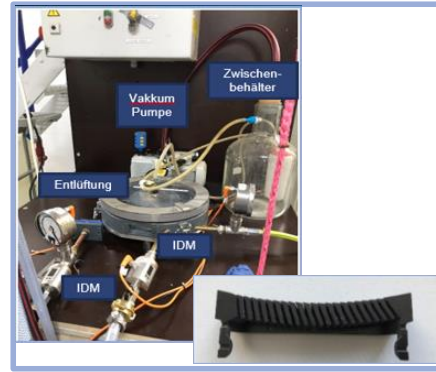
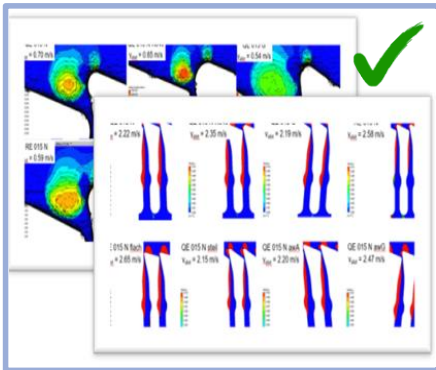
SYSTEMATIC APPROACH DEVELOP A NEW SCREEN BASKET

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STEP 1



STEP 2



➔ Simulation with
Fluid Dynamics

➔ Verifying in
Lab-Scale
Screening

STEP 2: Laboratory test rig

Setup of the lab testing rig

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3D-Print C-bar Q profile with //0.15mm slot



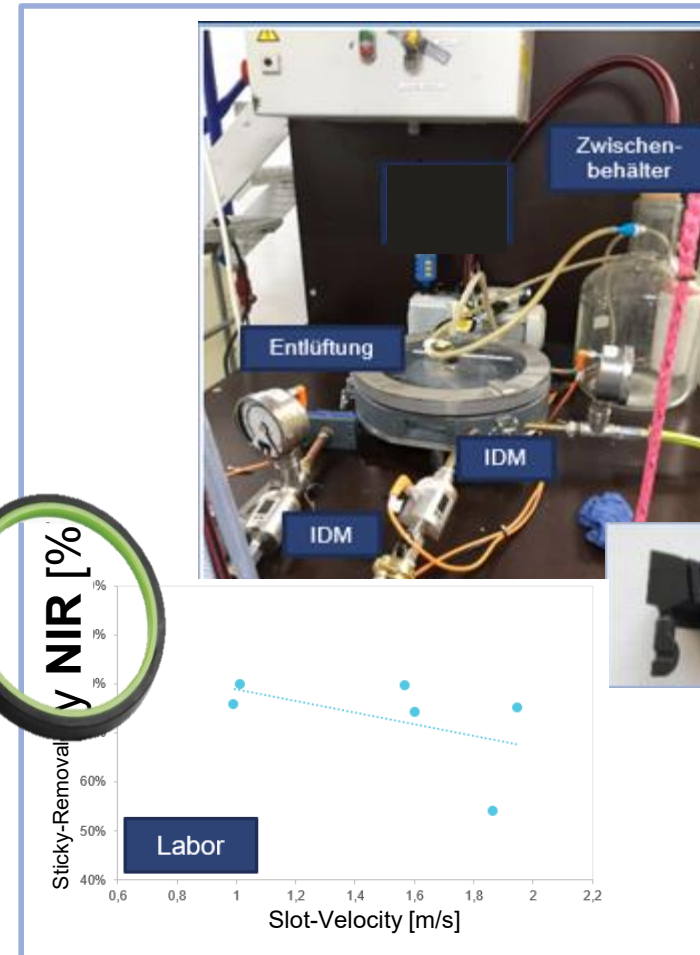
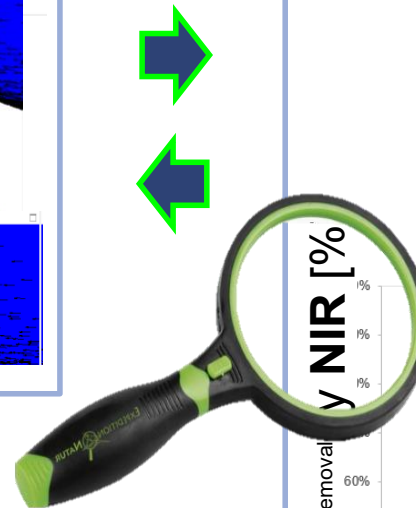
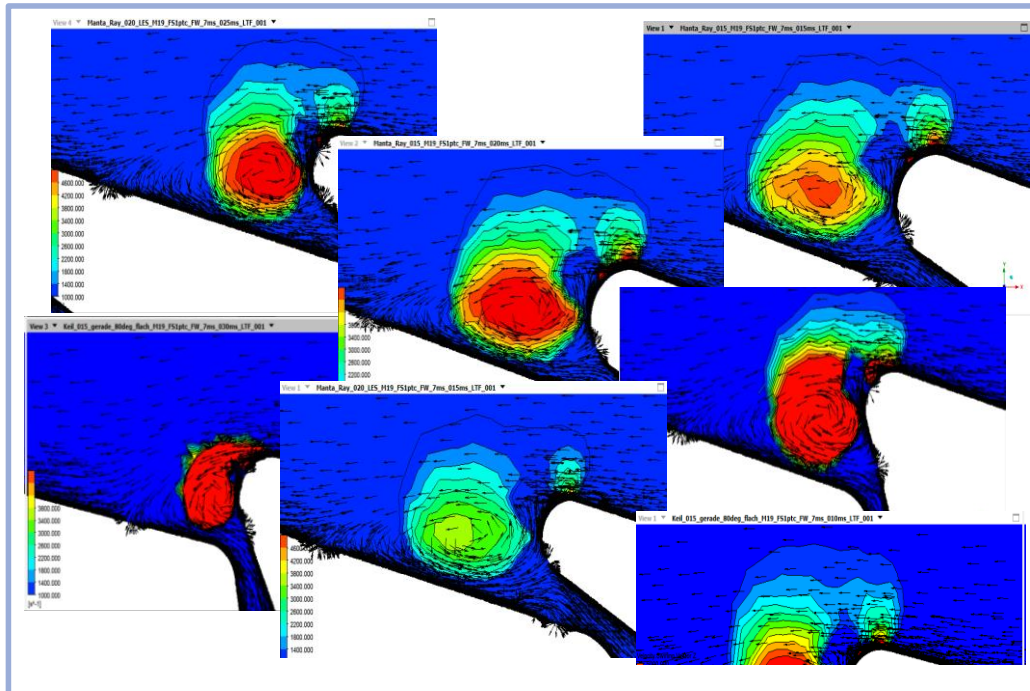
STEP 2: Laboratory test rig

Aligning the simulation results with lab testing rig

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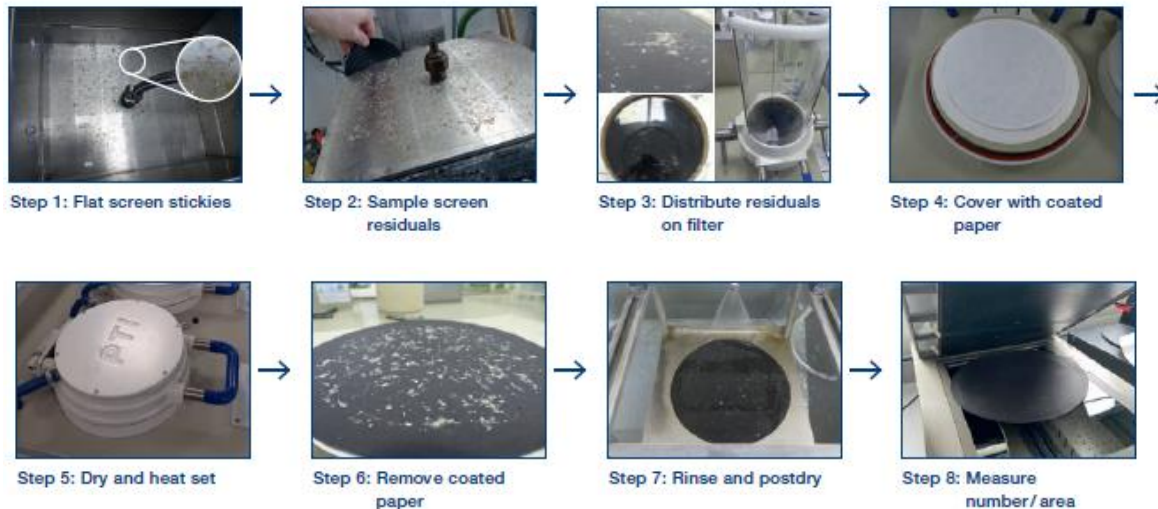
Technical University
Darmstadt/GER



Screen in
3D-Plot

Tappi VS NIR Sticky Measurement

Tappi – Sticky Method



Advantages:

- Well known method with high quantity of available data

NIR – Sticky Method



Advantages:

- At least 50% less laboratory work.
- Samples can be sent worldwide as laboratory sheets.
- High reproducibility, independent of the laboratory technician.
- Measurement accuracy is higher, more mini-stickies are recognized

Remark: With the same sampling, the stickies deposition after NIR is lower!

VS

SYSTEMATIC APPROACH DEVELOP A NEW SCREEN BASKET

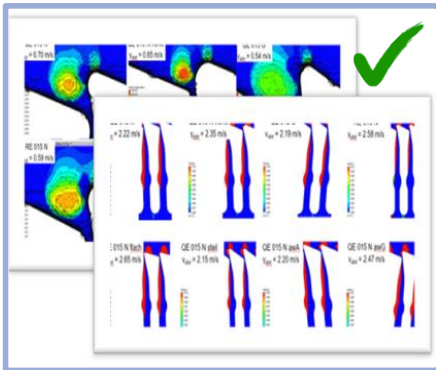
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STEP 1

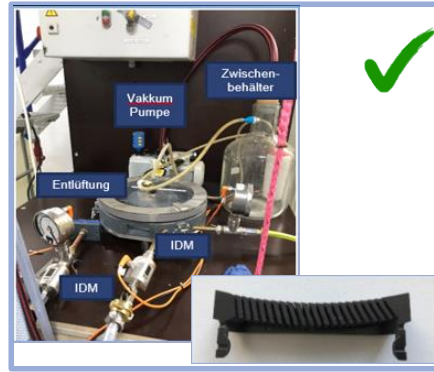


STEP 2

STEP 3



- ➔ Simulation with Fluid Dynamics



- ➔ Verifying in Lab-Scale Screening

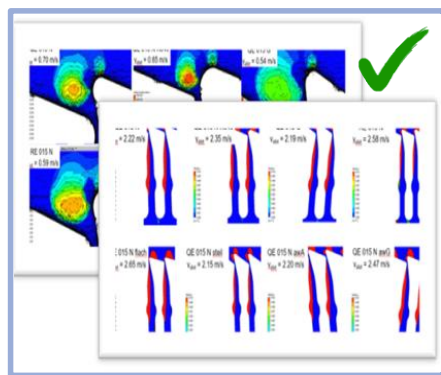


- ➔ Trials @ customer in bypass installation MS05/05

SYSTEMATIC APPROACH DEVELOP A NEW SCREEN BASKET

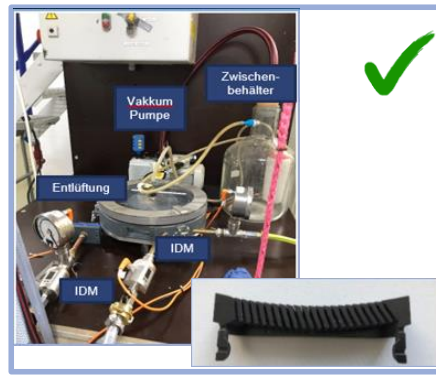
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STEP 1



- ➔ Simulation with Fluid Dynamics

STEP 2



- ➔ Verifying in Lab-Scale Screening

STEP 3



- ➔ Trials @ customer in bypass installation MS05/05

STEP 4



- ➔ Field Installations
OCC & DIP
Fine Screening,
Fractioning. Broke

Laakirchen PM10

OCC – Stock preparation



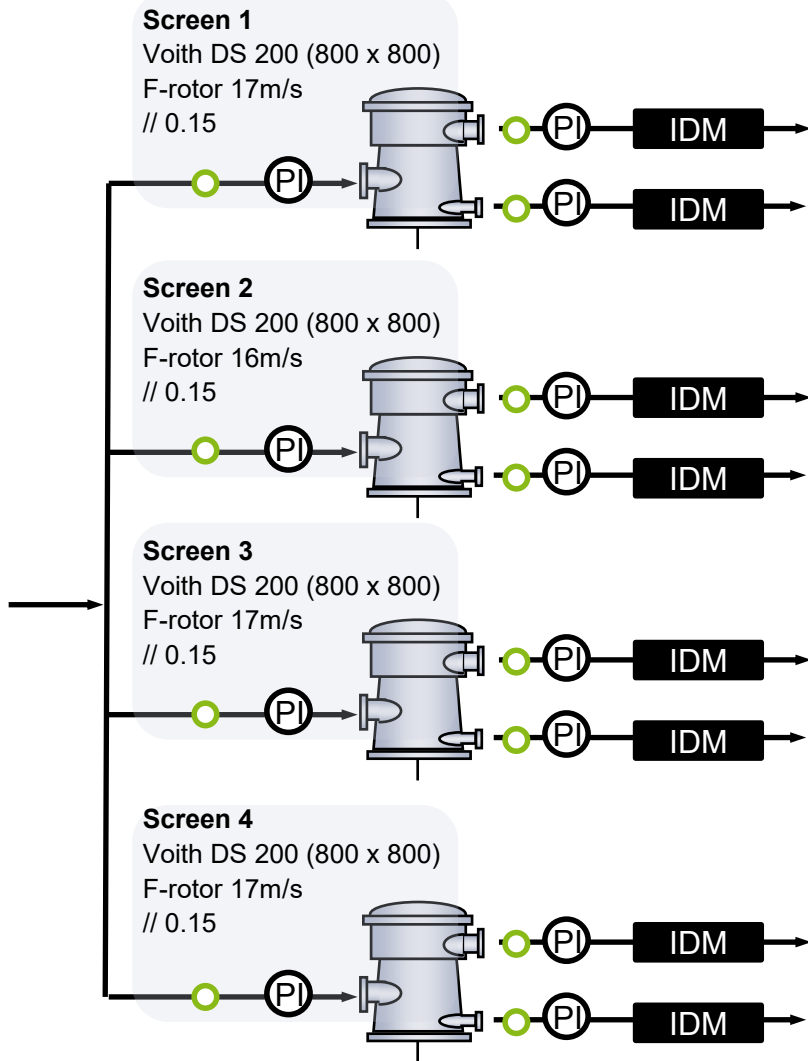
starboard 

PAPER MACHINE PM10

Mill:	Laakirchen
Year built:	1987, Rebuild: 1991, 1997, 2000, 2009, 2012, 2017
Products:	Corrugated base paper 'star-board' for smart packaging solutions (testliner, fluting)
Stock preparation	LC Pulper 130m ³ CoarseScreening 0,40 # Cleaner + Fractioning LF - FineScreening 0,15 # Circuit separation SF + DSP
Production:	Up to 490.000 Tons/Year
Base weight:	80 – 160 g/m ²
Speed:	Up to 1.600 m/min
Width:	Up to 7.500 mm

OCC 1st stage fine screening

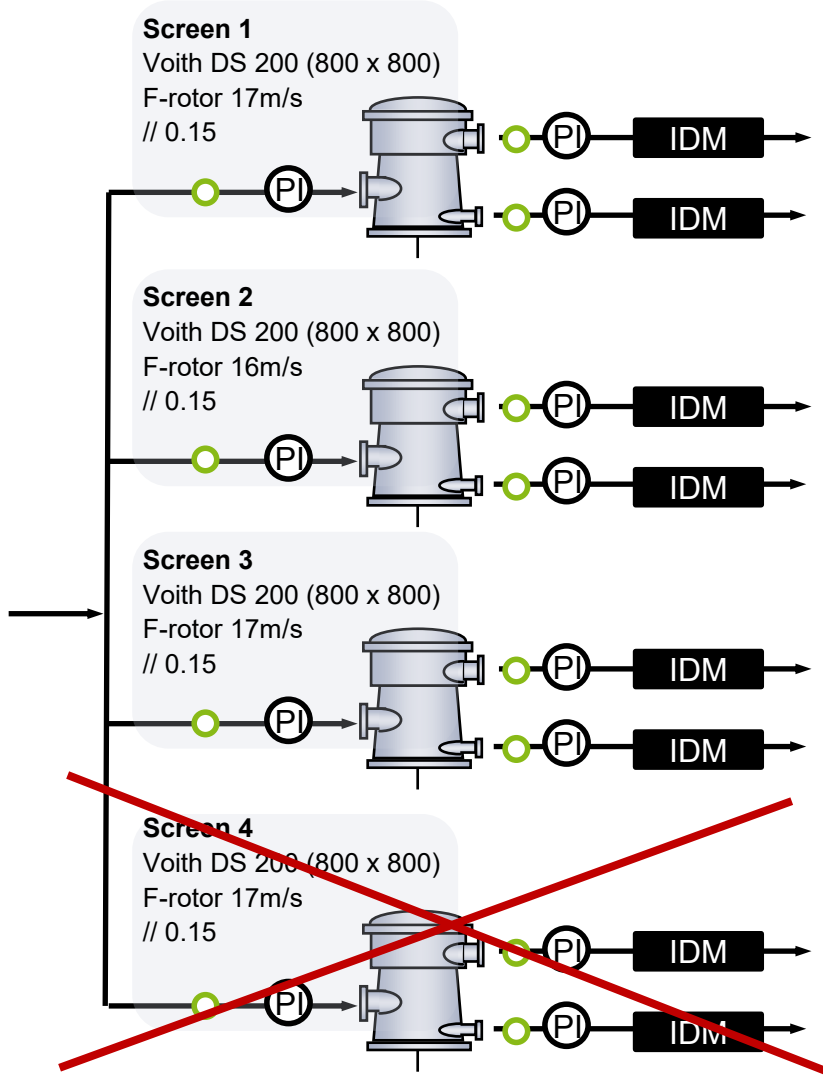
System setup, perfect conditions for comparative tests



IDM	Flow meter
PI	Pressure transmitter
○	Sampling point

OCC 1st stage fine screening

25% less energy consumption with Vertecs



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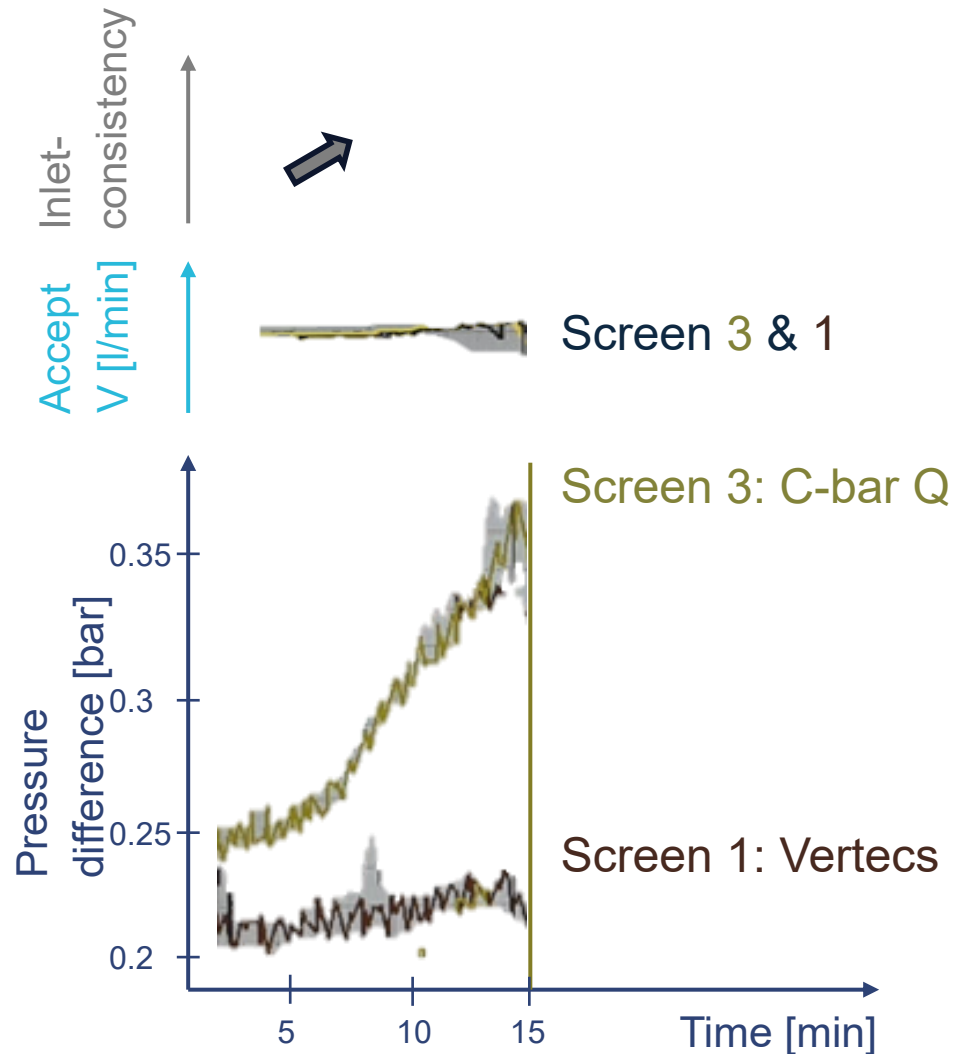
Boosts screening efficiency
to a new level – without any
compromises!
C-bar Vertecs



With Vertecs in Screen1, 2 or 3
Stopp operation of Screen 4

OCC 1st stage fine screening - ramp-up test

Increased operational reliability



! Increase of inlet stock consistency !

- Pressure difference of the C-bar Q increases "threateningly".
- Pressure difference of the **Vertecs** at a lower level and **stable**!

Sticky separation with the same throughputs

Boost to 90%* lower sticky content in accept

Process parameters:

Inflow: 1 Cs%

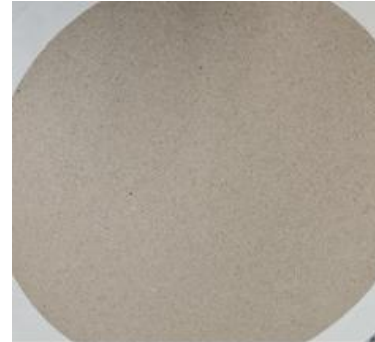
Overflow: 15% vol.
~ 25% mass

Slotting speed: ~1 m/s

Inflow



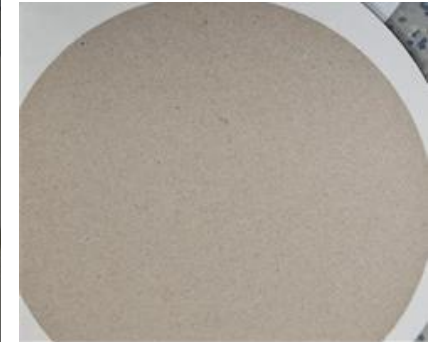
C-bar Q



Other



Vertecs



Sticky Ingede [mm²/kg]

30.856

1.853

2.455

263

Separation efficiency Ingede [%]

94%

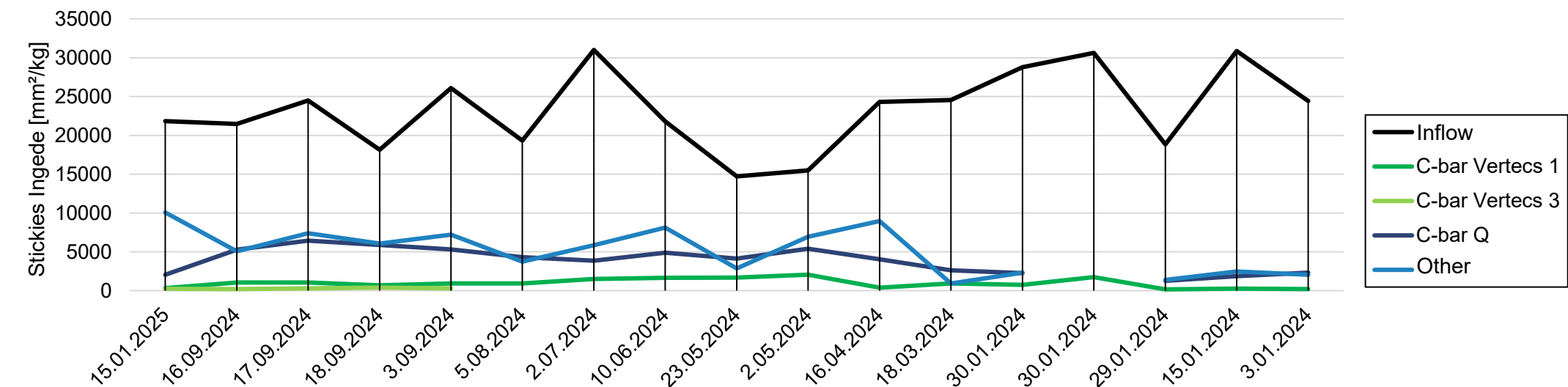
92%

99%

* Single measurement from January 3rd, 2024

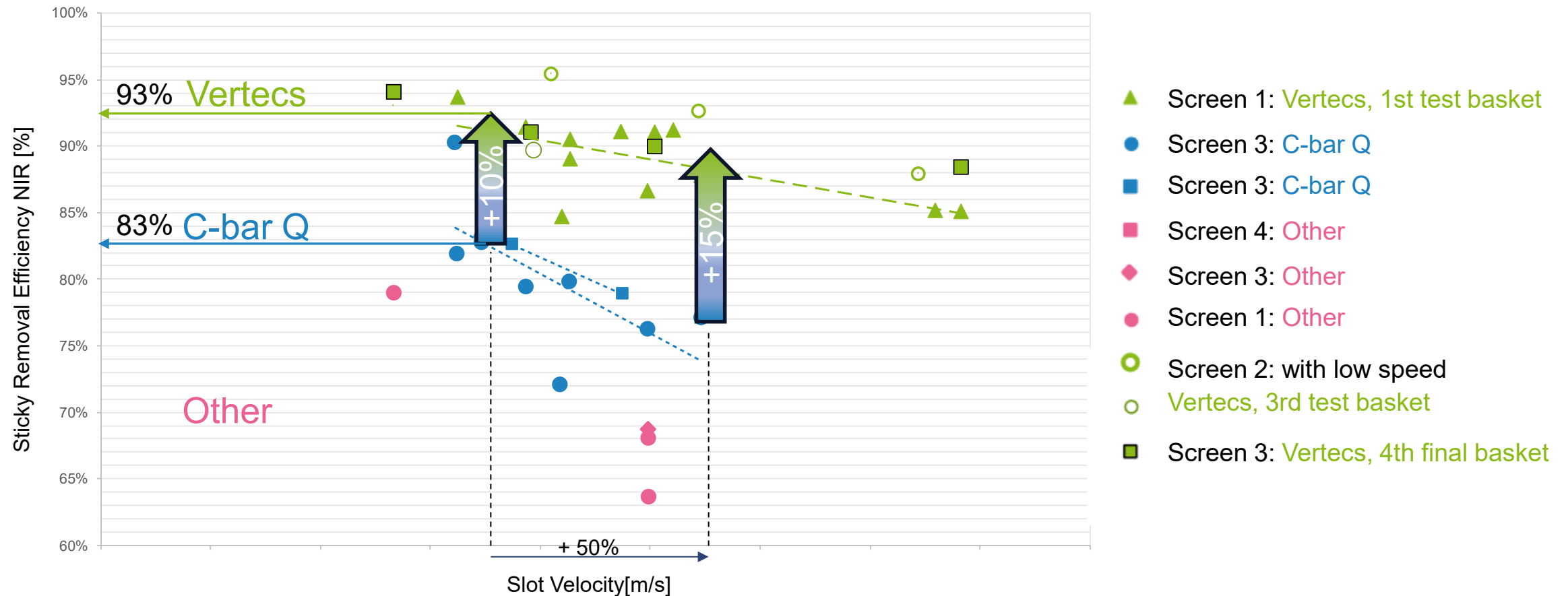
Sticky-Measurement with Ingede; 1 year period

Consistent high performance separation



Long-term study between 12/2023 - 04/2025

Vertecs with 10 - 15% better separation efficiency



The new technological limit for best separation is well above 1 m/s

Excerpt on further field installations

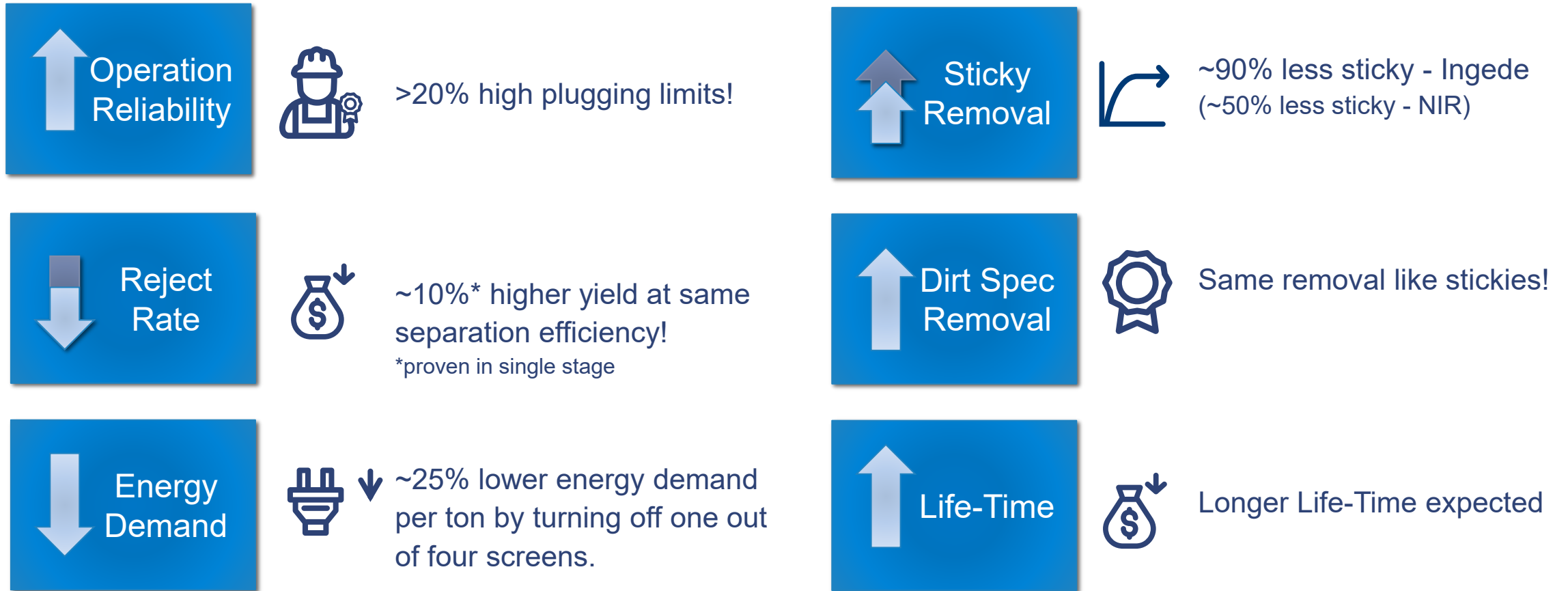
Status 2025-07-15

Installed	Region	Furnish	Process Area	Success Story
12/2023	EMEA	OCC	1st stage Fine Screening	Now 4 Vertecs successfully in operation
01/2024	EMEA	OCC	2 nd stage Fractioning	20% more throughput & 18% higher Sticky-Removal-Efficiency
07/2024	EMEA	OCC	1 st stage Fine Screening	50% more throughput @ same Sticky-Removal-Efficiency
10/2024	EMEA	DIP	1 st & 2 nd stage Broke Screening	Successful in operation at more production. Rebuild still pending to increase the production to its final target by customer.
01/2025	NA	AOCC	1 st stage Fractioning	Up to 30% more SF @ almost half sticky content in LF fraction.
03/2025	EMEA	DIP	1 st stage IC	~7% higher Sticky-Removal-Efficiency @ same throughput.
05/2025	EMEA	OCC	Coarse Screening	Successful in operation with no further benefits analyzed so far.
05/2025	EMEA	OCC	1 st stage Fine Screening	~5% higher Sticky-Removal-Efficiency @ same throughput.
08/2025	EMEA	OCC	3 rd stage Fine Screen	Overcome screening bottleneck with reliable operation even after reducing the reject overflow from 50% to 25%.

Boosts screening efficiency to a new level – without any compromises

C-bar Vertecs compared to C-bar Q

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Inspiring Technology
for Generations