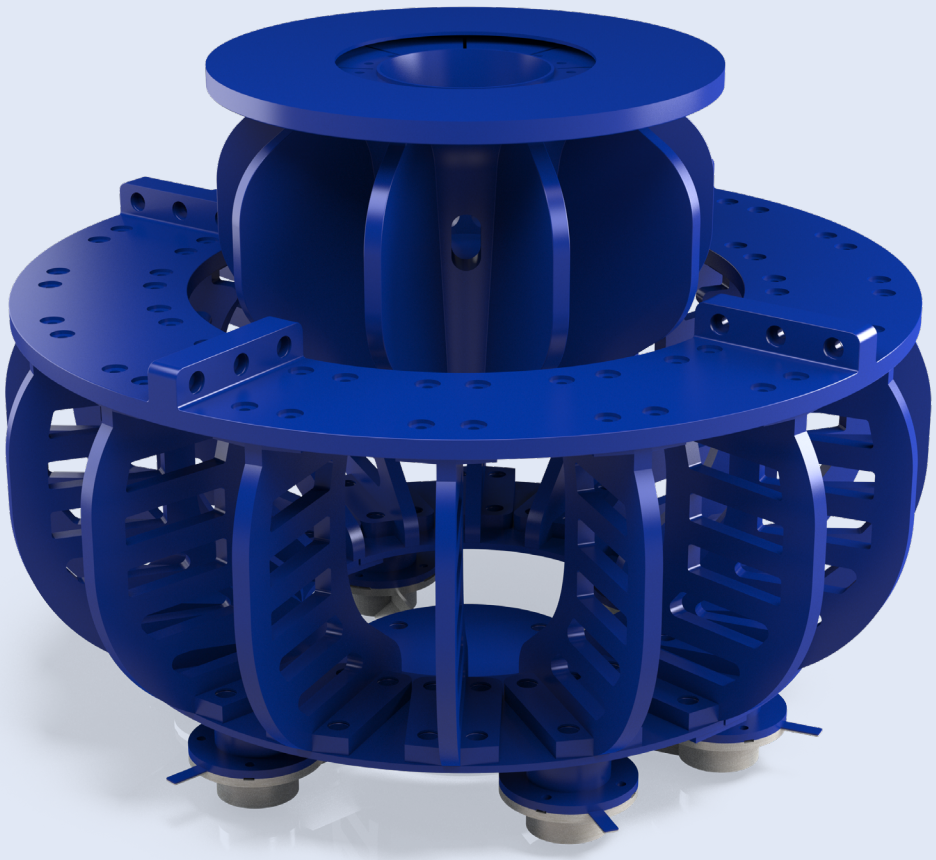
FLS NextSTEP™

Transforms forced-air flotation

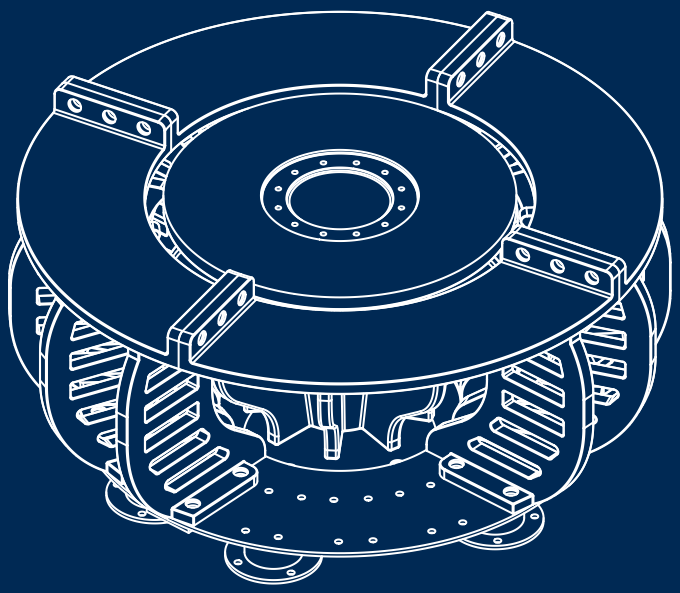


Mission Zero Towards zero emissions by 2030

FLS

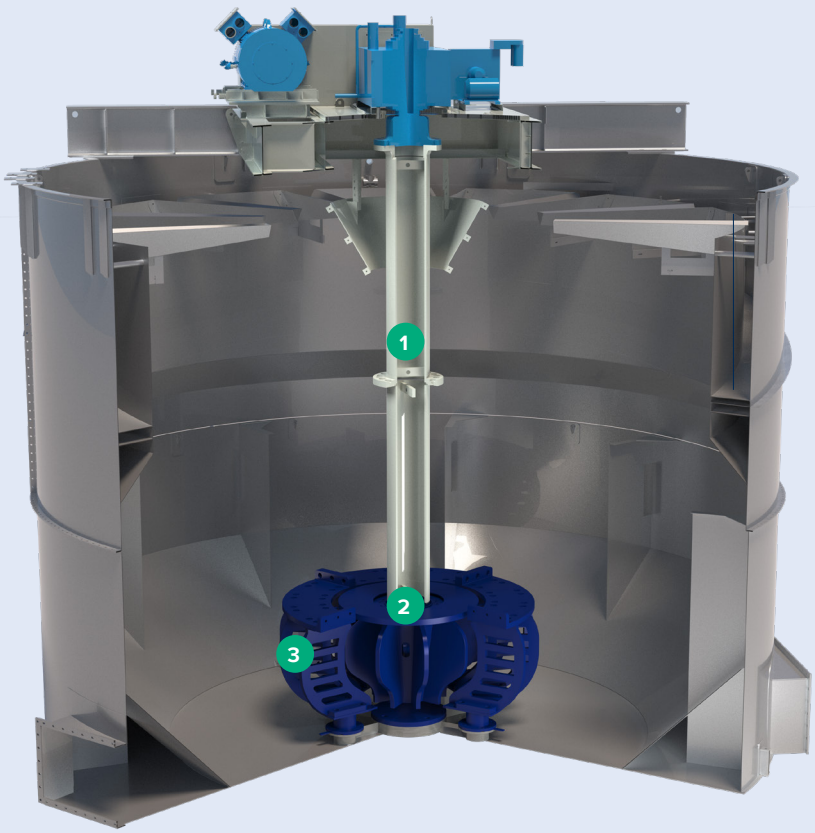
Taking forced-air flotation to the NEXT STEP

NextSTEP™ rotor/stator provides a step change in metallurgical performance and energy efficiency compared to any other forced-air design on the market.



Key benefits

- Significant improvement in both metallurgical performance and energy efficiency
- Lowest operating power of any forced-air flotation mechanism on the market
- Dramatic improvements in attachment rates which translates into statistically significant recovery increases
- Stronger air dispersion near the rotor/stator region, increased air dispersion and stronger pumping effect below the rotor
- Improved pumping efficiency and positive froth flow patterns near the top of the tank
- Designed to be retrofitted in all forced air machines, regardless of make or model



1. Shaft
2. Rotor
3. Stator

Innovative technology

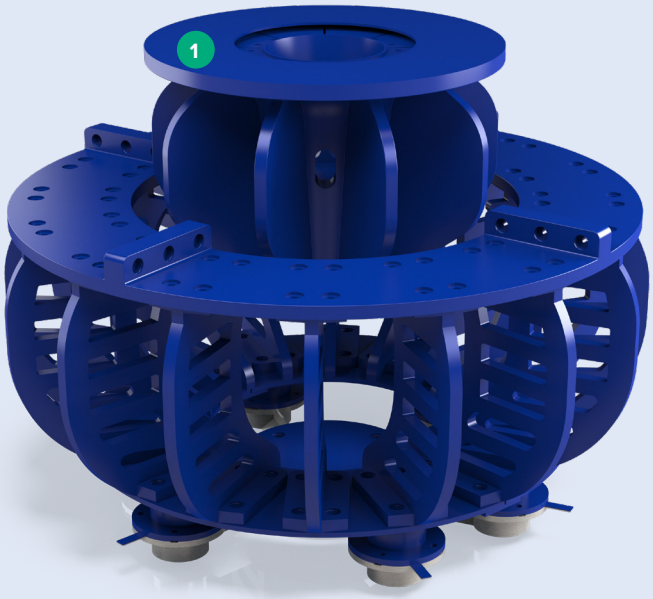
Our patented NextSTEP™ advanced flotation mechanism; the newest design for forced-air flotation technology which reduces operating costs with the lowest power consumption on the market. This new rotor/stator technology is the result of extensive fundamental studies, laboratory test work and full-scale plant testing.

We have proven to be the market leader in providing new technology for mineral processing, particularly top-of-the-line flotation equipment. Continuous improvement and development of new products demonstrates our strong commitment to the minerals market and its customers.

We spent four years developing NextSTEP, starting from first principles, using computational fluid dynamic models, and 3D printed prototypes, to optimize the rotor-stator design.

This final technology demonstrates significant improvement in both metal-lurgical performance and energy efficiency over existing forced-air designs. The exceptional performance of the nextSTEP mechanism comes from the rotor and stator being perfectly matched which delivers the best energy dissipation flow, thus maximizing recovery. The superior metallurgical performance of the nextSTEP mechanism shows up to a 5% increase in recovery, resulting from dramatic improvements in mineral-bubble attachment rates.

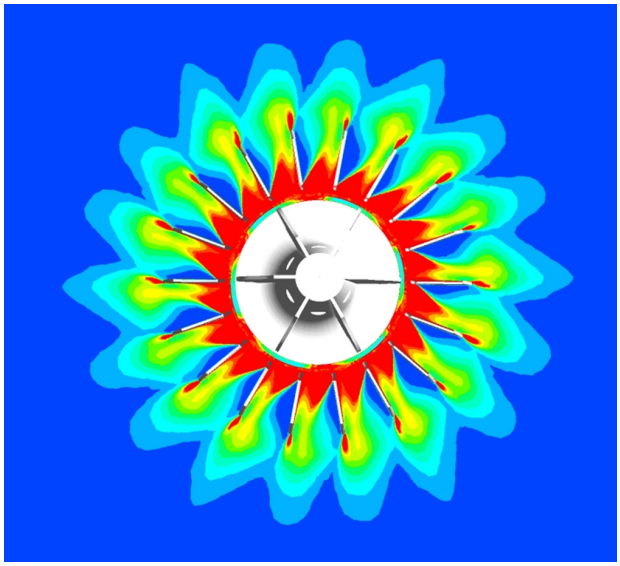
When installed, operators note a 15-40% reduction of power requirements and see better wear distribution for increased rotor/ stator life. These findings have a strong positive impact on total cost of ownership that can benefit both new and existing installations.



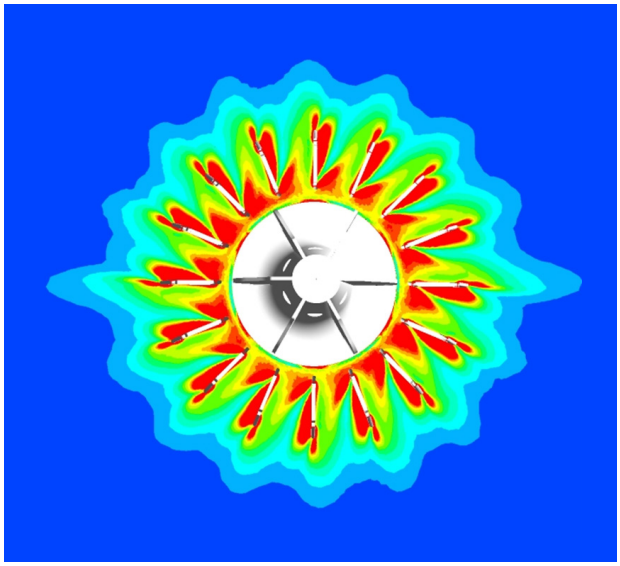
1. Rotor easily removes from stator

Clearance is optimised for easy assembly and disassembly

CFD Comparison of the turbulence eddy dissipation for stators with and without slots. Slots yield more homogenized turbulence dissipation.



Without slots



With slots

Increased flotation

Wide flow jets produced by the nextSTEP™ rotor and the cross pattern from the patented slotted nextSTEP stator increase the probability of bubble-particle attachment. Adding slots to the stator increases recovery and boosts overall flotation efficiency. One reason for this improvement is the higher homogenized turbulence dissipation energy.

Superior metallurgical performance

In-plant testing of the nextSTEP rotor/ stator combination showed superior metallurgical performance compared to a non-slotted stator design. These results showed dramatic improvement in the attachment rate from the slotted stator design which translates into statistically significant recovery increases.

Improved recovery of coarse particles

When compared to other forced-air flotation designs, the nextSTEP mechanism exhibits stronger air dispersion near the rotor/stator region, higher air hold-up and a stronger pumping effect below the rotor. CFD analysis shows that the nextSTEP™ mechanism generates a preferred slurry flow and positive froth movement pattern near the top of the tank. This improves froth mobility and recovery of coarse particles over other competitive designs.

Better mixing

Solids suspension tests performed in laboratory, pilot and full-scale conditions exhibited excellent mixing over a wide range of impeller speeds.

Lowest power consumption on the market

The nextSTEP™ mechanism demonstrates a significant decrease in power consumption in comparison to other flotation technologies and has proven to be the lowest energy flotation mechanism on the market.

The lower energy consumption and the superior metallurgical performance of the nextSTEP mechanism is beneficial for any operation. The nextSTEP mechanism has a strong positive impact on long-term operating costs for greenfield projects. In the case of brownfield projects and existing concentrators, the mechanism is interchangeable with existing FLS forced-air flotation mechanisms and can be retrofitted to all mechanical forced air flotation machines, regardless of make or model.

Converting to nextSTEP is simple and low risk. The existing mechanism assembly is utilised. Rotor and stator are attached with adaptor flange and baseplate respectively, and drive sheaves replaced to optimise speed. The FLS conversion process is thorough and proven - with a large number of successful retrofits already for flotation cells ranging in size for 1.7m³ to 250m³.

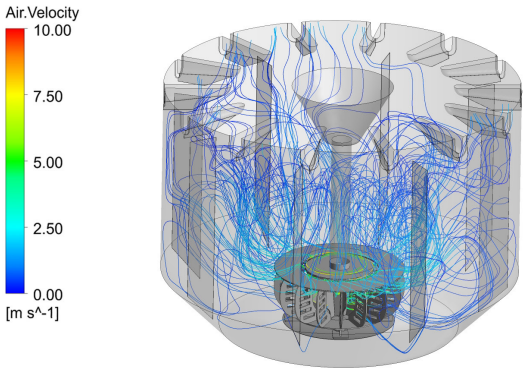
Increased wear life

Several tests performed on the nextSTEP™ rotor/stator showed a more even wear distribution than other available mechanisms. This increases the life cycle of the mechanism as there are no heavy wear spots during operation. This not only saves money over the life of the rotor/stator, but reduces downtime for repairs or replacements. In addition to even wear patterns, the rotor can be run in a reverse direction to further increase the life cycle of the mechanism.

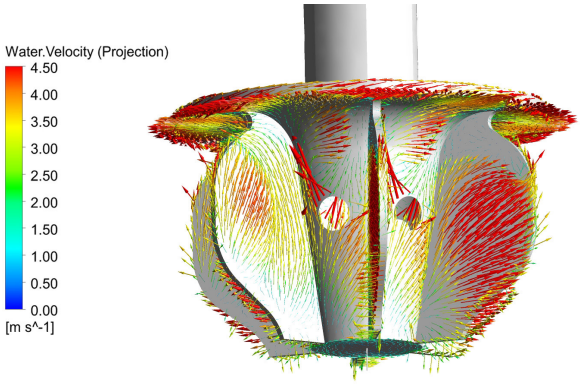
Wide flow jets produced by the nextSTEP rotor and the cross pattern from the patented slotted nextSTEP stator increase the chances of flotation

The next step in forced-air flotation

We are the world's largest supplier of flotation equipment offering lower energy consumption, improved recovery and increased operational efficiency.



CFD illustration of air velocities and flow paths showing higher air hold-up in the cell



CFD illustrates the water velocities of the nextSTEP™ rotor is distributed over a wider area for more effective shear and bubble formation

Improved performance

- Up to 5% better recovery rates
- 15-40% lower power consumption than any other mechanism
- Improves the performance of new and existing machines
- Dramatic improvements in mineral-bubble attachment rates
- Better wear distribution increases product life cycle

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