





Alfa Laval Solid Bowl Centrifuge Technology

Queensland Tailings Group Webinar

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Alfa Laval Australia

Alfa Laval Solid Bowl Centrifuge Technology



- Introduction to Alfa Laval
- Technology development of solid bowl centrifuge
- Operational examples in Australian coal industry
- Results obtained in coal industry
- Conclusions and discussions

Alfa Laval Separation Technology



Alfa Laval is a world leader within the key technology areas of heat transfer, separation and fluid handling. Our company was founded on a single brilliant invention i.e. the centrifuge, and innovation remains at the heart of everything we do.

With more than 3,700 patents, we provide worldwide solutions in areas that are vital to society both today and in the future.



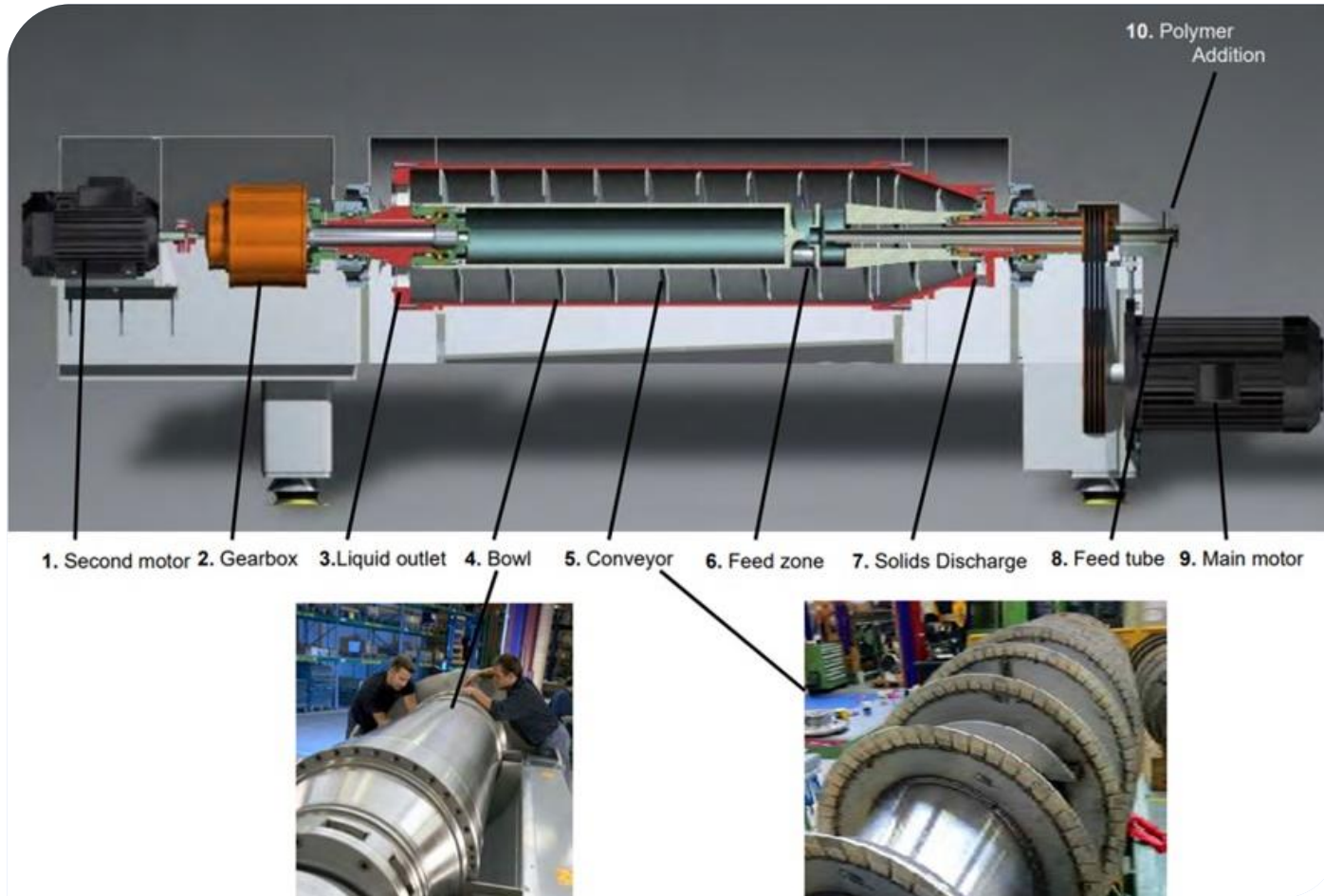
What is a Solid Bowl Centrifuge?



A solid bowl centrifuge is a type of mineral processing centrifuge that is used in the mining industry for separation of solids and liquids. A centrifuge uses G-Force to separate solids from liquids. Solid bowl centrifuge technology can be used for cost effective solid-liquid separation in applications such as tailings dewatering and fine coal recovery.

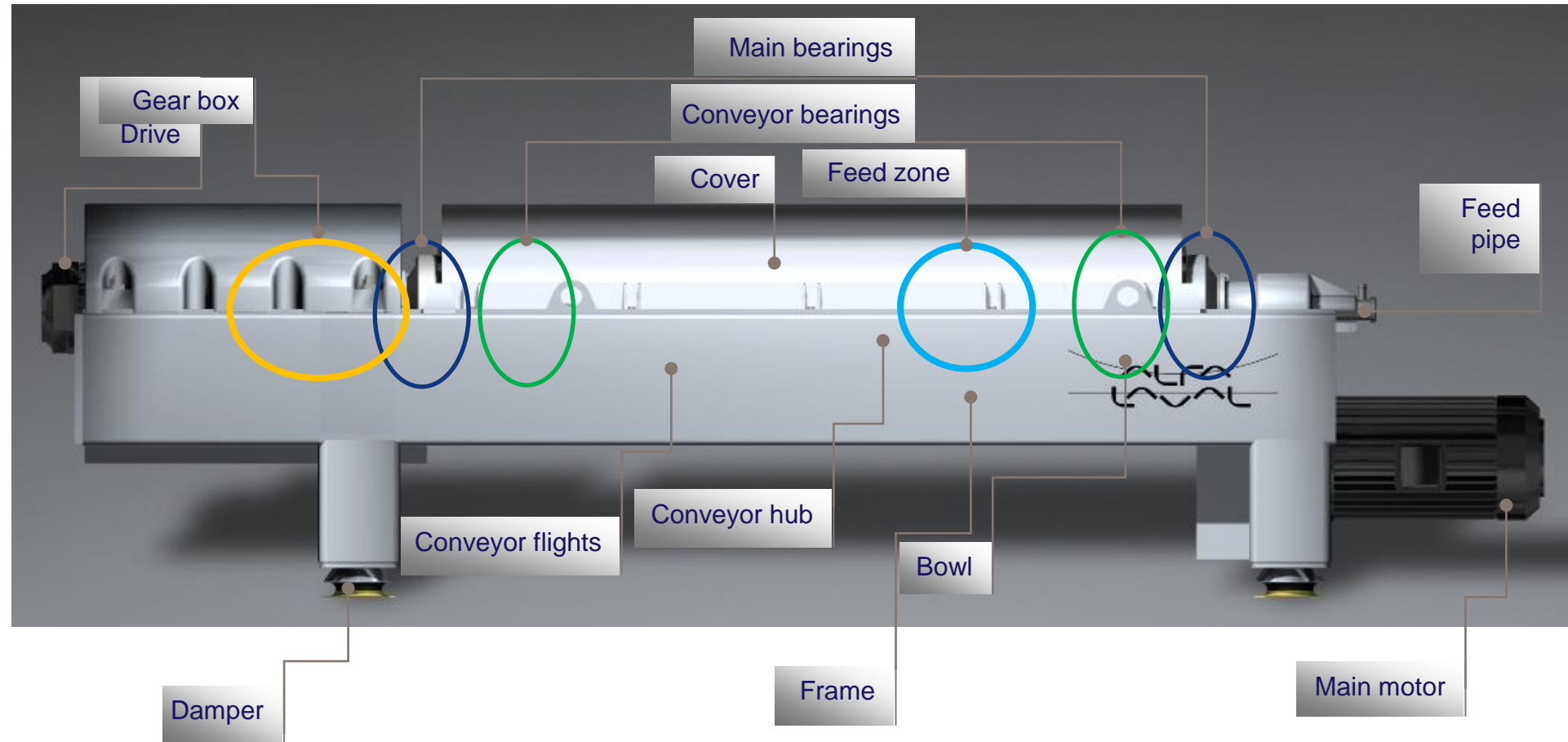


Solid Bowl Centrifuge Main Components

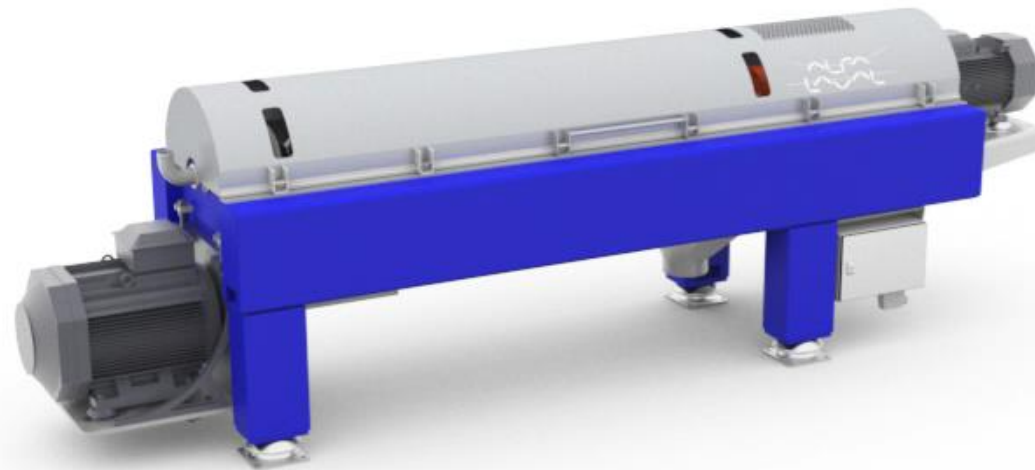


1. Back Drive Motor
2. Gearbox
3. Liquid Discharge
4. Bowl
5. Conveyor
6. Feed Zone
7. Solids Discharge
8. Feed Tube
9. Main Drive Motor

Solid Bowl Centrifuge Main Components



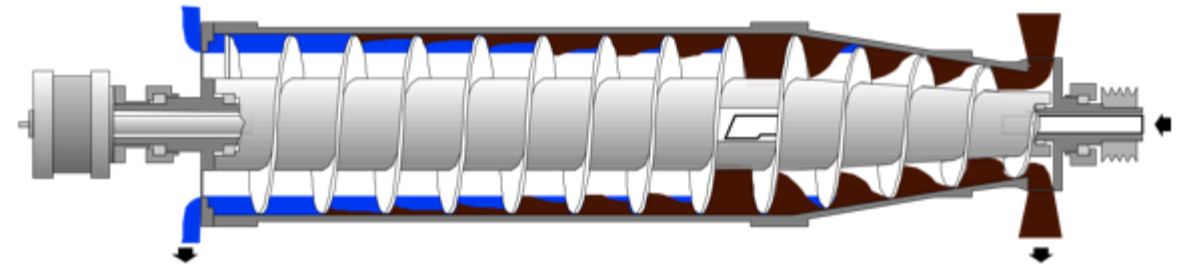
Alfa Laval Solid Bowl Centrifuge



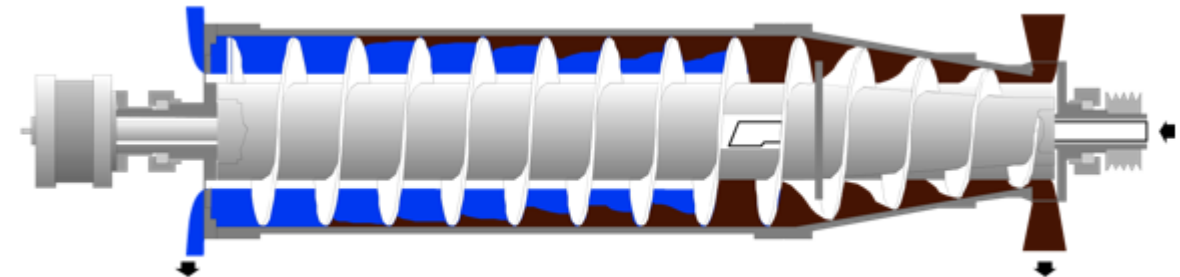
Unique design for capturing ultra fine inorganic solids



- High G/ Deep pond technology
- Greater clarification/ capture of fines
- Smaller radius discharge lowers power consumption
- Up to 2700 G's
- Alfa Laval patented Power Tubes reduce power consumption even further



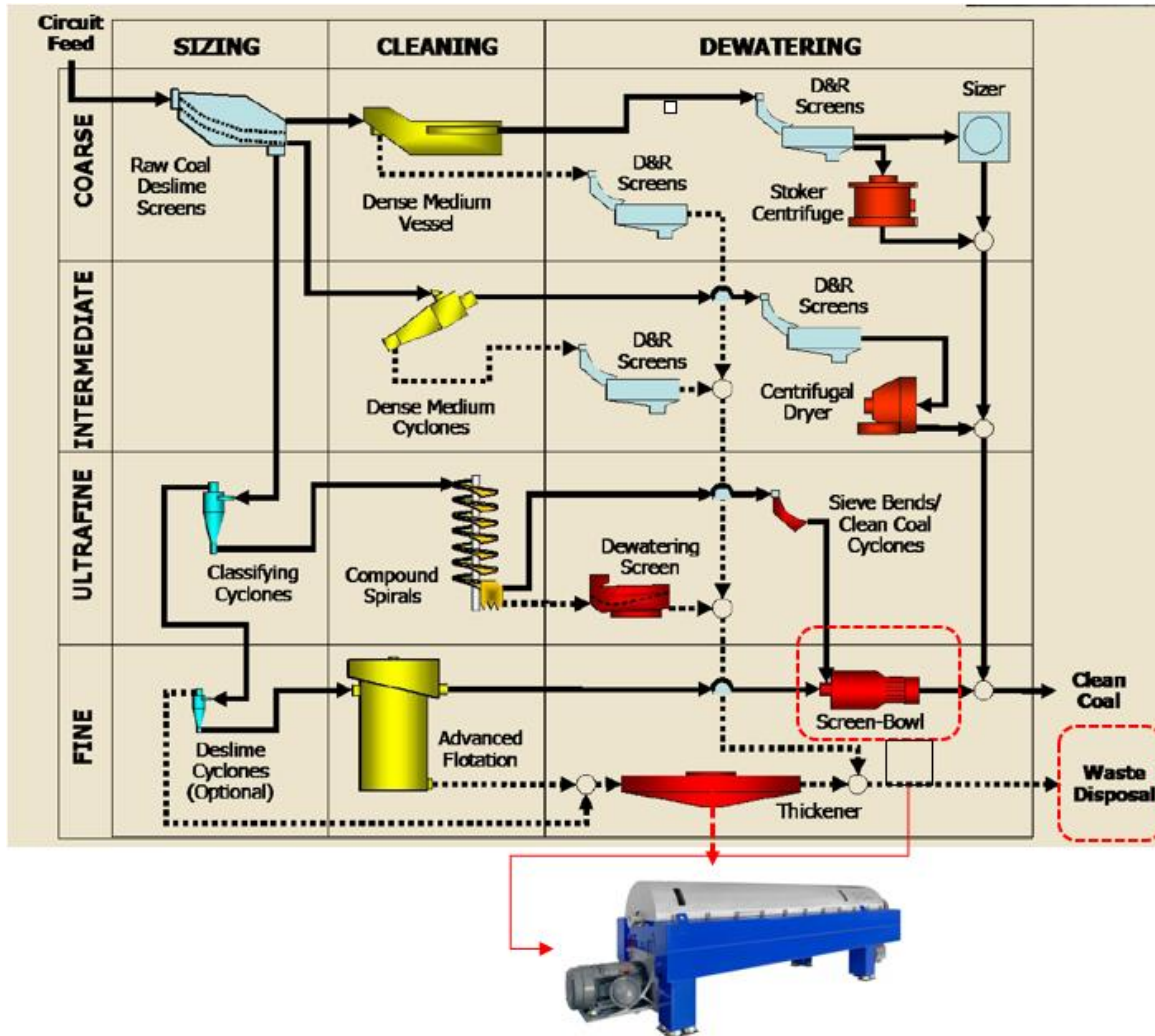
Conventional bowl geometry



P3 deep pond bowl geometry



Typical Coal Preparation Plant Flowsheet



Solid bowl centrifuge application:

Coal tailings dewatering

- Elimination of tailings dams

Fine & ultra fine coal (flotation product) dewatering

- Replacement of screen bowl centrifuge or HBFs

Cake & Centrate Quality

Centrate



Dry Cake Coal Tailings



Dry Cake Flotation Product - Coal



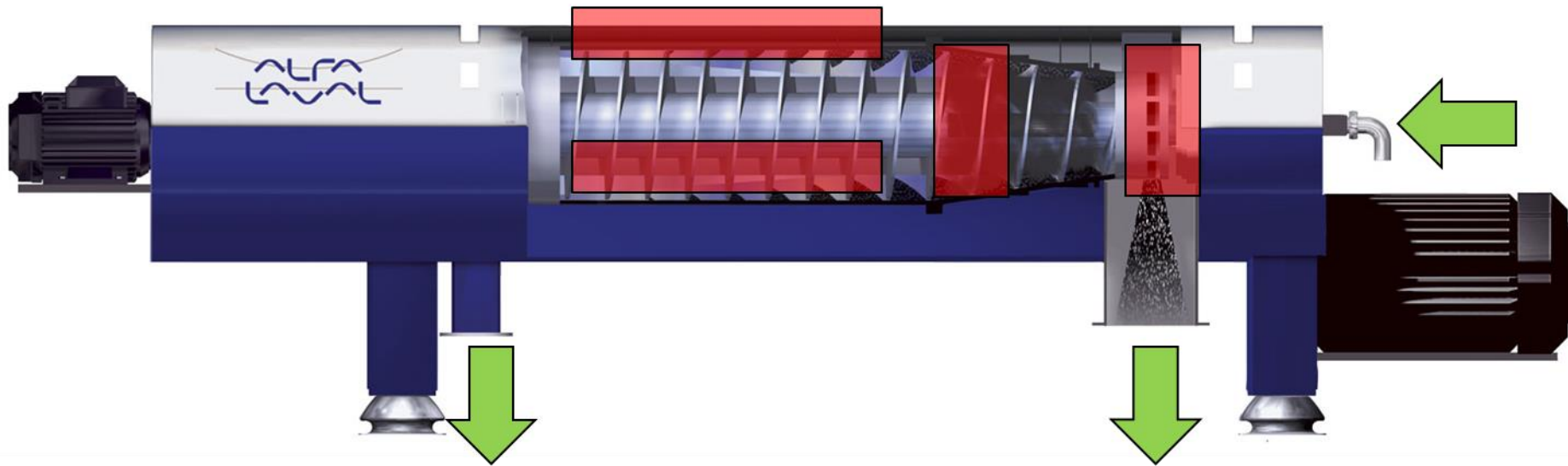
Alfa Laval Solid Bowl Centrifuge advantages:



- Very high solids recovery rate (up to 99%)
- Can separate ultra fine inorganic solids down to $-10\mu\text{m}$
- Lower flocculant consumption compare to other technologies
- Smaller foot prints – Lower installation costs – $0.5 \text{ m}^2/\text{tph}$ of dry solids
- Lower overall operating cost compared to other dewatering options
- Self adapts to varying slurry feed densities. SBC measures the torque by back drive VFD and adjusts the differential speed accordingly
- Fully enclosed process for liquid and solids
- Simple, fully automatic operation, no dedicated operator required
- Alfa Laval P3-10070 is capable of handling up to 70tph of solids

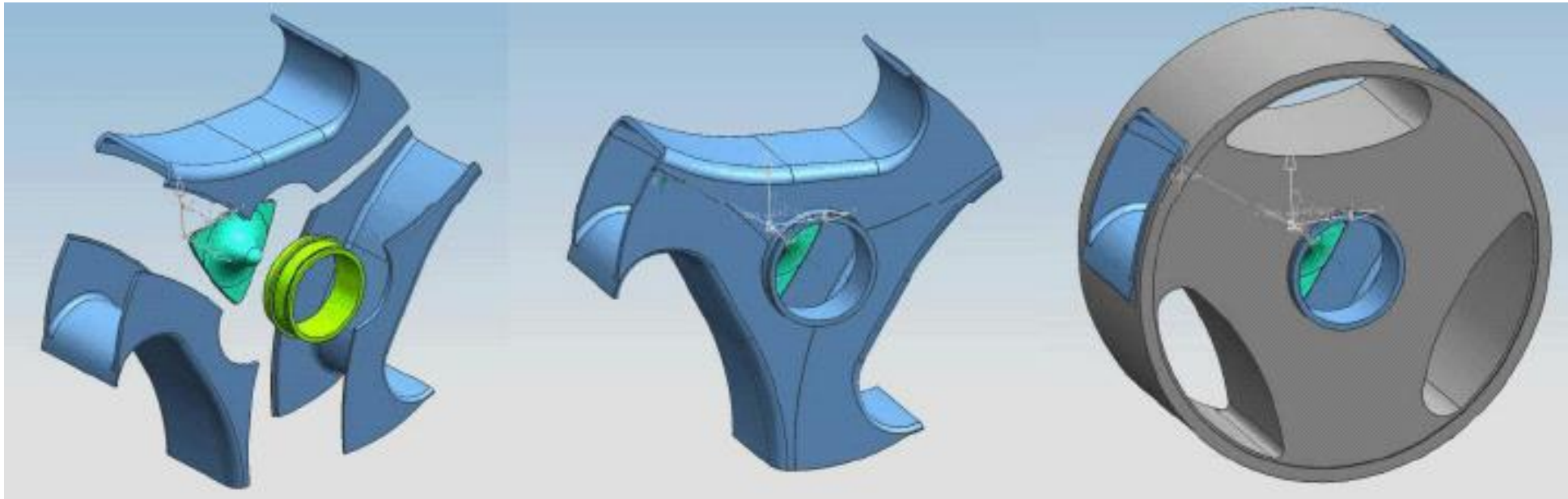
Erosion protection – more than usual

- Fully protected from inlet to outlet
- Tungsten carbide widely used



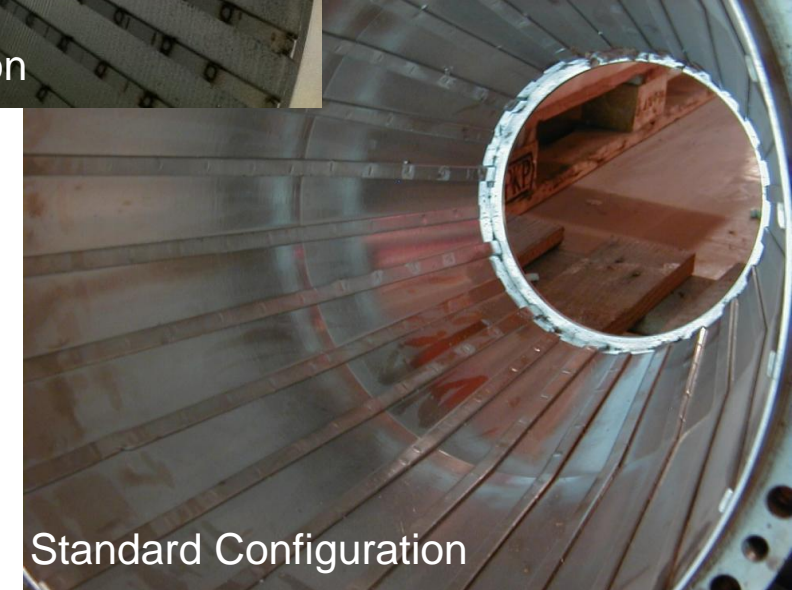
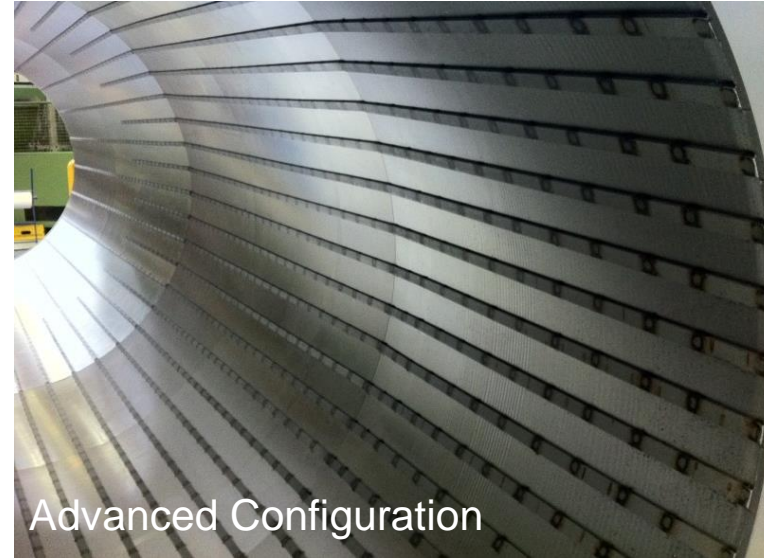
Enhanced feed zone protection

- Fully tungsten carbide protected feed inlet is standard
- Patented Yin / Yang design for soft acceleration/ minimal floc shearing (hence minimum flocculant dose).



Enhanced Bowl Protection

- The bowl wall is protected by Stellite strips
- > 50% more strips compared to standard configuration to improve abrasion resistance
- Aids conveying of solids
- Cone angle is optimized for highly dense mining slurries



Enhanced conveyor protection

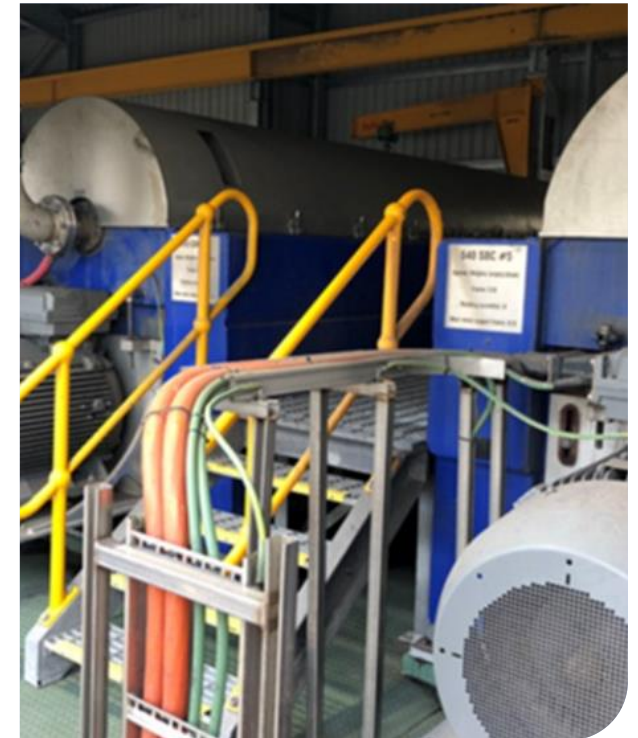
- The conveyor is protected by tungsten carbide tiles for maximum lifetime



Alfa Laval SBC Installations for Coal Tailings in Australia



- 5x SBCs in Rix's Creek Coal Mine – Singleton NSW
- 2x SBCs in Meandu – Nanango QLD
- 4x SBCs in Kestrel Coal – Emerald QLD



Onsite Testing

– Full Scale Skid Mounted P3-10070 SBC



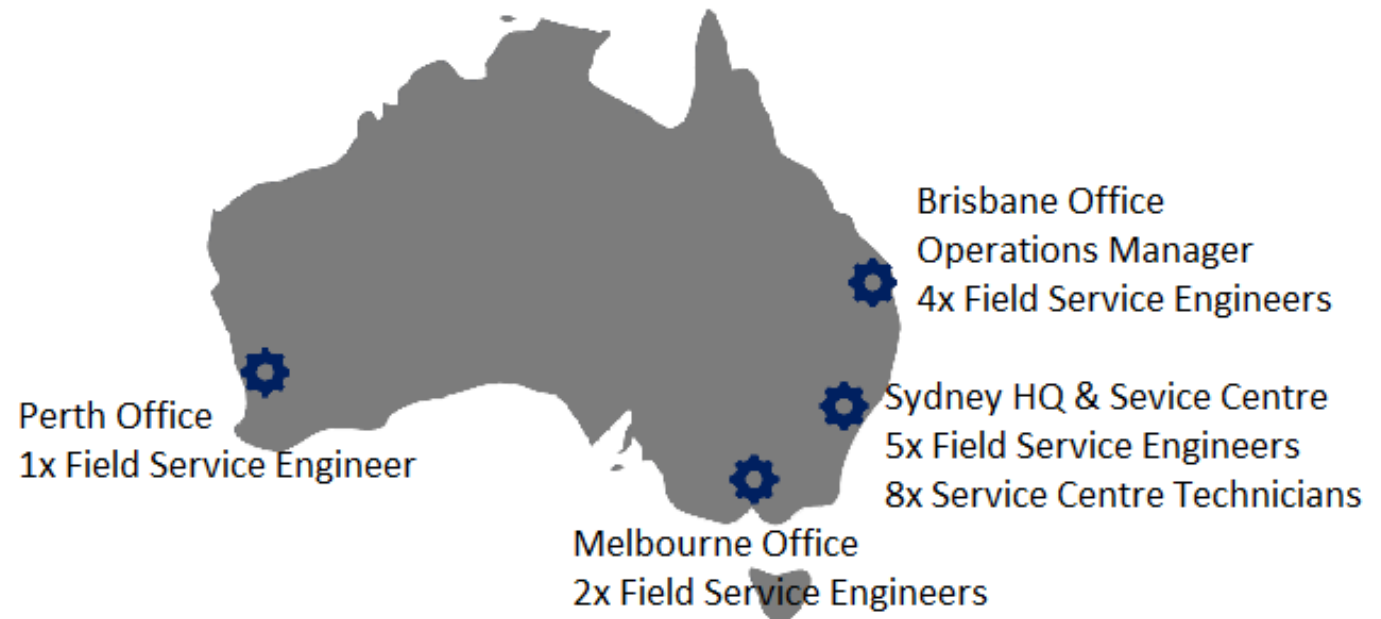
- **Capacity:** Up to 200 m³/h, depending on feed solids concentration
- **Solids Load:** Up to 70 t/h dry cake, depending on solids density and type



Alfa Laval Australia Service Organisation



- **Service Operations Manager**
- **Service centre**
 - Service centre manager
 - Service centre coordinator
 - Workshop team of more than 10 staff members
- **Field Service**
 - Field Service Coordinator
 - 4x Field service engineers in QLD
 - 5x Field service engineers in NSW
 - 2x Field Service engineers in VIC
- **Project Management**
 - Project Team Leader
 - 3x Project Managers
- **Customer Care Team**
 - Team of 4x employees look after customer service sales & spare parts



Solid Bowl Centrifuge In-house Repair Services

- Welding
- Parts refitting
- Replacement Parts
- Machining & Milling
- Balancing
- Testing



Australia's Largest Centrifuge Service Centre



- Major refurbishment of Centrifuges
- Dynamic balancing of Centrifuge bowls
- Centrifuge conveyor repairs & balancing
- Gearbox repairs & servicing
- NDT testing of major components
- Assembly and test run of machines
- Spare parts warehousing



