



MINING INDUSTRY

Decanter Applications



Overview of the Mining Sector

Mining is a critical industry that encompasses the process of discovering, extracting and processing the world's natural resources. It is an important building block of economic growth, providing essential raw materials for a wide range of industries such as energy, construction, technology and manufacturing.

Today, the mining industry is undergoing a major transformation not only in terms of ore production, but also in terms of environmental sustainability, occupational health and safety, and technological innovations. Modern mining practices aim to both reduce environmental impacts and optimize production costs by emphasizing efficient production, waste management and energy conservation.

Many stages, such as ore separation, water recovery and waste management, are optimized with the support of advanced technologies.

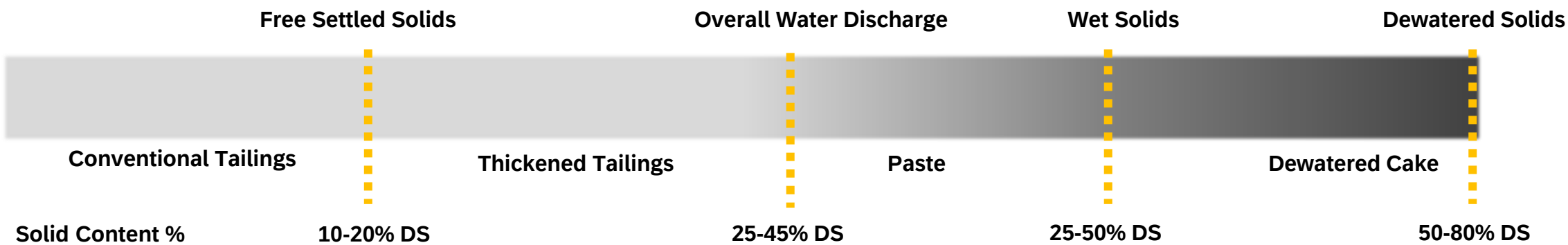
Decanter centrifuges, which are among these technologies, are among the indispensable equipment of mining operations thanks to their high efficiency in solid-liquid separation.

Decanter centrifuges play a critical role, especially in areas such as the processing of slurried ore, dewatering of flotation tailings and recovery of process water.

These devices both increase production efficiency and contribute to reducing environmental impacts. At the same time, it offers both economic and logistical advantages in mining operations by reducing the volume of waste and increasing its portability.



GENERAL INFORMATION



Thickened Tailings



Paste Tailings

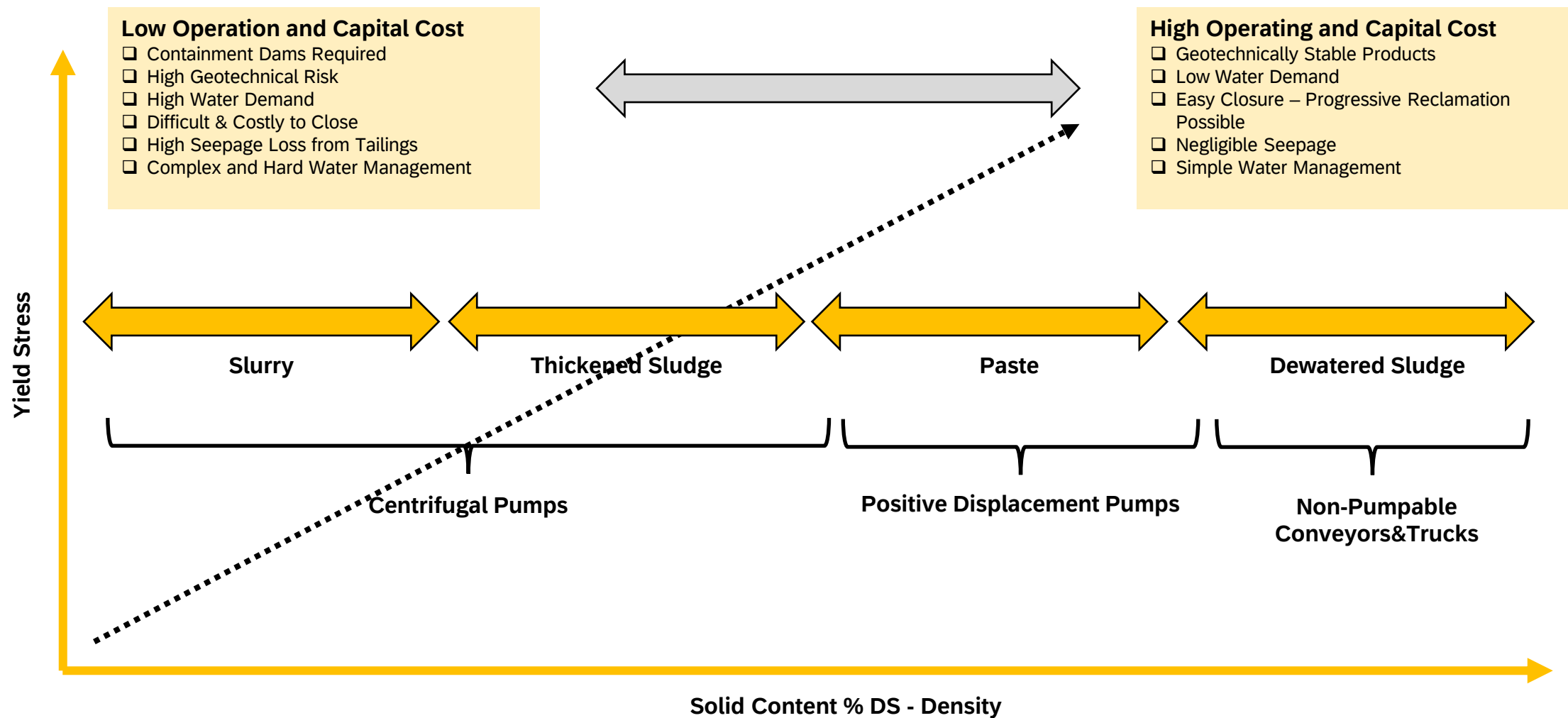


Dewatered Cake

Newtonian Rheology

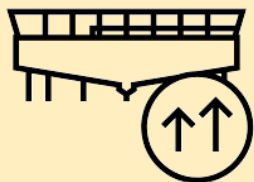


GENERAL INFORMATION



Mechanical Separation

Sedimentation



Thickener



Deep Cone Thickener



Tailings

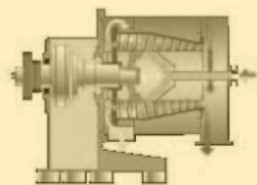
Centrifugation



Separator

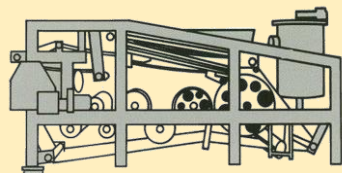


Decanter Centrifuge

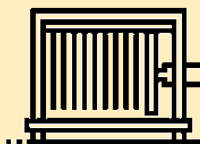


Screen Bowl Centrifuge

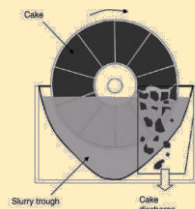
Filtration



Belt Press

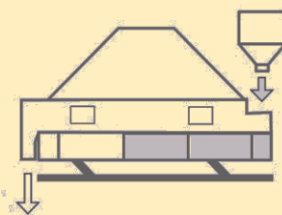


Filter Press



Disc Filter

Thermal Separation



Fluid Bed Dryer

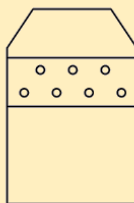
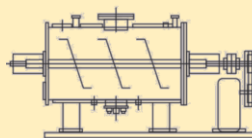


Plate Dryer



Paddle Dryer



Decanter Centrifuge are widely used in mining operations, especially in the following processes.

Tailings Dewatering After Ore Beneficiation: Tailings produced after flotation or other beneficiation methods can be used to dewater tailings, reducing tailings volumes and facilitating storage.

Thickener Downstream Processing: Further dewatering of the high solid content fluids coming out of the thickeners, both process water recovery and stabilization of the waste are ensured.

Process Water Recovery: Decanters are commissioned to treat the turbid process water resulting from processes such as washing, grinding or flotation and make it usable again in the system.

Acid Mine Drainage and Chemical Treatment Sludges: Chemical sludges formed after neutralization are dewatered before disposal.

Coal Beneficiation Plants: Decanters are used as an alternative or pre-treatment to filter presses for dewatering fine fraction coal slurries.

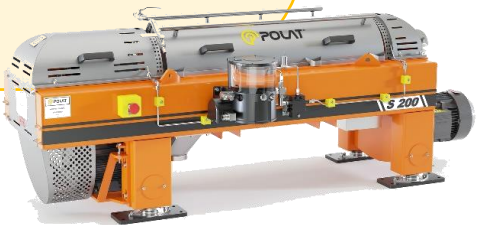
The use of decanter centrifuges in these processes not only improves mechanical separation efficiency, but also reduces water consumption, facilitates waste management and contributes to lower operating costs. In this context, decanters have become an essential part of both process control and sustainability goals in modern mining facilities.



DEWATERING EQUIPMENT COMPARISON



Feature	Belt Filter Press	Chamber Filter Press	Decanter Centrifuge
Installation	○○○	○○○○○	○
Space	↔ ↔	↔ ↔ ↔	↔
Maintenance	🔧 🔧	🔧 🔧	🔧
Solid Disposal	○○○	○○	○
Ventilation	❄ ❄ ❄	❄ ❄	❄
Water	💧 💧 💧 💧 💧	💧 💧 💧	💧
Labor	⚙ ⚙	⚙ ⚙ ⚙ ⚙	⚙
Power	⚡	⚡	⚡



Although thickeners and decanters are generally used for solid-liquid separation, their operating principles, efficiency and application areas are different. Understanding these differences will show you when decanter use can be advantageous.

Thickener

Principle of operation:

In large diameter tanks, the suspension slowly settles to separate the water and solid phase. The solids are concentrated at the bottom, while the overflow liquid is separated at the top.

Advantages:

Effective water recovery in large volumes.
Low energy requirement due to natural settling of sediment.
Wide range of applications; used for post-flotation or post-cyanidation settling in gold mines.

Disadvantages:

Requires large area.
Settling time can be long.
Efficiency may be reduced for very fine particles.
Solid concentration is usually limited (around 30-40%).

Decanter (Decanter Centrifuge)

Working principle:

It quickly separates the solid and liquid phase using centrifugal force. With the high speed, the particles settle on the tank wall and are separated and discharged continuously.

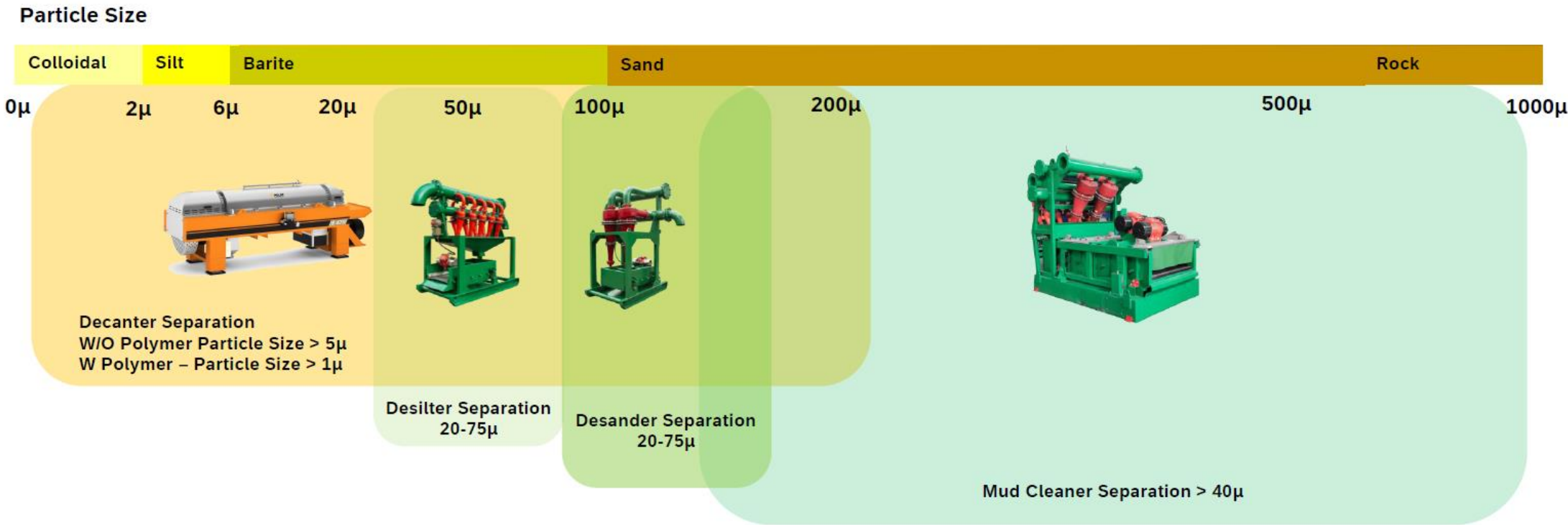
Advantages:

Much higher solid concentration (40-60% or more) can be achieved.
Space saving; much more compact than thickener.
More effective in separating fine particles.
Suitable for continuous operation, especially in processes where high throughput is required.
Faster water recovery, accelerating the process cycle.

Disadvantages:

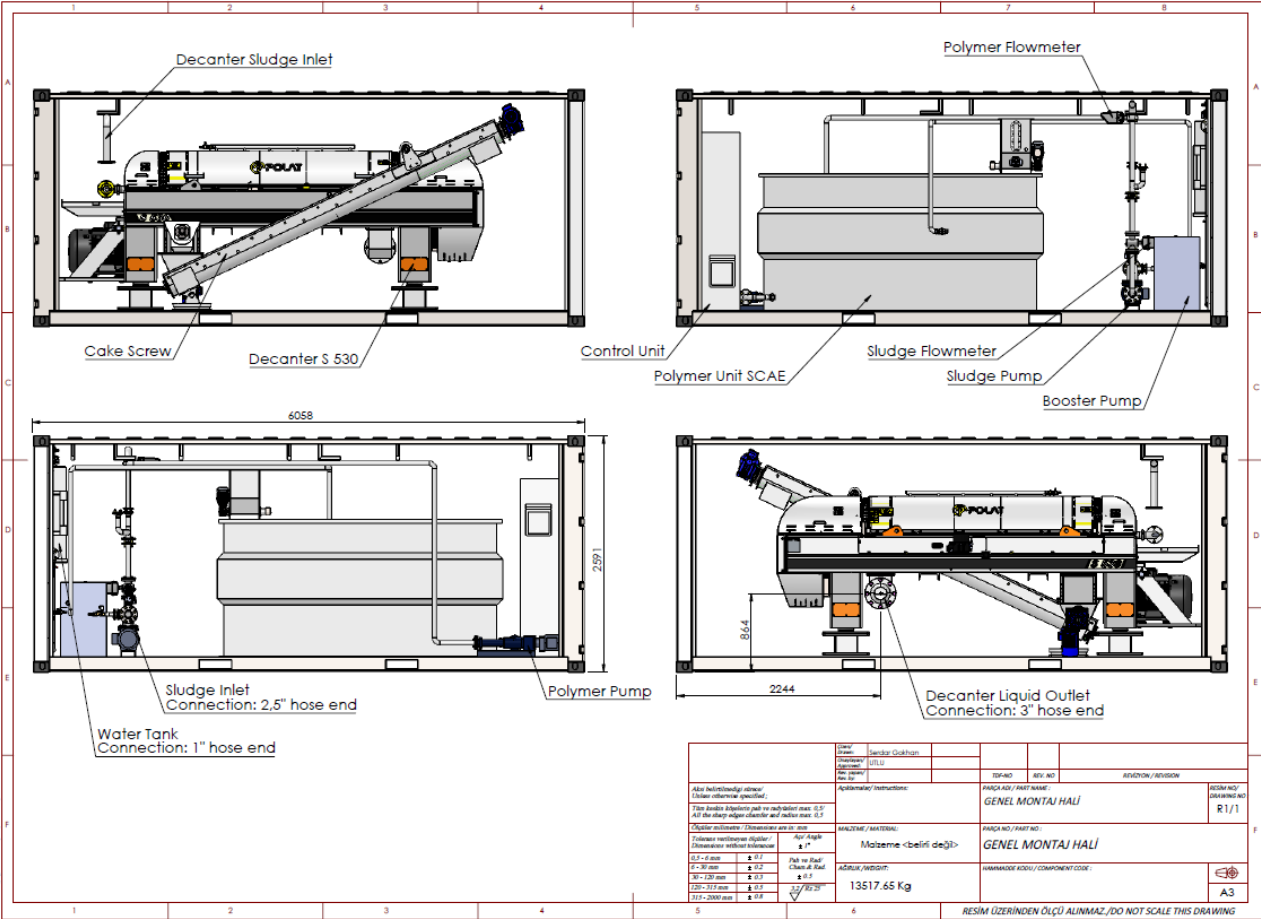
Investment and operating costs are higher than thickener.
Mechanical parts wear and maintenance required.
Energy consumption is high compared to thickener.



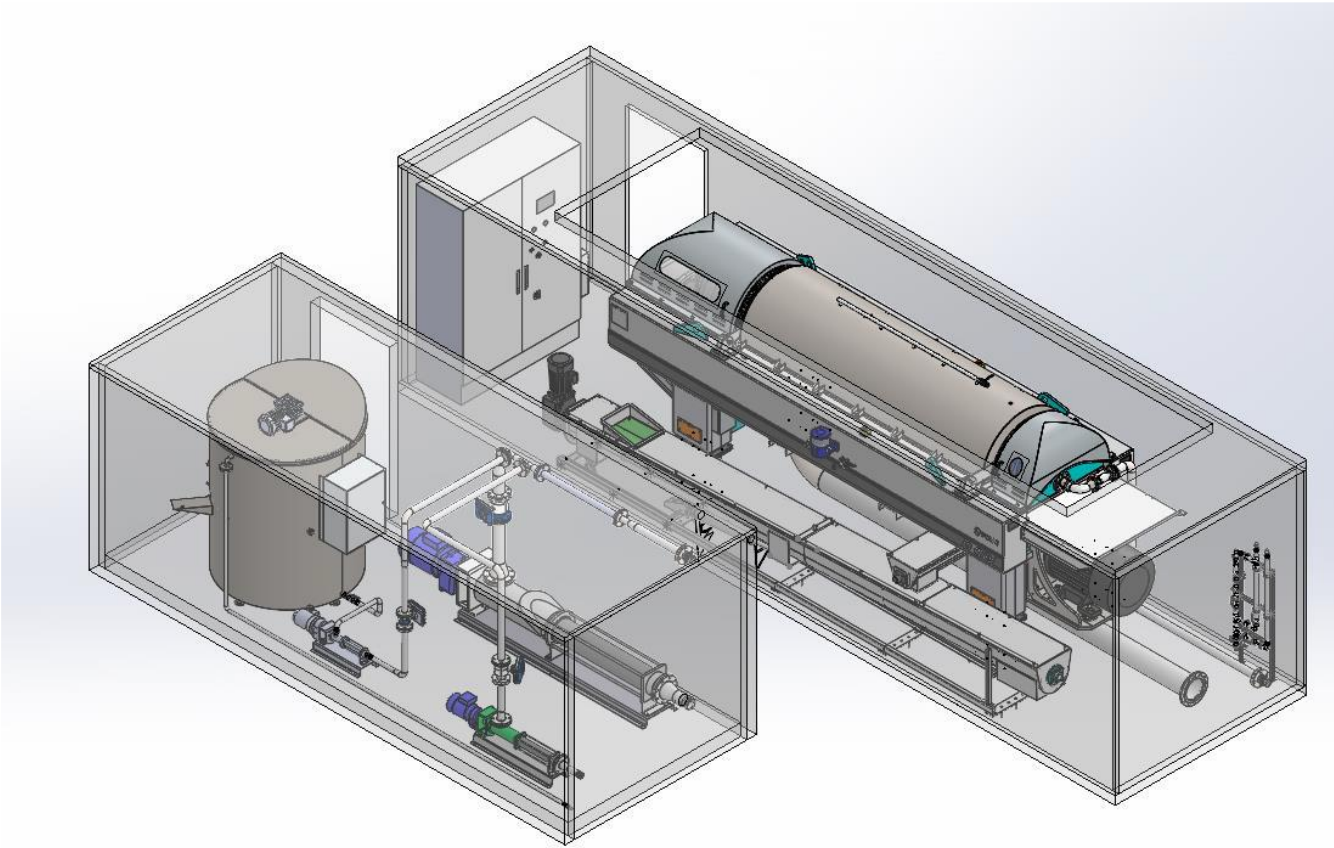




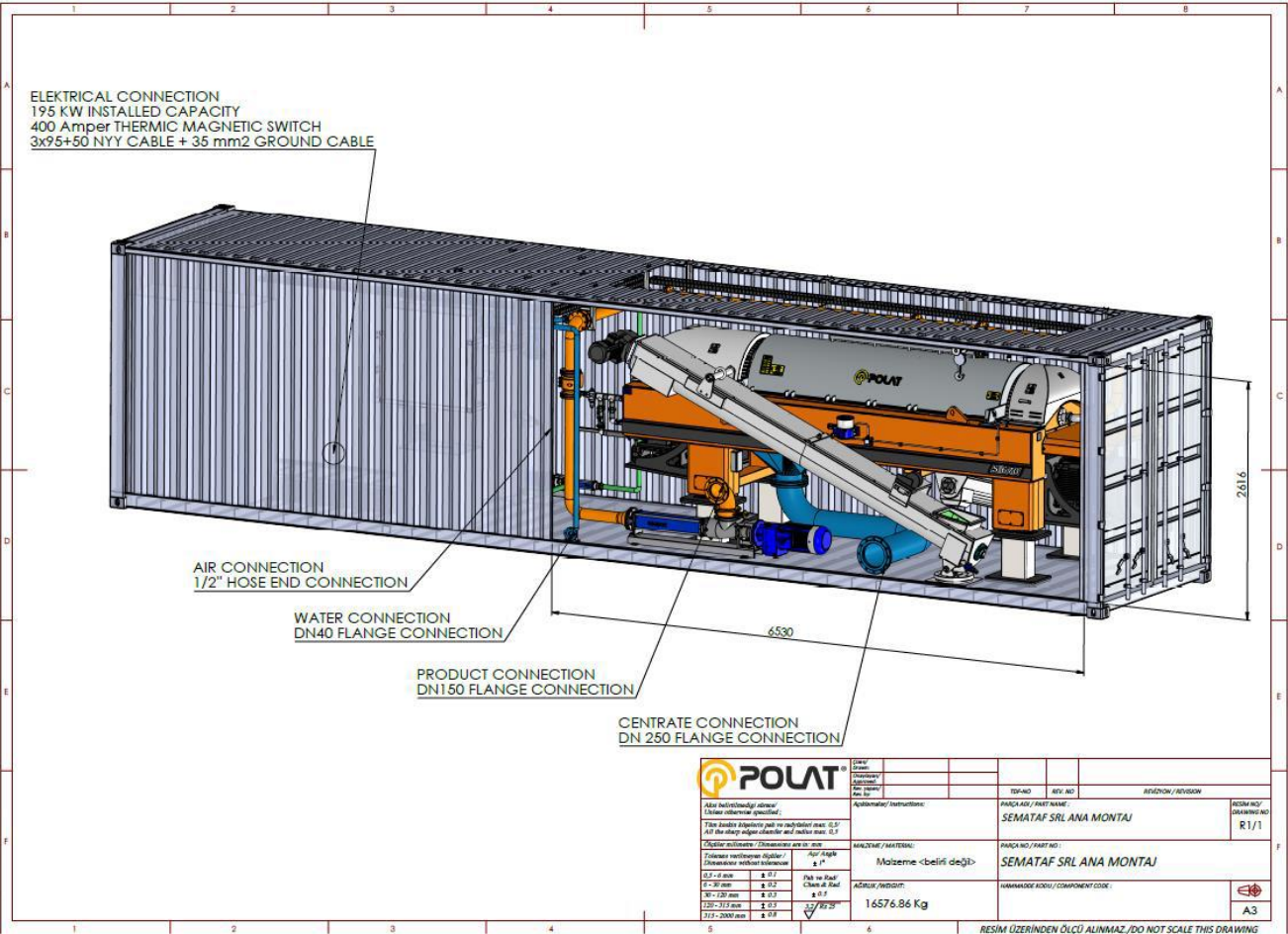
REFERENCES



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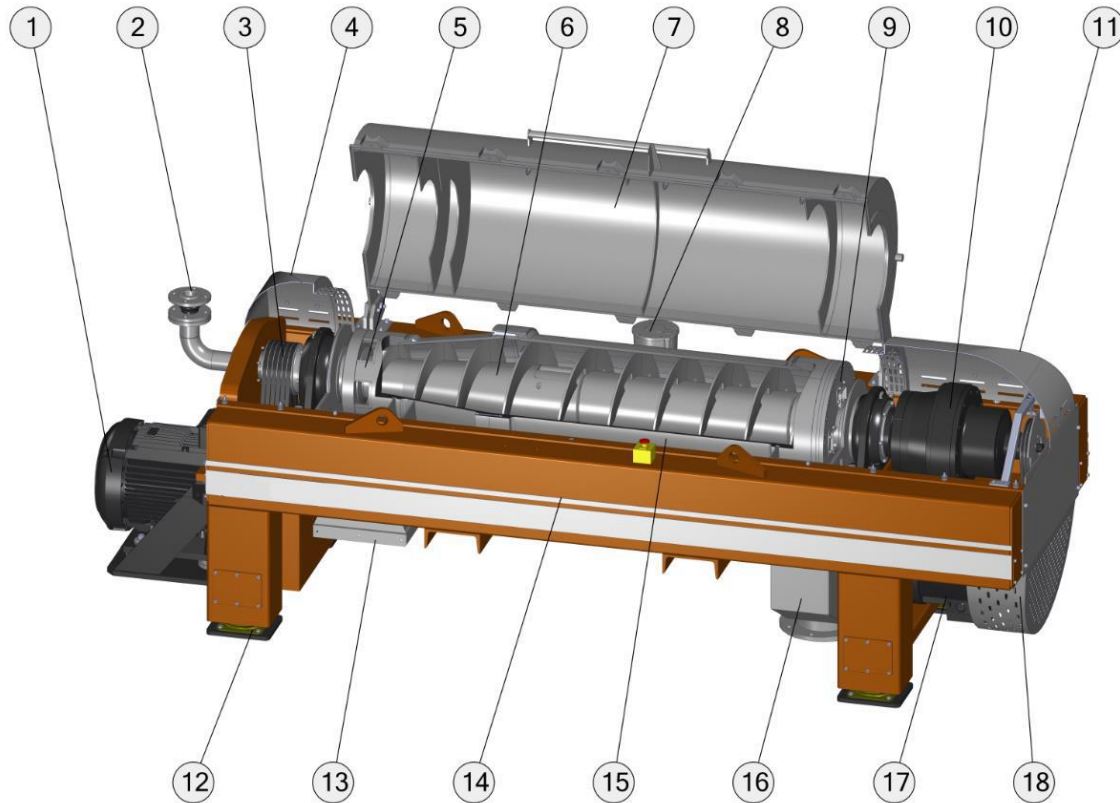
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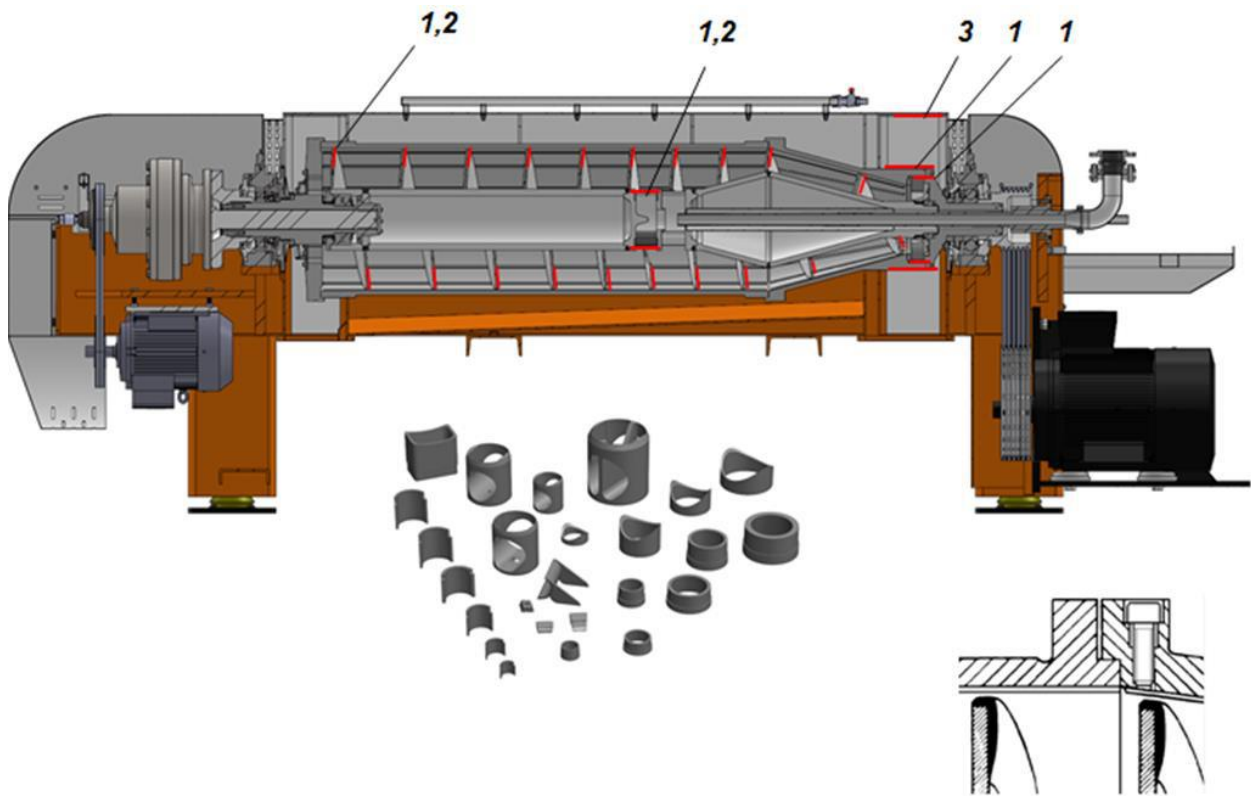
DECANTER MAIN PARTS



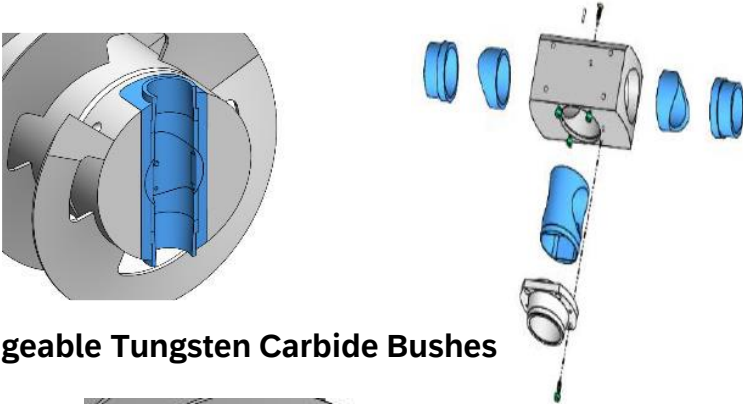
- 1-Main Motor
- 2-Feed Pipe
- 3-Main Drive Belts
- 4-Pulley Cover
- 5-Solid Outlet Ports
- 6-Scroll
- 7-Upper Casing
- 8-Lubrication Pump
- 9-Weir Plate
- 10-Gearbox
- 11-Gearbox Cover
- 12-Vibration Isolator
- 13-Solid Discharge
- 14-Frame
- 15-Bowl
- 16-Concentrate Discharge
- 17-Second Motor
- 18-Pulley Cover



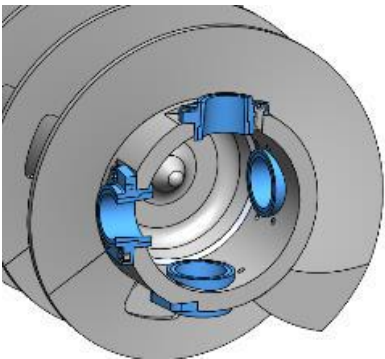
DECANTER WEAR PROTECTION



Changeable Sintered Tungsten Carbide Wear Parts
Nickel Based Coating
Polyethylene Plate



Changeable Tungsten Carbide Bushes



Tiles, Ceramic Plate

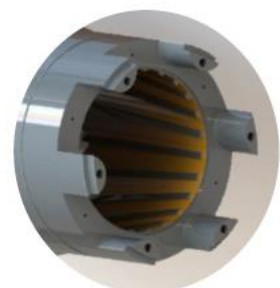


DECANTER WEAR PROTECTION

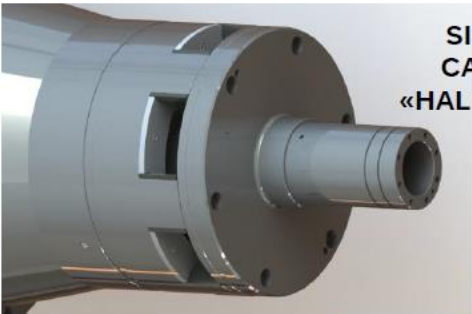
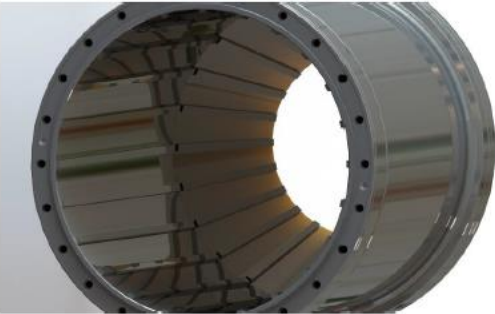


BOWL AND SOLID ROOM

OUTLET WEAR RING

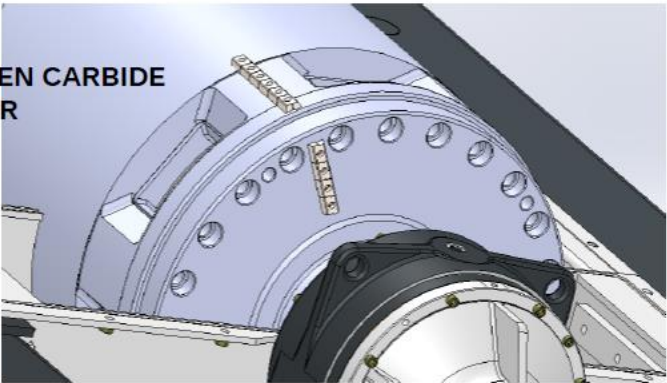


INTERNAL BOWL RIBBERS

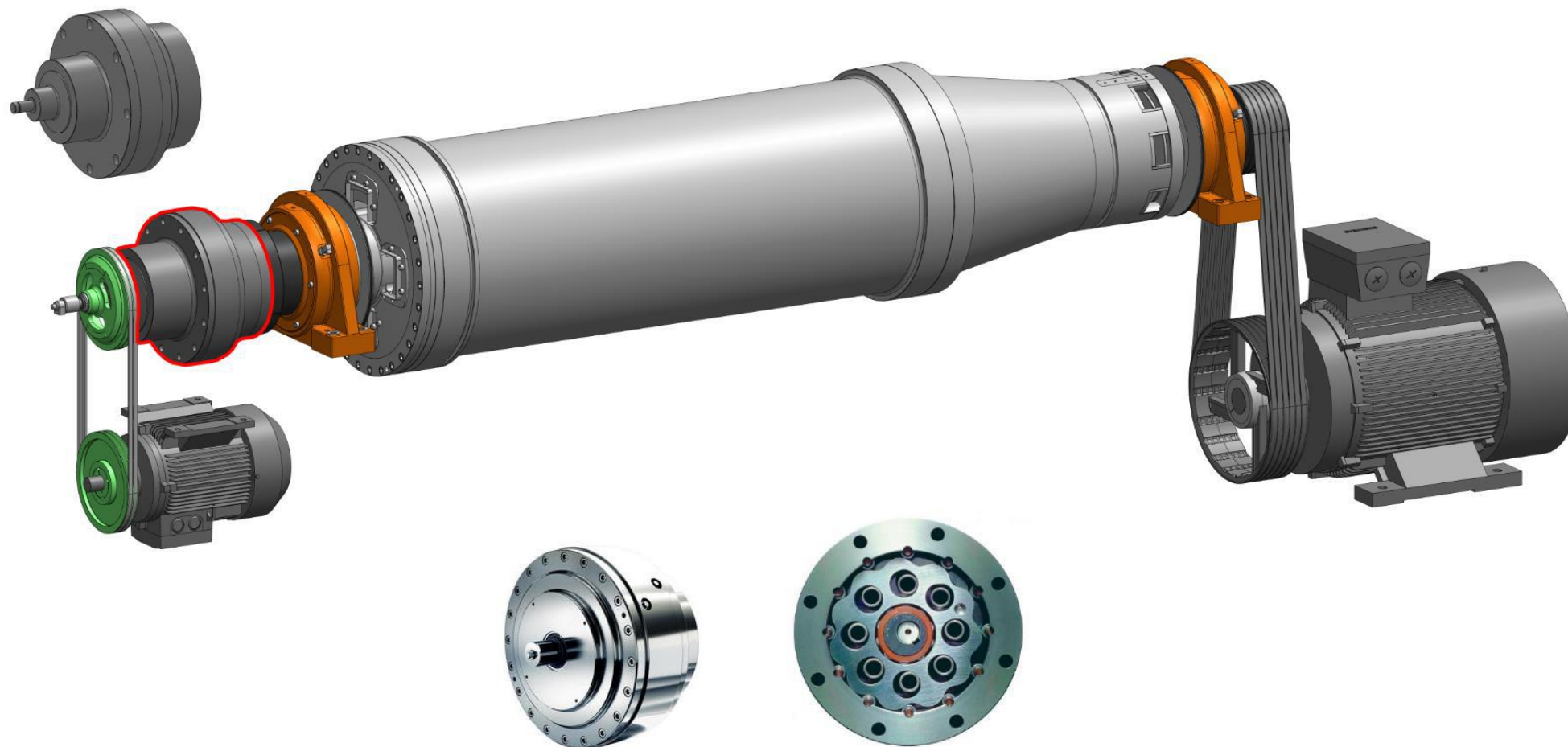


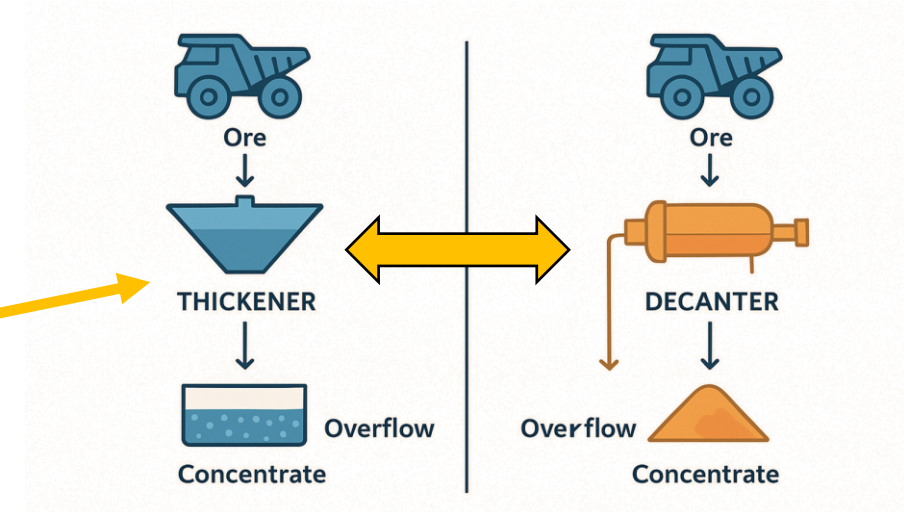
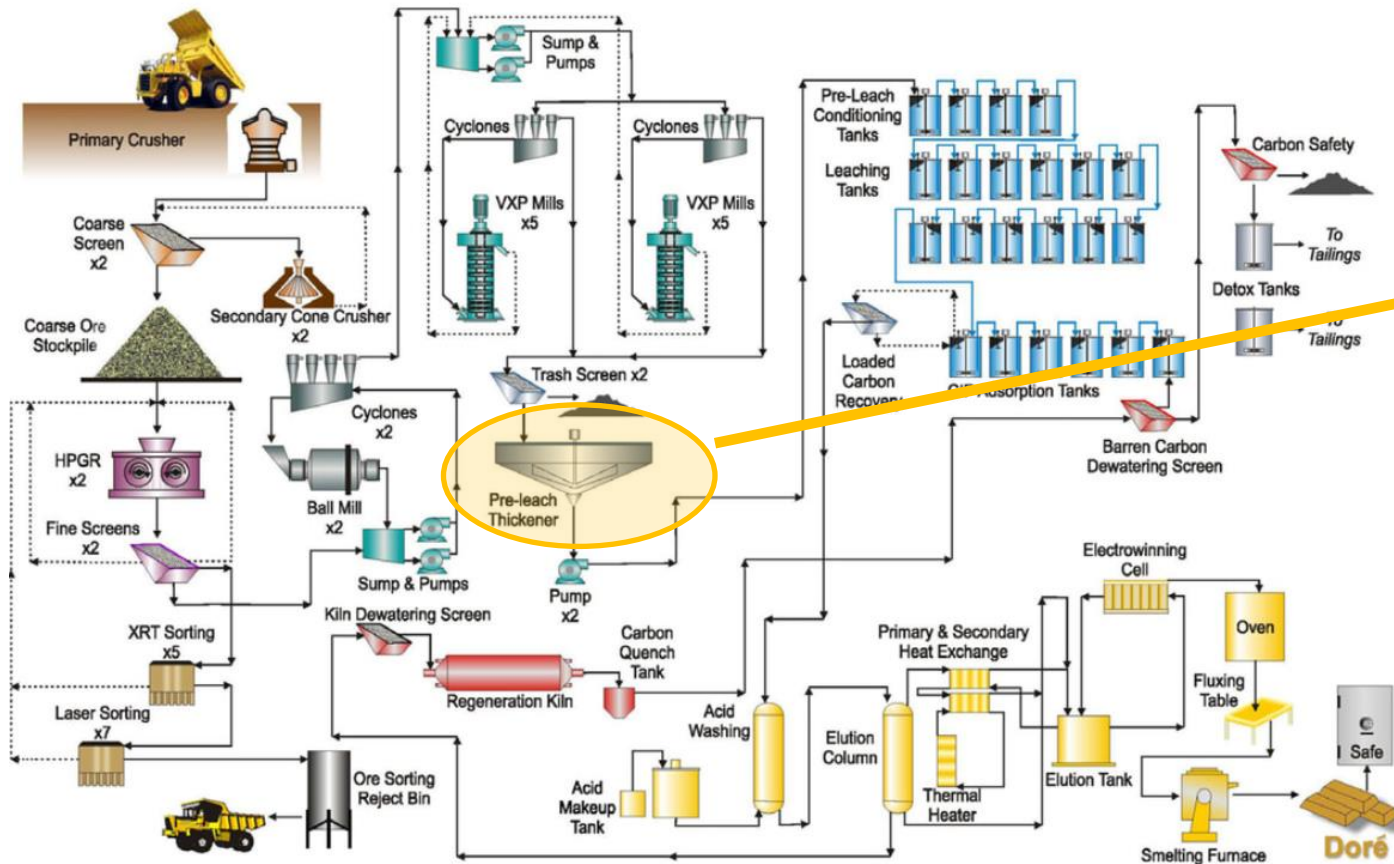
SINTERED TUNGSTEN CARBIDE REMOVABLE «HALF MOON» PROTECTION

SINTERED TUNGSTEN CARBIDE SCRAPER



SPECIAL GEARBOX FOR MINING INDUSTRY





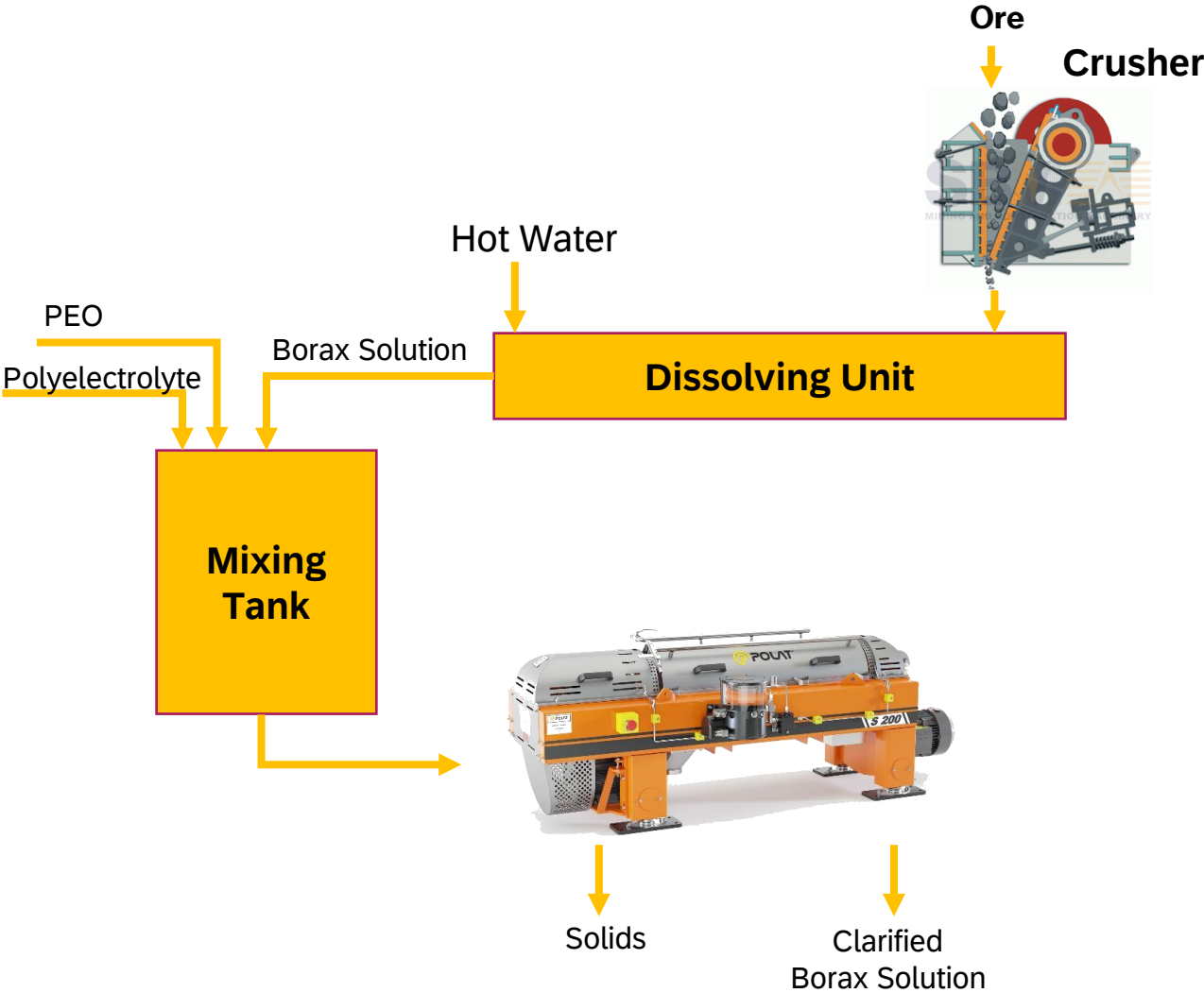
The decanter is used instead of a thickener, achieving faster solid and liquid phase separation and maximum performance in a smaller area.



GOLD MINING – POLAT SX 920 DECANTER CENTRIFUGE



BOR MINING – CLARIFICATION PROCESS





TEST VIDEOS

BOR MINING– POLAT S 670 DECANter CENTRIFUGE - INTALLATION



