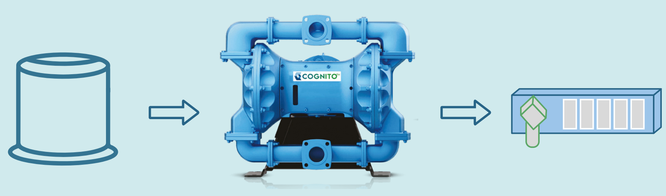
COGNITO™

Discover how one of the top leading explorers & producer of metal/metal oxide/ metal recycling/ mineral exploration company tackled pumping challenges in their filter press application by utilizing our

COGNITO™ EODD PUMP

Application: Filter Press Feeding

Highly abrasive and corrosive Alumina slurry/battery recycling paste is pumped from the slurry tank to the filter press machine for the separation of slurry into solid cake and liquid filtrate.



Alumina Slurry Tank → 4” EODD Pump → Filter press

Alumina Slurry

The Need

As the applications dealt with corrosive, abrasive, and chemically aggressive fluids, safety and reliability were crucial.

The customer faced challenges with inefficient **Peristaltic and centrifugal pumps** due to the abrasive nature of the fluid, leading to downtime, safety risks, and operational inefficiencies.

These pumps struggled to handle back pressure efficiently during operation, leading to internal damages and subsequent leakages.

Ineffective pumping resulted in extended batch times and reduced overall throughput.

The customer required a reliable pumping solution that could manage aggressive fluids while ensuring a steady flow rate into the filter press chamber. The solution had to address back pressure issues and deliver a consistent flow rate to enhance better cake formation.

Challenges with Peristaltic Pumps (Hose Pumps)

- Costly maintenance
- Safety issues due to leakages
- Excess pressure buildup leading to damage and safety concerns
- Increased downtime
- Decreased operational efficiency
- The hose had a short lifespan of 7-8 days, with spare parts costing 40% of the pump cost
- Constant load on the motor leading to increased power usage and energy consumption
- Continuous monitoring of the hose to detect and prevent leakage

Challenges with Centrifugal Pumps

- Frequent leakage from gland packing due to back pressure
- Safety concerns and unclean surroundings due to pressurized leaks
- Lack of reliability due to sudden & unexpected breakdown
- Longer batch time
- Limited pump lifespan of 2 months
- Higher Maintenance cost & downtime
- Poor quality of cake formation

Process Details

- **Fluid:** Alumina slurry
- **Nature:** Corrosive and Highly Abrasive
- **Flow:** 420 LPM
- **Discharge Pressure:** 5-6 bar gauge
- **Viscosity:** Up to 500 cP at operating temperature of 45 DegC
- **Specific Gravity:** 1.25 kg/cm2
- **Solid Particles:** 18%-40%

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The right Solution

The COGNITO™ team analysed the customer's needs and addressed the challenges related to managing highly abrasive fluids and back pressure issues.

Following a comprehensive evaluation, they proposed the 4” COGNITO™ Stainless Steel EODD pump with a Santoprene™ diaphragm, specially designed to meet the demanding fluid and process conditions. The system also included leak detection sensors and a VFD.

As a result, the client approved the replacement of few centrifugal pumps with COGNITO™ EODD pumps.

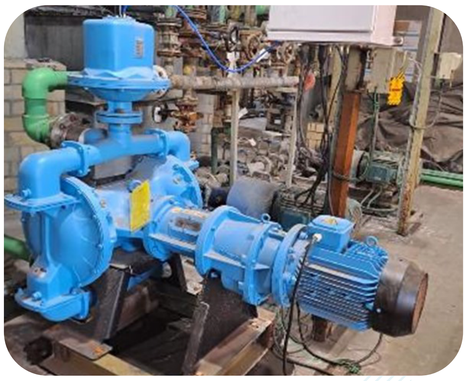
Incorporating the COGNITO™ EODD pump in their filter press application proved a significant transformation, addressing the earlier challenges - operational inefficiencies, downtime, safety concerns & recurring maintenance

By integrating the VFD, the customer could adjust the flow rate/frequency, resulting in improved cake formation in a shorter duration.

The leak detection sensors helped to maintain safe working environment, minimizing the risk of hazardous spills.

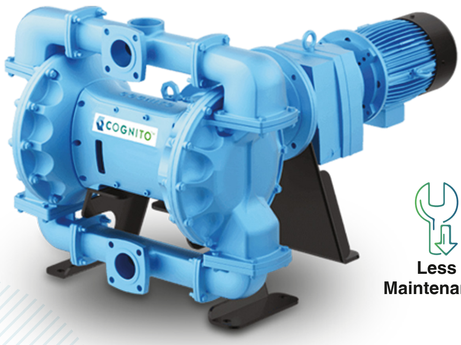
Before

After



Customer Experience

The customer was thrilled with the excellent performance of the 4-inch COGNITO™ EODD pumps, which met their operational requirements efficiently.



- Leakage free Operation
- Reliable solution with better cake formation
- Saving about 40-60 min per batch leading to more daily batches
- Less Maintenance
- Minimal downtime
- Increased filter press operation
- More energy savings

The above benefits translated to substantial cost reduction and a more streamlined filter press operation.

Energy consumption	Centrifugal Pump	COGNITO™ EODD Pump
No. of Working Hours/ Day	12 hrs	12 hrs
Energy Consume at Duty Point (estimated)	8.2 KW	4.7 KW
Electricity Consumption/ Month	2952 KWh	1692 KWh
Electricity Consumption/ Year	35424 KWh	20304 KWh

Maintenance	Centrifugal Pump	COGNITO™ EODD Pump
	Replacing the impeller and shaft every 4 to 6 months, along with changing the gland packing after each batch, led to substantial costs for spare parts and maintenance, as well as prolonged production downtime losses.	Under identical application and process conditions, our COGNITO™ EODD pump operated smoothly with minimal maintenance and zero downtime, resulting in increased production batches.

The recommended pumping solution was effective, prompting the customer to switch from centrifugal/peristaltic pumps to COGNITO™ EODD pumps in stages. This led to quickly securing additional orders.