Sludge Screw Press Operation

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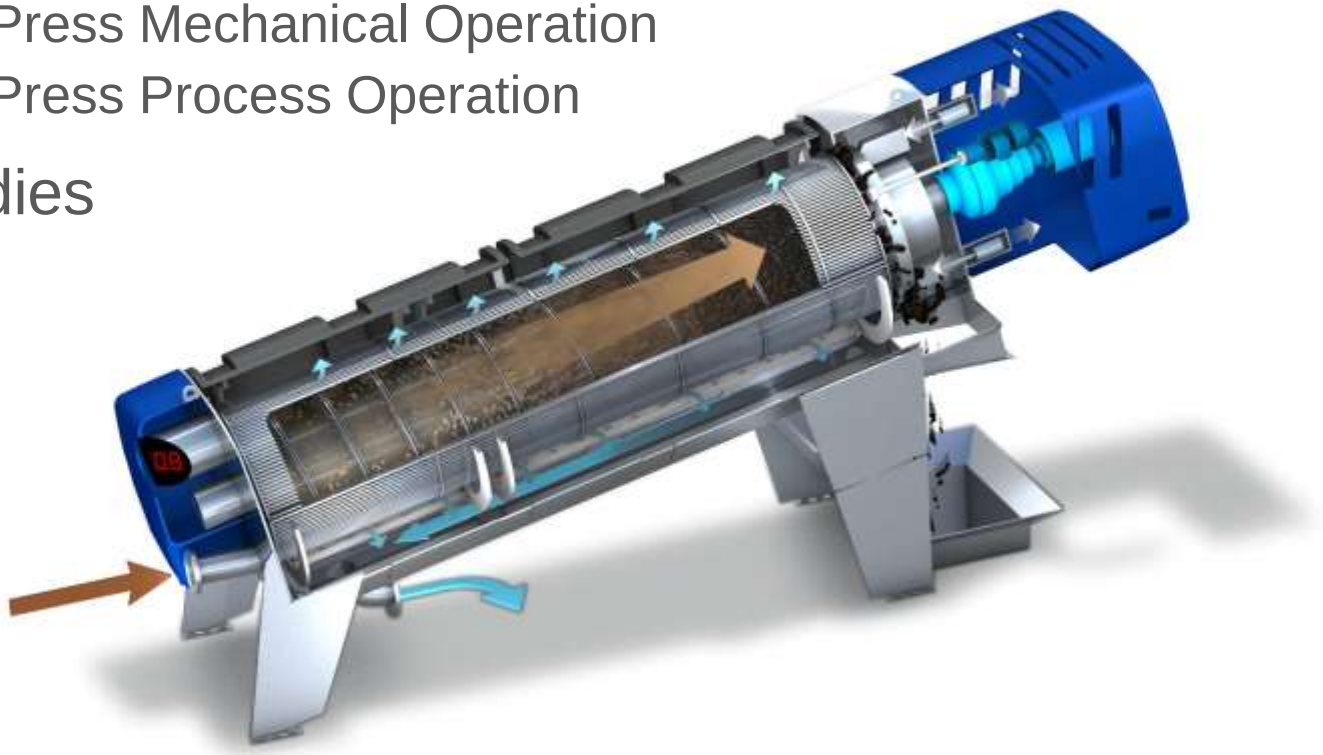
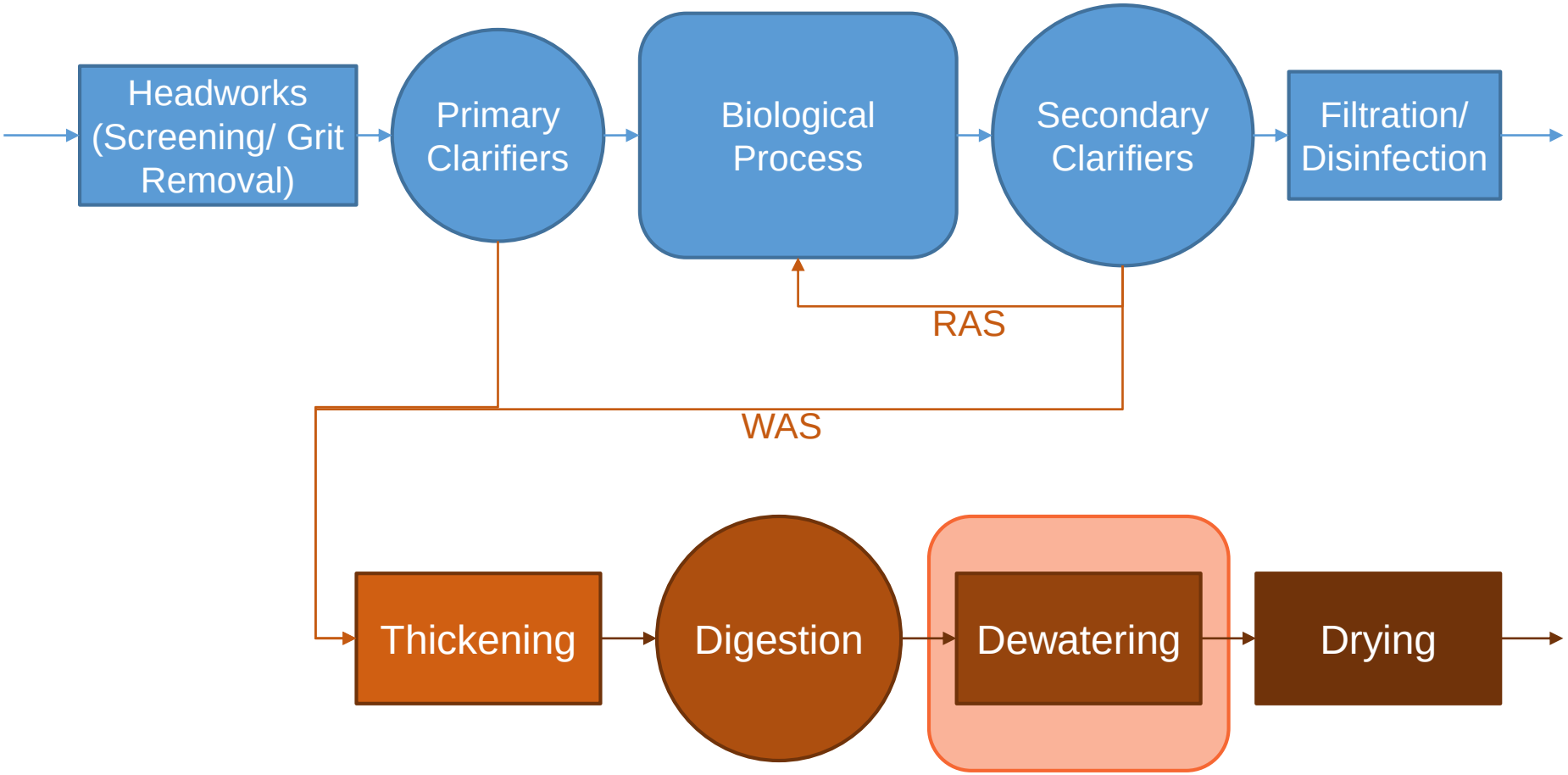
Outline

- Dewatering Unit Process
- Dewatering Equipment
- Screw Press Equipment
  - Screw Press Mechanical Operation
  - Screw Press Process Operation
- Case Studies



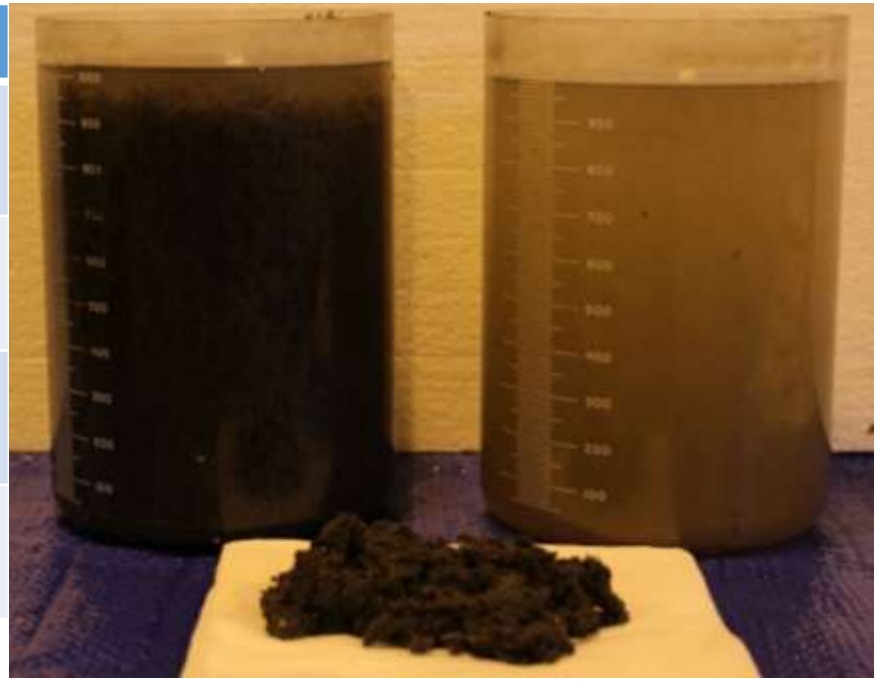
Where is Dewatering?



What is Dewatering?

"Dewatering is the removal of water from wastewater treatment plant (WWTP) solids to achieve a volume reduction and to produce a material for further processing or disposal." – WEF/WERF/EPA Solids Process Design and Management text

Property	Dewatering
Product	Sludge cake (nonfluid, semisolid material)
Inlet Concentration	0.5-6% solids
Outlet Concentration	15-40% solids
Primary Forces Used	Mechanical (Exc: drying beds)



Why Dewater Sludge?

Volume Reduction

No dewatering (0.5%)

With Dewatering (20%)

Precursor to downstream processes:

- Easier to incinerate (higher heat value)
- More efficient drying

Uses for Dewatered Sludge

- Fertilizer for agricultural land (typically Class A or Class B)
- Soil Amendment
- Composting
- Incinerator
- Dryer

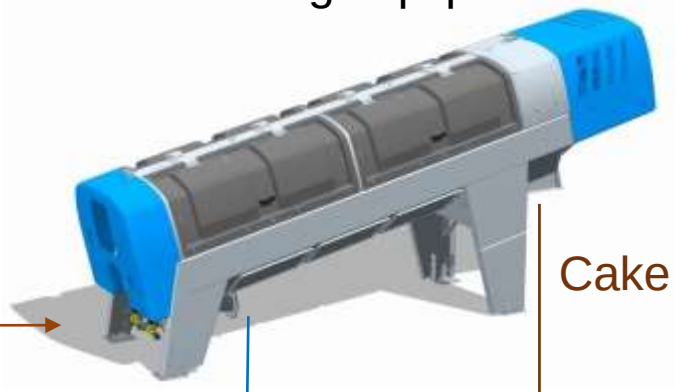
Dewatering Process

Upstream Process

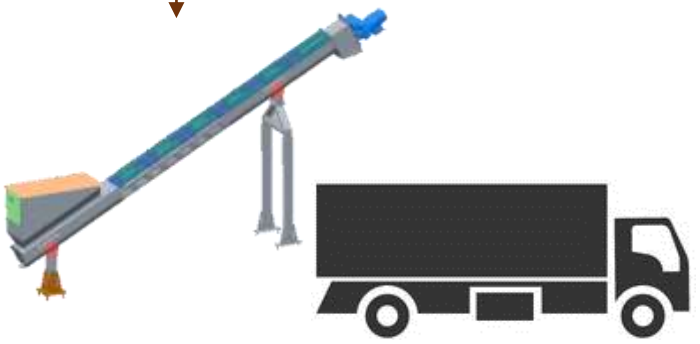
Sludge Conditioning

Dewatering Equipment

Feed Sludge



Cake



Use/Disposal

Pressate

Feed Sludge Characteristics

General characteristics which affect dewatering performance:

- Solids concentration
- Loading rates

Biological characteristics which affect dewatering performance:

- Type of sludge (primary, waste activated, blend)
- Sludge processing (digestion, thermal, chemical)
- Fibrous material or filamentous bacteria
- Volatile Suspended Solids

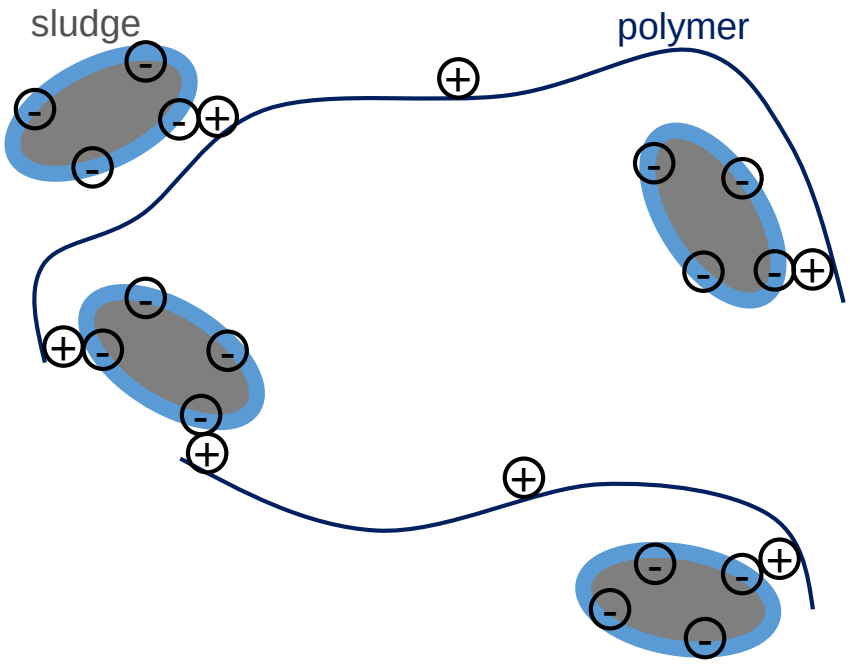
Chemical characteristics which affect dewatering performance

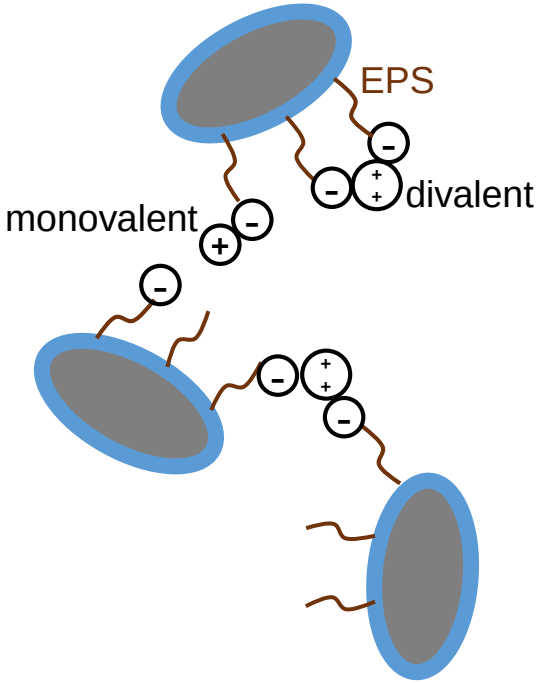
- Nature of water in sludge (free, interstitial, bound)
- Ortho-phosphorus (PO_4-P)
- Monovalent/divalent ions ratio
- pH
- Temperature

Sludge Conditioning

Promotes Flocculation:

- Polymer
- Metal salts





Dewatering Equipment

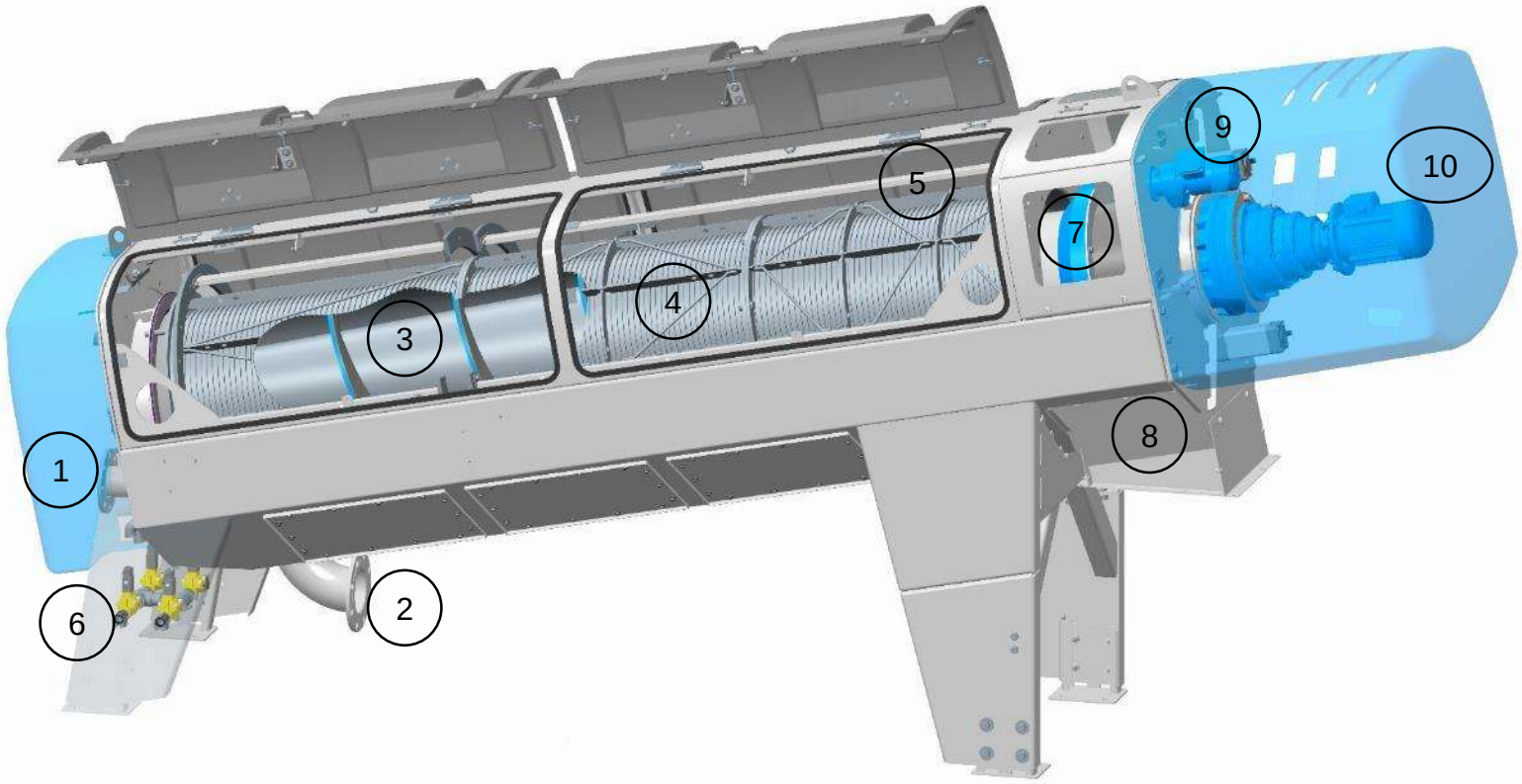
- Sludge Drying Beds
- Belt filter press
- Centrifuge
- Screw press

Andritz Belt Filter Press

Centrisys Centrifuge

Huber Screw Press

Screw Press – Mechanical Operation



1 sludge feed

2 filtrate discharge

3 auger

4 filter basket

5 spray basket for independent washing of feed and press zone

6 wash water connection

7 pneumatic pressure cone

8 sludge cake discharge

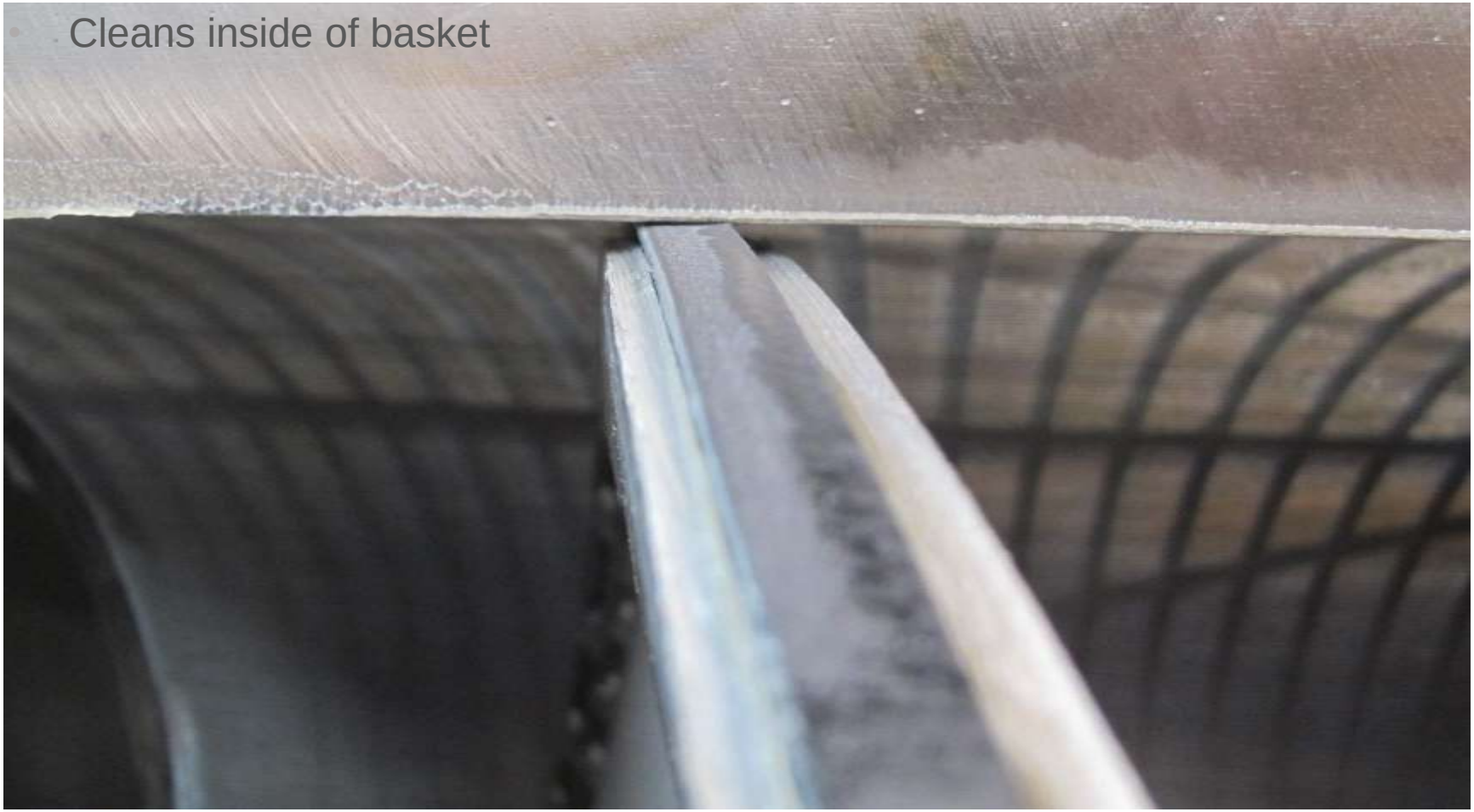
9 spray drive

10 auger drive

Screw Press – Mechanical Operation

Wiper:

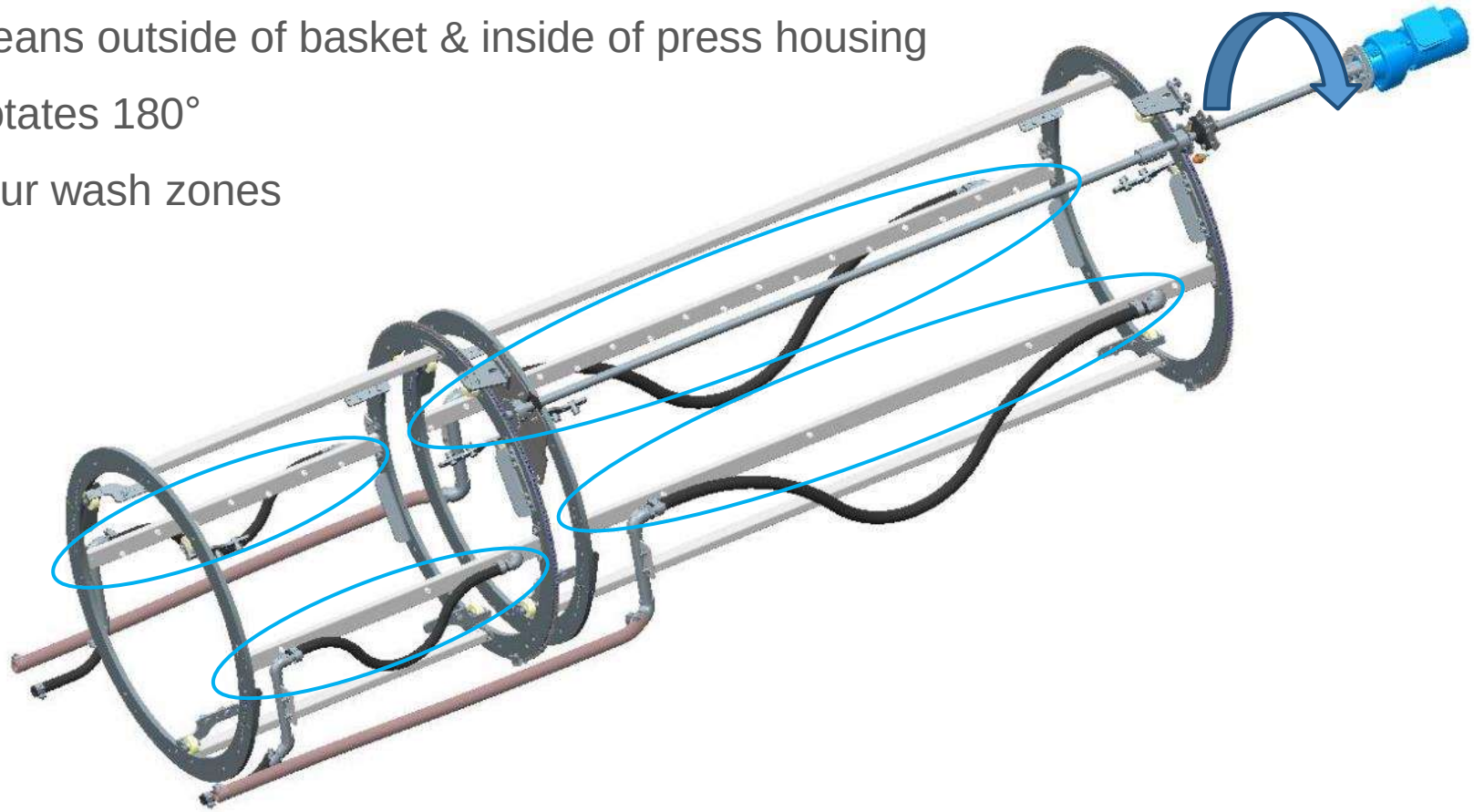
- Seals to convey sludge
- Cleans inside of basket



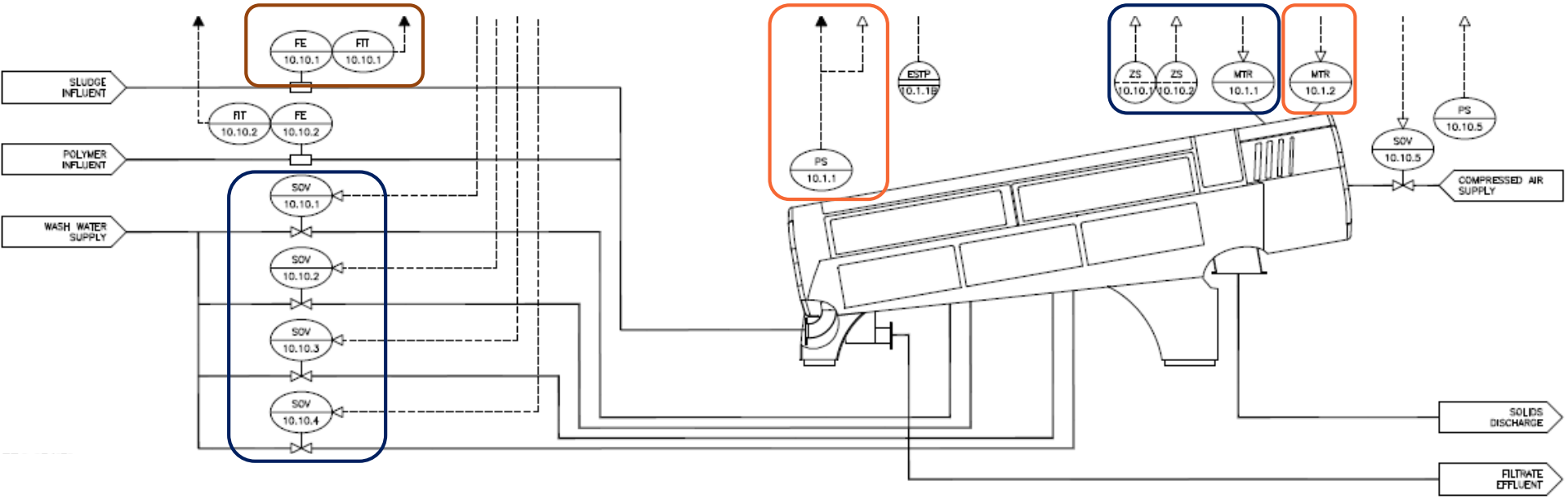
Screw Press – Mechanical Operation

Wash System:

- Cleans outside of basket & inside of press housing
- Rotates 180°
- Four wash zones



Screw Press – Process Operation



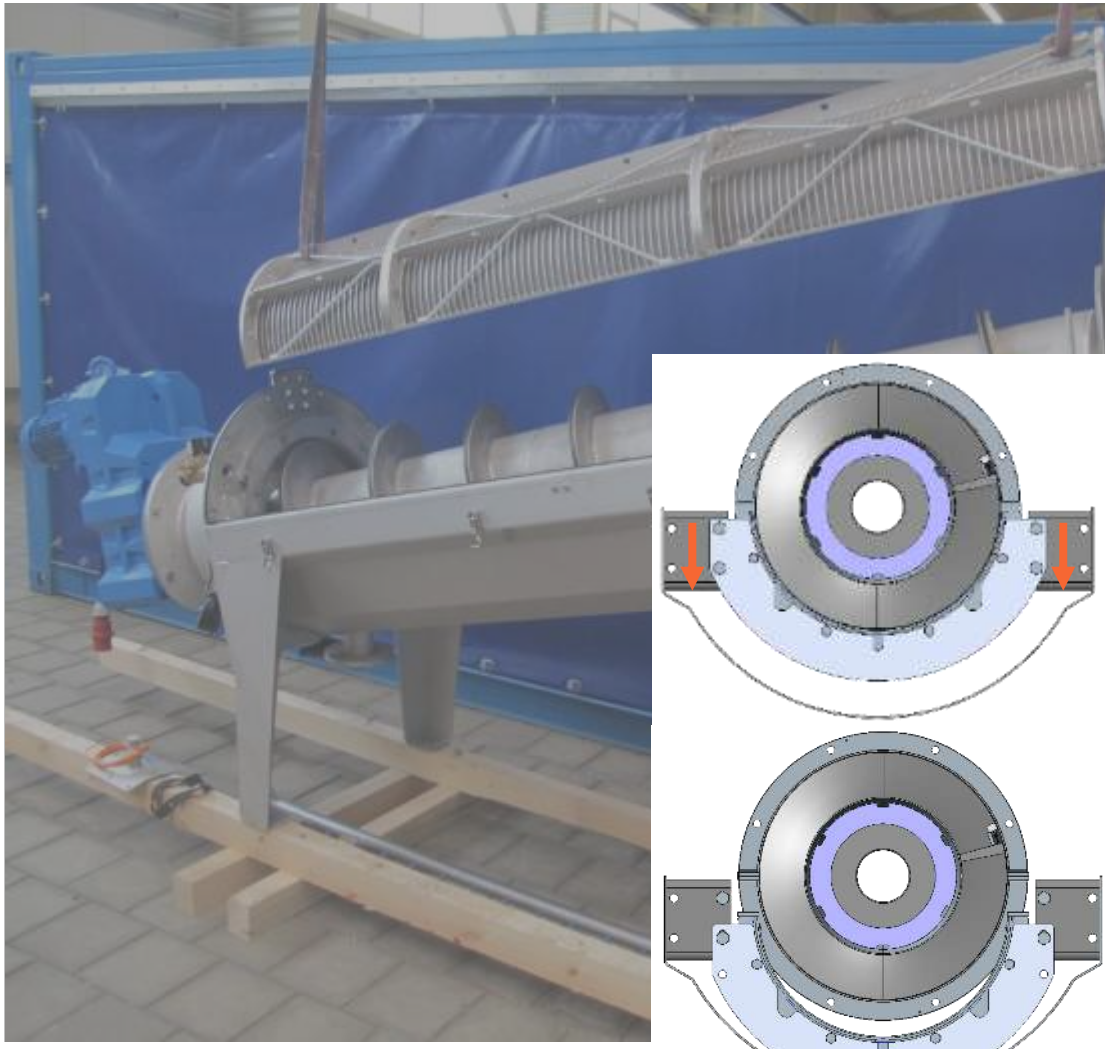
Automation:

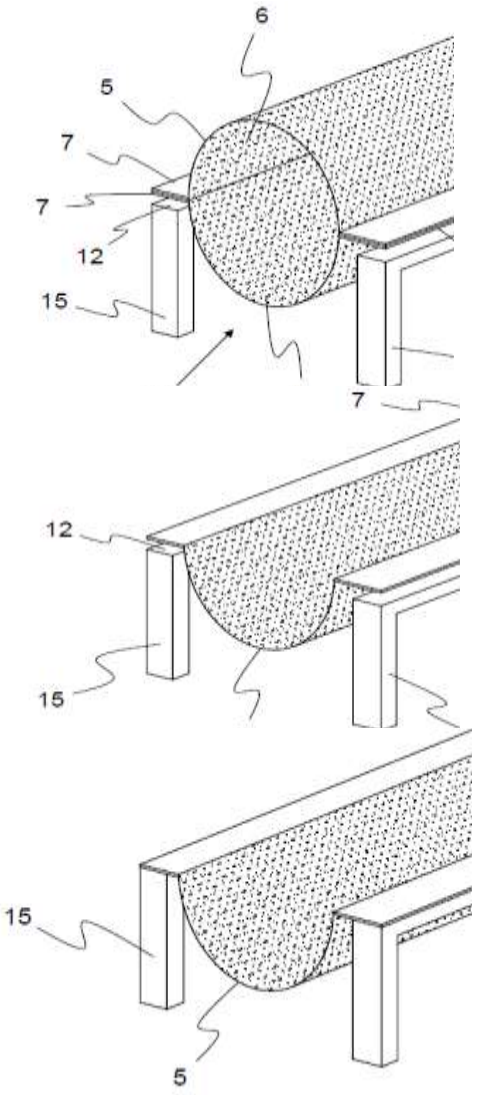
- Sludge Feed
- Inlet Pressure
- Motor Speed
- Wash Cycle

Screw Press – Maintenance

Screw Press – Maintenance

Screw Press – Maintenance





Case Study – Contentnea MSD, NC

Simplicity:

- Small footprint
- Low operator attention
- Low maintenance

Simplicity:

- Clean
- Startup

Case Study – Dover, NH

Operation:

- Highest Cake Solids
- Unattended Operation
- Lowest Electrical Consumption
- Ease of Maintenance
- Expanded to have both unit types

Case Study – Lawrenceburg, IN

Excellence

- Replaced BFP with Centrifuge, then Centrifuge malfunctioned
- Maintenance Reductions
- Energy Savings
- Superior Cake Solids
- Lower Labor Costs
- Fit into Footprint

Questions?

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