



ENVIRONMENT

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The indiscriminate use of the resources on Earth threatens the existence of life on the planet. Recovering these resources is the world's future challenge for making human life on Earth sustainable. Especially for those resources that are not renewable, such as water, Pieralisi offers a longtime experience and a strong expertise to guarantee an important contribution to this mission.

We are a global presence with 16.000 installed plants. Since 1970, we design and develop solutions for sludge thickening and dewatering, basing on our large range of continuously innovated decanters and separators. Pieralisi centrifuges allow to recover industrial and process fluids by removing solid and liquid contaminants with significant environmental and economic advantages.

1. **Municipal waste**

2. **Bio waste**

3. **Breweries waste water**

4. **Fruit juice waste water**

5. **Wineries waste water**

6. **Water purifying**

7. **Pharmaceutical waste water**

8. **Tannery waste water**

9. **Sugarbeet processing waste water**

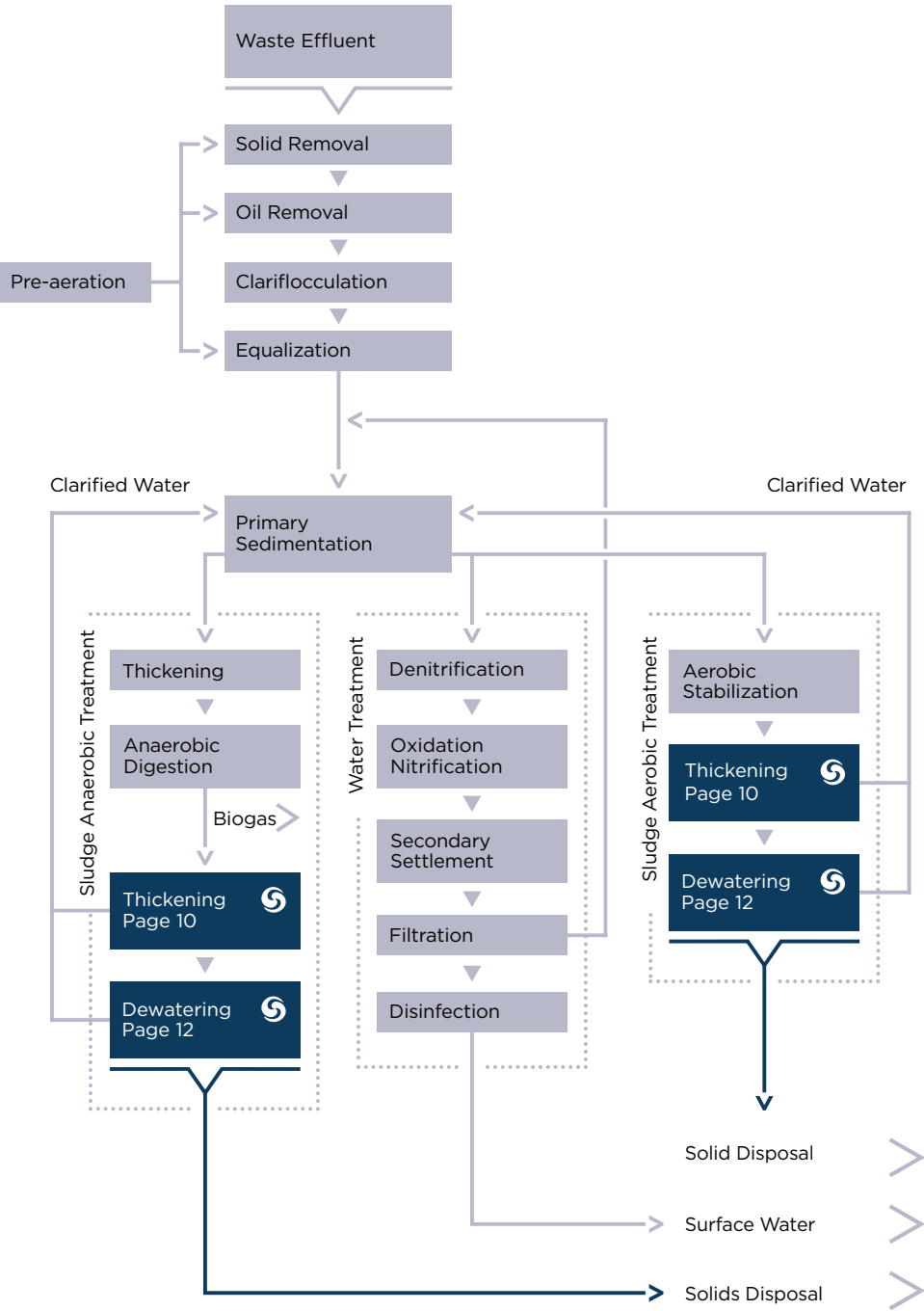
10. **Tomato processing waste water**



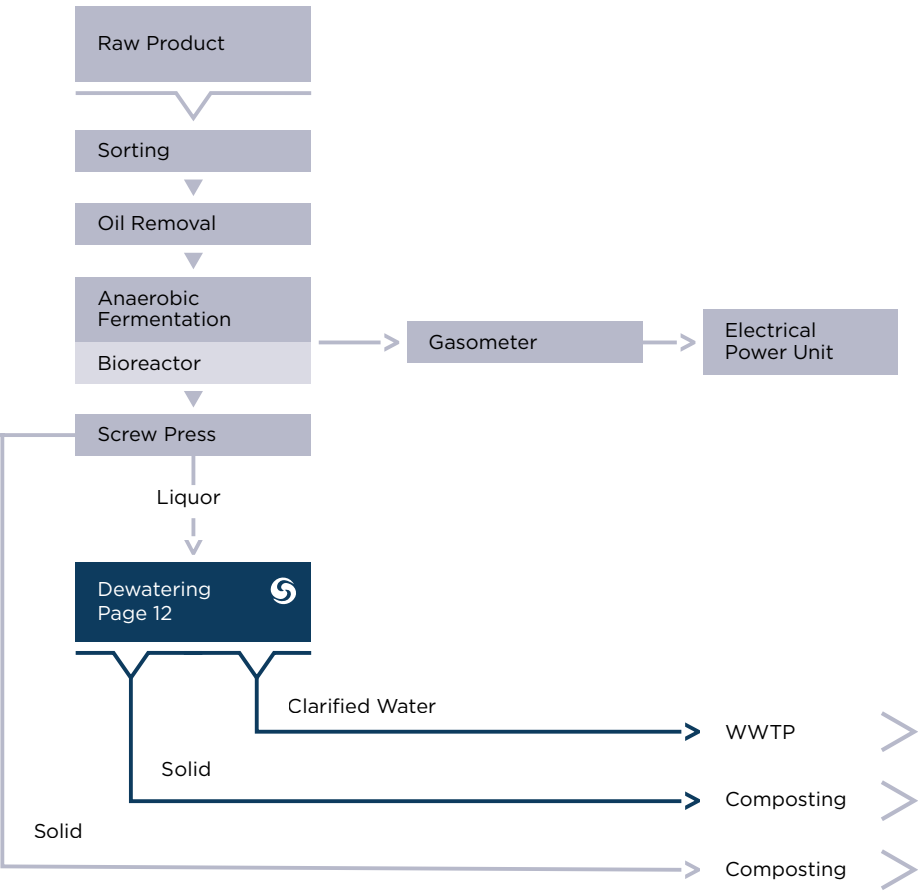
Processes

Process section involving Pieralisi technologies / Example of Process Flow Diagram

1 MUNICIPAL WASTE



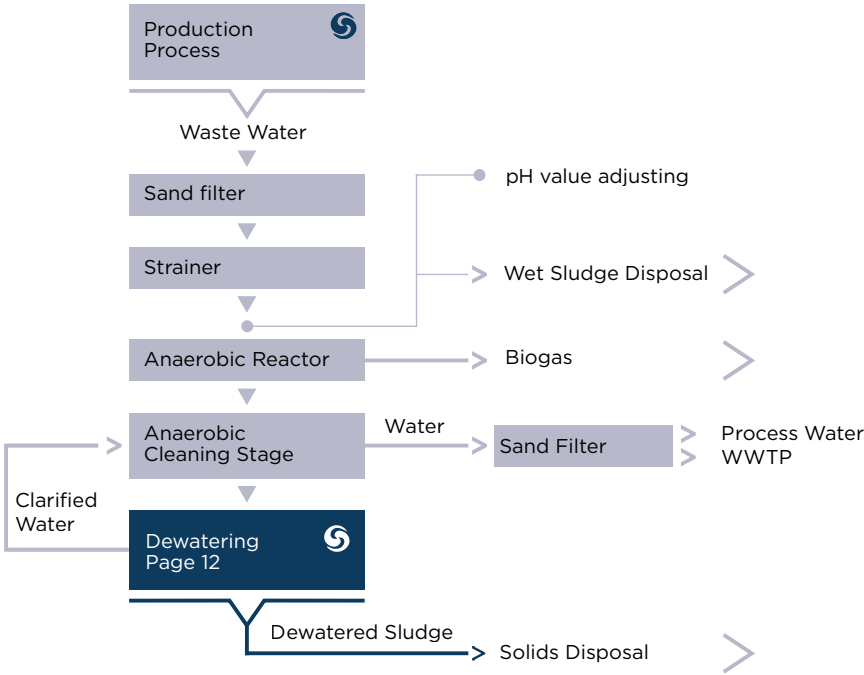
2 BIO WASTE



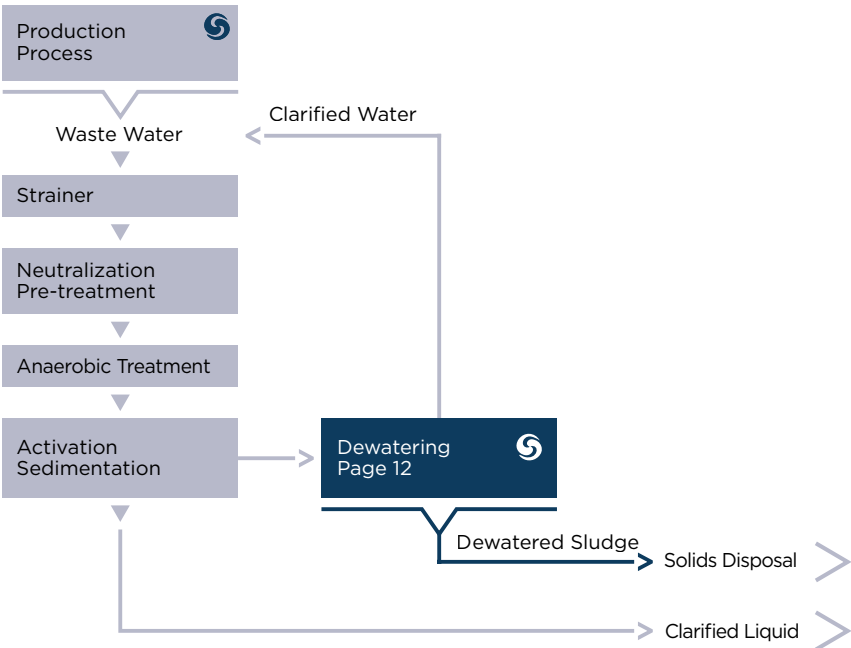
Processes

Process section involving Pieralisi technologies / Example of Process Flow Diagram

3 BREWERIES WASTE WATER

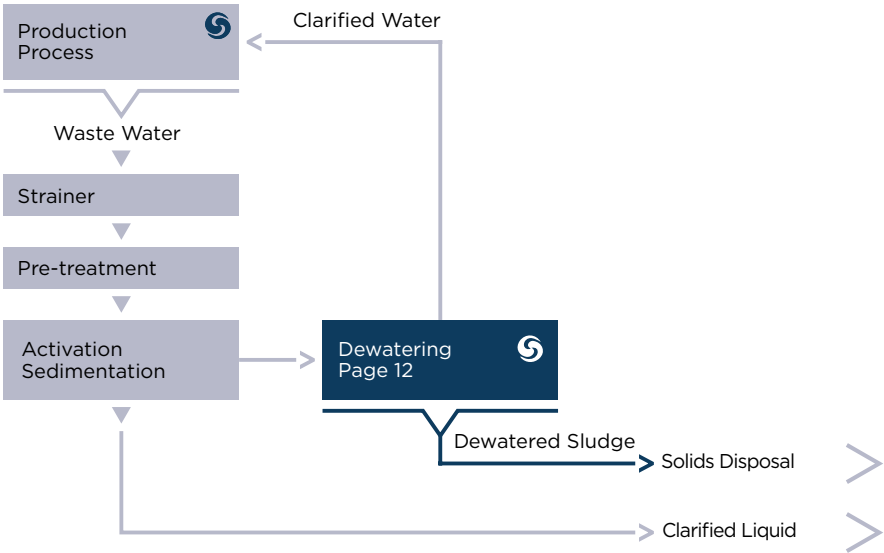


4 FRUIT JUICE WASTE WATER

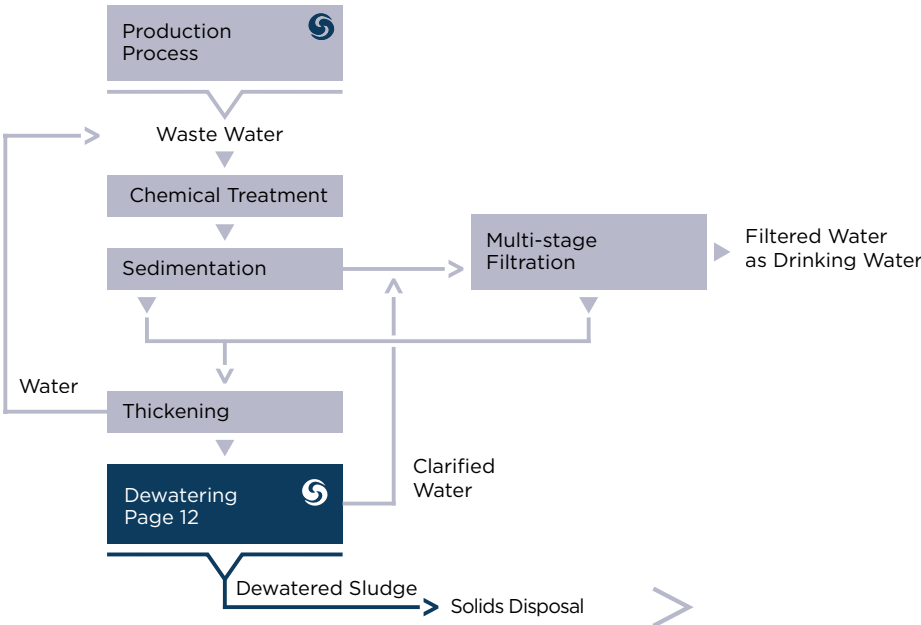
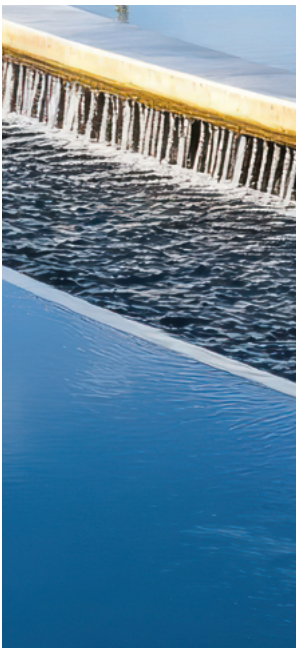


WASTE WATER

5 WINERIES WASTE WATER



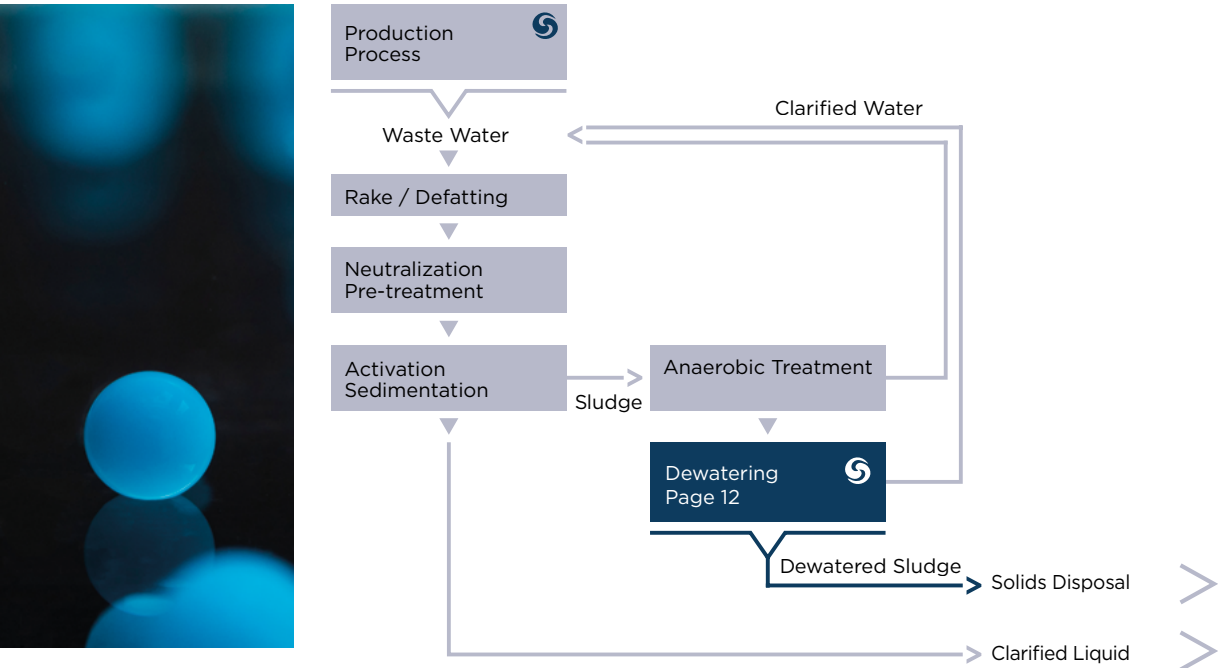
6 WATER PURIFYING



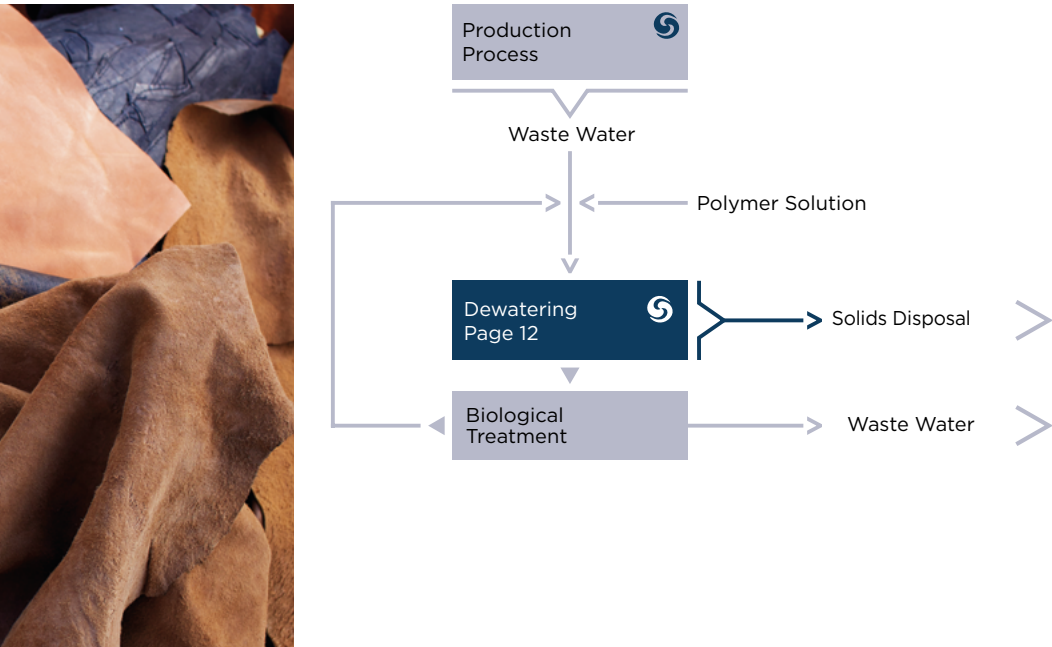
Processes

Process section involving PIERALISI technologies / Example of Process Flow Diagram

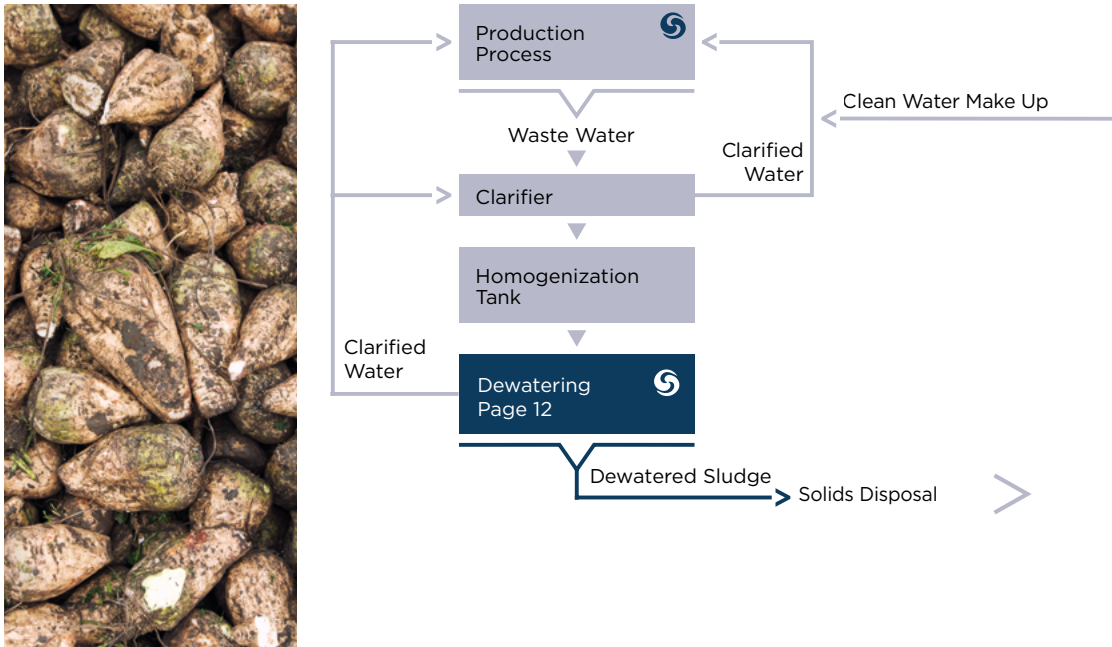
7 PHARMACEUTICAL WASTE WATER



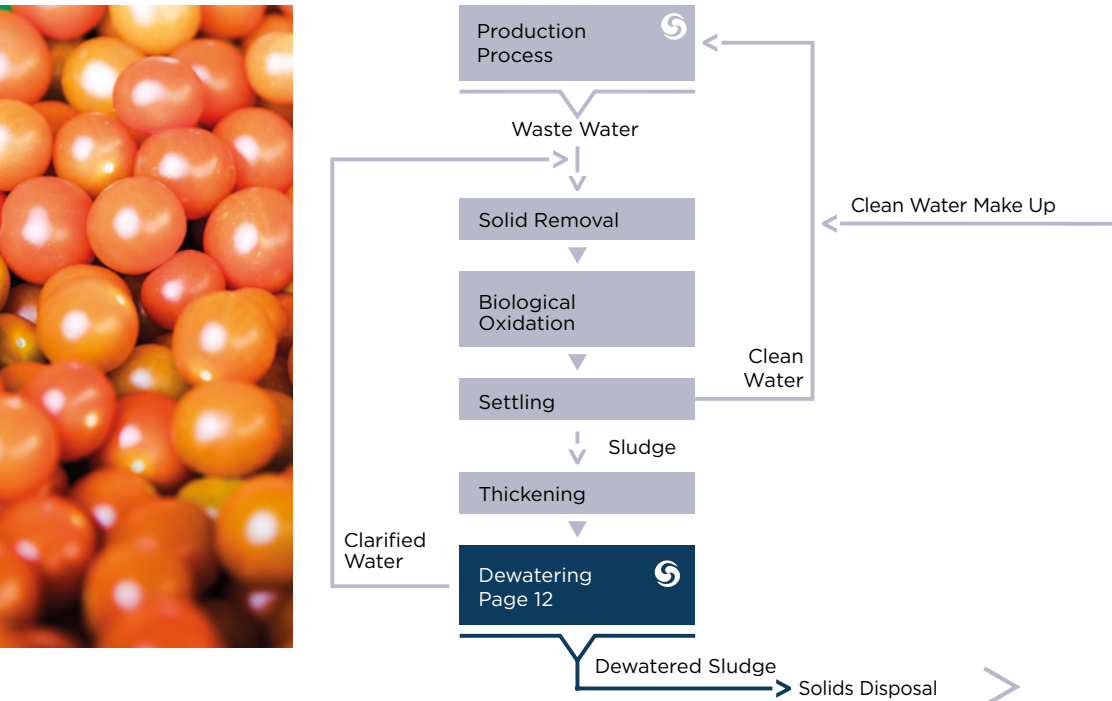
8 TANNERY WASTE WATER



9 SUGARBEET PROCESSING WASTE WATER



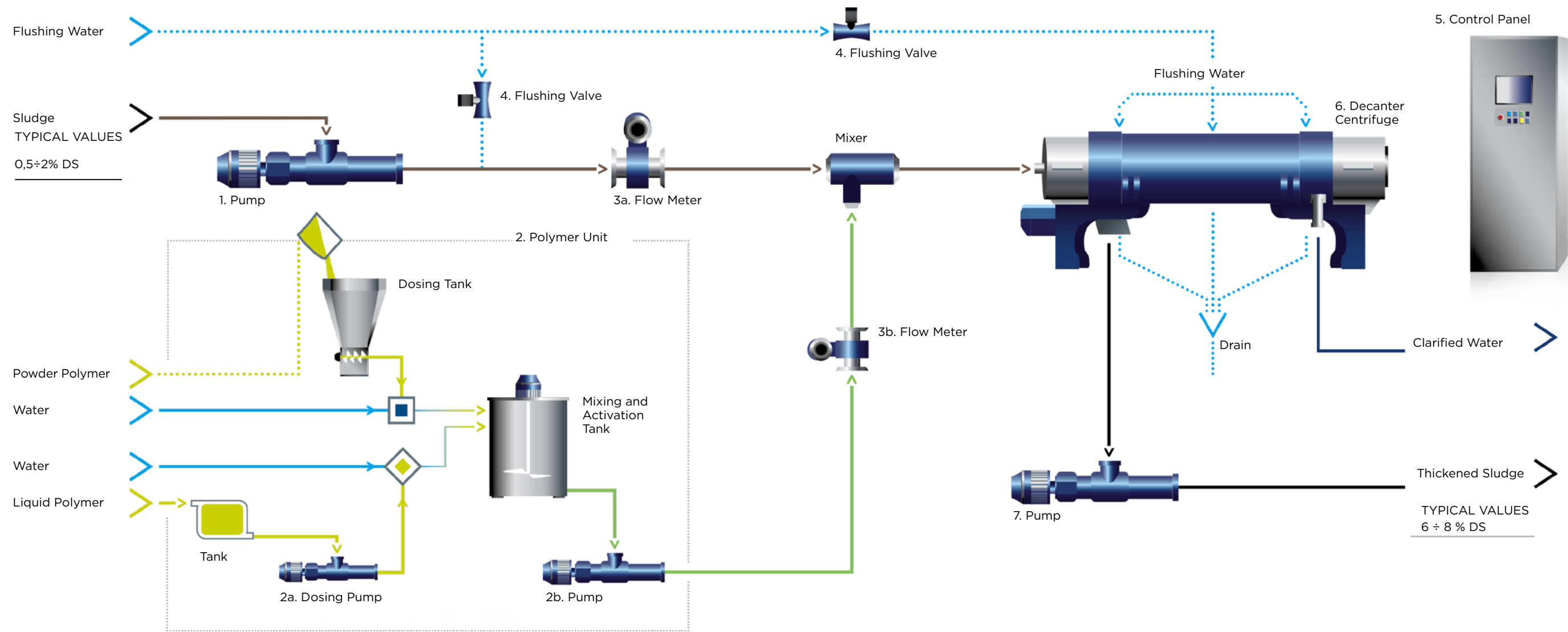
10 TOMATO PROCESSING WASTE WATER





Thickening

The Thickening Solution



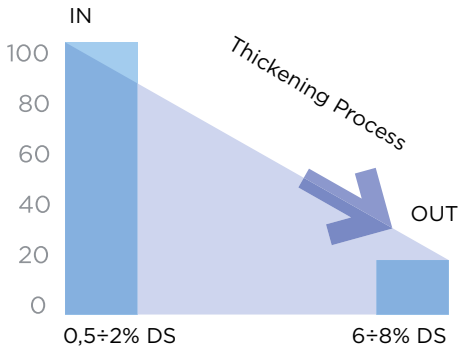
THE THICKENING PROCESS

A complete line of a solid-liquid thickening plant consists of the following equipment:

1. Sludge feeding pump (mono pump)
2. Preparation unit for polymer solution (for liquid for powder active ingredients)
 - 2a. Liquid polymer dosing pump
 - 2b. Polymer solution feeding pump
- 3a. Sludge flow meter
- 3b. Polymer solution flow meter
4. Flushing valves
5. Main control panel
6. Decanter centrifuge
7. Pump for thickened sludge

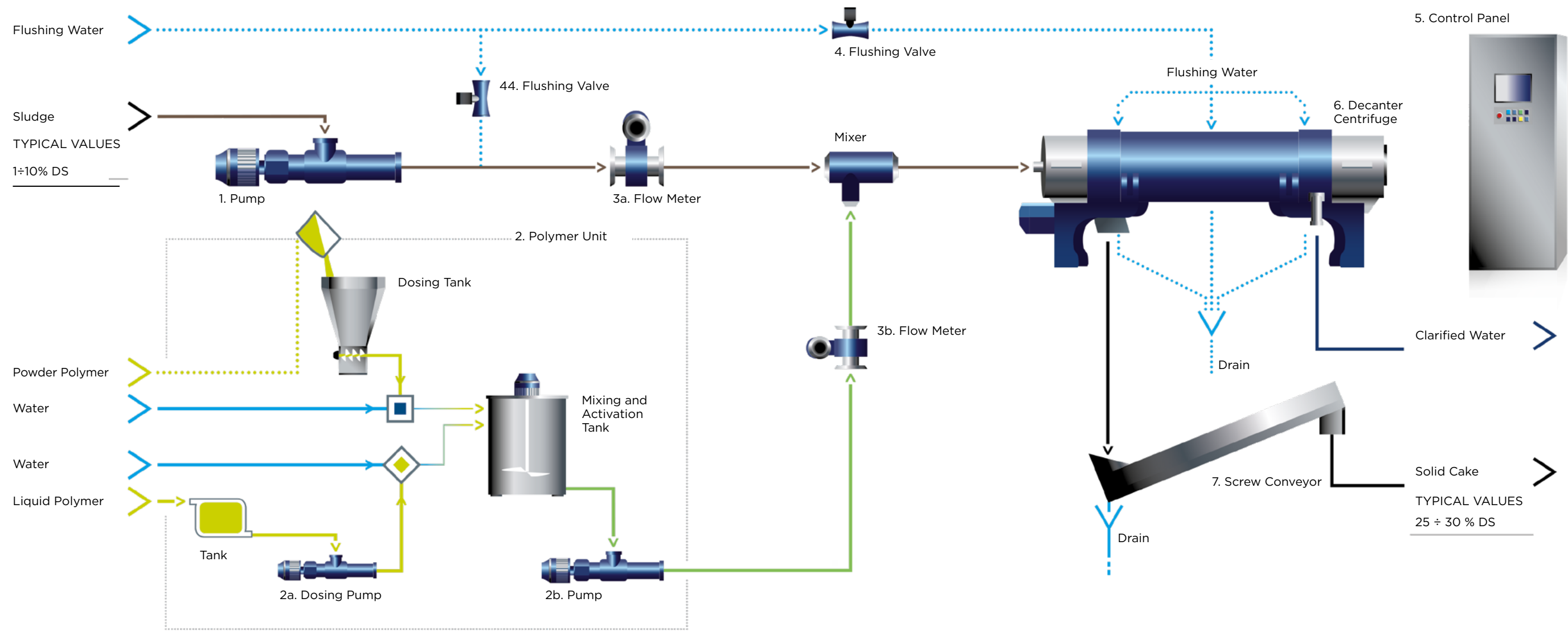
THICKENING: VOLUME REDUCTION AND SOLID CONCENTRATION INCREASE

Decanters are used for dynamic thickening in order to increase the solid concentration in the liquid up to 6-8% dry solid. Thickened sludge is usually sent to the following dewatering step.



Dewatering

The Dewatering Solution



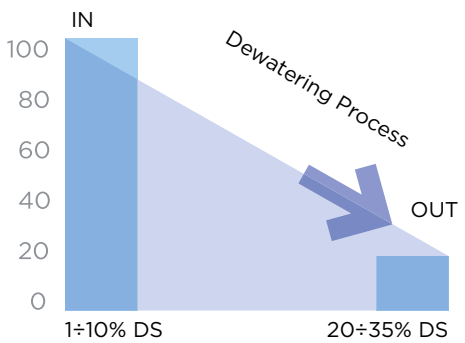
THE DEWATERING PROCESS

A complete line of a solid-liquid dewatering plant consists of the following equipment:

- 1. Sludge feeding pump (mono pump)
- 2. Preparation unit for polymer solution (for liquid or powder active ingredients)
 - 2a. Liquid polymer dosing pump
 - 2b. Polymer solution feeding pump
- 3a. Sludge flow meter
- 3b. Polymer solution flow meter
- 4. Flushing valves
- 5. Main control pane
- 6. Decanter centrifuge
- 7. Screw conveyor for solid cake trasportation

DEWATERING: VOLUME REDUCTION AND SOLID CONCENTRATION INCREASE

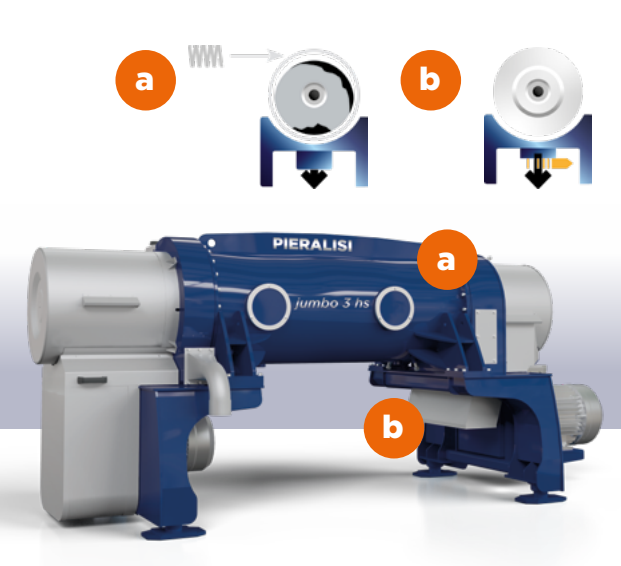
Decaners are used for dynamic solid-liquid separation and dewatering; the inlet solid concentration increases up to 20-35% dry solid, depending on the sludge stabilization efficiency obtained in the previous treatment steps.



Components

DECANTER CENTRIFUGE

High efficiency separation unit capable to handle liquid mixture containing a considerable amount of solid particles. Decanter performances are related not only to process operating parameters but also to the mixture composition, density and viscosity of the different phases, solid density and particles size.



The internal centrifugal force is the result of the rotational speed coupled with the large bowl diameter. The decanter is driven by a main motor connected to the horizontal shaft of the bowl. The product enters through the feed pipe into the centre of the bowl where it is accelerated generating the solid-liquid separation.

The clarified liquid phase is discharged from the rotating bowl by means of special devices on one side of the bowl.

The dewatered solid, collected on the bowl internal walls, is transported by the scroll and continuously discharged on the opposite side.

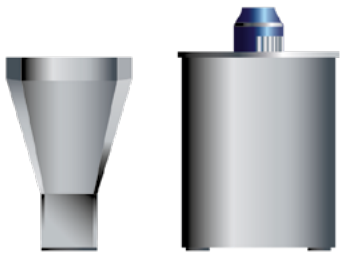
Several options are available to configure the decanter accordingly to the requirements of each specific process. Solid scraper (a) and gate valve (b) are the most commonly used in environmental applications.

ELECTRICAL AND CONTROL PANEL

“Pieralisi Control System” is divided in two main sections: power and control. In the power unit are placed all the main switches and the variable frequency drivers (VFD) for both decanter and auxiliaries. The control module is based on a PLC and HMI with touch screen panel. A dedicated software, designed by Pieralisi automation department, is embedded in the PLC to automatically control the whole thickening and dewatering sections in each operating step: start-up, duty, flushing and shut-down. The HMI allows to navigate through several areas:

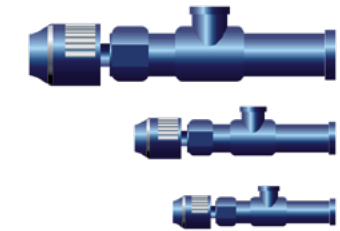
- separation process monitoring
- operating parameters control
- alarms detection
- trends display

The last control release optimizes the separation performances and stabilizes the operation conditions by controlling the decanter in “torque mode”. The logic is continuously measuring the torque on the decanter scroll, keeping it stable at its set point value, by smoothly acting on the scroll differential speed. All Pieralisi control panels can be equipped with a dedicated module for remote connections and assistance.



Preparation unit for polymer solution

Several additives are largely considered to increase the performance of thickening and dewatering plants. Polyelectrolyte is the type of additive most commonly used for environmental applications. Pieralisi polymer preparation unit is specifically designed to be operated both with powder and liquid additives according to the specific requirements of the client. The results is a fully homogenized and activated polymer solution with the concentration suitable for the requested performances. The system is suitable to work on a continuous base and its automatic control can be demanded to a dedicated local panel or integrated in the main control panel.



Pumps

The centrifugal technology requires a constant inlet flow in order to keep stable separation conditions. For this reason, mono pumps (progressive cavity pumps) are usually installed to properly feed the sludge and the polymer solution to the decanter and eventually to pump the clarified liquid to the storage area. Each pump can be equipped with VFD, constantly monitored and automatically regulated by the main control panel.



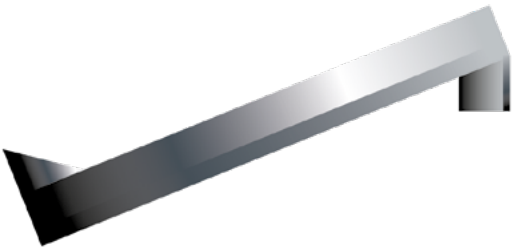
Flow Meter

The possibility to measure the flows to the decanter allows a more precise control of the operating parameters assuring cost optimization and more stable performances. Pieralisi installs on its unit only major brands flow meters with proven quality and reliability.



Sludge - Polymer Mixer

The proper mixing of the activated polymer solution into the sludge is a key factor for the separation performances. Pieralisi static mixer is designed to blend the flows in a gently and effective way, guaranteeing the full contact of the polymer with the sludge solid particles.



Screw Conveyor

The solid exiting from the decanter can be discharged by gravity on an underlying container or transported to a side container by means of a screw conveyor. The unique design of Pieralisi decanter allows to install both horizontal and inclined conveyors directly under the solid outlet. The layout of the conveying system is tailored on the specific path required on each site and can be based on a multiple solution with more than one element. In any case the control of each component and the automatic management of the transition sequences is implemented in the main control panel in accordance with the decanter operating status.



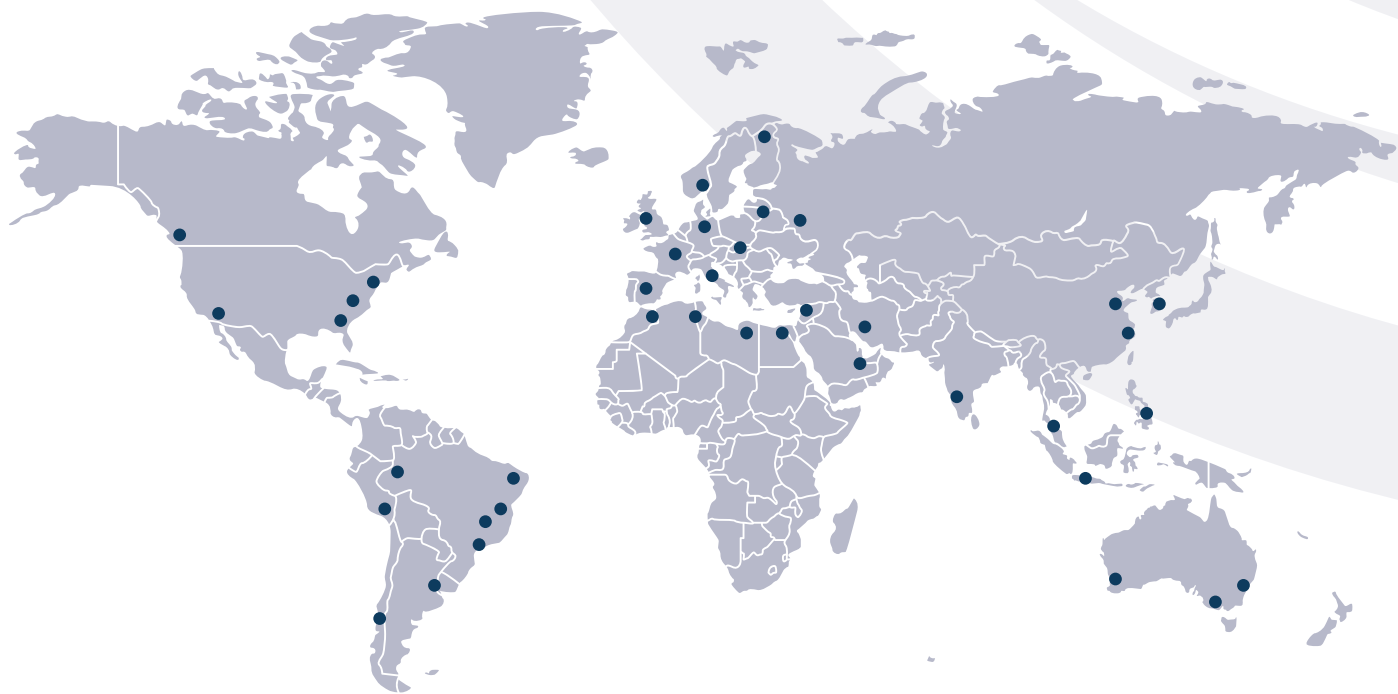
Flushing Valves

The flushing procedure is a key factor for the main components life cycle and long term performance stability. Thus, two specific cleaning sequence are automatically activated by the PLC before the centrifuge shut down or in case of necessity. Dedicated solenoid valves are installed on the circuits to allow the flushing of both the internal part of the rotating assembly and the case volume outside the bowl. The flushing cycle parameters can be adjusted from the HMI in accordance to the requirements of each plants.



GLOBAL PRESENCE

Pieralisi is strategically located in Italy and worldwide, together with an extensive network of agents, technical service centres and spare parts warehouses. We support our customers with specific competences for each market, country and application.





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