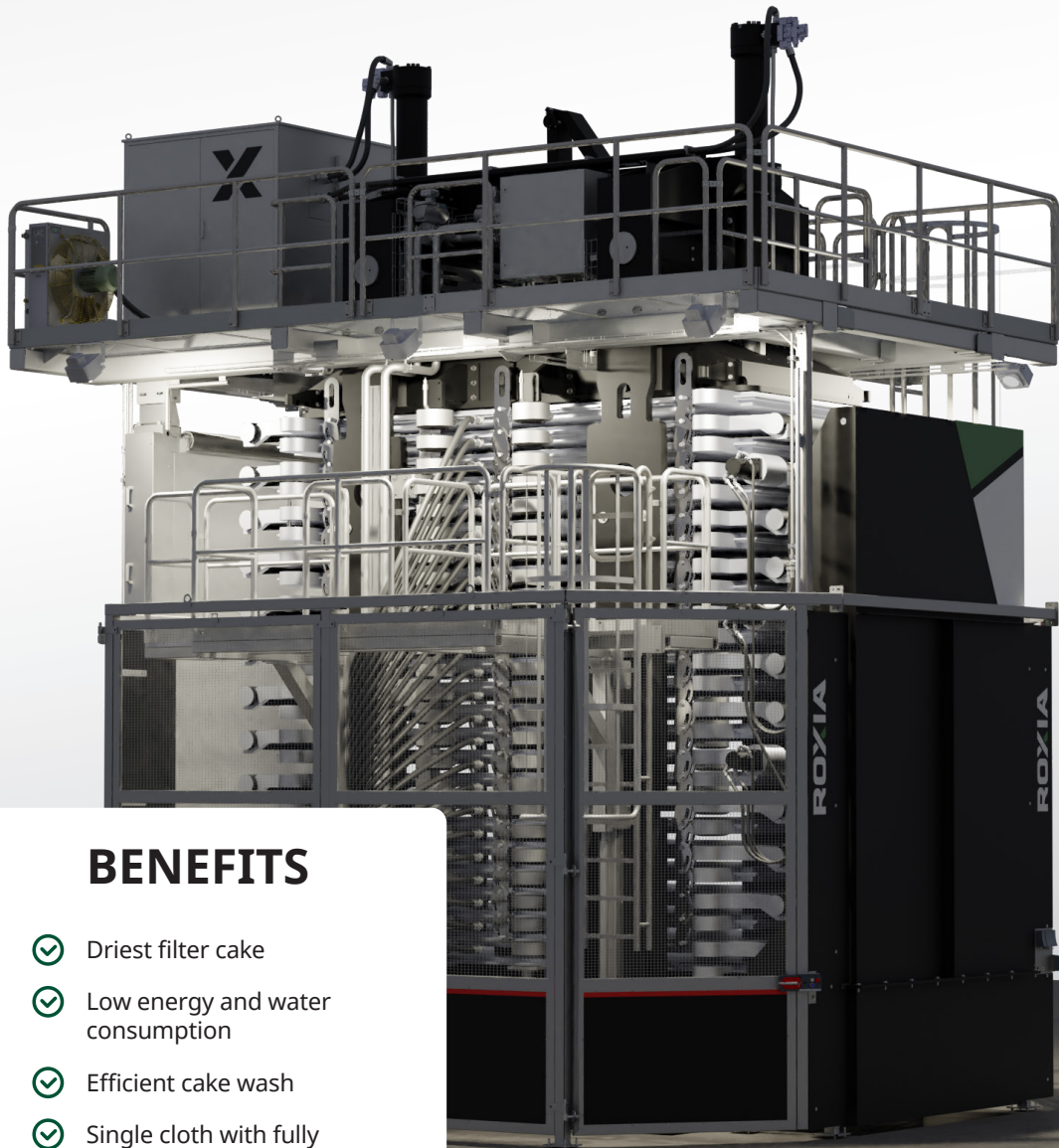# Roxia Tower Press TP60™

BENEFITS

- ✅ Driest filter cake
- ✅ Low energy and water consumption
- ✅ Efficient cake wash
- ✅ Single cloth with fully automatic cake discharge
- ✅ Integrated Smart features

Fully Automatic & Reliable Operation

Roxia Tower Press™ (TP) is a fully automatic pressure filter excellent for any process that requires efficient solid/liquid seperation. The design follows 40 years of respected experience in the field. Roxia TP filter is a reliable production machine that delivers high performance over and over again. Horizontal pressure filtration technology provides the following benefits:

- × Uniform cake formation in the chamber enables efficient cake wash and air drying.
- × High-pressure diaphragm pressing ensures a more even and drier cake.
- × A single and continuous cloth design ensures a fast and reliable cake discharge without operator intervention.

Complete filtration support

Roxia can also provide detailed analysis of the process, filtration testing, equipment selection and sizing. Get complete service through the entire filter life cycle, modernizations, refurbishments, spare parts and maintenance support.

Roxia TP filter is ideal if you need:

- × High production capacity
- × Dry cake
- × Clear filtrate
- × Efficient cake washing
- × Reliable cake discharge
- × Fully automatic & safe operation
- × Low water and energy consumption
- × Small footprint

Roxia Tower Press is engineered to withstand demanding use and deliver reliable performance.

Sizes and main dimensions

Filter type		Roxia TP 60									
Filtration area	45 mm chambers (m²)	60	72	84	96	108	120	132	144	156	168
	60 mm chambers (m²)	60	72	84	96	108	120	132	144	-	-
Frame size (m²)		72		96		120		144		168	
Filter chambers		10	12	14	16	18	20	22	24	26	28
Length (m)		7.2									
Width (m)		6.1									
Height	45 mm chambers (m)	5.5	5.5	5.8	5.8	6.4	6.6	6.9	7.0	7.6	7.8
	60 mm chambers (m)	5.5	5.5	6.3	6.3	7.0	7.2	7.9	8.1	-	-
Weight	45 mm chambers (t)	61	63	68	72	77	80	84	88	91	94
	60 mm chambers (t)	62	66	70	73	77	84	88	91	-	-

# Pressure Filtration Principle

Slurry feed and filtration

- × Closed filter plate pack forms filter chambers.
- × As the slurry is pumped into the chambers, liquid passes through the filter cloth and solids remain at the top of the cloth.
- × Filtrate flows out from the filter chamber's filtrate ports.
- × Solid particles start to build up forming the filter cake above the filter cloth.
- × Slurry feed continues until optimal cake thickness is achieved.
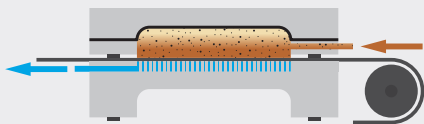
Diaphragm pressing I

- × Using pressurized air or water, diaphragms squeeze the cake and finalize cake forming.
- × Pressing continues and more filtrate is discharged.
- × This step ends when the optimal cake structure is reached.
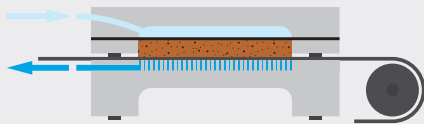
Cake washing (optional)

- × Wash liquid is fed into the filter chamber on top of the cake.
- × Pressure is pushing the wash liquid into the cake. The mother liquid gets replaced and other substances from the mother liquid are removed.
- × This step ends when desired wash result is achieved.
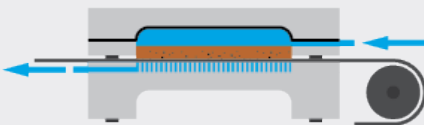
Diaphragm pressing II (optional)

- × Using pressurized air or water, diaphragms squeeze the remaining free wash liquid within the chamber through the cake.
- × Pressing continues and discharges more filtrate.
- × This step ends when an optimal cake structure is reached.
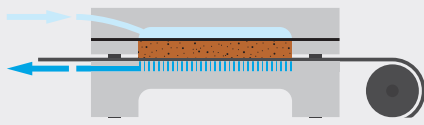
Air drying

- × Pressurized air is fed into the chamber above the cake.
- × Air passes through the cake and dries it by replacing part of the liquid with air.
- × This continues until the desired cake dryness is reached.
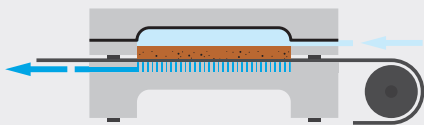
Cake discharge and cloth washing

- × Filter plate pack opens.
- × Filter cloth acts as a conveyor belt and simultaneously discharges cakes from each chamber in less than 30 seconds.
- × During cake discharge, the filter cloth is washed from both sides.
- × After this step is finished, the entire cycle is repeated.
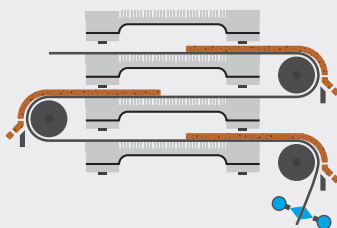
Typical Application Areas

Metal concentrators	Metal refineries	Chemical industry
Fine ferrous	Leach residues	Titanium dioxide
Base metals	Battery metals	Calcium carbonate
Precious metals		Starch
Tailings		Industrial minerals

Note! Tower press filtration technology is successfully used in approx. 200 different applications globally.

Filtration Testing and Process Support

Testing the slurry is essential before choosing the correct filter type and size. By careful testing, we can ensure the best possible process performance and the most cost-efficient solution for each solid/liquid separation application. Filtration testing can be done on-site or in the Roxia filtration laboratory.

We only require a minimum sample of 20 litres of slurry or 20 kg of dry solids.

Obtained test results:

× Recommendation of the most suitable filtration technology
× Optimal filtration parameters
× Filtration capacity, $kgDS/m^2$
× Cake moisture
× Filtrate clarity
× Cake washing efficiency (optional)
× Filter media recommendation based on test results

Tower press test unit simulates the operation of the full-size industrial filter.

Typical concentrate slurries performance at Roxia TP filter:

Material	Cycle time (min)	Capacity (kgDS/m²h)	Production with TP 144 (t/h)	Cake moisture (w/w%)
FE	9 – 10	600	75 – 85	8,5
Copper	10 – 12	410	50 – 60	8
Nickel	10 – 12	440	54 – 64	7
Zinc	10 – 13	400	30 – 60	9 – 11
Tailings	10 – 15	150 - 250	23 – 33	13 – 18

Safety Features

ROXIA TP filters safety features are designed according to European Machinery Directive. Other countries safety requirements are carefully followed during each delivery project.

Safety interlocks integrated into the automation programme

× Protect the operators and the filter itself from failures and unintended misuse.

Perimeter protection with safety interlocked doors

× When any of the doors open, the filter automatically stops. This prevents access to the possibly hazardous areas during the filter's operation.
× See-through construction minimises the need to open the door and approach the filter.
× Emergency stop button located on each corner of the filter.

Safe working at height

× Caged ladder with fall arrest system
× Railings around the top maintenance platform
× Lifts for safe and ergonomic service of the plate pack area

Safe use

× Filters come with a user manual including safety instructions for safe operation and working procedures.
× Before starting to use the filter, operators and maintenance crew receive safety training.
× The operator interface guides users to safe use during daily operation. It also includes warnings about possible safety threats.
× Password-protected user roles secure critical filter parameters.

Easy and safe maintenance

× Filter cloth change happens at only one access point outside the filter.
× Filter design includes extra space around the filter and enables an easy approach.
× Check and maintenance points are easily accessible and away from the most corrosive areas.
× Includes a remote handheld unit for safe maintenance and troubleshooting.
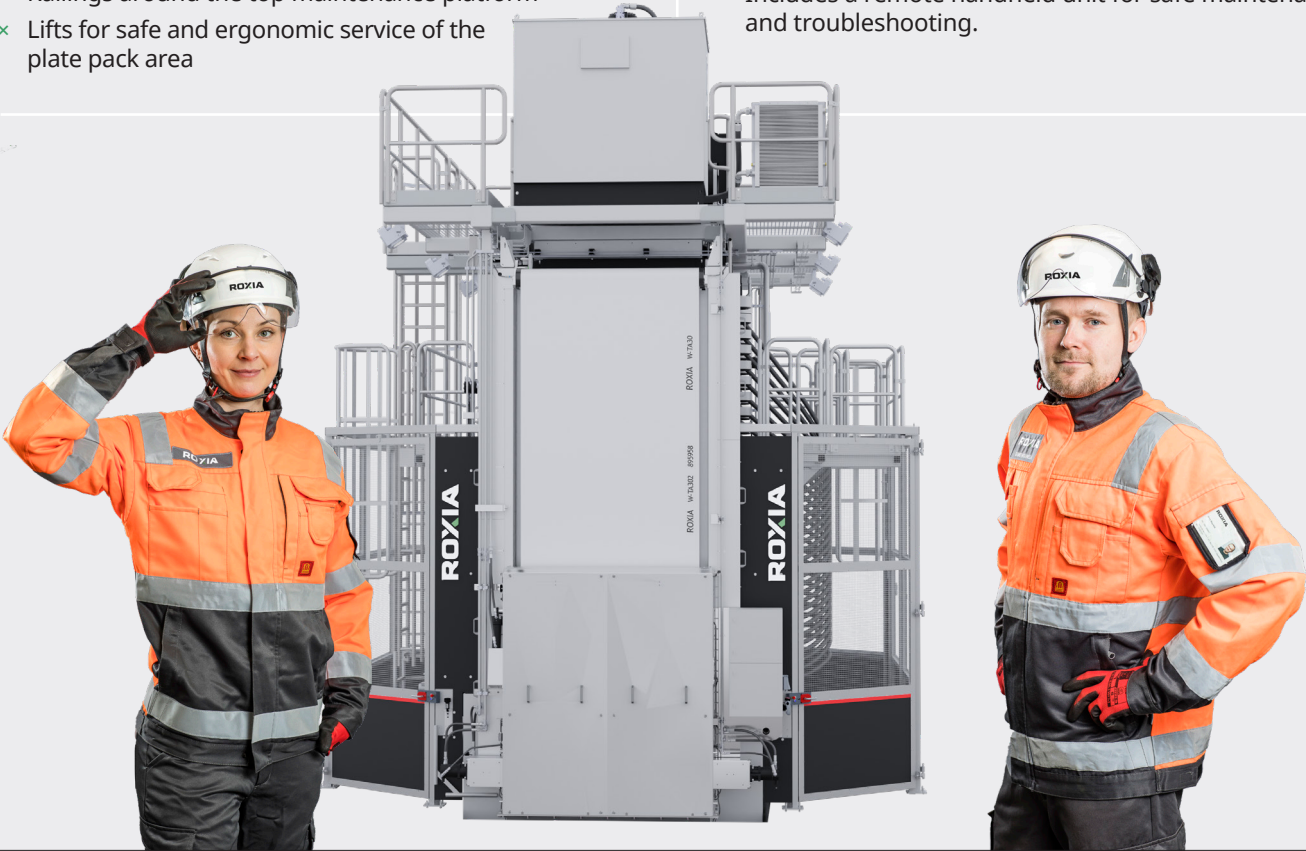
Perimeter protection prevents access during filter's operation, but leaves enough room for safe maintenance.

Smart Filtration

Roxia connects industrial filters to the Roxia Malibu online portal and enables remote monitoring of performance. With Smart Filtration, operators can analyse and optimize filtration process, increase production volume and detect failures before they even occur. All that can be done from anywhere with any computer, smart phone or other handheld device with internet connection.

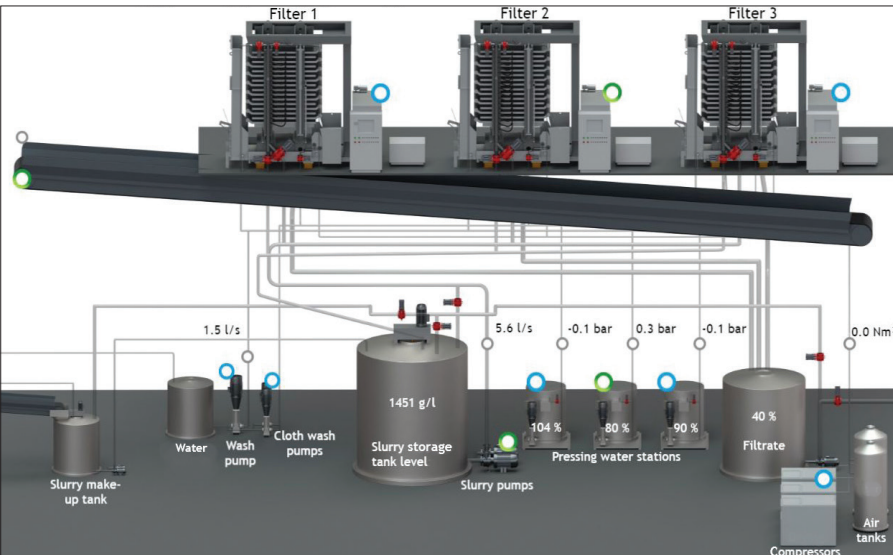## Roxia Smart Filtration for All Filters

Roxia Smart Filtration can be installed on any filter and integrated with any other process equipment and control systems (DCS). Monitoring the filtration process online through Roxia Malibu™ portal is easy and user-friendly. Access is possible when- and wherever with any computer, smart phone or other handheld device connected to the internet. Malibu also automatically generates user defined reports which are easy to understand. Data analysis provided by Smart Filtration can be used for comparing filter's productivity, quality changes, energy consumption, production output, to determine reasons for its waiting time, alarms and more.

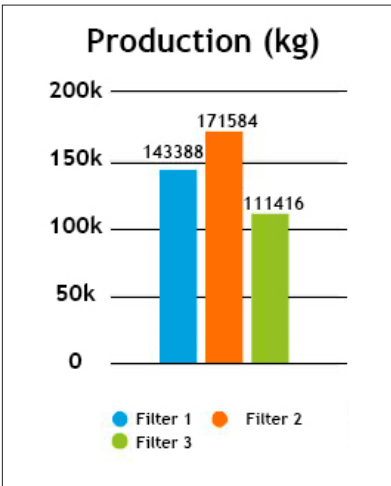### Production Volume and Process Results Information

- × Fast analysis of production volume and process results
- × Performance comparison between multiple filters
- × Utilities comparison and OPEX reporting

Runtime Monitoring

- × Generates utilization timeline
- × Extracts most common alarms and reasons for downtime
- × Reports of chosen time periods and measurements

Production (kg)

200k
171584
150k · 143388
111416
100k
50k
0
● Filter 1   ● Filter 2
● Filter 3

In multiple filters installation, clear comparison of production between the filters is one of the most useful KPI's for everyday use.

Live and detailed online view of the filter process plant shown on Roxia Malibu™ portal.

YOUR BENEFITS

- ⊘ Improved performance by comprehensive process understanding
- ⊘ Less unplanned downtime
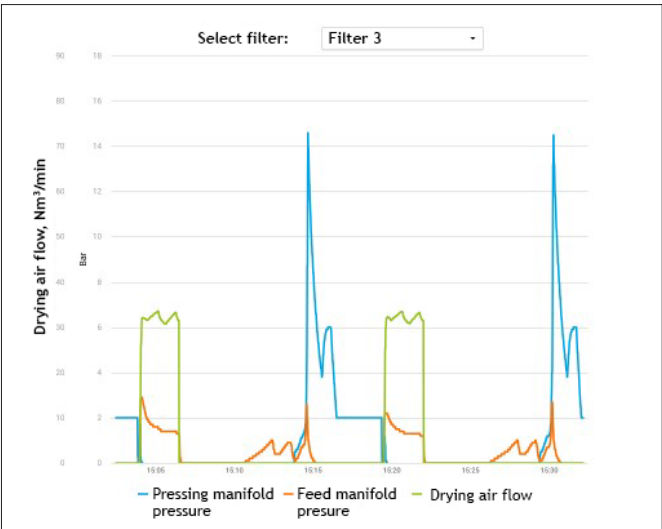- ⊘ Quicker troubleshooting
- ⊘ Efficient failure analysis

Optimize Your Filtration Process

Roxia Smart Filtration includes complete evaluation of your filtration process. Roxia professionals will help you optimize the entire filtration process to reach quality targets and to maximize production capacity.

Different alarm limits can be set to automatically notify you via email about changes in the process. Optionally, additional sensors and equipment can be added for more comprehensive analytics, observations of spare part replacement intervals and assistance with auxiliary synchronizing. The tool can even detect filtration problems originating from upstream and downstream of the filter.

How Can You Benefit From Roxia Filtration Analysis?

- × Discover problems in drying by following abnormalities in air pressure curves. Efficiency in drying phase can be estimated from changes in pressure. Even possible cake cracking can be detected.
- × Detect cloth and membrane damages at early stage by analyzing water volume changes.
- × Ensure product quality by analyzing cake moisture or filtrate opacity and conductivity.
- × Discover indications of cloth damage and clogged grids and put a stop to decreased production, raised moisture and bending filter plates.
- × Determine the reasons for waiting times. Get a real-time insight into the process: how long are the waiting times, what are the filters waiting for (slurry, air, conveyor). Discover the real reasons for delays and instantly improve the filtration process.

Roxia troubleshooting tools and filtration analysis detect abnormalities in the process and automatically send alarms via email.

Key Performance Indicators - Tailored view according to user needs

Complete Delivery:
Filter and Auxiliaries

Auxiliaries play an important role in filter operations. Correctly selected and sized auxiliaries are essential for an optimal filter performance. Therefore it is Roxia's goal to ensure the best performance of the entire filtration process.

Roxia TP filter

Filtrate pumps

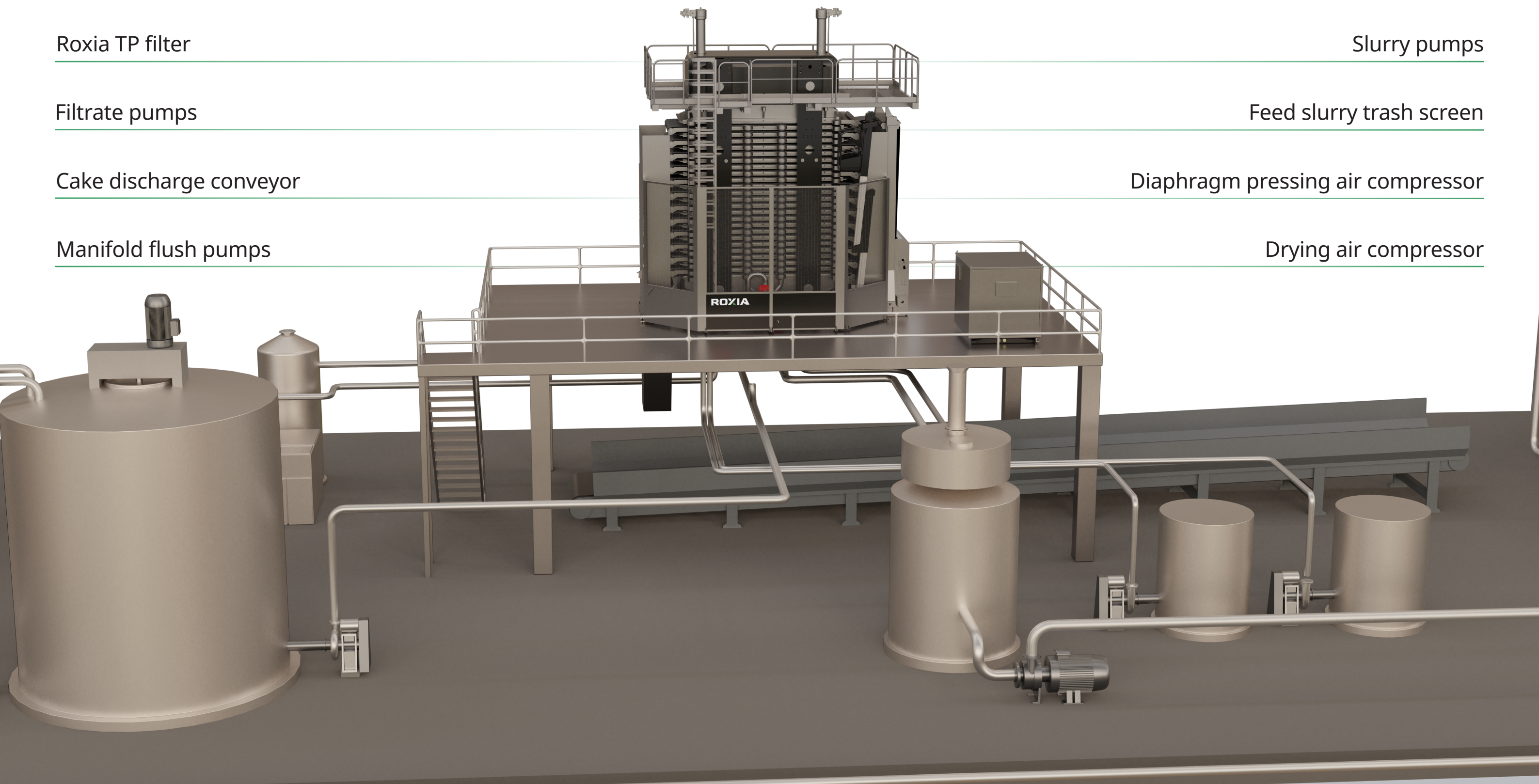Cake discharge conveyor

Manifold flush pumps

Slurry pumps

Feed slurry trash screen

Diaphragm pressing air compressor
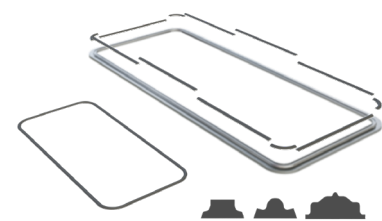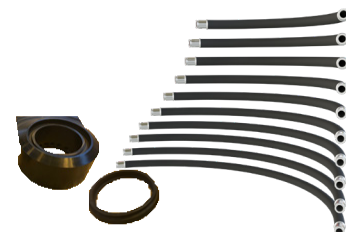
Drying air compressor

Plate seals

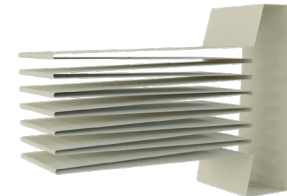**Mounting components for plate pack**

Hydraulics

Hoses & collectors for plate pack

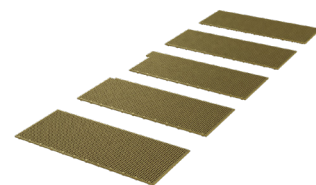**Rollers and scrapers**

Filter cloths

Genuine Roxia spare parts

Services & Service Agreements

× Filtration testing and cycle optimization
× Filter inspection
× Maintenance support
× Modernization, expansions and refurbishments
× Installations and Shutdown services
× Operator and maintenance staff training

Filter plates and frames

Grids

Filtrate vats

Diaphragms

Pinch valves

Complete plate packs

About us

Roxia delivers high-tech dewatering and industrial automation. Specializing in mining, minerals, metallurgy, chemical, food and pharmaceutical industries, our team generates best performing
solutions for each specific need.

We offer our support from Chile, China, Finland, Germany, Kazakhstan, Peru, South Africa and the United States.

Roxia Oy
Myllykallionkatu 2, FI-53101 Lappeenranta, Finland
Tel. + 358 201 113 311

info@roxia.com
www.roxia.com