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A team dedicated to serve you

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Process Filtration & Liquid Equipment

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Introduction

With over one hundred years’ industrial experience, the Belgium-based PRAYON Group is a world leader in phosphate chemistry (fertilisers, detergents, food additives, various technical applications) and in the development of specialty inorganic chemicals.

PROFILE is the Equipment Division of the PRAYON Group

Its business is the design and sale of process equipments, mainly developed for phosphoric-acid production units.

PROFILE’s activities are centred on the following:

FILTRATION: Prayon’s tilting pan filter is considered by the industry to be a highly reliable and efficient equipment for the production of phosphoric acid. PROFILE has also developed a new belt filter and a new TDF filter with lateral tilting.

AGITATION: PROFILE has designed special agitators to keep solids in suspension and ensure optimal crystallization with low energy consumption.

GAS SCRUBBING and droplet recovery.

PROFILE supplies engineers and technicians according to customer requests for the following operations:

- Supervision of equipment installation at new production sites;
- Supervision of work during equipment revamping;
- Technical auditing of existing equipment.

ENGINEERING AND PART DESIGN

PROFILE takes special care over the design of its equipment to ensure reliable operation and easy maintenance.

To guarantee high quality, all parts of our equipments are entirely designed, drawn and mechanically dimensioned by our design and engineering department.

For this purpose, new CAD 3D software is used to:

- Make drawings;
- Calculate stresses;
- Simulate relative movements between the various parts (e.g. cell tilting).
**PRAYON FILTERS**

Over 300 Prayon tilting pan filters have been sold since the 1950s and approximately 250 installed in phosphoric-acid production units. The remainder are used in other fields such as:

- Copper, cobalt, zinc and uranium hydrometallurgy;
- Na$_2$PO$_5$ impregnated active carbon washing;
- Phosphate washing;
- Acid filtration in general.

**NEW FILTERS**

**BELT FILTERS**

Following a number of experiments with partners, PROFILE has developed its own belt filter. Specific characteristics of the PROFILE belt filter:

- A polygonal vacuum box for pre-separating gases and filtrates;
- A pneumatic vacuum-box lifting system offering easy access for maintenance;
- A single central weir belt with transversal grooves allowing some transversal displacements of the main filtering belt and enhancing vacuum tightness;
- A main carrier belt with sloping grooves supported with water lubricated rollers;
- An automatic system for maintaining filter cloth tension and position.

Main developments

- A special compact vacuum box for separating gases and the various filtrates;
- A fast drain filtration cell (pan) which can increase filter capacity and filtration yield;
- An automatic system to keep the pans horizontal;
- A new tilting-back design for higher rotation speed and filtration capacity;
- Support rollers designed for heavy back;
- A robust car frame with a replaceable wear plates;
- A new waterproof clothes-fixing system whereby the clothes can be replaced in a very short time;
- A high ratio of filtering surface to foot print.

**Main benefits**

- Prayon filters are highly reliable due to their robust design. A number of filters sold in the 1960s are still in operation;
- On-stream factor of over 95%;
- Excellent ratio between capacity and extraction yield, due to batch filtration and a high level of authorized maximum vacuum;
- Extremely energy-efficient equipment;
- Negligible recycling of the solids recovered during cloth washing means that the cake discharged from Prayon filters contains a minimal quantity of free water;
- High reliable experience with very large filters (e.g. 30-240 filter with a surface area of 275 m²).
**TDI FILTERS**

This filter, where the pans tilt sideways to a vertical position, has been designed to offer the same benefits as the Prayon filter while enabling filtration of very thick cakes.

**Main benefits**

- Compactness;
- Batch filtration;
- Fewer mechanical parts;
- Lower energy consumption;
- Lower investment costs;
- More efficient cloth washing.

**AGITATION**

Prayon has developed and built hundreds of special agitators for its own use and processes. This experience now enables PROFILE to offer reliable agitators requiring minimal energy consumption for the following applications:

- Setting and holding of solids in suspension in a pulp (up to 50% in some cases);
- Acid attack on ores;
- Suspension, formation and enlargement of crystals in a pulp.

**Developments**

- In cooperation with Prayon Technologies, each agitator is optimised using 3D simulation software;
- To increase lifetime and cut maintenance costs, electron beam vacuum welding is used for certain critical welds;
- PHTZ blades are used to optimise through-flow and shearing effect.

**GAS SCRUBBING**

This separator is used to collect droplets from gas in order to reduce contamination of the water used to condense vapour contained in the gas.

This compact and compartmented scrubber cleans gas by central water spraying into each compartment.