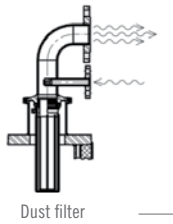


ROLAB FILTER DRYER

FOCUS ON THE ESSENTIAL



Drying



Discharging

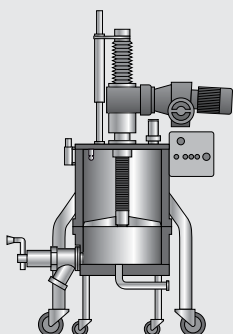


Optional

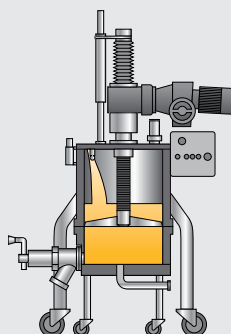


Filter/Dryer RoLab 0.2 m²

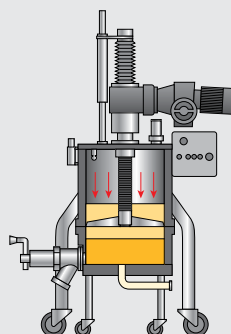
Process steps filtration and drying procedure (Example of use with RoLab 0.3 m²)



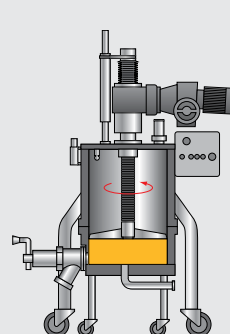
1. Pressure test and Nitrogen purge



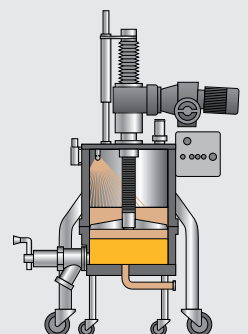
2. Fill in of the slurry



3. Filtration under pressure



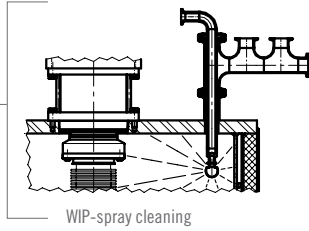
4. Smoothing of the filter cake



5. Displacement washing

STANDARD OPTIONS

Cleaning



- Heated agitator
- Heated vessel cover
- Side discharge valve for protected discharge of the product
- Gas Knife system for complete discharge of the product
- Dust filter for the improvement of the drying process
- Mounting screws of the filter media placed outside of the product area
- Attachment for sampling
- WIP-device for efficient cleaning of the inner vessel
- Vapor condensation skids
- Different control options
- Containment-systems

Controlling

RoLab is manufactured in stainless steel EN 1.4404 (316L) or in the alloy EN 2.4602 (Alloy C-22). This enables an optimal alignment of the plant to the requirements of the planned application. RoLab is supplied in ex-version.

Agitating/Mixing



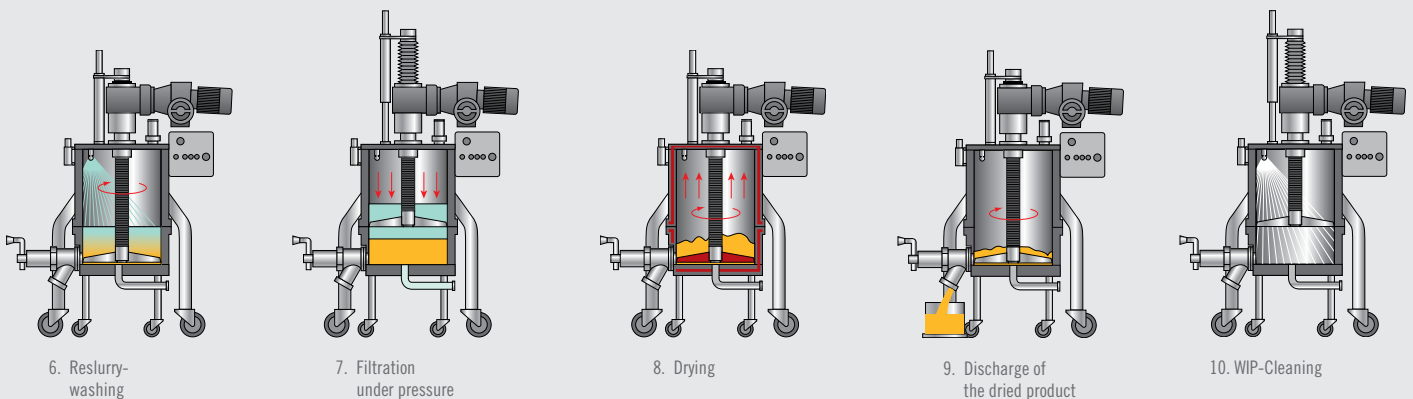
THIS RESULTS IN THE FOLLOWING ADVANTAGES:

- Lower investment costs
- Reduced delivery times
- Small floor space required
- Minimal installation costs on site
- Simple user-friendly installation and start of operation
- Lower maintenance costs
- High cost-effectiveness
- Versatile application due to its flexible mobility

Filtering



RoLab offers an excellent cost/performance ratio, versatile application possibilities and high user comfort.



TECHNICAL DATA

Pneumatic motor
Raising/Lowering agitator

Electric motor
Drive agitator

Mechanical seal

Dust filter

Control

Drive shaft with
metal bellows

Vessel insulated and
heated

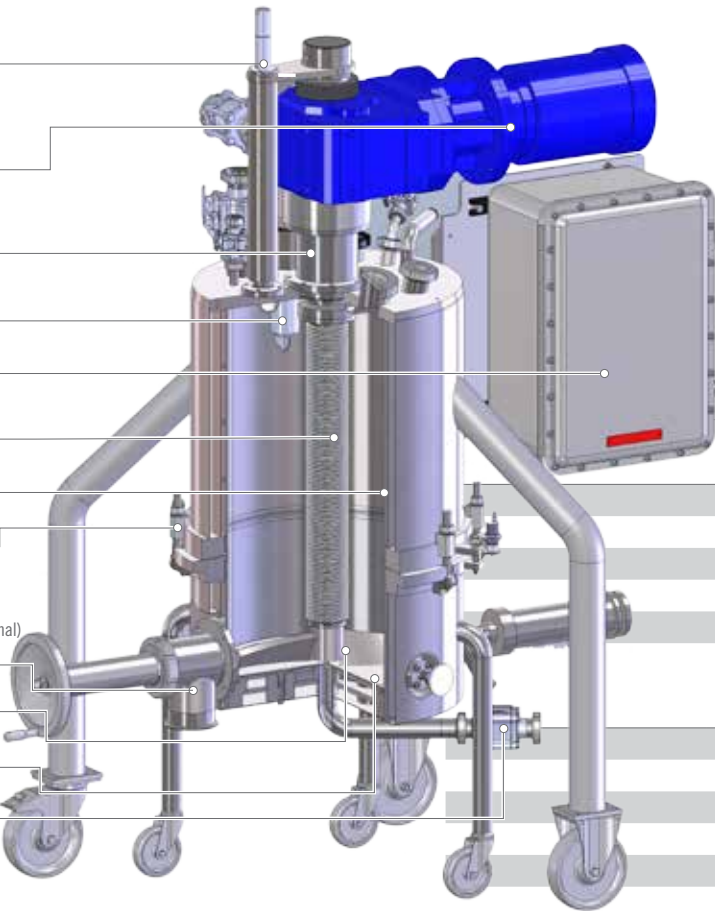
C-clamps for
attachment of base

Side discharge valve (optional)
Final product

Agitator

Filter media

Outlet filtrate



Filtration surface (nominal)	Volume suspension (max.)	Volume filter cake (max.)	Diameter vessel (inside)	Height (agitator in top position)	Required floor space (approx.)
m²	l	l	mm	mm	mm x mm
0.03	34	7	195	2230	860 x 1170
0.06	42	14	265	2230	860 x 1220
0.1	64	24	355	2230	860 x 1290
0.2	189	68	540	2530	1010 x 1620
0.3	252	89	620	2530	1090 x 1760
0.4	364	128	740	2530	1160 x 1850
ft²	gal	gal	in	in	in x in
0.3	8.9	1.9	7.7	87.8	33.9 x 46.1
0.6	11.1	3.7	10.4	87.8	33.9 x 48.0
1.1	16.9	6.3	14.0	87.8	33.9 x 50.8
2.2	49.9	18	21.3	99.6	39.8 x 63.8
3.2	66.6	23.5	24.4	99.6	42.9 x 69.3
4.3	96.2	33.8	29.1	99.6	45.7 x 72.8

TESTIMONIALS

«RoLab convinces me because of its flexibility and versatility. This pilot plant allows us to carry out all steps of a professional modern filtration and drying procedure.»

Dr. Martin Biendl, Head of research and development,
Hallertauer Hopfenveredlungsgesellschaft m.b.H. (HHV), Mainburg/Germany.
Application RoLab: Process development for the insulating of hop components

«The simple operation of RoLab is well-suited for our operations and meets the highly flexible demands of our facility. The unit is compact and easily portable, yet it is fully developed for containment and cGMP compliance. De Dietrich Process Systems worked with us to customize the unit and we are pleased to have another on order.»

Rebecca Y. Ahn, Engineering and Operations Manager, Ash Stevens, Inc., Riverview, Michigan / USA.
Application RoLab: Research, development and manufacture of active pharmaceutical ingredients (API)

ENGINEERED SYSTEM ROLAB

On demand, De Dietrich Process Systems expands the classic RoLab to a customized system solution. In addition to filter/dryer the required ancillary equipment is integrated in this mobile «Engineered System» too.



Skid Filter/Dryer RoLab 0.03 m²

The skid-mounted unit is composed of:

- Filter/Dryer RoLab
- Mobile filtrate collector; can also be used as cleaning system (WIP/CIP)
- Vacuum pump with condensation unit and heating/cooling unit
- Control unit with display and data logging

CONTAINMENT SOLUTIONS

In the chemical and pharmaceutical industry, substances are increasingly being processed which have an extremely toxic or pronounced pharmacological action. The safe handling by separating the processes from the environment is therefore becoming increasingly important.

Following this trend, De Dietrich Process Systems provides containment solutions specifically designed for filtration and drying equipment. By using these systems, optimum protection for operators of equipment for the production of fine chemicals and active ingredients can be achieved. Depending on the category of the required personal protection systems are used with one chamber and, for particularly active substances, using two chambers for emptying in containers.

The rigid discharge glovebox has the following advantages:

- Creation of a microenvironment that limits the impact on the cleanroom
- Reduction of the need for PPE (Personal Protective Equipment)
- Full recovery of the product heel



GLASS-LINED FILTER/DRYERS ROLAB

Certain agents, intermediates and extracts make complex demands on the processes of filtration/drying; whether by corrosive effects on the material or by high sensitivity to metals, contamination or temperature. These conditions can lead to the fact that plants made from high quality steel or alloy C-22 do not satisfy the requirements anymore.

The application of the material enamel as surface protection is an ideal solution. For this reason De Dietrich Process Systems also provides the RoLab in glass-lined execution. The surfaces and components in contact with the product are covered with high quality steel-enamel. This specification is distinguished by a very large constancy against high corrosive media and offers a large range of applications regarding operating temperature and pressure. The smoothness of the surface of enamel helps to clean the vessel on CIP-level. Thereby the danger of mixing product-batches and residues is decreased (Cross-Contamination).

The glass-lined parts of the plant can also be furnished with devices in nickel-based alloys, nickel-free metals or special plastic materials. De Dietrich Process Systems also offers the possibility to furnish the glass-lined filtration and drying systems with a completely nickel-free product space.



Glass-lined Filter/Dryer RoLab 0.2 m²

COMPETENCE CENTER

De Dietrich Process Systems has a long history and experience in providing our customers qualified assistance in the area of mechanical solid/liquid separation and drying. In addition to innovative product solutions a large variety of services is available.



- Process coaching and process advice
- Process tests in our pilot plant individually tailored to your product, including scale-up
- Rental machines
- Planning, integration and qualification of our installations
- Complete systems: design and integration of peripheral equipment to our installations
- Service and maintenance of your installations at your site
- Upgrading and improvement of your existing filtration and drying systems

FILTRATION TRIALS

We propose a wide range of test equipment, allowing you to perform both filtration trials and drying trials. All the equipment we offer can be shipped to your site.

- Measure of the filterability of a product
- Calculation of the cake specific resistance
- Definition of the best type of media (pore size, media type: textile or metal monolayer multilayer)
- Extrapolation of filtration areas and cycle times at the industrial scale



ROSENMUND

ROLAB – THE LATEST GENERATION OF FILTER/DRYERS

De Dietrich Process Systems is an international provider of system solutions in the area of mechanical and thermal process engineering. The comprehensive range reaches from research and development to production scale and is based on equipment which uses glass-lined steel, stainless steel, special alloys and borosilicate glass technologies respectively for the chemical and pharmaceutical industries.

De Dietrich's competence also covers the engineering, planning, installation and commissioning of chemical units in materials resistant to corrosion and provides the corresponding service provisions.

Comprehensive consulting and services are an important and integral element of De Dietrich's product range. This allows the customer to individually compose the service package according to the requirements.

Rosenmund® is a global leading brand in the area of mechanical filtration and drying processes with focus on the pharmaceutical and chemical applications with high demands regarding sterility and containment. The capability of Rosenmund® is the conception and manufacturing of installations for challenging filtration and drying procedures including furnishing of the required peripheral devices and control.

FLEXIBLE OPERATION THANKS TO MOBILITY

RoLab stands for «Rosenmund® Laboratory» and is the name of our latest generation of filter/dryers. The product line RoLab is manufactured for use in the laboratory and in pilot plants. It allows the efficient implementation of filtration and drying trials as well as reliable scale-ups. This multi-purpose equipment also can be integrated in the normal manufacturing process for the production of small batches of active ingredients or intermediates.



USER-FRIENDLY AND SIMPLE

RoLab allows users to carry out all steps of a professional modern filtration and drying procedure under cGMP and FDA guidelines. The installation enables fast and frequent product changes and can be flexible due to its mobility. These features result in a high cost-effectiveness of the testing and manufacturing processes as well as the used capital goods.

RoLab impresses with its simplicity and focus on the essential. The machine has no hydraulic system and the extent of electronic function support is reduced to a minimum. The installation of RoLab is straightforward and fast. The filter/dryer only needs to be connected by the user with the supply lines:

- Compressed air
- Electricity
- Heating/Cooling

Subsequently, the process connections (suspension, nitrogen, etc.) have to be attached and the RoLab is ready for operation.

FILTER / DRYER: ROLAB WITH MICROWAVE ENHANCED DRYING ON AN AGITATED NUTSCHE



Whether for the pharmaceutical or chemical processes, the reduction of your production time while drying your product is a key expectation.

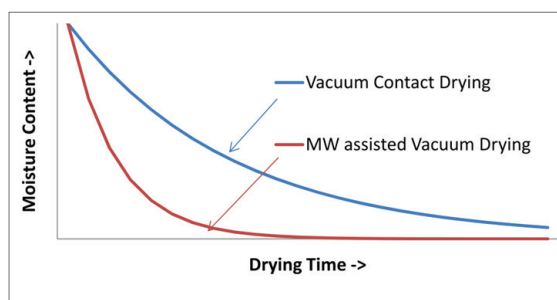
You can now benefit from our state of the art Rolab Filter / Dryer combined with a microwave to reach high drying efficiency.

DESCRIPTION

The RoLab equipment provides the advantages of combining the mechanical solid / liquid separation phase as well as the thermal drying phase under vacuum. Microwaves can be added as an additional energy source to further reduce the drying time significantly. Through careful control of product temperature and forwarded and reflected microwave power, this technique is ideal for the fast processing of pharmaceutical products.

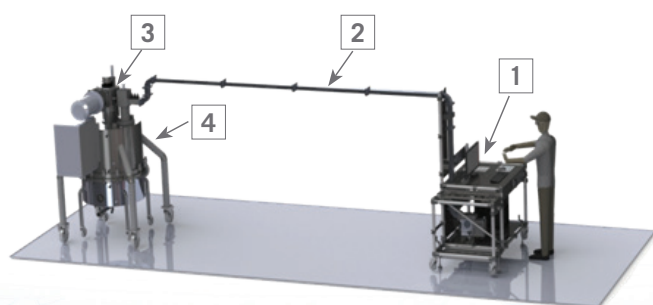
The RoLab can also be used as an outstanding solid-liquid solvent extractor for trials or small scale production of plant-based ingredients. The microwave generator gives new possibilities of product development, as well as drastically improving the desolventation operations (drying of the spent material to remove the solvent content).

Applications: Filtration and drying trials as well as reliable scale-ups either for small batches of active ingredients or intermediates.



BENEFITS

- User friendly and simple
- Combined equipment for filtration, vacuum- and microwave drying
- Reduction of drying time
- Faster processing
- Small floor space required



Microwave Setup on RoLab 0.4

1. Microwave Generator
2. Waveguide Piping
3. Microwave Tuner and Connector to Process
4. RoLab 0.4 Filter / Dryer



CHARACTERISTICS

RoLab 0.4

- Filter area 0.4m²
- Cake volume max. 128 L
- Slurry volume max. 364 L
- Vessel volume total 387 L
- Heating area 2,4m²
- Stroke of agitator (nominal) 300mm
- Speed of agitator reversible 9-35min-1
- Main motor power 5.5kW

Microwave Power Supply

- MW Power: 2 kW
- Frequency: 2.45 GHz +/- 20%
- Cooling water: 4 l/min, 4 bar

THE SIMPLE AND EFFECTIVE FILTER / DRYER

Traditionally, the heat source comes from the heated dryer walls and agitator and the heat transfer rate is related to the surface area and the volume of product being processed. As such, this direct heating method is most effective for small-scale applications.

As the heated wall and agitator are the only source of drying energy limitations exist for 'pure' vacuum drying on bigger machines. Microwave energy as a further source of energy can be used to overcome these limitations.

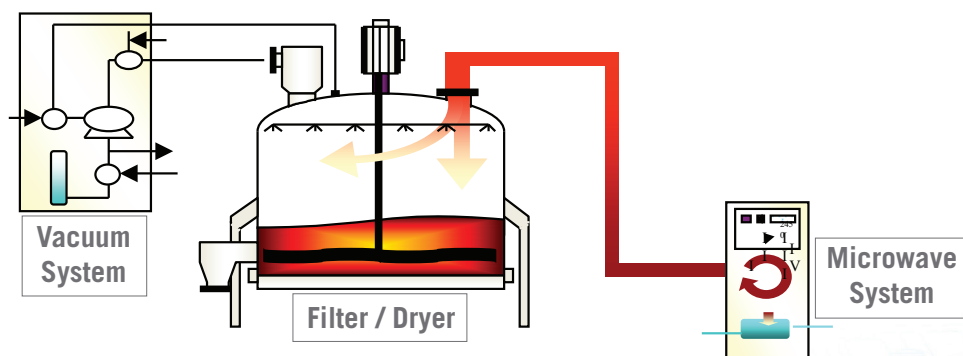
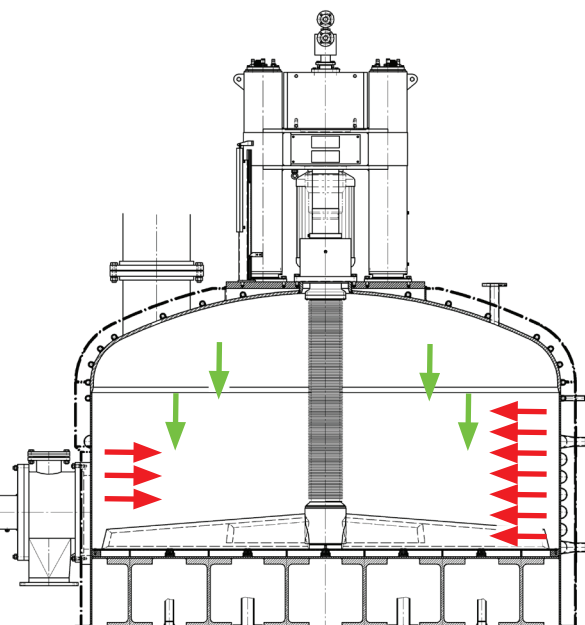
Also microwave radiation has, compared to the conventional drying method, a much greater penetration, resulting in faster drying of larger agglomerates and wet products with low thermal conductivity.

CONTACT DRYING

Heat transfer through wall

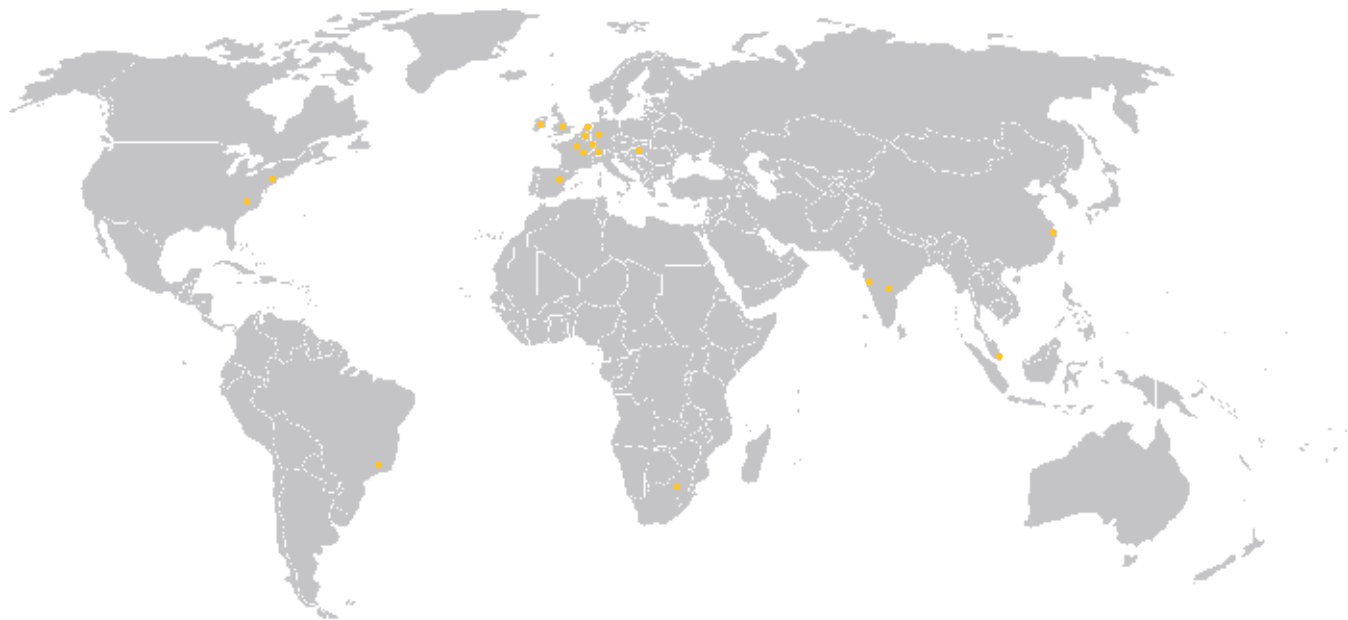
MICROWAVE DRYING

Heat transfer directly into the product



Principle Arrangement of Microwave Drying on a Filter/Dryer





De Dietrich PROCESS SYSTEMS



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