

# Product catalogue

for the Food Processing  
and Packaging Market

Edition 02/2017



# Applications of the Food & Packaging Market

The matching vacuum solution for every application

Pumps	SOGEVAC SV 10 FP / 16 FP	SOGEVAC SV 25 FP	SOGEVAC SV 45 FP	SOGEVAC SV 70 FP	SOGEVAC SV 105 FP	SOGEVAC SV 200 FP	SOGEVAC SV 300 FP	SOGEVAC SV 470 B / 570 B(F)	SOGEVAC SV 630 B	SOGEVAC SV Oxygen version	SOGEVAC SV Hydro version	RUVAC WAU 251 FP	RUVAC WAU 501 FP	RUVAC WAU 1001 FP	RUVAC WAU 2001 FP	LEYVAC LV	DRYNAC DV	SCREWLINE SP	Central Vacuum Systems (CVS)
<b>Applications</b>																			
Vacuum packaging / Chamber machines	■	■	■	■	■	■	■	■				■	■	■	■	■	■	■	■
Metal can sealing (coffee, powder milk, etc.)					■	■	■	■							■	■	■	■	
Thermoforming / Rollstock			■	■	■	■	■							■	■	■	■		
Modified atmosphere packaging (MAP without O <sub>2</sub> )			■	■	■	■	■					■	■	■	■	■	■	■	■
Modified atmosphere packaging (MAP with O <sub>2</sub> )								■							■	■	■	■	
Freeze drying (fruits, spices, coffee, etc.)				■	■	■	■			■	■	■	■	■	■	■	■		
Vacuum cooling					■	■	■		■			■	■	■	■	■	■		
Slaughterhouse applications					■	■	■		■									■	■
Stuffing / Mixing	■	■	■	■	■	■									■				
Tumbling				■	■	■	■		■						■	■	■	■	
Vacuum cutting			■	■	■	■									■				
Vacuum clipping	■	■	■	■	■										■				

For any other applications please contact us.



Production line for Pasta, equipped with SOGEVAC FP pumps.

## Application Challenges

Challenges				
	Gas and ambient temperature	Heavy duty operation (cycles)	Dust / Powder / Particles	Moisture
<b>Applications</b>				
Vacuum packaging / Chamber machines	◆	●	▲	●
Metal can sealing (coffee, powder milk, etc.)	◆	●	◆	▲
Thermoforming / Rollstock	◆	◆	▲	▲
Modified atmosphere packaging (MAP without O <sub>2</sub> )	●	●	▲	●
Modified atmosphere packaging (MAP with O <sub>2</sub> )	●	●	▲	●
Freeze drying (fruits, spices, coffee, etc.)	▲	●	▲	◆
Vacuum cooling	▲	●	▲	◆
Slaughterhouse applications	●	●	◆	◆
Stuffing / Mixing	●	▲	▲	◆
Tumbling	●	▲	▲	◆
Vacuum cutting	●	▲	▲	◆
Vacuum clipping	●	◆	▲	▲

▲ = Low  
● = Medium  
◆ = High

## Oil for SOGEVAC by pump types

Pumps												
	SOGEVAC SV 10 FP / 16 FP	SOGEVAC SV 25 FP	SOGEVAC SV 45 FP	SOGEVAC SV 70 FP	SOGEVAC SV 105 FP	SOGEVAC SV 200 FP	SOGEVAC SV 300 FP	SOGEVAC SV 470 B / 570 B(F)	SOGEVAC SV 630 B / 750 B(F)	SOGEVAC SV Oxygen Version	Central Vacuum Systems (CVS)	
<b>LEYBONOL Oils</b>												
LVO 120 (Standard Mineral Oil)	●	●										
LVO 130 (Standard Mineral Oil)			●	●	●	●	●	●		■	■	
LVO 140 (Food Grade Oil)	■	■										
LVO 150 (Food Grade Oil)			■	■	■	■	■	■		●	●	
LVO 400 (PFPE Oil)									■		●	

- = Standard
- = Possible, please contact Leybold

The table only lists general applications. Your specific requirements might be subject to deeper analysis. For further questions, please contact our technical sales support.

**For information on oil specifications please refer to our general catalog.**

# Food Packaging

## Application examples

### Food Packaging

Vacuum packaging evacuates air from the package prior to sealing.

The intent is (usually) to remove oxygen from the container to extend the shelf life of foods and, with flexible package forms, to reduce the volume of the contents and package. By reducing the oxygen residual contents, the growth of aerobic bacteria is limited and the shelf life can typically be extended by a factor of 5 to 10.

Additionally, vacuum packaging prevents evaporation of volatile components, protects flavor and texture, and reduces freezer burn by protecting the food from the dry cold air.

Different processes / technologies are commonly used:

### Chamber Machines

Chamber packaging machine can be single or double types, with or without belt conveyor. Resulting product is a skin packaged food. These machines are working in cycles from atmosphere pressure to 1 mbar (29.9" HG) every 0.5 to 2 minutes.

### Typical pumping system

Single stage rotary vane pumps or dry pumps, often with Roots blower if main vacuum pump is remote from the machine.



### Modified Atmosphere Packaging (MAP)

MAP packs are produced by evacuation and gas flushing. The protective atmosphere inside the pack depends on the specific requirements of the product.

A combination of the following gases is very often used:

- Oxygen (O<sub>2</sub>) which in high concentration, keeps an appetizing food colour
- Nitrogen (N<sub>2</sub>) mainly used as a stabilizing gas to maintain the pack volume, e.g. for protection during handling or as transportation packaging
- Carbon dioxide (CO<sub>2</sub>) which reacts with water to form carbonic acid and helps to lower the pH. This atmosphere inhibits the growth of microorganisms

### Typical pumping system

Single stage rotary vane pumps or dry screw pumps in combination with Roots blowers. Oxygen reinjection is typically used for red meat packaging to enhance the red color.

Specific vacuum pumps, free of hydrocarbons, with inert oil and oxygen compatible seals might be required.



### Thermoforming / Rollstock / Tray Sealing

This process allows for packaging continuously all types of food products between two plastic films reels or into pre-formed trays. The lower film is heated and forms the container.

The upper film is positioned above the thermoformed containers and is then thermowelded to protect the product from ambient air. The product is therefore skin packaged or packaged in a modified atmosphere. In both cases, vacuum is necessary.

### Typical pumping system

Central vacuum systems made of rotary vane pumps or dry pumps.



# Food Processing

## Application examples

### Food Processing

Food processing includes all the transformation steps of raw ingredients into food, or of food into other forms. This processing typically takes clean, harvested crops or butchered animal products and uses these to produce attractive, marketable and often long shelf-life food products. Similar processes are used to produce animal feed.

Food processing covers a very wide range of applications where vacuum is often used for various properties.

### Tumbling

Tumbling is used on meat, fish and seafood products to add or enhance flavor, taste, colour, weight, conservation, texture, etc.. By combination of vacuum, pressure, heat and mechanical effects (due to the rotation of the drum), tumblers can achieve de-frosting, marinating, curing, cooking and chilling operations. Typical tumbling process lasts from 3 to 24 hours.

#### Typical pumping system

Rotary vane pumps or dry screw type pumps.



### Vacuum cutting

Vacuum cutting is mainly used in meat processing industries (sausages makers). It provides a firm emulsion free of air and reduces the volume by 5-7% at constant weight. This saves packaging costs and less casings are needed. It betters the texture, improves hygiene, reduces product oxidation but also allows to get a more effective absorbing and seasoning.

#### Typical pumping system

Small rotary vane pumps.



convey specified risks materials and other sub-products from the slaughtering line to storage tanks for further use in rendering or before destruction.

Vacuum is also used to extract the spinal cord from cattle before carcass splitting (measure implemented after the mad cow crisis for the prevention, control and eradication of BSE on cattle aged twelve months or more).

#### Typical pumping system

Rotary vane pumps with improved water vapor capacity or dry screw type pumps.

### Vacuum cooling



Compared to traditional cooling solutions, vacuum cooling allows a quicker cooling down of vegetables after harvest. Vacuum cooling is particularly suited for leafy vegetables (such as lettuce, endives, spiro) because they offer a high surface/volume ratio.

Nevertheless all vegetables (beans, berries...) can be processed.

The main advantages of vacuum cooling processes are:

- Low energy consumption
- Fast refrigeration time
- Refrigeration "to the heart"
- Significant increase in shelf life

#### Typical pumping system

Rotary vane pumps or dry screw type pumps in combination with Roots blowers.

### Freeze drying



Freeze-drying, also known as lyophilisation, is a dehydration process typically used to preserve a perishable material or make the material more convenient for transport. Freeze-drying works by freezing the material and then reducing the surrounding pressure to allow the frozen water in the material to sublimate directly from the solid phase to the gas phase.

Freeze drying main advantages:

- Freeze dried products can be stored at ambient temperature
- Less damage to the substance than other dehydration methods using higher temperatures : in particular color and shape
- Does not usually cause shrinkage of the material atng dried (no volume reduction)
- Frozen products can be carried out all year long (no seasonal effect)

#### Typical pumping system

Rotary vane pumps or dry screw type pumps in combination with Roots blowers.