

# **Stable High Vacuum**

Oil diffusion pumps

Oil vapor jet pumps





## High vacuum with

The oil diffusion pumps and oil vapor jet pumps from Leybold are rugged, provide a long service life and excel through an optimized user interface.





more efficiency

Using the innovative PLC controlled power efficiency control unit you can expect energy savings up to 30% and an extended service life of the pump fluid and the heating cartridges.

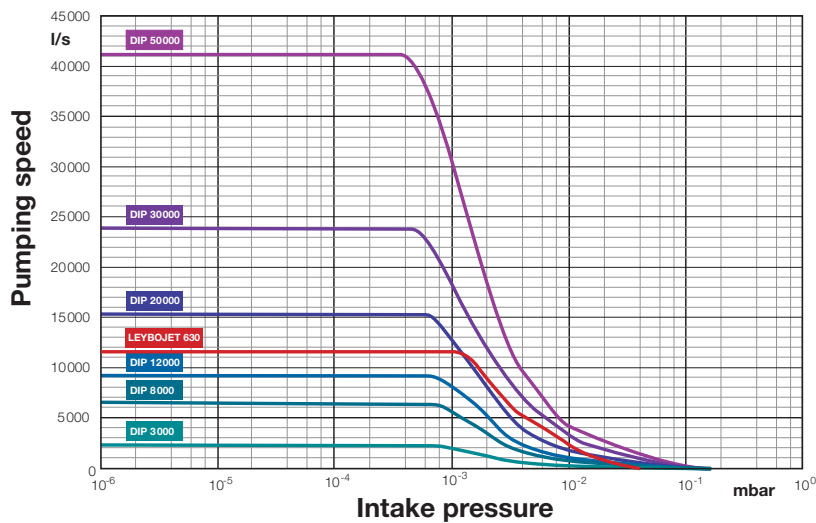
# Oil Diffusion Pumps

The oil diffusion pumps and oil vapor jet pumps from Leybold are ideally suited for industrial high vacuum applications. They are characterized by superior vacuum performance data and are well-adapted as reliable components in medium vacuum and high vacuum systems due to their rugged design.

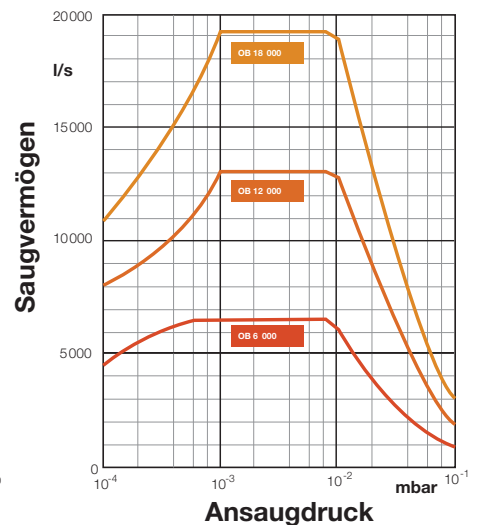


## Vacuum Performance

Oil diffusion pumps DIP and LEYBOJET



Oil vapor jet pumps OB



Your vacuum solution for pumping speeds ranging from 3,000 I/s to 50,000 I/s.

LEYBOLD

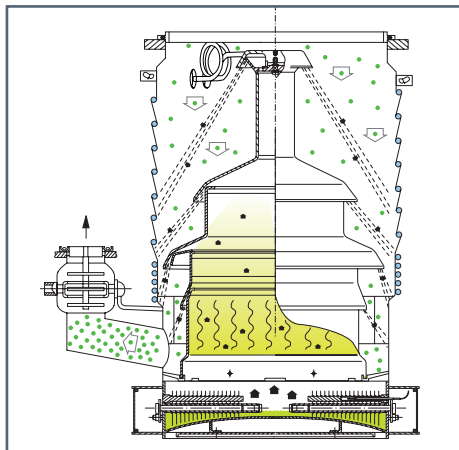


## Design

**DIP** and **LEYBOJET** oil diffusion pumps are high vacuum pumps without wearing and moving components. The pumping effect of these ejector pumps is created through the diffusion of the gases which are to be pumped, into the vapor jet. Compared to other high vacuum pumps the pumping speed with regard to the surface area is very high. For an operating range between  $10^{-2}$  mbar and  $10^{-7}$  mbar the pumping speed will depend on the model size selected between the pump range of 3,000 l/s to 50,000 l/s.

## Advantages

Prolonged maintenance intervals, non-wearing, high safety standard.



DIP oil diffusion pumps - operating principle

### Pumping speed

DIP: 3,000 to 50,000 l/s

LEYBOJET: 12,000 l/s

### Operating range

DIP:  $< 10^{-2}$  to  $10^{-7}$  mbar

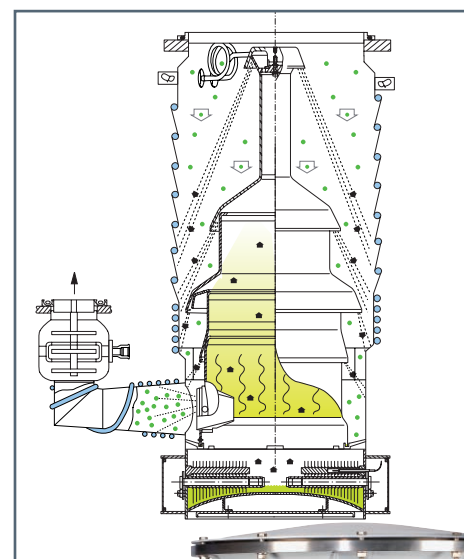
LEYBOJET:  $< 10^{-2}$  to  $10^{-5}$  mbar

### Optimum pumping speed

in the pressure range  $< 10^{-4}$  mbar (DIP) and  $10^{-2}$  to  $10^{-4}$  mbar (LEYBOJET)

- Stable high vacuum
- High forevacuum tolerance
- High pumping speed
- Safe and economical
- CE compliant electronics supplied
- No wear caused by revolving parts
- Simple to operate
- Maintenance friendly design for rapid and simple replacement of the heating elements
- Ample accessories available
- Flexible electrical wiring for worldwide deployment
- Innovative efficiency control (ROI  $< 2$  years)

The **LEYBOJET 630** is equipped with an additional ejector nozzle (Laval nozzle) for a stable pumping speeds down to the medium vacuum range thereby optimized for applications in the  $10^{-3}$  mbar range (e.g. sputtering processes).



LEYBOJET 630  
operating principle





# Oil Vapor Jet Pumps



**OB oil vapor jet pumps** are equipped with one or several four stage nozzle systems and a jet stage.

**Pumping speed:** 6,000 to 18,000 l/s

**Operating range:**  $10^{-1}$  to  $< 10^{-4}$  mbar

**Optimum pumping speed** in the pressure range of 1 to  $10^{-3}$  mbar

- Stable pumping speed in low pressure ranges
- Very high forevacuum tolerance
- Highly reliable
- Compact design with central supply connections
- Simple to operate

- Prolonged maintenance intervals
- Easy heating element replacement
- Central electronics supplied

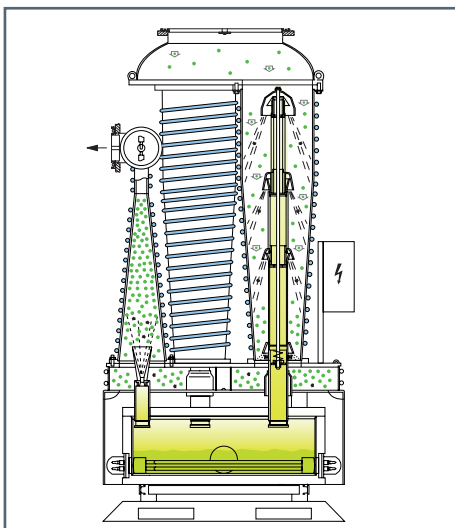
## Typical Applications

Principal fields of Industrial applications for **oil diffusion pumps** include:

- Vacuum coating
- Metallurgy
- Vacuum furnaces
- Vacuum drying
- Space simulation
- Research and development
- Mechanical engineering

**Oil vapor jet pumps** excel in steel production processes including:

- Vacuum Induction Melting (VIM)
- Vacuum Induction Degassing (VID)



OB oil vapor jet pumps - operating principle



Rugged endurance runner  
for your vacuum requirements

# Power Efficiency Control

Energy savings up to 30%  
without power loss

**Oil diffusion pumps require a certain minimum oil temperature for optimizing operation.**

**Operating the pump at higher temperatures will only increase power consumption without increasing the pumping speed of the pumps.**

**Commonly, 100% of the installed heating power is constantly utilized.**

The innovative Leybold power efficiency control unit for diffusion and oil vapor jet pumps ensures optimum power consumption conditions perfectly adapted to the current heating demand.

This innovative control unit cuts power consumption by up to 30% since after the pump has attained its operating temperature the supplied power is significantly reduced.

Further savings result from the utilization of the standby mode during which the pump is maintained in the ready state at a reduced temperature.

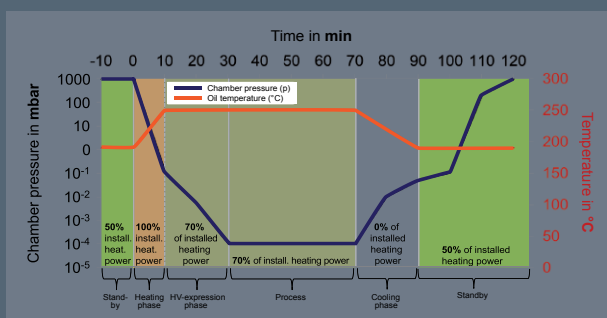
■ Simple, visual monitoring of the parameters through the graphic user interface:



- Cost reductions through energy-saving (up to 30%)
- Increased service life of oil and heating cartridges
- Excellent operating convenience and simple use
- Fast ROI (< 2 years)

- PLC driven
- USB Interface and Ethernet
- Retrofit kit available for already installed pumps

## Smart Pump Control



100% power demand during the warm-up phase:

Approx. 70% power demand after attaining the defined oil temperature:



**Functional and effective!**

# LEYBONOL

## Pump fluid for oil diffusion pumps in any application



The matching pump fluid influences the performance and pumping speed of oil diffusion pumps. Our LEYBONOL pumping fluids fulfil the requirements for working in a high vacuum:

- High-quality, reliable lubricants for a long service life of the oil and the pump
- Constant quality guaranteed
- Excellent vacuum performance data

The product line of suitable pump fluids and vacuum oils for your fields of application are described in our Full Line Catalogue.

We gladly provide personal advice for the selection of the suitable pump fluid. Please contact us.

## Technical Data

Oil diffusion pumps		DIP 3 000	DIP 8 000	DIP 12 000	DIP 20 000	DIP 30 000	DIP 50 000	LEYBOJET 630
High vacuum connection	DN	250 ISO-K	400 ISO-K	500 ISO-K	630 ISO-F	800 ISO-F	1000 ISO-F	630 ISO-F
Forevacuum connection	DN	63 ISO-K	63 ISO-K	100 ISO-K	100 ISO-K	160 ISO-K	160 ISO-K	160 ISO-K
Nominal pumping speed <sup>1)</sup>	l/s	3 000	8 000	12 000	20 000	30 000	50 000	12 000
Ultimate total pressure <sup>1)</sup>	mbar	$< 5 \cdot 10^{-7}$	$< 5 \cdot 10^{-7}$	$< 5 \cdot 10^{-7}$	$< 5 \cdot 10^{-7}$	$< 5 \cdot 10^{-7}$	$< 5 \cdot 10^{-7}$	$< 5 \cdot 10^{-7}$
Weight	kg	29	70	102	172	296	560	145
Cooling water consumption	l/h	160	290	500	600	900	1500	500
Oil filling LEYBONOL LVO 500	l	1.0 - 1.4	2 - 3.5	3 - 5.5	6 - 9	10 - 15	15 - 25	5 - 8
Number of heating cartridges		2	6	9	12	18	24	9
Heating power	kW	2.4	4.8	7.2	12	18	25	10.8

P/N								
DIP with standard fuse box		222 10	222 20	222 25	222 30	222 35	222 40	502 180
DIP mit with power efficiency controller EU					22230V001	22235V001	22240V001	
DIP mit with power efficiency controller US			22220V003		22230V002	22235V002	22240V003	
DIP mit extended cold cap baffle				22225V001	22230V003	22235V004	22240V005	

<sup>1)</sup> in accordance with ISO/R 1000, DIN 28 400 with LVO 500 as the pump fluid

For detailed information please refer to our general catalog.

Oil vapor jet pumps		OB 6 000	OB 12 000	OB 18 000
High vacuum connection	DN	500	630	630
Forevacuum connection	DN	100	160	160
Nominal pumping speed <sup>1)</sup>	l/s	6 000	12 000	18 000
Ultimate total pressure <sup>1)</sup>	mbar	$< 6.6 \cdot 10^{-6}$	$< 6.6 \cdot 10^{-6}$	$< 6.6 \cdot 10^{-6}$
Weight	kg	450	850	1400
Cooling water consumption	l/h	700	900	1360
Oil filling LEYBONOL LVO 540	l	45	60	90
Number of heating cartridges		3 each 4 kW	6 each 4 kW	9 each 4 kW
P/N				
OB with standard fuse box		503750V001	503654V001	503508V001
OB with electronic heater controller		503750V002	503654V002	503508V002

<sup>1)</sup> in accordance with ISO/R 1000, DIN 28 400 with LVO 540 as the pump fluid

Accessories		P/N
Astrotorus baffle DN250 - DN1000		227 70
Overtemperature protection switch		122 84
Contact thermometer		218 81
Resistance thermometer (Pt 100)		200 02 958
Pump fluids/oils		P/N
LEYBONOL LVO 500	1 l	L500 01
	5 l	L500 05
	20 l	L500 20
LEYBONOL LVO 510	1 l	L510 01
	20 l	L510 20
LEYBONOL LVO 520	1 l	L520 01
	5 l	L520 05
LEYBONOL LVO 530	1 l	L530 01
LEYBONOL LVO 540	20 l	L540 20
	200 l	L540 99

For detailed information please refer to our general catalog.

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