



# Product Overview 2017

Innovative

Vacuum Components

and Systems for Versatile

Applications

# Product Overview 2017

## The entire world of vacuum

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# Product Overview 2017

## Global support

## Oil sealed Vacuum Pumps

### Leybold

Consulting, sales and service



Your partner for vacuum engineering. Benefit from our worldwide support.

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#### Your Expectations:

- First-class consulting
- Excellent product quality at optimized price-to-performance ratio

#### Our Solution:

- Worldwide sales and service network
  - Highly qualified and committed staff
  - Comprehensive consulting service
  - Customer specific application support
  - Highly reliable top quality solutions
  - Competitive pricing
  - Certified in accordance with DIN ISO 9001/9002
  - After sales, application and production support
- 

### SOGEVAC B/BI/D

Single-stage rotary vane pumps



Effective investment, long service life. No oil loss, low power consumption.

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#### Your Expectations:

- Industrial rough vacuum generator
- Favorable price-to-performance ratio
- High reliability
- ATEX explosion protection, optionally

#### Our Solution:

- Pumping speed 10 to 1,200 m<sup>3</sup>/h
  - Ultimate pressure  $\leq 5 \cdot 10^{-2}$  mbar
  - O<sub>2</sub>-compatible versions
  - Separate standard product line for the food and packaging market
  - Flexible pump design
  - Certified according to ATEX RL 2014/34/EU
-

# Product Overview 2017

## Oil sealed Vacuum Pumps Dry Vacuum Pumps

### TRIVAC B, E and T

Dual-stage rotary vane pumps



A well-proven vacuum pump for long-time operation lasting for years. Broad range of accessories such as dust filters, adsorption traps, etc.

#### Your Expectations:

- Rugged vacuum generator
- High reliability
- ATEX explosion protection, optional

#### Our Solution:

- Pumping speed 2.5 to 65 m<sup>3</sup>/h
- Ultimate pressure 10<sup>-4</sup> mbar
- For medium and high vacuum applications
- Certified according to ATEX RL 2014/34/EU

### DIVAC

Diaphragm pumps



Environment-friendly, low operating costs.

#### Your Expectations:

- Backing pump for turbomolecular pumps
- Corrosion resistant vacuum pump for laboratories

#### Our Solution:

- Pumping speed 0.8 to 4.8 m<sup>3</sup>/h
- Ultimate pressure ≤ 1 mbar
- Dry operation, oil-free
- Pumping speed 0.6 to 2.2 m<sup>3</sup>/h for corrosive media
- Media contacting parts made of PTFE and PVDF

### SCROLLVAC

Oil-free scroll pumps



Dry, universal solution, low operating costs.

#### Your Expectations:

- Oil-free vacuum pump
- Quiet, low vibration operation
- Long maintenance intervals
- Low particle generation

#### Our Solution:

- Pumping speed 5 to 60 m<sup>3</sup>/h
- Ultimate pressure ≤ 1 · 10<sup>-2</sup> mbar
- Robust, low-maintenance design
- High pumping speed even at 1000 mbar

# Product Overview 2017

## Dry Vacuum Pumps

### ECODRY plus

Dry compressing multi-stage roots pumps



Compact vacuum pumps with low noise emission for clean applications.

#### Your Expectations:

- Noise-free and clean environment
- Easy handling
- High energy-efficiency
- Maintenance-free pump

#### Our Solution:

- Pumping speed 40 to 65 m<sup>3</sup>/h
- Lowest noise level in class
- Air-cooled pump
- Oil and particle-free operation

### LEYVAC

Dry compressing screw pumps and systems



Rugged vacuum pumps for rough applications and high process throughputs. Simple vacuum performance upgrade with RUVAC roots pumps.

#### Your Expectations:

- Industrial vacuum generator
- Long system uptimes
- High pumping speed already at atmospheric pressure
- Compact unit
- Low cost of ownership

#### Our Solution:

- Pumping speed 80 to 300 m<sup>3</sup>/h
- Ultimate pressure  $\leq 1 \cdot 10^{-2}$  mbar
- Optimized performance for light gases
- Hermetically sealed pump
- Low noise operation, low heat loss
- Direct connection of RUVAC Roots pumps via adapter

# Product Overview 2017

## Dry Vacuum Pumps

### DRYVAC

Dry compressing screw pumps and systems



Rugged, compact vacuum solutions with smart monitoring and control system for coating, photovoltaic and process industry applications.

#### Your Expectations:

- Maximum system availability
- Low cost of ownership
- Minimum footprint
- Self protection of the pump and easy communication

#### Our Solution:

- Pumping speed 450 to 9.800 m<sup>3</sup>/h
- Robust design for demanding processes
- Highest energy efficiency
- Flexible modular system for compact vertical and horizontal installation
- Variants with ATEX certification according to ATEX directive 2014/34/EU, Cat. 2i available.
- Integrated smart monitoring of major parameters; i-versions with touch screen control and digital I/O interface (optional Profibus, Profinet)

### SCREWLINE

Dry compressing screw pumps



Extremely robust for harshest industrial applications, simple on-site maintenance.

#### Your Expectations:

- High pumping speed
- Easy to clean
- Air cooled
- ATEX explosion protection

#### Our Solution:

- Pumping speed 250 and 630 m<sup>3</sup>/h
- Ultimate pressure  $\leq 1 \cdot 10^{-2}$  mbar
- Expandable to pump systems by adding Roots pumps
- Monitoring system
- Easy to disassemble pump chamber for rapid cleaning
- Certified according to ATEX RL 2014/34/EU

# Product Overview 2017

## Roots Vacuum Pumps

### RUVAC WA(U)/WS(U)

Roots blowers



Long-lasting and reliable. Easy connection to any forevacuum pump.

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#### Your Expectations:

- Pumping speed increase at low pressures
- Simple to use
- Oil-free pumping of the gas
- ATEX explosion protection

#### Our Solution:

- Pumping speed range from 250 to 4,000 m<sup>3</sup>/h
  - Reliable and robust
  - Available with flanged motor or with hermetically sealed drive motor
  - Suitable for 100% O<sub>2</sub> applications
  - Certified according to ATEX RL 2014/34/EU
- 

### RUVAC WH(U)

Roots blowers



An innovative product line, efficient and cost-effective for use in modern Process Industry applications.

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#### Your Expectations:

- Flexible pumping speed through frequency converter operation
- Rapid pumpdown times
- Compact design
- Oil-free pumping of gases
- System compatibility
- Low current consumption

#### Our Solution:

- Pumping speed from 720 to 9,800 m<sup>3</sup>/h (with frequency converter)
  - Excellent performance and consumption specifications
  - Hermetically sealed drive motor (IE2)
  - Small footprint
  - Innovative bypass valve
  - Certified according to ATEX RL 2014/34/EU, partially also according to ATEX Cat 2i
  - Direct connection of large forevacuum pumps via adapter
-

# Product Overview 2017

## Fluid Entrainment Pumps

### Oil Booster OB

Oil vapor jet pumps



Long maintenance intervals, wear-free. High safety standard.

#### Your Expectations:

- High vacuum
- Very high critical backing pressure capability
- High pumping speed
- Safe and economic
- CE compliant electronics power supply

#### Our Solution:

- Pumping speed: 6,000 to 18,000 l/s
- Operating range:  $< 10^{-1}$  to  $10^{-4}$  mbar
- Stable pumping speed in low pressure ranges
- No wear by revolving parts
- Small footprint
- Simple operation

### DIP / DIJ / LEYBOJET

Oil diffusion pumps



Long maintenance intervals, wear-free, high safety standards.

#### Your Expectations:

- Stable high vacuum
- High critical backing pressure capability
- High pumping speed
- Safe and economic
- CE compliant electronics power supply

#### Our Solution:

- Pumping speed:
  - DIP: 3,000 to 50,000 l/s
  - DIJ: 2.800 to 28.000 l/s
  - LEYBOJET: 12,000 l/s
- Operating range:
  - DIP:  $< 10^{-2}$  to  $10^{-7}$  mbar
  - DIJ:  $< 10^{-2}$  to  $10^{-7}$  mbar
  - LEYBOJET:  $< 10^{-2}$  to  $10^{-5}$  mbar
- Optimum pumping speed in the pressure range  $< 10^{-4}$  mbar (DIP, DIJ) and  $10^{-2}$  to  $10^{-3}$  mbar (LEYBOJET)
- No wear by revolving parts
- Simple operation
- Suited for application in sputtering processes (LEYBOJET)
- Innovative power efficiency controller (ROI  $< 2$  years)



# Product Overview 2017

## Controller for Fluid Entrainment Pumps Turbomolecular Pumps

### Power Efficiency Control

Control unit for oil diffusion pumps and OB pumps



Fast ROI (< 2 years) with power savings up to 30%.  
Easy and convenient to use. Optimized power and oil consumption data.

#### Your Expectations:

- Cost savings through reduction of energy consumption
- Simple to use
- PLC controlled

#### Our Solution:

- Power savings up to 30%
- Improved service life for the oil and the heating cartridges
- Simple visual monitoring of the parameters through graphic user interface
- Equipped with USB interface and Ethernet

### TURBOVAC i/iX

Turbomolecular pumps with hybrid bearing technology (mechanical/magnetic)



Innovative and flexible product range with outstanding performance data and integrated electronics.

#### Your Expectations:

- Clean high and ultrahigh vacuum generation
- Long service life
- Ease of installation and operation
- Reliable usage under most varied applications and operation conditions

#### Our Solution:

- Pumping speed up to 440 l/s
- Oil free hybrid bearings (mechanical/permanent magnetic)
- Installation in any orientation
- Integrated electronics including a variety of options for communication and control of accessory components
- Versions for high compression and high gas throughputs available

# Product Overview 2017

## Turbomolecular Pumps

### TURBOVAC MAGiNTEGRA

Turbomolecular pumps, magnetically levitated



Most compact product line for industrial applications. On-board frequency converter and power supply. Easy and space-saving system integration.

#### Your Expectations:

- Clean high and ultrahigh vacuum generation
- Suitable for industrial use, like PVD and coating processes, display and glass coating
- Insensitivity to particles or deposits
- Low maintenance requirements

#### Our Solution:

- High pumping speed and high compression ratios for all gases
- Holweck stage incorporated
- Resistant to particles and deposits
- Insensitive to shock-venting
- Monitoring and self-protection functions
- Maintenance-free in most applications

### TURBOVAC MAG digital

Turbomolecular pumps, magnetically levitated



Flexible, vibration-free and low-maintenance turbomolecular pumps with separate frequency converter.

#### Your Expectations:

- Clean high and ultrahigh vacuum generation
- Robust and reliable in demanding semiconductor processes
- For installation in any orientation
- High forevacuum tolerance
- Long service life

#### Our Solution:

- Pumping speed up to 3,200 l/s
- Magnetically levitated
- Compound stage versions available
- Stable system performance capability; high pumping speed and high compression ratios for all gases
- Easy system integration
- Temperature management system (TMS)

# Product Overview 2017

## Cryo Pumps, Cold Heads

### COOLVAC

Refrigerator cryo pumps



High water vapor pumping capability, long maintenance intervals, installation in any orientation.

#### Your Expectations:

- Hydrocarbon-free vacuum
- High and ultrahigh vacuum generation

#### Our Solution:

- Pumping speed up to 60,000 l/sec
- DN ISO, CF and ANSI flange versions
- Two cryo pump versions for manual and for fully automatic system control and regeneration available
- Pump controller mounted on pump for fully automatically controlled iCL version for easy process and network system integration

### COOLPOWER

Cold heads for cooling cryo pumps/cryostats



Gas refrigerating machines for cryogenic temperature generation based on the Gifford-McMahon principle. Designed for cooling superconductors (magnets, samples) from medicine and research.

#### Your Expectations:

- High refrigerating capacity
- Small footprint
- Long maintenance-free operating time
- Low vibrations

#### Our Solution:

- Ultimate temperatures:
  - two-stage models down to 8 K
  - single-stage models down to 25 K
- High refrigerating capacity from the smallest volume:
  - up to 18 W @ 20 K and up to 110 W @ 80 K for double stage coolers
  - up to 250 W @ 80 K for single stage coolers possible
- Resistant to particles and deposits
- Simple operation by key-press
- No need for liquid helium and liquid nitrogen

# Product Overview 2017

## Vacuum Gauges, Vacuum Controllers

### Measuring Instruments

Vacuum gauges and pressure gauges



Reliable monitoring and control for all vacuum processes.

#### Your Expectations:

- Gauge systems for every application
- Precise pressure measurement of gases and vapors
- Reproducibility across a wide pressure range

#### Our Solution:

- Measurement with active and passive sensors in a pressure range from  $10^{-12}$  to 2.000 mbar for every application
- Intuitive operation and flexible data retrieval
- Pressure switches and pressure control instruments
- Handheld versions for easy and reliable pressure measurements
- DAkkS or factory calibration of vacuum gauges in the pressure range from  $10^{-8}$  to 1,000 mbar



### GRAPHIX

Vacuum controller



Universal controllers for the connection of active vacuum sensors for direct pressure measurements in the range of  $10^{-10}$  mbar to 2000 mbar

#### Your Expectations:

- Operation and control of the entire vacuum system
- Simple handling and operation (plug & play)
- Fast process data accumulation and transfer via USB to PC

#### Our Solution:

- Monitoring and control of the entire vacuum process
- Product range with 1, 2 or 3 measurement channels
- 3.5" TFT touchscreen display with intuitive user interface
- Easy to read curve or bar graph display
- Internal and external data-logging (USB port on the front) for configuration and real-time measurement data
- Readout selectable between mbar, Torr, Micron, Pascal, Psi
- Option to connect active vacuum gauges from various brands

# Product Overview 2017

## Leak Detectors

### PHOENIX L300i

Leak detectors and leak testing systems



Designed for the requirements of industrial series production. Well-proven and easy to use in production and quality control programs.

#### Your Expectations:

- Non-destructive components testing for quality assurance
- Reliable technical solution
- Professional consulting
- Design and delivery of custom leak detection systems

#### Our Solution:

- Suitable for mobile or stationary vacuum and sniffer operation
- Configuration of leak rate, time and type of gas according to customer specifications
- Quick start-up, high measurement accuracy
- Remote control for wireless operation up to a distance of 100 m

### PHOENIX L500i

Leak detectors and leak testing systems



Highest productivity and reliability in testing all kinds of components during continuous short cycle operation. Unique operating concept.

#### Your Expectations:

- Absolutely reliable leak detection for quality assurance
- Rapid and reproducible test results
- High productivity
- Series testing in short cycle operation
- Testing of all kinds of components
- Simple and convenient operation
- Mobile unit, always ready for operation

#### Our Solution:

- Rapid evacuation, fast start-up time
- Response time: < 1 s
- Helium pumping speed at the inlet up to 50 l/s
- Simple operation, clear test results visualization
- Integrated data memory
- Rugged, innovative industrial design
- Remote control for wireless operation up to a distance of 100 m

# Product Overview 2017

## Vacuum Solutions / Engineering

### Vacuum Systems

#### Engineering



Vacuum solutions and systems of all kinds from the worldwide leading supplier. Benefit from our long-term experience.

#### Your Expectations:

- Comprehensive consulting service
- Customer specific application support
- Design and manufacture of custom vacuum solutions
- High flexibility and reliability
- Efficient solutions



#### Our Solution:

- System solutions - tailor-made concepts based on customer specifications
- Integrated forevacuum and high vacuum pump systems for custom requirements
- Worldwide engineering, production and service centers
- Global project coordination
- Custom software programming and customization
- Constant product improvements and innovations
- On-site commissioning and training

### CVS

#### Central vacuum stations



Modular systems for improved operational reliability in frequent varying vacuum consumptions. Delivery of turnkey ready-to-operate and tested units.

#### Your Expectations:

- Industrial grade vacuum generator
- For covering demands of numerous small vacuum consumers individually and simultaneously
- Modular design for customizing to customer specific processes

#### Our Solution:

- Typically consisting of SOGEVAC pump(s), buffer vessel, electrical cabinet with controller, all connecting components
- Pumping speed 25 to 840 m<sup>3</sup>/h
- Ultimate pressure  $\leq$  0.5 mbar
- Vessel volume 60, 160, 300, 500 or 1000 liters
- Electric power from 0.8 to 18.9 kW
- Control type BASIC or Full Featured
- Low cost of ownership



# Product Overview 2017

## Vacuum Systems

### RUTA Vacuum Systems

Multistage forevacuum systems



Reliable process engineering solutions due to long-term experience in designing customized vacuum systems and custom controls.

#### Your Expectations:

- Professional consulting
- Design and delivery of demand-oriented and optimized vacuum systems
- Reliable engineering solution

#### Our Solution:

- Custom designed forevacuum pump systems
- Oil-sealed/dry compressing
- Pumping speed and ultimate pressures adapted to the process
- Additional high vacuum stages facilitate operating pressures down to  $10^{-7}$  mbar

### UNIVEX

Experimentation and coating systems



Easy operation and accessibility of vacuum chambers. Manual or automatic process control and documentation.

#### Your Expectations:

- Flexible laboratory systems for vacuum coating
- Systems for university and industrial research
- Results transferable to large scale systems or serial production
- High reproducibility degree

#### Our Solution:

- Multipurpose systems for the production of functional layers
- Modular system configuration, wide range of accessories
- Customized system solutions
- Variable chamber sizes

### Calibration Systems CS

Custom vacuum calibration systems



Process reliability by regular checks, adjustments and recalibration of vacuum gauges and sensors.

#### Your Expectations:

- Checking the characteristics of vacuum gauges
- Precise calibration of vacuum gauges in accordance with DAkkS (national accreditation body for the Federal Republic of Germany)

#### Our Solution:

- Universal calibration systems with a special vacuum chamber, turbo-molecular pump system, vacuum gauges and additional components depending on the calibration pressure (heating jacket, separate pump system for admitting gas, et al.)

# Product Overview 2017

## Controllers for Vacuum Systems High Vacuum Pump Systems

### Controllers

Innovative pump and system management



Tailor-made controllers and control systems adapted to customer and process requirements for optimum performance and user convenience.

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#### Your Expectations:

- Customer specific system interfaces
- Simple to complex visualization
- Power distribution integrated within the system
- Convenient control of all system components

#### Our Solution:

- Control and data acquisition of system parameters via digital I/O interfaces or bus systems, Ethernet, Profibus, RS 232, WiFi, GSM, for example
  - Implementation of custom software programming
  - Simple digital display via touch panel up to visualization on mobile devices (via apps)
- 

### TURBOLAB

High vacuum pump systems



Plug-and-play high vacuum pump systems based on well-proven components. Different configurations cover individual vacuum demands.

---

#### Your Expectations:

- High vacuum pump systems for industry and research
- Oil-sealed or dry compressing forevacuum pumps for a hydro-carbon-free vacuum possible
- Compact and user-friendly solution

#### Our Solution:

- Pumping speed 78 - 400 l/s provided by the TURBOVAC i pump range
  - Ultimate vacuum down to  $10^{-10}$  mbar
  - Completely preassembled units with turbomolecular pump, TPU display power unit, frequency converter and forevacuum pump
  - Easy to relocate pumps out and away from the frame
  - Backlight display in the innovative TPU power unit
  - Covering a wide range of applications with a full range of high vacuum and dry or wet forevacuum pumps
  - Integrated data logger and webserver for system control, monitoring and configuration
  - Connection of up to six accessories and two gauges
  - Benchmark design, reliability and functionality
-



# Product Overview 2017

## Valves Fittings

### LEYCON

Valves in different design types and driving modes



Reliable valve technology is widely used in a broad range of applications.

#### Your Expectations:

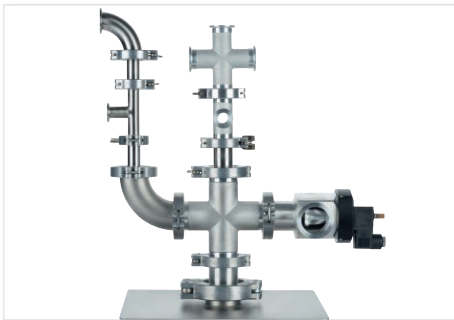
- Reliable leak tightness
- High number of actuations
- Simple to fit and remove
- Delivery from a single source

#### Our Solution:

- Manually actuated valves
- Valves with electromagnetic/electropneumatic drive
- Gate valves
- All-metal valves for UHV systems
- SECUVAC safety valves
- Special valves, such as vacuum lock and sealing valves, venting valves, leak valves

### Flange systems

Connection components



Well proven and widely used technology. Almost any connection possible.

#### Your Expectations:

- Simple to fit and remove
- Reliable leak tightness
- High class materials, top quality
- Delivery from a single source

#### Our Solution:

- ISO-KF style small flanges in sizes DN 10 to DN 50
- ISO-K flanges in sizes DN 63 to DN 630
- CF flanges in sizes DN 16 to DN 250

# Product Overview 2017

## Vacuum Oils and Pump Fluids Leybold Academy

### LEYBONOL

Vacuum oil, pump fluids and special lubricants



Broad product portfolio for every application in practical container sizes. Guaranteed, constant quality for a long pump lifetime.

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#### Your Expectations:

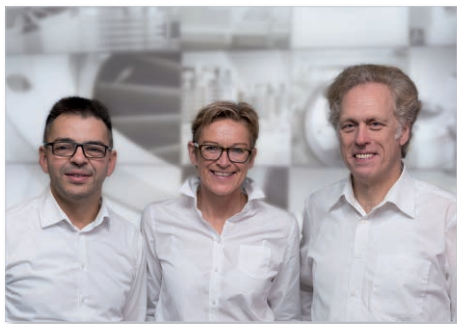
- High quality lubricant with long lifetime
- Excellent vacuum performance
- Reliable pump fluids for diffusion pumps

#### Our Solution:

- Special vacuum oil in 5 star quality for highest demands, qualified according to proven standards
  - Mineral, Ester, PAO special synthetic and PFPE oils for exchange intervals up to 3 years in clean applications
  - Permanent quality control
  - Oil analysis services for process control and optimization
- 

### Leybold Academy

Vacuum technology seminars/training center



Qualified training of your staff by practical knowledge transfer. Provides best possible performance and equipment uptime.

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#### Your Expectations:

- Understand vacuum technology
- Get practical and hands-on oriented training

#### Our Solution:

Systematic training covering the entire spectrum of vacuum and leak detection technology.

The program comprises:

- Fundamentals of vacuum technology
  - Leak detection and leak testing
  - Maintenance work on vacuum pumps
  - Customer-specific workshops
  - Qualified according to DIN ISO 9712 (leak testing)
-

# Product Overview 2017

## Spare Parts

### After Sales Support, Online Shop

#### Spare Parts

Genuine wear parts and consumables



Original spare parts for long and trouble-free operation.

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**Your Expectations:**

- Guaranteed availability
- Highest manufacturer quality
- Short delivery times

**Our Solution:**

- Range for all commonly requested spare and wearing parts, widely available in practice-oriented parts kits
  - Spare parts are subject to the same rigorous quality requirements which apply to our pumps
- 

#### After Sales Support

Services



Reliable original equipment manufacturer service from one source.  
Easy, competent, reliable

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**Your Expectations:**

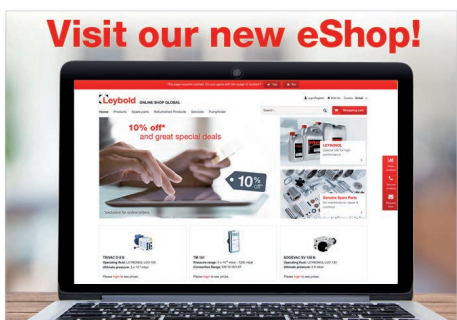
- Global availability of service
- Short downtimes
- Fair repair charges

**Our Solution:**

- Range of service that accompanies your vacuum equipment over the entire life cycle
  - Tailor-made service concepts and contracts
  - Maintenance and repair, on-site or at a Leybold Service Center
  - Installation and training
  - Exchange and backup pool
  - Calibration of measurement systems
- 

#### Online Shop

[www.leyboldproducts.com](http://www.leyboldproducts.com)



Shop vacuum technology online. Available in more than 12 countries worldwide.

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**Your Expectations:**

- Easy order process
- Secure payment options
- Large product range, fast delivery

**Our Solution:**

- Purchase vacuum components which do not require consulting, such as fittings, measuring instruments, pumps, spare parts, vacuum oils, lubricants
  - Delivery with invoice, credit card or pre-payment
  - Order 24 hours online
-

# Leybold Services.

Easy, competent, reliable.



## Your contact – wherever you are

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The Leybold logo consists of a stylized 'L' inside a square, followed by the word 'Leybold' in a bold, red, sans-serif font.

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