



**Leybold**

**Innovative  
vacuum solutions**  
for special metallurgy



**Leybold is a world leading supplier of vacuum pumps, systems and accessories for almost every application. Especially in the wide field of metal production and refining, Leybold vacuum solutions are utilized in all production steps.**

From secondary metallurgy degassing processes, over special metallurgy refining steps until the final heat-treatment processes of the machined metals, at all vacuum demanding process steps you can benefit from our long-term experience and market specific competence. The Leybold industrial vacuum solutions feature a durable and reliable design. Combined with excellent performance data, this makes them ideal suitable for demanding special metallurgy applications as e.g. VIM or VAR.



**VIM -  
Vacuum Induction Melting**

Degassing of molten metal under vacuum. Induction is used to melt and stir the metal. The molten metal is refined under vacuum to remove impurities until the precise melt chemistry is achieved.

The VIM process is used to produce e.g., stainless steels, superalloys, magnetic or battery alloys.

**Specific challenges for the vacuum system:**

- Metal- and metal oxide dust entering the vacuum system (potentially pyrophoric)
- High gas inlet temperatures
- Low process pressure requirement down to  $10^{-4}$  mbar, depending on the alloy

**VAR -  
Vacuum Arc Remelting**

The VAR process is used to improve the composition of standard air-melted or vacuum induction melted ingots to produce clean, homogeneous metals with improved fatigue resistance and fracture strength. The ingots are used as a consumable electrode and are remolten via an arc under vacuum. High vacuum is maintained during the melting process to remove impurities and prevent from oxide formation.

**Specific challenges for the vacuum system:**

- Metal- and metal oxide dust entering the vacuum system (potentially pyrophoric)
- Residual humidity and aggressive gases
- Low process pressure requirement down to  $10^{-4}$  mbar, depending on the alloy



**Matching Products**

**Oil Vapor Jet Pumps OB**

Oil vapor jet pumps and systems are characterized by offering the highest available pumping speed for metallurgical high-vacuum processes. These pumps are rugged endurance runners proven in steel production processes like VIM and VAR.

OB vapor jet pumps comprise out of a four-stage nozzle system backed up by a vapor jet stage. They are best suited for high vacuum generation in the  $10^{-1}$  to  $< 10^{-4}$  mbar operating range.

Their pumping speed range covers 6,000, 12,000 and 18,000 l/s pump sizes.

**Dry Vacuum Pump Systems**

Vacuum systems combining Roots pumps with dry screw pumps provide best performance in applications involving the handling of large amounts of dust. They are highly recommended when reduced energy consumption and minimized maintenance demands are required.

Based on their inherent robustness, dry screw-type pumps like the DRYVAC DV and Roots pumps as the RUVAC WH are proven to ensure high system uptime, even for demanding applications as VIM or VAR.

# Vacuum Pumps

## for VIM and VAR Melting Processes



### OB Oil Vapor Jet Pumps

#### Product and process benefits

- Best vacuum performance in its class
  - > 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
- Highly robust and reliable
- Modular design
- Easy to service
- ECO power efficiency control unit for optimum power consumption conditions perfectly adapted to the current oil temperature demand
  - > Cost reductions through energy savings (up to 30%)
  - > Increased service life of oil and heating cartridges

### DRYVAC SYSTEMS

DRYVAC Systems are robust, reliable and durable, ready to fulfill highest process requirements. They are ideally suited for demanding industrial applications.

The standard systems, equipped with “state-of-the-art” mechanical pumps, are available in the following versions:

- Basic (no electronics)
- Smart with integrated power electronics, monitoring devices for the purge gas system and key parameters, local remote for easy and user-friendly operation handling, and additional features, e.g. connecting a gauge head.
- Pumping speed 450 to 7,000 m<sup>3</sup>/h
- Ultimate pressure down to  $10^{-3}$  mbar
- Flexible modular system family
- Easy to adopt to customer needs
- Different options available, i.e. DRYVAC Energy Saver power saving unit

#### Product and process benefits

- High tolerance to dry metallurgy dust
- Extreme robust, most compact and wear-free design
- Hermetically sealed, no shaft-seal (depending on the chosen model)
- High reliability, high performance
- Low power consumption and noise emission
- Energy efficient, cost effective
- Long lifetime of seals, bearings and gear oil by intelligent purge gas system
- Minimized annual maintenance
- World wide service support