



Vacuum Systems

for Tertiary Metallurgy
Melting Applications



Vacuum Solutions for Tertiary 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 tertiary 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 tertiary metallurgy applications as e.g. VIM or VAR.

VIM Vacuum Induction Melting



Melting of metal via electromagnetic induction under vacuum. The induction furnace is located inside a vacuum chamber. The melted metal is refined under vacuum until the precise melt chemistry is achieved. Impurities are removed by chemical reaction, flotation, disassociation, and volatilization.

The VIM process is used to produce stainless steels, superalloys, magnetic and battery alloys, for example.

Challenges to the vacuum system

- Dust in the process gas
- High gas inlet temperatures
- Process pressures down to 10^{-4} mbar l/s, depending on the alloy

VAR Vacuum Arc Remelting



Continuous remelting of a consumable electrode via an arc under vacuum. High vacuum is maintained during the melting process to remove impurities and prevent from oxide formation.

The VAR process is used to improve standard air-melted or vacuum induction melted ingots to produce clean, homogeneous metals with improved fatigue resistance and fracture strength.

Challenges to the vacuum system

- Dust in the process gas
- Residual humidity and aggressive gases
- Process pressures down to 10^{-4} mbar l/s, depending on the alloy

High Vacuum

Oil booster high vacuum solutions for VIM



Forevacuum

Dry vacuum systems for VIM and VAR



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 highest 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 m³/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



Pioneering products. Passionately applied.