AMG ENGINEERING

ALD Vacuum Technologies

High Tech is our Business

VIM02 - VIM70

Vacuum Induction Melting and Casting Furnaces

Vacuum induction melting, a common process in secondary metallurgy for production of high purity metals

The vacuum melting process ensures the formation of non-metallic oxide, which allows for effective degassing of the melt and precise adjustment of the alloy composition. Inclusions that are responsible for premature part failure, particularly critical applications, such as jet engine parts, require the production of alloys with a very low concentration of undesired volatile trace elements.

VIM Process Characteristics

- High flexibility and versatility
- Fast change of programs
- High efficiency due to desoxidation
- Close compositional tolerances
- Precise temperature control
- Low dust output
- Removal of undesired elements

Extremely precise adjustment of the alloy composition and melt homogenization since

- melt temperature,
- vacuum,
- gas atmosphere,
- pressure and
- kinetics

can be adjusted independently. VIM technology can be used in conjunction with a number of casting and mold treatment processes.

Our range of add-on components allows you to adapt or retrofit any furnace model to meet your special process requirements

The vacuum prevents oxidation of sensitive alloy elements

Backfilling with inert gas after melting guarantees that the purity of the melt, which is a result of the vacuum treatment, is preserved. Continuous casting allows intensive cooling of the poured metal and an exact range of solidification. That prevents segregation.

VIM12
VIM basic equipment furnace single chamber design with melt chamber, induction coil, vacuum pump set, melt power supply, controls and accessoires

VIM70 VMC
Furnace with separate Vertical Mold Chamber for ferrous and non-ferrous alloys (in combination with mold treatment directional solidification is possible)

Standard VIM Furnaces

ALD's vacuum induction melting and casting furnaces of the VIM 02 to VIM 70 product line are modular, universal standard systems endowed with a broad range of accessories to tailor them to customers' individual production needs.

- Availabe for all furnaces, for example, are additional coils to be used for different melt materials and crucible sizes
- Ingot mold turntable for pouring into several molds under identical conditions
- Facilities for charging
- Temperature measurement
- Sampling
- Mold treatment

Special Applications upon request

Semi-finished products like:

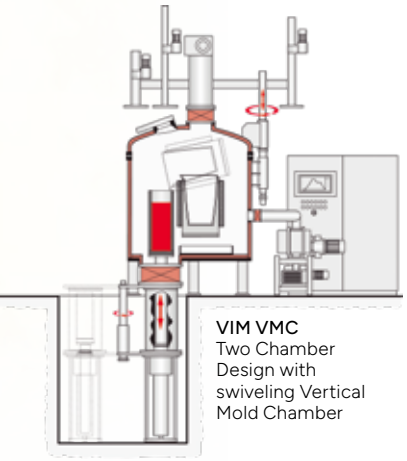
- Strips and rods
- Ingots and electrodes
- Targets and flakes

by the following procedures:

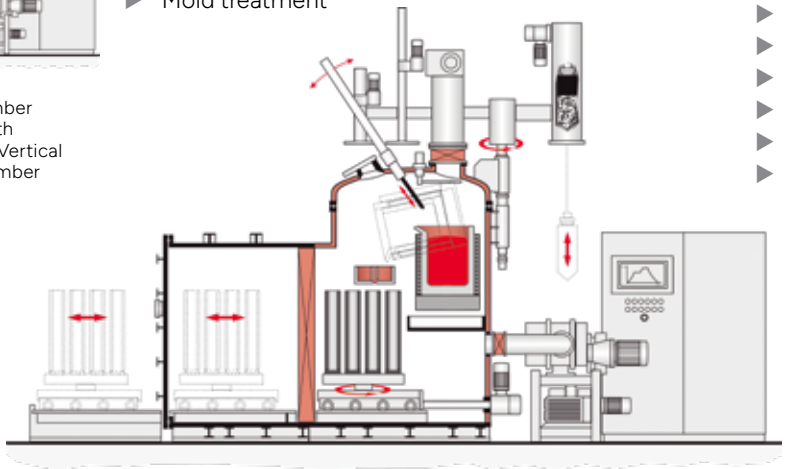
- Mold casting
- Continuous casting
- Vacuum induction distillation
- Flake casting

in:

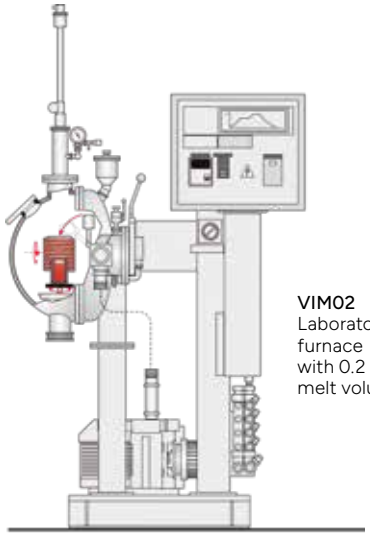
- Research & development
- Electronic industry
- Dental application
- Automotive and aerospace industry
- Ferrous applications
- Non-ferrous applications
- Precious metal industry



VIM VMC
Two Chamber Design with swiveling Vertical Mold Chamber



VIM HMC
Two Chamber Design with Horizontal Mold Chamber allows to lock in molds prior to casting without interrupting the furnace atmosphere – this avoids excessive temperature losses of preheated molds



VIM02
Laboratory
furnace
with 0.2 ltr.
melt volume

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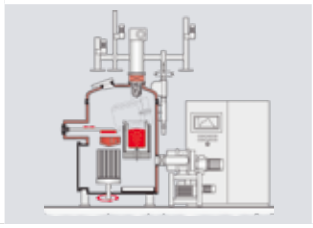
VIM50
VIM furnace with tundish
heater and oxygen resp.
inert gas blowing device for
research and development



VIM
with bottom purging,
tundish heating and
rotary mold table

VIM12 HMC
VIM with separate horizontal
Mold Chamber

Control Systems

- Manually via manual valve
- With buttons for pumps, gas-inlet valves with LED display
- By operator control with recipe management and cleartext display
- Programmability for diverse melt recipes
- Automatic system for melting down and casting
- Display on mosaic mimic diagram or video screen

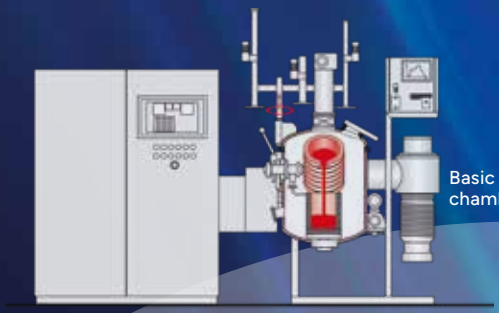
The nomenclature of different furnace designs

VIM02-70	Vacuum Induction Melting in range of 0.2 to 70 litres crucible volume, basic equipment
VIM-MT	with Mold Treatment Module
VIM-DS	with Directional Solidification
VIM-HMC / VIM-VMC	with separate Horizontal or alternatively Vertical Mold Chamber
VIM-P	with Over-Pressure-Operation

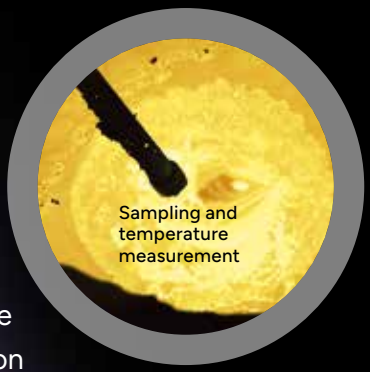
other furnace designs upon request

Basic system easy to modify with special equipment

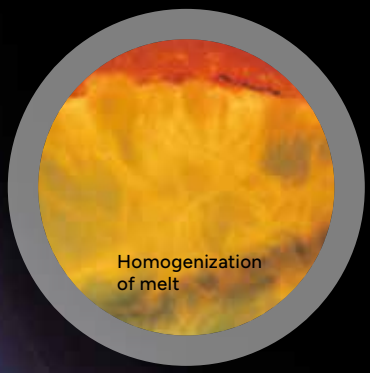
Produce a system tailored to individual production needs like "Vacuum Induction Distillation furnace" or "Vacuum Induction Melting furnace" with separate mold chamber for inserting molds into the melt chamber shortly before casting.



Basic single chamber design



Sampling and temperature measurement



Homogenization of melt

		VIM02	VIM05	VIM2	VIM4	VIM6	VIM12	VIM20	VIM35	VIM50	VIM70
Crucible											
Nom. capacity (from...to...)	[l]	0.1–0.2	0.04–0.5	0.5–1.95	1.95–3.5	3.5–5.8	5.5–12	12–21.4	18-35	21.4–50	50-70
Nom. capacity, max. (g St.=7.2 g/cm³)	(kg)	1.5	4	14	25	40	85	150	250	350	500
Max. Size/Mold Setup											
Diameter	(mm)	100	180	180	220	320	380	500	800	550	1000
Height	(mm)	180	220	360	400	440	480	750	1000	1000	1100
Vacuum Range											
Medium-vacuum pumping system*	(mbar)	$x10^{-2}$	$x10^{-2}$	$x10^{-2}$	$x10^{-2}$	$x10^{-2}$	$x10^{-2}$	$x10^{-2}$	$x10^{-2}$	$x10^{-2}$	$x10^{-2}$
High-vacuum pumping system	(mbar)	$x10^{-4}$	$x10^{-4}$	$x10^{-4}$	$x10^{-4}$	$x10^{-4}$	$x10^{-4}$	$x10^{-4}$	$x10^{-4}$	$x10^{-4}$	$x10^{-4}$
Recommanded Power Supply for Melting											
MF power at 250 V	(kW)	6	20	40	60	80	120	180	250	250	450
Frequency	(KHz)	20	10	4	4	4	4	2	1.5	1	1
Coil voltage	(V)	250	250	250	250	250	250	250	400	400	400
Electr. connected Loads incl. High-Vacuum											
Pumping Unit	(kVA)	20	40	60	100	120	190	320	400	460	650
Line-voltage data	(V/Hz)	3x400/50	3x400/50	3x400/50	3x400/50	3x400/50	3x400/50	3x400/50	3x400/50	3x400/50	3x400/50
Cooling-Water Consumption	(l/min)	20	60	80	120	150	200	290	350	400	700
Cooling-water pressure, min.	(bar)	4	4	4	4	4	4	4	4	4	4
Compressed Air Pressure	(bar)	6	6	6	6	6	6	6	6	6	6
Space Requirement	(mxm)	1.1x1.1	1x2.7	1x2.9	1.4x3	2.7x3.4	3.4x3.7	4.8x4.8	4.5x5.5	5.6x6.7	8.0x9.0
System height, with options	(m)	2.0	3.0	3.1	3.2	3.5	3.9	5.3	5.7	5.9	6.4
Total Weights (approx.)	(kg)	475	1500	1750	1900	3150	4000	7000	9500	11500	15200
Weight of furnace (approx.)	(kg)	450	900	1050	1200	2400	2800	5200	7600	9500	13000
Weight of MF power supply (approx.)	(kg)	25	600	700	700	750	1200	1800	1900	2000	2200

*mechanical pumps only

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ALD – Leading Supplier for Advanced Vacuum Furnaces

Being one of the leading suppliers of vacuum plants and process technology we supply the entire vacuum metallurgy and vacuum heat treatment sector with our high-tech products and processes. ALD offers individual solutions for the best economic performance. We offer worldwide support and maintenance service for our high-quality plants during their entire lifecycle. Each newly delivered ALD plant meets the latest digital standards and is characterized by a particularly high level of environmental compatibility.

150+ YEARS EXPERIENCE – A Young Company with History

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