

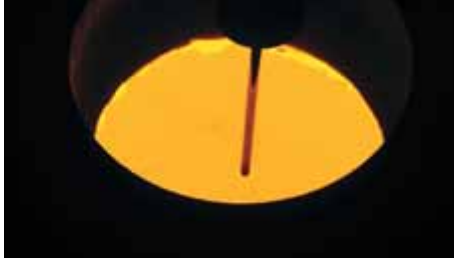


## **VIM-IC**

**Vacuum Induction Melting - Investment Casting**

**The New Modular System Design for the Highest Demands in Vacuum Precision Casting**

# VIM-IC - Advanced Equipment and Process for the Production of Near Net Shape Com



**Charging – Melting – Temperature Measurement**

## System and Process Technology

Depending on the size of the components, ALD offers vertical or horizontal furnace designs. The required solidification structure of the casting can be adjusted to be equiaxed (E) or, through the use of an additional mold heater and baffle, directionally solidified (DS) or single crystal (SC). ALD offers a system to fulfill all requirements.

## Products

- Blades, vanes and impellers as well as structural parts for the
- Aircraft industry
  - Power generators
  - Automotive industry
  - Medical/Chemical/Electronic industries

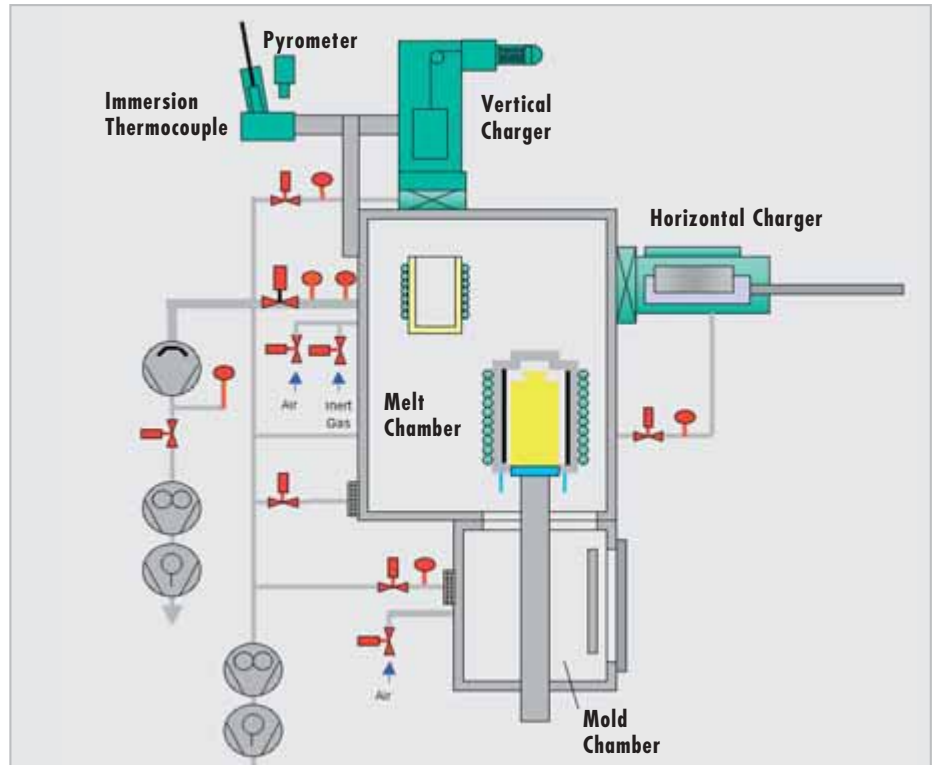


**Turbine Blades with Equiaxed (E), Directionally Solidified (DS) or Single Crystal (SC) Structures**



**VIM-IC 10 E/DS/SC with Double Door Design for quick Change from E to DS/SC Operation and Vice Versa.**

# Technology ponents



Furnace Schematic with main Modules

## New VIM-IC Furnace Generation

Modular design provides the highest flexibility for meeting specific customer requirements.

All modules can be adapted to your special needs.

- Size of melt and mold chamber
- Capacity of the vacuum system
- Type of mold heating (resistance or induction)
- Thermocouples, chargers, withdrawal unit, power system

# VIM-IC – Main Furnace Components

## VIM-IC – Main Features

- Menu driven furnace control in customer's language
- All electrical drives – no hydraulics
- Coil tilting and traversing device with highly, efficient power feedthrough
- Vertical and horizontal charging device
- Resistance or induction mold heating devices



**Mold Chamber with  
Lock Valve in Service  
Position**

**VIM-IC 10 E/DS/SC  
Service Platform**



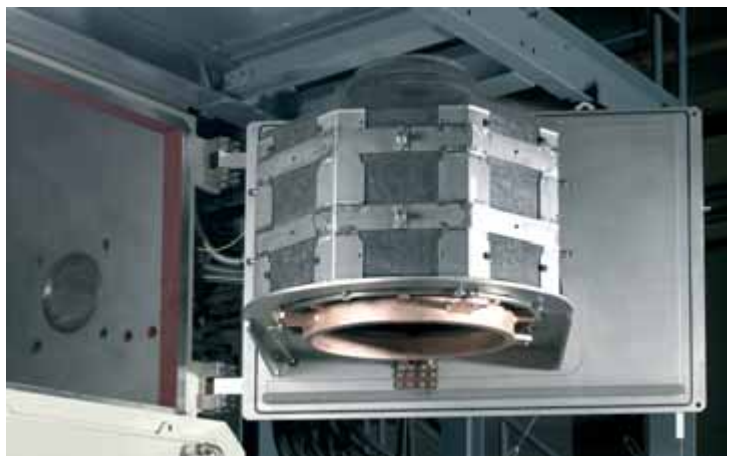
**Devices for Coil Tilting and Traversing**



**Melting Furnace Box attached to Furnace Door**



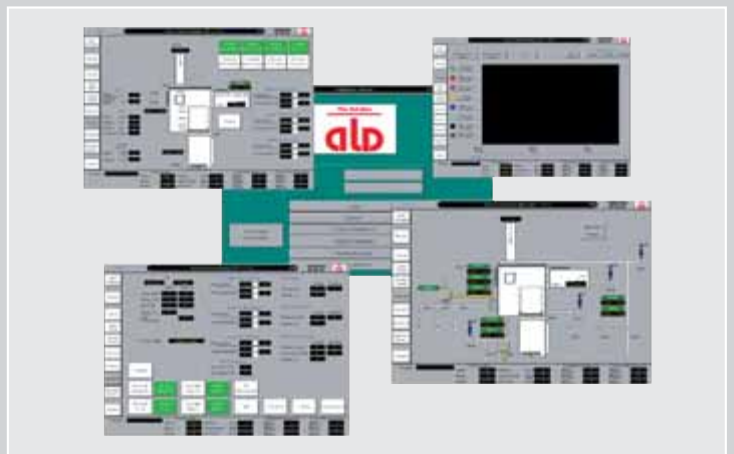
**Induction Mold Heater  
attached to Furnace Door**



**Resistance Mold Heater attached to Furnace Door**



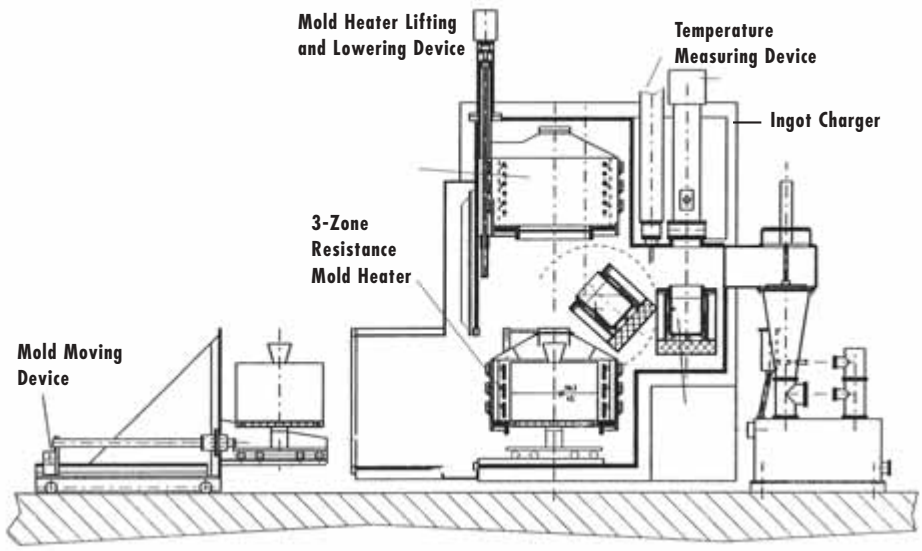
**Main Control Station - Visualization Monitor with Touchscreen**



**Visualization Screens**

# Special Casting Furnaces for Large Compon

## Horizontal Casting Furnaces for Large Components and Vibration-Free DC/SC Withdrawal

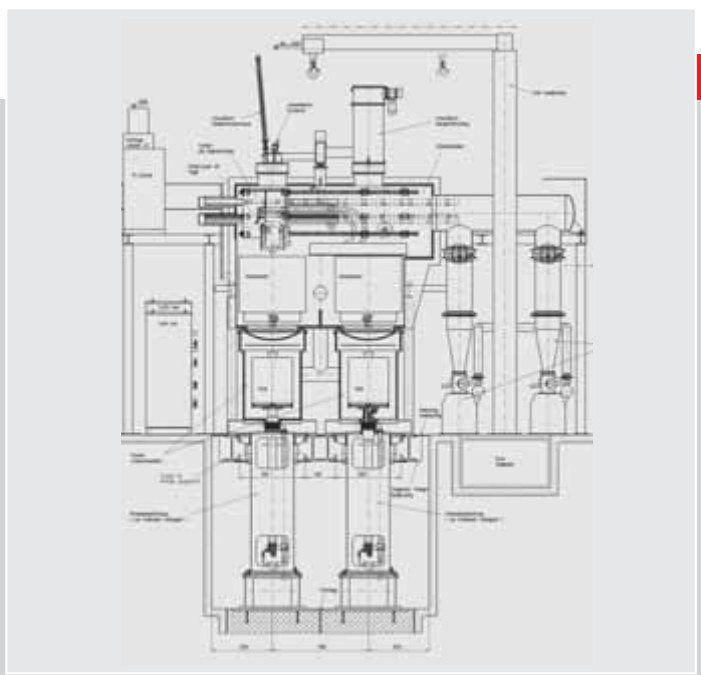


**Horizontal Furnace VIM-IC 40 E/DS/SC for the Production of large E, DS and SC Components**

**Casting Weight: 360 kg/800 lbs  
Mold Diameter: 1000 mm/40"  
Mold Height: 1000 mm/40"**

**Schematic of large horizontal VIM-IC Furnace**

## Dual Withdraw Furnace for Highly Economic Production of Large DS/SC Components



**Dual Withdrawal Furnace VIM-IC 20 DS/SC**

**Max. Casting Weight: 150 kg/330 lbs  
Max. Mold Diameter: 800 mm/32" / Mold Height: 1000 mm/40"**

**Schematic of Dual Withdrawal Furnace**

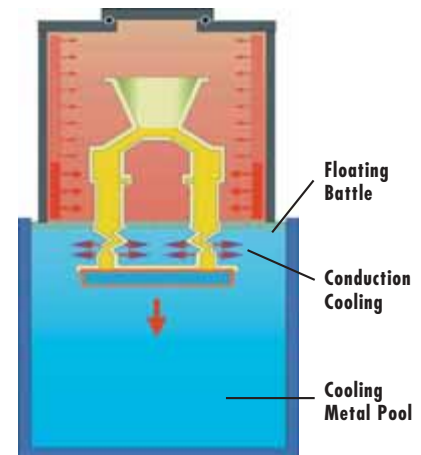
# ents

## Liquid Metal Cooling (LMC) Process Technology for Large DS/SC Components and Highest Thermal Gradients

### Main Features of the LMC Process

- Complex mold clusters can be processed
- Floating baffle allows optimal separation of hot and cold furnace zones
- 2 - 3 times higher thermal gradients by improved heat extraction
- Improved microstructure (by a factor of 2 smaller PDAS)
- Improved solidification conditions for large DS/SC components

The LMC Technology is of particular interest for the production of large DS/SC components where thermal gradients and thus the process efficiency are very limited. ALD has built several LMC furnaces up to cast weights of 150 kg and mold dimensions of 800 mm/ 32" dia. and 1000 mm/ 40" height.



Schematic of the LMC Process with improved Baffle Technique



VIM-IC 10 DS/SC/LMC for the Pilot Production of large DS/SC Components using LMC Process



VIM-IC 0.5 DS/SC/LMC R & D Furnace for the LMC Process

## Technical Data

Furnace Type	Unit	VIM-IC 5	VIM-IC 10	VIM-IC 20
<b>Nominal Furnace Capacity</b>	Liters	5	10	20
<b>Max. Cast Weight</b> Ni-Base-Alloy:	(kg/lbs)	50/110	100/220	200/440
<b>Max. E-Mold Diameter</b>	(mm/inches)	500/20	900/36	1000/40
<b>Max. E-Mold Height</b>	(mm/inches)	600/24	1000/40	1250/50
<b>Max. DS/SC-Mold Diameter</b>	(mm/inches)	400/16	600/24	1000/40
<b>Max. DS/SC-Mold Height</b>	(mm/inches)	500/20	760/30	1200/48
<b>Typical Operation Vacuum</b> with Oil Diffusion Pump(s)	(PA)	0.1	0.1	0.1
with Oil Booster Pump(s)	(PA)	0.5	0.5	0.5
Typical Leak Rate	(PA x l/s)	0.5-0.7	0.6-0.8	0.7-2
Standard Melt Power Supply	(KW)	150/175	200/250	250/300
<b>Cooling Water Consumption</b> for E-Furnace	(l/min. / gpm)	330/90	380/100	400/110
for DS/SC-Furnace	(l/min. / gpm)	430/120	540/150	640/170
<b>Connected Load</b> for E-Furnace	(KVA)	290	420	520
for DS/SC-Furnace	(KVA)	440	590	800
<b>System Dimensions</b> Length x Width x Height	(m/feet)	7/23 x 6/20 x 5/19	7/23 x 7/22 x 8/25	10/34 x 6/19 x 8/27
Pit Depth	(m/feet)	3/10	3.4/11	3.6/12
<b>Special Versions on Request</b>				

### ALD Vacuum Technologies GmbH

Wilhelm-Rohn-Strasse 35  
D-63450 Hanau  
Tel.: +49 (6181) 307 - 0  
Fax: +49 (6181) 307 - 32 90

e-mail: [info@ald-vt.de](mailto:info@ald-vt.de)  
Internet: [www.ald-vt.de](http://www.ald-vt.de)

### USA / Canada

ALD Vacuum Technologies, Inc.  
18, Thompson Road  
East Windsor, CT 06088  
Phone +1 (860) 386 7227  
Fax +1 (860) 386 7220

### Great Britain

ALD Vacuum Technologies Ltd.  
First Floor  
276 High Street  
Guildford, Surrey GU 1 3JL  
Phone +44 (1483) 45 - 44 34  
Fax +44 (1483) 30 - 66 41

### Japan

ALD Thermo Technologies Far East Co., Ltd.  
6F. Shinjuku Nomura Bldg.  
1-26-2 Nishi-Shinjuku, Shinjuku-Ku  
Tokyo 163-0558  
Phone +81 (3) 3340 - 37 26  
Fax +81 (3) 3340 - 37 27

### China

ALD China Liaison Office  
c/o C&K Development Co., Ltd.  
Rm. 1102, South Office Tower  
Hong Kong Plaza  
283 Huai Hai Zhong Rd. Shanghai  
Phone +86 (21) 6385 - 55 00  
Fax +86 (21) 6384 - 03 11