

# VID

Vacuum Induction Degassing  
VID 400 – VID 3000

Vacuum Treatment of Melts  
with Charge Weights up to 30 tons

# VID – Vacuum Induction Degassing

The optimal link between conventional Steel Degassing (Secondary Metallurgy) and Vacuum Induction Melting (VIM)

## VID

The Vacuum Induction Degassing (VID) furnace concept has been developed for special applications in the ferrous and non-ferrous metals industry for charge weights up to 30 tons. Whenever pouring under vacuum is not specified or not required for metallurgical reasons, this bell type furnace with open-air teeming is recommended for its favourable economics.

Smaller steel shops and foundries will be able to produce with the VID furnace, within one step, high quality vacuum treated steels, whereas larger shops have to realize these qualities employing a conventional LF/VD/VOD production line. The temperature losses during degassing treatment are compensated by induction heating.

Product Application and Quality Improvement in Different Processes						
	VD	LF/VD	VOD	VODC	VID	VIM
Low carbon steels	+	+	+	+	+	-
High carbon steels	+	+	-	-	+	-
Tool and die steels	+	+	-	-	+	+
Stainless steels	-	-	+	+	+	+
Fe-Ni-Alloys	-	-	-	-	+	+
Superalloys	-	-	-	-	+	+
Non ferrous alloys	+	+	-	-	+	+
Hydrogen removal	+	+	0	0	+	+
Nitrogen removal	+	+	+	+	+	+
Decarburization	0	0	+	+	+	0
Vacuum carbon deoxidation	+	+	+	+	+	+
Desulphurization	+	+	+	+	+	-
Inclusion removal	+	+	+	-	+	+
Extra low carbon	-	-	+	+	+	+
Fine trimming	+	+	+	+	+	+
Temperature control	-	+	-	-	+	+

+ good    - not suitable    0 secondary effect

### Basic design [1]

Vacuum tight, tiltable, charge weights up to 30 tons

### Melting under vacuum [2]

Vacuum degassing/Deoxidation  
Precise temperature adjustment  
Decarburization/Desulphurization  
Alloying and Pouring

### Pouring

VID: Pouring at air [3]  
VID-Pro: Pouring under protective gas [4]  
VID-Oxy: Decarburization with dissolved oxygen [5]



Basic design

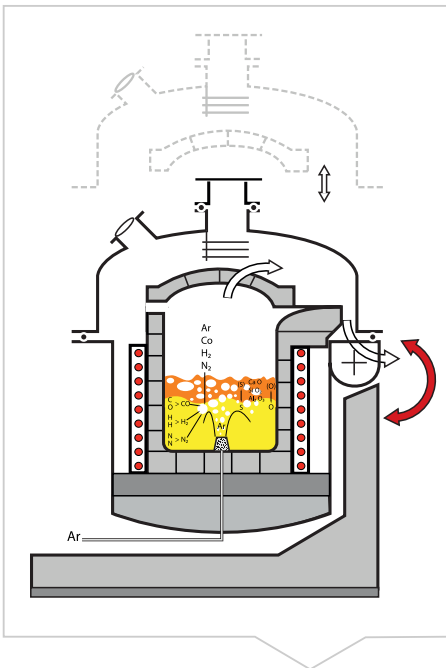


Melting under vacuum

## VID

All important secondary metallurgy treatment steps – melting under vacuum, refining such as decarburization, desulphurization, deoxidation, removal of undesired gases like hydrogen and nitrogen, exact adjustment of chemical analysis, cleaning, alloying, heating – are done in one single unit. The melt will be cast at air.

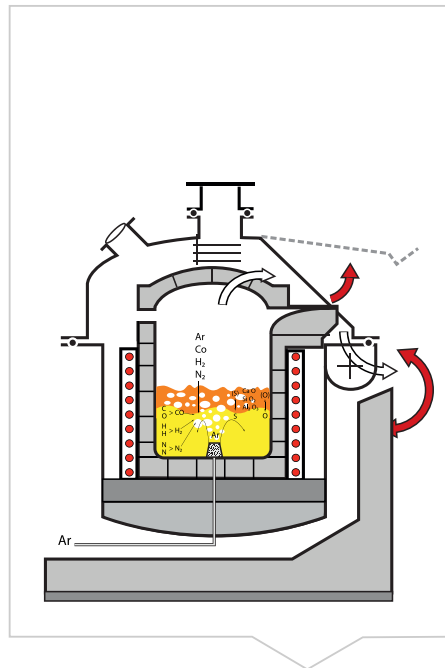
[3] VID: Pouring at air



## VID-Pro

The modified VID-Pro furnace allows not only meltdown and vacuum-refining, but also pouring under protective inert gas. The vacuum lid stays in closed position during melting, refining and casting. Gas-pick-up during tapping can be minimized.

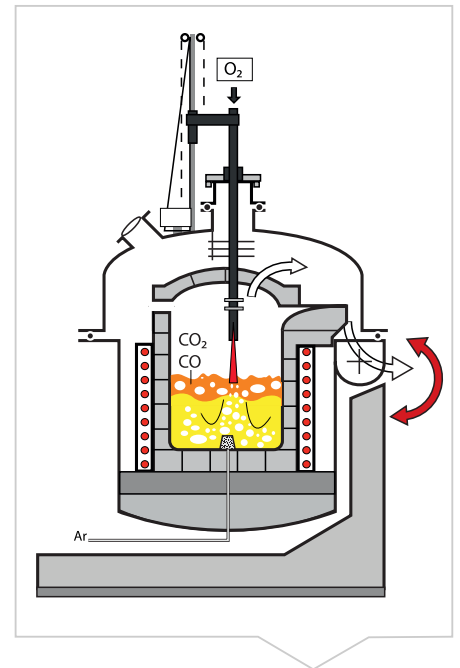
[4] VID-Pro: Pouring under protective gas



## VID-Oxy

The VID-Oxy furnace is dedicated to economical production of high-chromium steel grades, accomplished by using low-cost raw materials. Soft oxygen top blowing by means of a gas lance allows additional removal of carbon. With the VID-Oxy furnace concept it is possible to carry out metallurgical work such as degassing, deoxidation, desulphurization and removal of oxide-inclusions with a reactive basic slag and chemistry adjustment under vacuum. The results are very low carbon and nitrogen contents and high chromium yield. The VID-Oxy furnace is the ideal alternative to conventional steel degassing with EAF/VD/VOD at charge weights up to 30 tons.

[5] VID-Oxy: Oxygen blowing and slag treatment



Pouring at air



Pouring under protective gas



Slag treatment

# VID Systems and References



## [1+2] VID

**VID 1000 – 5 t**  
**Kind & Co, Germany**  
 Producer of tool-steels  
 Pouring at air



## [3] VID-Pro

**VID-Pro 2000 – 16 t**  
**KM-Kabelmetall, Osnabrück, Germany**  
 Pouring of copper alloys under protective inert gas atmosphere into slab caster

## [4] VID-Pro

**VID-Pro 400 – 3 t**  
**Vacuumschmelze Hanau, Germany**  
 Pouring of Fe-base alloys under protective inert gas atmosphere



**[5] VID-Oxy**

**VID-Oxy – 6 t**

**Shagang, China**

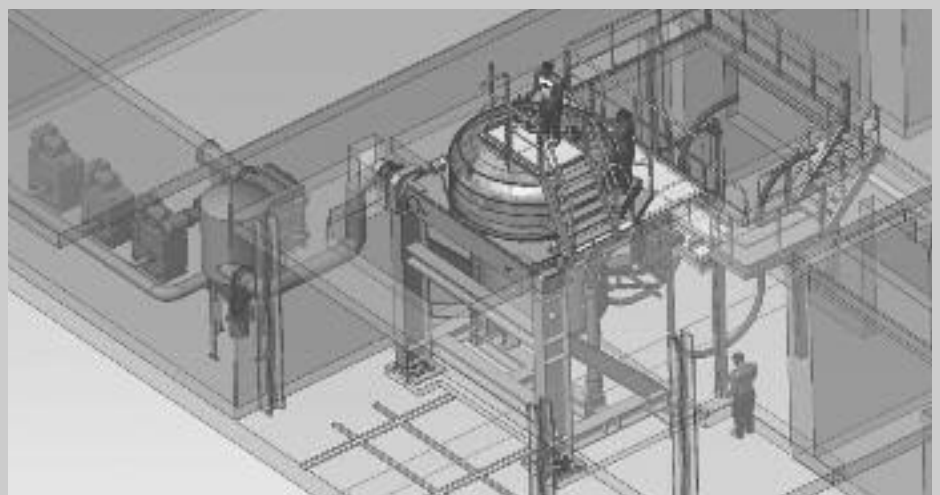
Decarburization by oxygen blowing

Production of special steels and low carbon steels

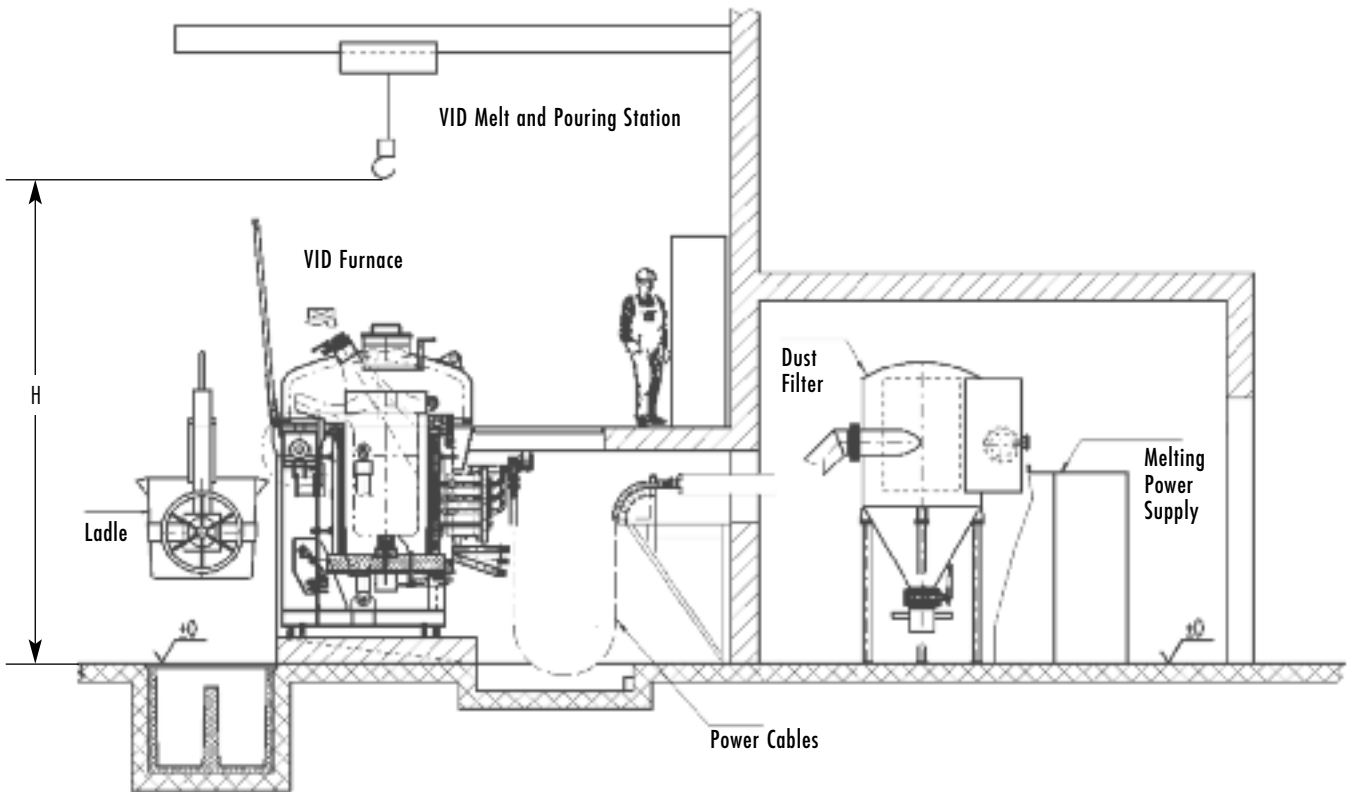


[6] VID

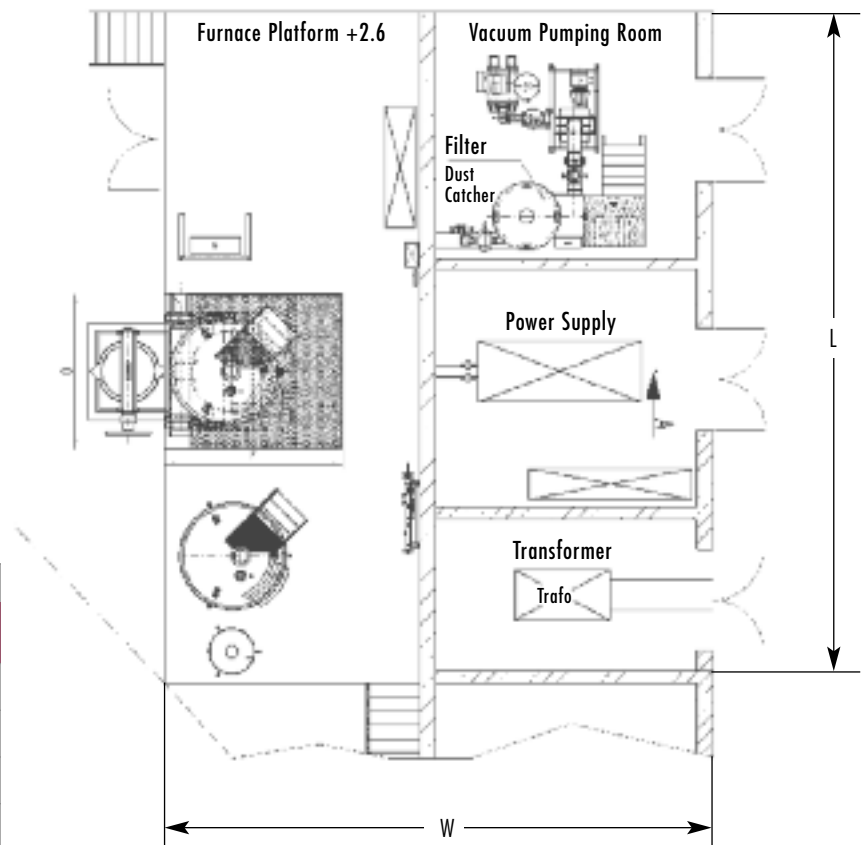
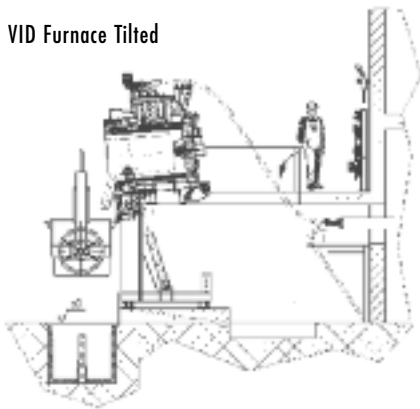
VID 2000 – 14 t  
Böhler Edelstahl, Kapfenberg, Austria  
Production of special steels



# Typical system configuration



VID Furnace Tilted



Furnace Size (metric ton)	Type	Space Requirement (in m)		
		L	W	H
1 - 3	VID 400	10	10	8.5
4 - 8	VID 1000	12	10	9.5
9 - 16	VID 2000	14	14	10
17 - 30	VID 3000	25	16	12

## Technical Data

Characteristic	Units	VID 400	VID 1000	VID 2000	VID 3000
<b>Crucible size</b> Capacity (based on Ni)	(metric tons)	1 - 3	4 - 8	9 - 16	17 - 30
<b>Typical cycle times</b> Fe-Cr base alloy/ Fe-Ni base alloys/ special steels	(h)	3 - 6	3 - 6	3 - 6	3 - 6
<b>Typical operating pressure</b> with mechanical pump set	(mbar)	0.5 - 5	0.5 - 5	0.5 - 5	0.5 - 5
<b>Electrical layout</b> Output, melting power supply Connected power vacuum pump set and auxiliary equipment (depending on scope of supply)	(kW) (kVA)	600 - 1,500 80	1,500 - 2,500 100	2,500 - 3,500 130	3,500 - 5,000 150
<b>Cooling water</b> Total consumption ( $\Delta t=10\text{ }^{\circ}\text{C}$ )	( $\text{m}^3 \times \text{h}^{-1}$ )	80	100	150	200
<b>Floor area</b> length (L) x width (W) Height	L x W (m) (m)	10 x 10 8.5	12 x 10 9.5	14 x 14 10	25 x 16 12
<b>Recommended Crane Capacity</b>	(metric tons)	15	30	50	70



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