

The VC series Vacuum Pressure Casting Machines

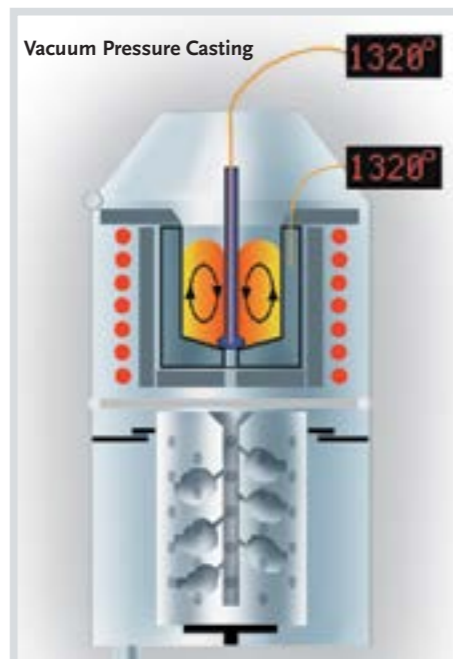
Technology for high quality casting



Find the casting solution perfectly fitting to your requirements

The range of our VC series machines reach from small to very large capacities, from semi-automatic systems to solutions for a fully automated casting production. A lot special features are enabling you to optimize each casting according to its individual characteristics.

Melting by induction technology:
The crucible with the material is located in the core of the induction coil. By generating a strong alternating magnetic field, the result is a strong alternating current in the graphite crucible and in the metal. This leads to fast heating up and thorough mixing of the material.



Efficient process handling



Separate lock systems for Overlapping Casting

All Induterm VC machines have separate lock systems for the melting chamber and flask chamber. This allows time to be saved by "overlapping" casting: while the flask remains in the flask chamber for several minutes after the casting, you may fill in and heat up the next charge.

Pneumatic bell lock and closing system

The melting chambers of all VC machines are locked by a pneumatic system. VC 650 V and VC 680 V are additionally equipped with an automatic closing system.

Automatic flask and chamber lift

The flask lift facilitates the handling of the flasks. When swivelling-in the vacuum chamber, the inserted flask is lowered and then the chamber is automatically docked. When opening the chamber, the flask is lifted for easy take out. This way you can use of economic flasks without flange.

Program control system for fast and certified casting processes

Thanks to the control panel with full text LCD display, all programs and parameters

are very easy and convenient to set. The semi-automatic machines offer temperature programs. The fully automatic machines have a program control system involving all parameters. Up to 100 casting programs guarantee fast operation and consistent casting results. Parameters are pre-programmed for all major alloys, e.g. for AGS, Alpha Plus, Heraeus, Legor and Pandora alloys. In practice this means: from the first flask, you can expect good casting results without carrying out expensive pre-tests.

The program control and the integrated data printer ensure a high level of safety and the possibility of precise process documentation (important for certified casting processes).



Industry 4.0 ready

As all our systems the VC series machines are equipped with a software and interface management that allows remote service and support and forms the base for future networking with other systems.

Pressure conditions and control – essential for your perfect casting result

Automatic vacuum and overpressure in the melting and flask chambers

Vacuum in the melting chamber provides the degassing of the alloy and avoids

undesired oxidation during melting (a low oxygen content is particularly important when casting silver or red gold). Vacuum in the flask chamber during casting improves the form filling when casting filigree parts and avoids air inclusions. In addition, the system switches to overpressure in the melting chamber and increases the pressure difference.

Oxidation-reduced Casting system

This special feature eliminates the danger of oxidation while the flask is cooling down.

Turbulence Reduction Software

TRS ensures a faster and more laminar metal flow. It improves form filling and avoids that investment particles are broken off at critical areas of the form.

Turbo Pressure / Turbo Pressure PLUS

It optimises the casting of very small and filigree objects and guarantees perfect results when casting with stones. Turbo Pressure allows a precisely defined pressure to be achieved rapidly. For all program-controlled VC models, depending on the selected program the Turbo Pressure will start automatically exactly at the required time. The **Turbo Pressure PLUS system** allows an even higher and faster pressurizing.

HSC – High Speed Casting

HSC improves even more the filling and surface quality of filigree designs or those with large and flat surfaces. With HSC it's possible to cast treated colour stones with low flask temperature.



Precise temperature control

Dual temperature control

Temperature measurements in both the crucible wall and the crucible center (integrated into the sealing rod) mean the temperature limits are strictly adhered to.

Flask temperature measurement

Until recently flasks with incorrect or different temperatures were a safety risk. During casting of very small or delicate parts the temperature of the flask is of utmost importance. The measurement of the flask temperature (standard for the machines VC 650 V and VC 680V) is an important feature with regards to safety. The temperature of the flask can be monitored to within one degree.

The Indutherm Vibration Technology



The semi-automatic VC versions



VC 400



VC 500 with an optional granulating tank

VC 500

Vibration technology for enhanced casting results



- Vibration during casting generally improves material flow and mould filling
- Castings exhibit a higher and more consistent density
- Porosity is substantially reduced
- 50% smaller grain size
- Risk of hot cracks is reduced.
- Castings have greater stress and elasticity properties, making them easier to process further.

In practice this means: higher and more consistent quality, less waste, less post-processing, better deformability.

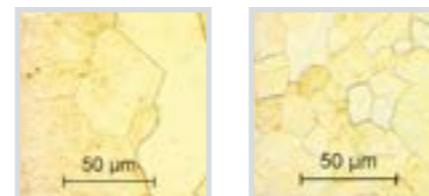
A customer in USA has discovered that by using Indutherm vibration technology the total production time including post-processing has been reduced by 25% (compared with a machine without vibration).



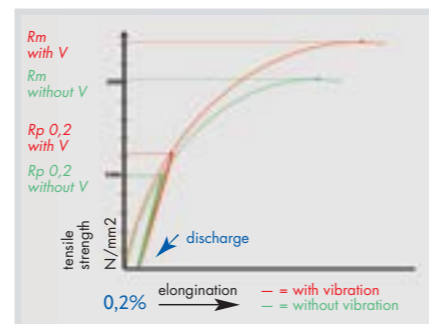
The new sweep mode vibration system can do even more: it considers that each casting tree and even each item of a tree has a different resonance frequency, depending on its shape and size. The sweep mode vibration generating variable frequencies covers all natural resonances.



porosity without vibration porosity with vibration



grain structure without vibration* grain structure with vibration*



elongation limit ~12% better with vibration
tensile strength ~25% better with vibration

*Au 18 ct: 750 Au, 128 Ag, 122 Cu

VC 400

The ideal machine for smaller companies producing moderate quantities but needing considerably more capacity than that offered by the MC machines. Often, experienced casters are not particularly interested in automated functions or program control, and they can achieve the same quality with the VC 400 machine as with more advanced ones. Its induction generator guarantees fast heat-up and thorough mixing of the molten metal by inductive bath movement. VC 400 and VC 500 do not only provide the Turbo Pressure function, in addition they also switch to over-pressure automatically after casting.

VC 500

For larger production quantities with continuous casting operation, greater performance (shorter casting times) with even larger crucibles and flask capacities (flasks up to 160 mm ø/400 mm H) is important. The high maximum temperature of 1,600°C extends the possible range of alloys. Temperature measurements in both the crucible and the flask mean the best possible repeat accuracy in the process. If alloys are changed frequently, 20 different temperature programs simplify working procedures.

	VC 400	VC 500
performance		
power max. / electrical connection	3.5 kW 230 V or 4.5 kW 3x400 V	10 kW 3x400 V / 3x208 V
temperature max.	1400° C	1600° C
capacity		
crucible volume	■ 170 ccm = 2.5 kg Au 18 ct*	■ 245 ccm = 3.6 kg Au 18 ct* ○ 386 ccm = 5.8 kg Au 18 ct*
for use of flasks up to	ø 130 mm / 240 mm h	■ ø 130 mm / 240 mm h ○ ø 160 mm / 400 mm h
handling+control		
maximum pressure	■ 1.5 bar/○ 3.0 bar	■ 1.5 bar/○ 3.0 bar
automatic bell lock	■	■
program control/programs	by LCD-display, full text readout/20	
dual temperature control	○	○
flask and chamber lift	■	■
variable vacuum in flask chamber	■	■
turbo pressure system	■	■
turbulence reduction software	■	■
quality management		
RS 232, Ethernet, USB interface,		
diagnostic system	■	■
data printer	—	—
GSM-modem for remote service	○	○
accessories		
sintering kit (for diffusion bonding)	○	○
granulation tank	○	○
other versions		
also available as granulating unit	—	GU 500

* Liquid metal up to top level of the crucible ■ = standard equipment ○ = optional

Ready for the future



Industry 4.0 ready

Our casting plants are already prepared for the requirements of the future such as Industry 4.0. The program control unit, the interfaces and the GSM modem enable communication with other systems. For instance, remote controlling, online software updating and robot integration in the casting process are all possible.

NEW

Thanks to its novel filling system, the new VC 680 V vacuum pressure casting machine ensures maximum efficiency. With this innovative filling technique it is no longer necessary to open the melting chamber for the next batch of metal. An automatic metal sensor signals when material is missing in the feeder and needs replenishing.

The advantages:

- lower personnel costs
- more consistent casting quality
- better process stability, less waste
- optimised overlapping casting
- up to 20 casting cycles per hour
- high energy efficiency
- longer service lives for consumables
- minimised metal loss
- replenishment without loss of pressure



SweepMode Vibration
Overlapping Casting +



Automatic sealing rod, dual temperature measurement

Additional Turbo Pressure PLUS pressure tank

Refilling without loss of temperature and pressure. The refill system with programmable dosing makes it possible to introduce the next batch of metal without the need to open the melting chamber. This ensures that the melting chamber temperature remains high and unnecessary loss of energy is avoided. Most importantly: No oxygen enters the melting chamber so the chamber does not need to be evacuated again and refilled with inert gas.

This makes for faster casting cycles; the crucible and sealing rod benefit from the largely constant atmosphere and temperature and have significantly longer service lives.

An additional pressure tank integrated into the plant provides for even faster overpressure build-up for activation of the TurboPressure PLUS function.

The VC 680 R special development has been specifically programmed and converted for use with robots.

The fully automatic VC machines



VC 450 / VC 450 V



picture:
VC 480 V with optional vacuum chamber for large flasks

VC 480 V



picture: VC 650 V

VC 650 V

VC 680 V

VC 450

The VC 450 is equipped with a program control system with full text read out LCD display. 20 different casting cycles may be stored for reproducible and consistent casting results. Optionally this machine is also available with INDUTHERM vibration system (VC 450 V).

VC 480 V

In addition to the technical equipment of the VC 450, the VC 480 V comes with an 8 kW generator, an advanced program control with 100 casting programs, automatic flask and chamber lift, variable vacuum in the flask chamber and the INDUTHERM vibration system.

VC 650 V

The fully equipped VC 650 V is convincing by very high speed and casting quality. High crucible capacities, sweep mode vibration system and up to 3 bar overpressure are the essential advantages predestining this machine for large productions.

VC 680 V

The new VC 680 V is based on the VC 650 V. However, the filling device provided as standard means there is no need to open the melting chamber for refilling, making for even more efficient and safe casting production. You will find further details on the VC 680 V on page 23.

Peripheral equipment for the VC machines

For the VC machines VC 400 – VC 680 V and also for the VTC series machines we recommend our investment mixer **Indumix 4+** and the **burnout furnace AK 135** (see page 11). For all machines working with water cooling systems (VC, VTC, CC, VCC, AU) we are offering our water **re-cooler**. For all vacuum casting machines a special **vacuum pump** is available.

performance

power max. / electrical connection
temperature max.

4.5 kW 3x400 V
1400° C

8 kW 3x400 V
1600° C

12 kW 3x400 V
1700° C

12 kW 3x400 V
1700° C

capacity

crucible volume

■ 170 ccm = 2.5 kg Au 18 ct*

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○ 245 ccm = 3.6 kg Au 18 ct*

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○ 386 ccm = 5.8 kg Au 18 ct*
○ 700 ccm = 10,5 kg Au 18 ct*

■ 245 ccm = 3.6 kg Au 18 ct*
○ 386 ccm = 5.8 kg Au 18 ct*
○ 700 ccm = 10,5 kg Au 18 ct*

for use of flasks up to

ø 130 mm / 240 mm h

■ ø 130 mm / 240 mm h
○ ø 160 mm / 400 mm h

■ ø 130 mm / 240 mm h
○ ø 160 mm / 400 mm h

■ ø 130 mm / 240 mm h
○ ø 160 mm / 400 mm h

handling+control

vibration technology

– / ■ VC 450 V

■

■ in sweep mode

■ in sweep mode

automatic bell lock/automatic closing system

■/–

■/–

■/■

■/■

maximum pressure

■ 1.5 bar/○ 3.0 bar

■ 1.5 bar/○ 3.0 bar

3 bar

3 bar

program control/number of programs

■ by LCD-display, full text readout/20

■ by LCD-display, full text readout/100

■ by LCD-display, full text readout/100

■ by LCD-display, full text readout/100

dual temperature control

○

○

○

○

flask temperature measurement

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–

■

■

automatic feeding system w/ autom. sealing rod

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–

–

automatic flask and chamber lift

■

■

■

■

variable vacuum in flask chamber

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■

■

turbo pressure/turbo pressure PLUS system

■/–

■/○

■/■

■/■

additional gas tank for turbo pressure PLUS

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–

turbulence reduction software

■

■

■

■

HSC feature

○

○

○

○

quality management

RS 232, Ethernet, USB interface, diagnostic system

■

■

■

■

data printer

○

○

■

■

GSM-modem for remote service

○

○

■

■

accessories

sintering kit (for diffusion bonding)

○

○

○

○

granulation tank

○

○

○

○

* Liquid metal up to top level of the crucible ■ = standard equipment ○ = optional

The Vacuum Pressure Casting Machines for large casting parts



Capacity and power for large scale projects

Our large vacuum pressure casting machines are mostly used for precise castings in aluminium alloys or for art and crafts objects in brass or bronze. They are always the first choice for parts with complicated geometry or when the number of pieces is not large enough for die-cast production.

VC 1000 V, 3000 V and 12000 V offer the best pre-conditions for high quality castings in aluminium: the hydrogen content of aluminium alloys may be adjusted by regulating the vacuum during melting. This way, foaming of molten metal can be avoided

without any melt additives. Overpressure in the melting chamber during and after casting and simultaneous vacuum in the flask chamber optimise form filling especially in filigree or thin-walled areas.

The new standard

From 2018 on, all our large VC machines are equipped with a program control system with 100 programs. The control panel with full text LCD display enables the user to set all programs and parameters very easy and convenient. VC 1000 V and VC 3000 V use the vibration technology for improved casting results especially concerning form filling and further processing properties.

	VC 1000 V	VC 3000 V	VC 12000 V
performance			
power max. / electrical connection	20 kW 3x400 V	30 kW 3x400 V	40-60 kW 3x400 V
temperature max.	1500° C	1500° C	1200° C
capacity			
crucible volume*	■ 1,500 ccm = 4 kg Al*	■ 3,400 ccm = 9 kg Al*	■ 12,000 ccm = 30 kg Al*
for use of flasks up to	ø 250 mm / 500 mm h	ø 450 mm / 600 mm h	ø 600 mm / 800 mm h
handling+control			
vibration technology	■	■	-
automatic bell lock	■	■	■
maximum pressure	0.5 bar	0.3 bar	0.3 bar
program control (100 programs)	■ by LCD-display, full text readout	■ by LCD-display, full text readout	■ by LCD-display, full text readout
dual temperature control	■	■	■
automatic flask and chamber lift	■	■	-
variable vacuum in flask chamber	■	■	■
turbo pressure PLUS system	-	-	-
turbulence reduction software	■	■	■
quality management			
RS 232, Ethernet, USB interface, diagnostic system	■	■	■
data printer	■	■	■
GSM-modem for remote service	■	■	■
accessories			
granulation tank	○	○	○

* Liquid metal up to top level of the crucible – other volumes on request. ■ = standard equipment ○ = optional