

An abstract graphic of a sphere composed of many thin, white, curved lines. The lines are arranged in a way that creates a sense of depth and movement, with some lines being solid and others dotted. The sphere is positioned on the left side of the page, with its right edge curving towards the center.

Quality
and technology
for die casting



1.

INTRODUCTION

PAGE 5

2.

VACUUM APPLICATION

PAGE 7

3.

PRODUCTS

PAGE 9

4.

PROFESSIONAL ASSISTANCE

PAGE 25



INTRODUCTION 1.

FONDVACUUM® IS A WELL-ESTABLISHED BRAND OWNED BY **MAMBRETTI METALLI** IN THE FIELD OF **VACUUM DIE CASTING PROCESSES OF NON-FERROUS METALS SUCH AS ZINC, MAGNESIUM ALLOYS AND COPPER ALLOYS.**

Italian based, Mambretti Metalli, leads the world in the supply of technical products, consumables, and accessories used by non-ferrous metal foundries. It produces the Fondvacuum® machines, ensuring high efficiency in managing the vacuum systems for the mold.

MAMBRETTI METALLI

THE SERVICES OF THE FONDVACUUM® SYSTEMS CURRENTLY INCLUDE:

FONDVACUUM
SERVICES

ANALYZING AND CONSULTING ■
for the most appropriate product
that fits the client's needs,

DESIGNING ■

PRODUCTION ■

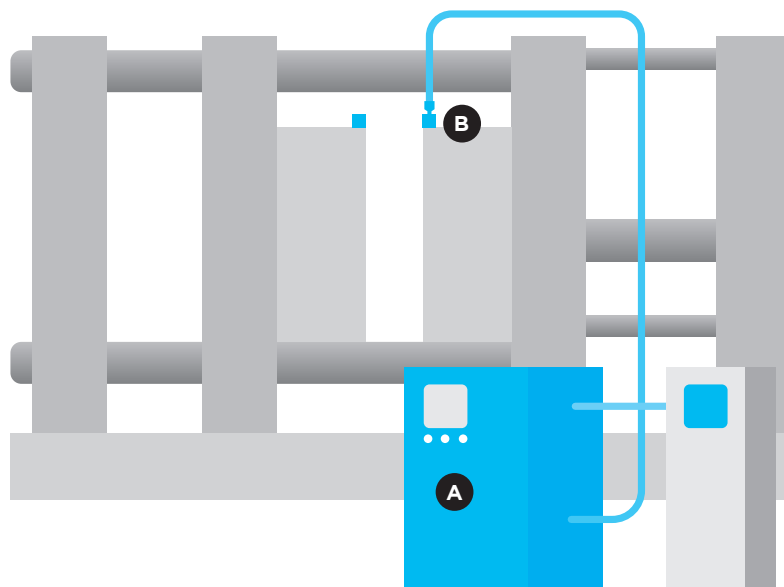
INSTALLATION AND START-UP ■

POST-SALE ASSISTANCE ■
to ensure the efficiency
of the sold products.



VACUUM APPLICATION 2.

THE VACUUM APPLICATION IN THE DIE CASTING PROCESS IS CONSIDERED THE **MOST EFFECTIVE TECHNOLOGY FOR GAS EVACUATION** FROM THE MOLD AND, FOR THIS REASON, THE **BEST SOLUTION** TO REDUCE MICRO POROSITY, TO IMPROVE SURFACE QUALITY AND TO CREATE ESTETICALLY VALUABLE CASTING.



However, just using the vacuum does not absolutely guarantee a stable and optimized process.

It must be optimized with the mold, diecasting machines, the manufactured alloy and other peripherals.

A

ELECTRIC UNIT FOR SUCTIONING AND VACUUM CONTROL

B

VACUUM VALVE

THE FONDVACUUM® SUCTIONING SYSTEM INCLUDES:

the **UNIT FOR SUCTIONING AND CONTROLLING THE VACUUM** which is interfaced with the diecasting machine;

one or two **MECHANICAL VALVES** set on the mold **FOR PROPER AIR REMOVAL**;

THE OPTIMIZATION OF PARAMETERS FOR BOTH the diecasting machine and the suctioning machine;

MAMBRETTI'S ASSISTANCE AND CONSULTATION to ensure optimal use of the vacuum system.



PRODUCTS 3.

VACUUM UNITS	SYSTEMS FOR ALUMINUM/MAGNESIUM AND COPPER ALLOYS MOD D2 - NEXT P50 MOD D2 - NEXT P75	PAGE 10
	SYSTEMS FOR ZINC ALLOYS MOD D1 - NEXT P40	PAGE 12
VALVES	ALUMINUM MAGNESIUM ALLOYS	MODEL A03D MODEL A10D MODEL A20D HY - VENT PAGE 14
	ZINC ALLOYS MODEL MICRO MODEL A03D	PAGE 16
	COPPER ALLOYS MODEL B	PAGE 18
	FILTER	PAGE 20
ACCESSORIES	VACUUMLUKE	PAGE 22



LUBRICANT
TANK

Integrated
lubrication system
of the vacuum valves.



SYSTEMS FOR ALUMINUM/MAGNESIUM AND COPPER ALLOYS

MOD D2 - NEXT (P50 - P75)

PERFORMANCES VACUUM SYSTEM
FOR DIECASTING OF NON-FERROUS METALS
(ALUMINUM, MAGNESIUM, COPPER ALLOYS).

OPERATIONAL CHARACTERISTICS

Wide application range
(machines from 150 to 2500 tons and more*)

Industrial PC/SIEMENS PLC

Touch screen monitor 10"

User-customizable vacuum level on the tank

Ability to download/upload data via USB

Remote network access

*Possibility to upgrade (tank and pump)

STRUCTURAL CHARACTERISTICS

Frame made entirely in stainless steel AISI 304

Tank in stainless steel AISI 304

Tank volume approximately 660 L

Vacuum pump of 50 m³/h up to 70 m³/h

Double stainless steel grid filter to ensure a better filtration from metal particles and polluting gas (i.e. oil mist)

Wide lid to inspect vacuum chamber

Possibility to expand vacuum tank

CONTROLS AND MEASURES

Vacuum measurement and control for each channel

Suctioning capability measurement and control
for each channel

Pollution control for each channel

Vacuum curve representation
for each channel/h

Process data statistics by vacuum
data level detection for each casting

Control of the time between start of the vacuum
and start of the fast phase (accuracy of 1 ms)

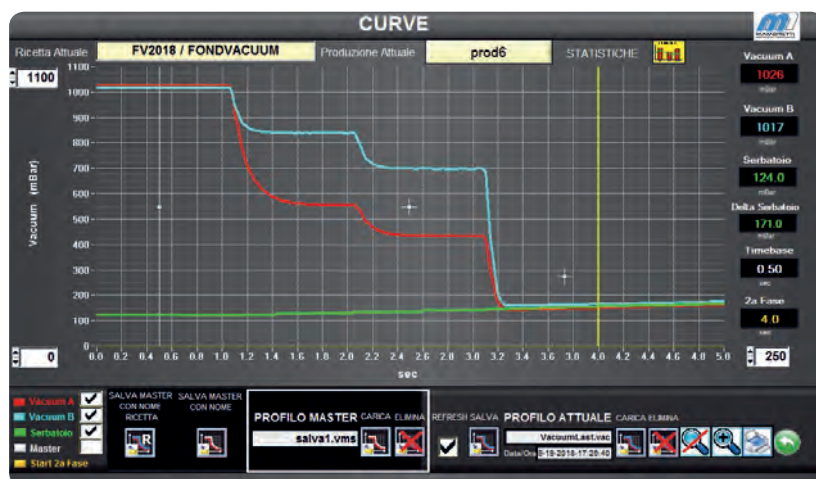
User Interface with security controls
for the diecasting machine (i.e. stopping the vacuum
if the machine is not working)

Control of valves by both Fondvacuum®
and other brands

Pre-vacuum control and regulation separate
on each vacuum channel

Possibility to remote control the signal
from the transducers on the machine

Diecasting machine Profinet connection ready





LUBRICANT
TANK

Integrated
lubrication system
of the vacuum valves.



HIGH PERFORMANCES VACUUM SYSTEM FOR DIE CASTING OF NON-FERROUS METALS, IN PARTICULAR ZINC ALLOYS AND ALUMINUM.

OPERATIONAL CHARACTERISTICS

Wide application range
(machines from 5 to 200 tons and more*)

Industrial PC/SIEMENS PLC

Touch screen monitor 10"

User-customizable vacuum level on the tank

Ability to download/upload data on an SD card

Remote network access

*possibility to upgrade (tank and pump)

STRUCTURAL CHARACTERISTICS

Frame made entirely in stainless steel AISI 304

Tank in stainless steel AISI 304

Tank volume approximately 200 L

Vacuum pump of 40 m³/h

Double stainless steel grid filter to ensure a better filtration from metal particles and polluting gas (i.e. oil mist)

Wide lid to inspect vacuum chamber

Possibility to expand vacuum tank

CONTROLS AND MEASURES

Vacuum measurement and control for each channel

Suctioning capability measurement and control for each channel

Pollution control for each channel

Vacuum curve representation for each channel/h

Process data statistics by vacuum data level detection for each casting

Control of the time between start of the vacuum and start of the fast phase (accuracy of 1 ms)

User Interface with security controls for the diecasting machine (i.e. stopping the vacuum if the machine is not working)

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Pre-vacuum control and regulation separate on each vacuum channel

Possibility to remote control the signal from the transducers on the machine

Diecasting machine Profinet connection ready





VALVES FOR ALUMINIUM/MAGNESIUM ALLOYS

THE FONDVACUUM® VALVES GUARANTEE MAXIMUM AIR SUCTION AND DURATION, WITH REDUCED NEED OF MAINTENANCE. WITH PROPER USAGE, THEY CAN BE USED FOR APPROXIMATELY 20,000 CYCLES WITHOUT MAINTENANCE.

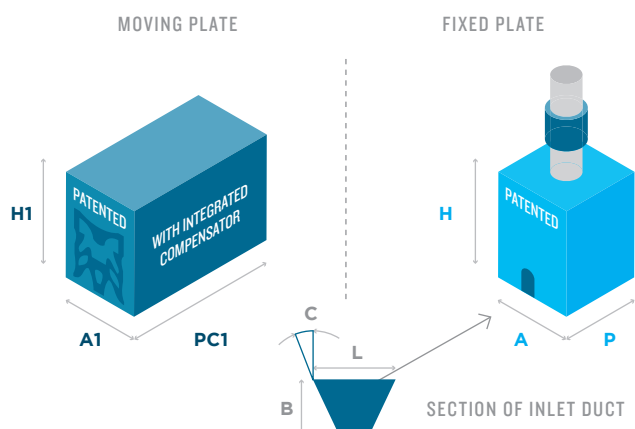
Modern diecasting faces critical procedural issues - such as the **reduction of the refuse caused by porosity**. Porosity can have different root causes, such as air incorporated during the injection process.

Internal porosity can have dimensions ranging from a few microns to a few millimeters, causing

subsequent poor surface quality that can be seen during the extraction and even after thermal surface treatments.

The presence of air also creates a **counter-pressure** generated in the filling phase, which can cause cold joints or incomplete fillings.

A03D - A10D - A20D



VALVE SIZE	SECTION OF INLET DUCT (L x B x C)	A1	H1	PC1	A	H	P
A03D	7x5x20°	63	75	63,5	63	76	63,4
A10D	12x6x15°	100	126	88,9	100	127	70,00/88,9*
A20D	16x9x15°	140	151	108,0	140	152	90,0/108,0*

*with adapting plate

VALVE SIZE	MACHINE CLAMPING FORCE	DIE CASTED ITEM MAX WEIGHT** (KG)			
		Al	Zn	Mg	ALLOYS Cu/BRASS
A03D	From 40 to 450 T	0,2 - 0,8	0,4 - 2,0	0,15 - 0,4	-
A10D	From 200 to 1200 T	0,6 - 5,2	1,6 - 11	0,35 - 2,7	0,5 - 9
A20D	From 600 to 3500 T	4 - 11	8 - 25	2,4 - 6	-

**indicative value

MODEL HY-VENT

The **Fondvacuum® HY-VENT (Hybrid venting) valve** combines the capability of air evacuation systems of normal valves with the efficiency of the active vacuum obtained from the Fondvacuum® suctioning units.



Thanks to their innovative design, **Fondvacuum® Hy-vent valves** are able to guarantee a high performance in air evacuation from molds and a fast aluminum solidification.

Furthermore, Fondvacuum® HY-VENT valves are able to endure intensive usage at high temperatures thus, allowing for long periods of time without maintenance.

MICRO



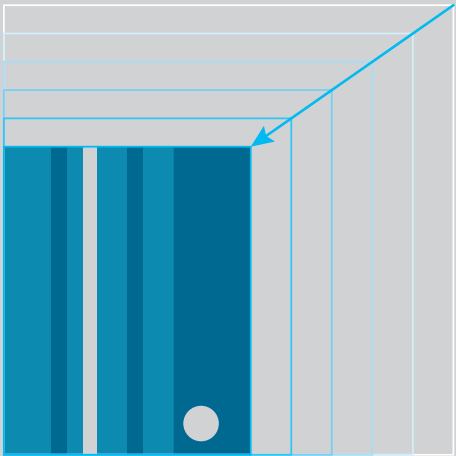
FIXED PLATE



MOVING PLATE

USUAL SIZE FOR VALVES

DIFFERENCE FROM
FONDVACUUM
VALVES
MODEL MICRO
AND OTHER
VALVES



FONDVACUUM VALVE

A03D



FIXED PLATE



MOVING PLATE

ZINC ALLOYS VALVES

MODEL MICRO/A03D

HIGH PERFORMANCES IN SUCTIONING, EXTREMELY SMALL SIZE, AND LOW MAINTENANCE ARE THE REASONS WHY FONDVACUUM® IS THE MOST EFFICIENT VACUUM VALVE FOR THE HOT CHAMBER IN THE WORLD.

The ratio between volume of the valves and suctioning power is optimal.

The Fondvacuum® system is perfect also for the diecasting sites and for very complex very small molds.

With proper usage, they can be used **for approximately 20,000 cycles without maintenance.**

OPTIMAL FOR SMALL AND COMPLEX MOLDS

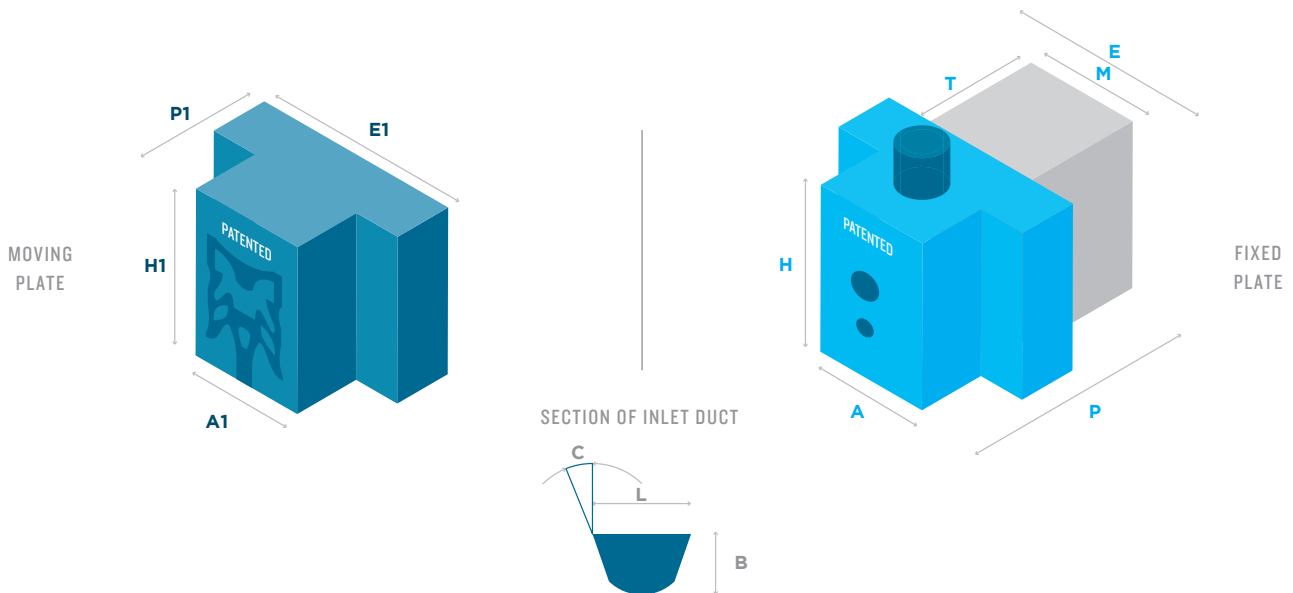
UP TO 20,000 CYCLES WITHOUT MAINTENANCE

The closing of the valve in a millisecond - operated by the kinetic force of the metal flow - prevents even the smallest metal particles from penetrating.

CLOSING OF THE VALVE

Furthermore, **the valves are precisely lubricated at every cycle, the valves have their own thermic regulation system, and the actuator mechanism works with no friction.**

LUBRICATION AND THERMIC REGULATION



VALVE SIZE	SECTION OF INLET DUCT (L x B x C)	A1	H1	P1	E1	A	H	P	E	T	M
01 MICRO	4,5x3x20°	43,00	57,01	15,00	50,15	43,00	57,01	30,00	50,15	17,00	42,90
A03D	PAGE 15										

VALVE SIZE	MACHINE CLAMPING FORCE	DIE CASTED ITEM MAX WEIGHT** (KG)			
		Al	Zn	Mg	ALLOYS Cu/BRASS
01 MICRO	From 5,0 to 250 T	0,01 - 0,38	0,01 - 0,90	0,005 - 0,20	-
A03D	PAGE 15				

**indicative value



MOVING PLATE

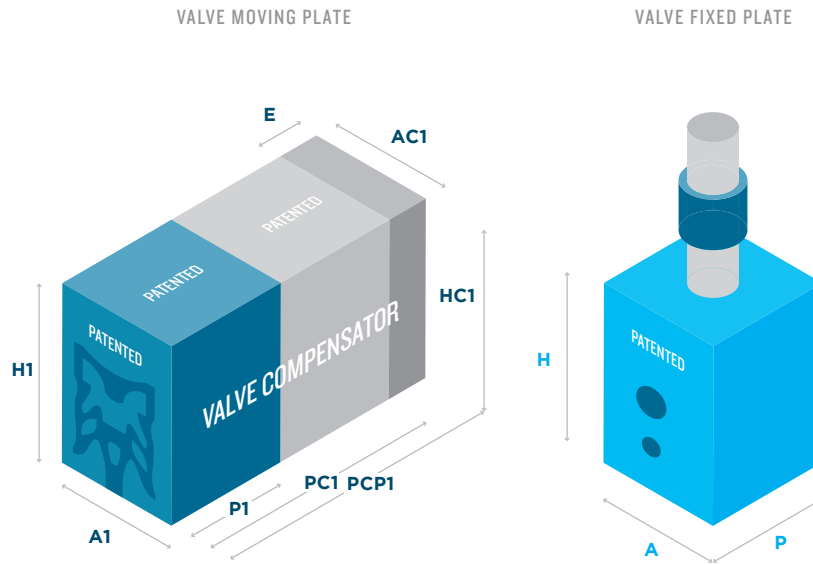


FIXED PLATE

COPPER ALLOYS VALVES

MODEL B

THE VACUUM APPLICATION IN DIECASTING PROCESSES WITH COPPER ALLOYS, ESPECIALLY BRASS, IS IMPORTANT IN THE REDUCTION OF MICRO POROSITY CAUSED BY GAS. ITS APPLICATION IMPROVES SURFACE QUALITY, CREATING ESTHETICALLY VALUABLE CASTING.



VALVES	A1	H1	P1	AC1	HC1	PC1	PCP1	E	A	H	P
B10A	125,0	135,0	50,0	134,0	134,0	197,2	224,4	27,2	125,0	135,0	69,95

VALVES MODEL B

The critical issues for its application are related to the **extreme temperatures (950-1050°C)**, the **high viscosity** of copper alloys, with subsequent difficulty in the filling, its **low latent heat**, and its **fast cooling**.

These aspects state **the necessity to keep the mold at high temperatures and have a high injection speed**.

The Fondvacuum® valves model B (brass) have been designed with a specific structure and dedicated features.

The valves **are built with special materials, with high mechanical and thermal performances**, to be used in the brass diecasting.

The special thermal surface processing guarantees long duration and high reliability.

COOLING CIRCUIT

Moreover, the Fondvacuum® valves model B have a **specific cooling circuit for the correct management of the extreme temperatures** that it has to face.

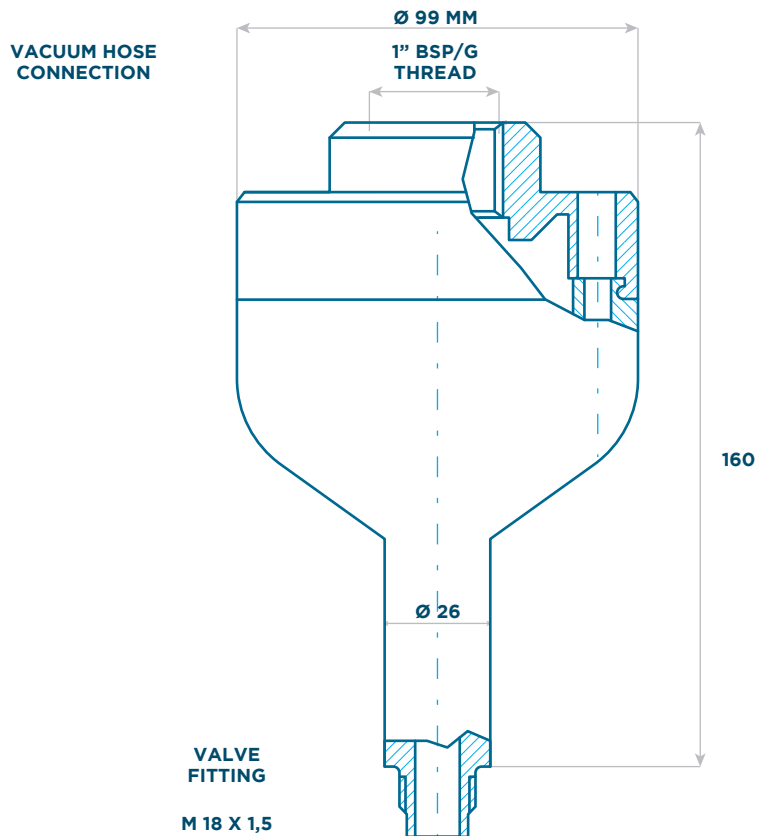
The diecasting vacuum application for brass can considerably improve the quality of the casting of valves, counters, taps, handles, furnishings, window frames, and more.



FILTER FOR VALVES

A03D - A10D - A20D

SPECIAL FILTERS **SPECIFICALLY DESIGNED** FOR VACUUM SYSTEM.

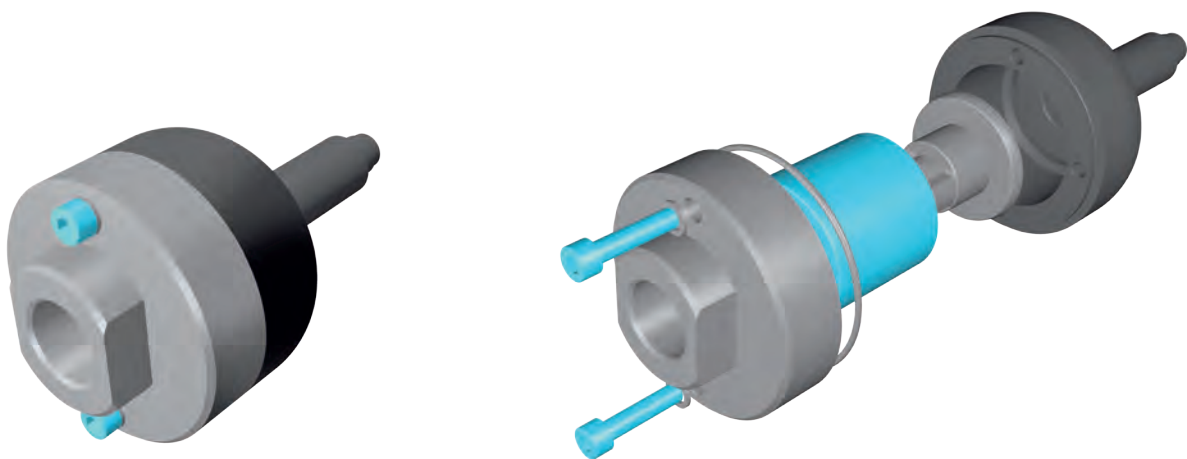


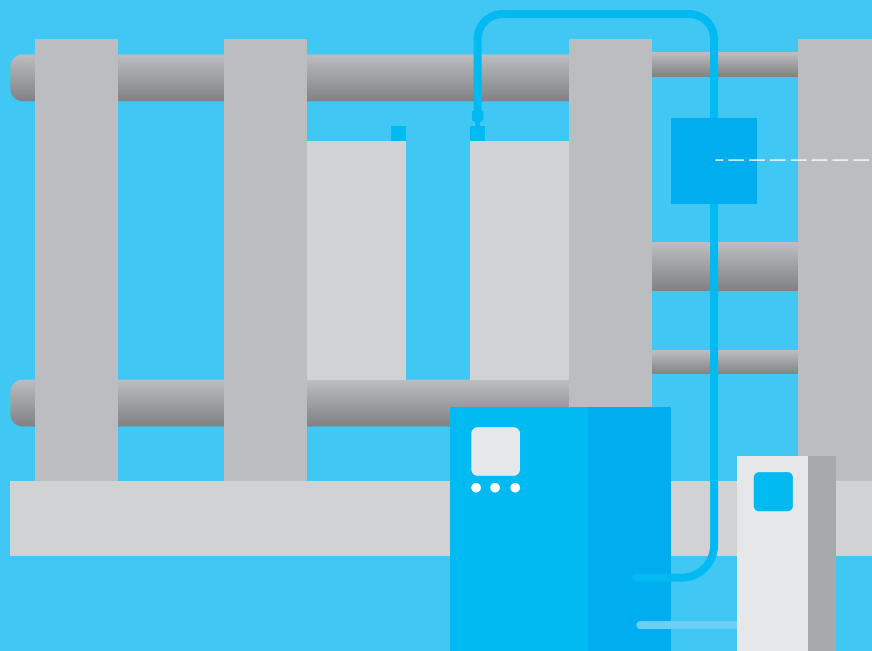
We accurately designed specific filters to maintain **the cleanliness of the vacuum units** at their best. The filters **can stop the impurities generated through time**, such as oil fumes and micro particles, that come from the mold during the metal injection.

The body of the filters is built with steel characterized by great compressive strength, fatigue strength, impact strength, optimal hardness, tenacity and endurance to use and heat (up to 400°C).

The material is treated by nitriding and phosphate coating for corrosion resistance. Internal filter made in stainless steel for easy polishing.

Moreover, the specific internal structure of the filters gives the possibility **to keep all the impurities in an easy-to-remove container** with guarantees no danger of contamination for the filter body and for the channel connected to the vacuum valve





AUTOMATIC SYSTEM FOR VALVES LUBRICATION FOR DIE CASTING VACUUM SYSTEMS WITH NO INTEGRATED LUBRICATION SYSTEMS.

**LUBRICANT
TANK**
VOLUME 1.2 LITERS
NEXTOL ZN15

AIR FILTERS



LEFT SIDE:
PIPE INLET
FROM VACUUM
UNITS
VALVES A AND B
THREAD 1/4" F GAS

EXIT
LEVEL SENSOR



RIGHT SIDE:
EXIT TO
VACUUM VALVES
A AND B
THREAD 1/4" F GAS



The VacuumLube PN2 system is a **completely automatic pneumatic unit for lubrication of the valves** to apply in the vacuum units for die casting.

VacuumLube gives the possibility to inject a measured quantity of special lubricant NEXTOL ZN 15 during the production cycle.

Vacuumlube uses the compressed air (5-6 bar) from the control channel of vacuum of the vacuum systems.

No electric interface and wiring is needed: is sufficient to connect the 1/4" pipe inlet (VALVE A IN or VALVE B IN) from the vacuum units, and the 1/4" gas pipe toward the chosen valve (A or B).

VacuumLube will inject the correct quantity of lubricant automatically every cycle.



ASSISTANCE SERVICE 4.

THE **FONDVACUUM®** TEAM PROMISES **TO HELP ITS CLIENTS** DURING THE OVERALL ANALYSIS OF THE **DIECASTING PROCESS** - INCLUDING ASSISTING IN THE DEVELOPMENT OF THE MOLD (IN PARTICULAR DESIGNING THE SPRUES AND VACUUM CHANNELS) AND OPTIMIZING THE INJECTION PARAMETERS, LUBRICATION PARAMETERS, AND THE THERMOREGULATION SYSTEM. FURTHERMORE, FONDVACUUM® CAN HELP INTEGRATE THE **VACUUM SYSTEM** INSIDE THE DIECASTING SITE.

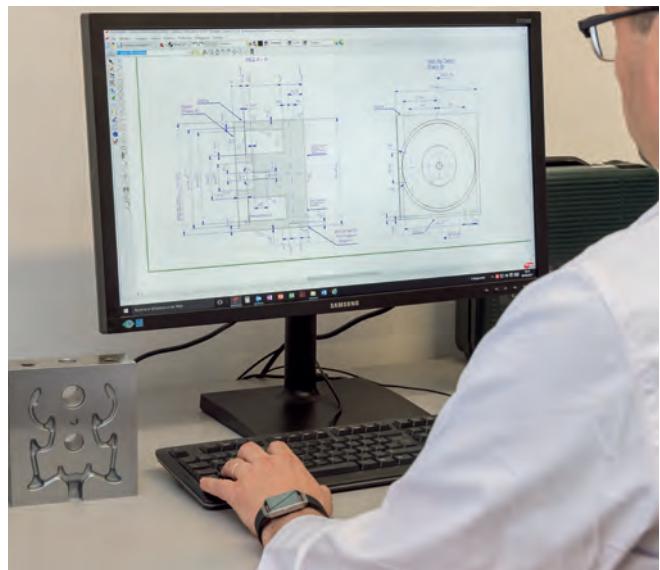
The service is fast and efficient **all over the world** and includes both the installation of the vacuum systems directly at the production sites and operator training.

IN-SITE
INSTALLATION

Even **in the most complex situations, Fondvacuum®** makes its knowledge available and ensures top level customer assistance before and after installation.

POST-SALE
SERVICE

The implementation of a remote control system allow us to simplifying and speed up interventions of technical assistance and software updates.



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PA1

PB1

 **Danfoss**
VIP

TYPE NC
MAX CONTROL PRESSURE 8 bar
SEAL VITON
THREAD G

DN22 DN10
MS58 PAT.

PA1OFF
PA1ON

PB1OFF
PB1ON

P16ON

A5

