

Something New in Vacuum Die-Casting: ProVac[®] Ultra Sonic Vacuum Valve

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VDS

Since 25 Years

Swiss
made



Typhoon



Sonic



Summary

- 1. Modern castings require a modern vacuum system**
 - In the past - now
 - Modern controllers
 - Pump and vacuum tank
- 2. Innovative and efficient vacuum valves**
 - ProVac[®] Standard Plus
 - ProVac[®] Ultra and Ultra Sonic
- 3. R & D**
- 4. Conclusion**

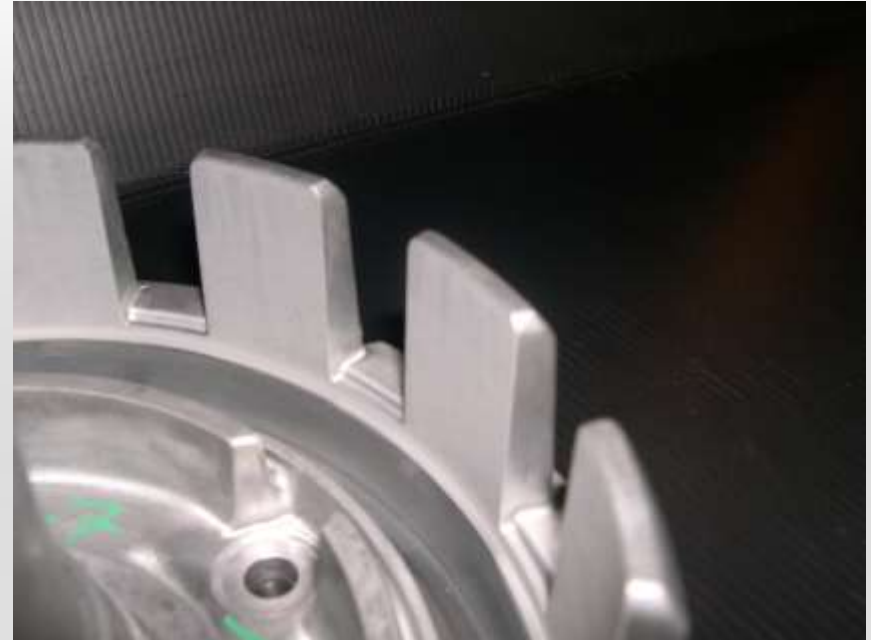
In the past and now



Vacuum for porosity reduction



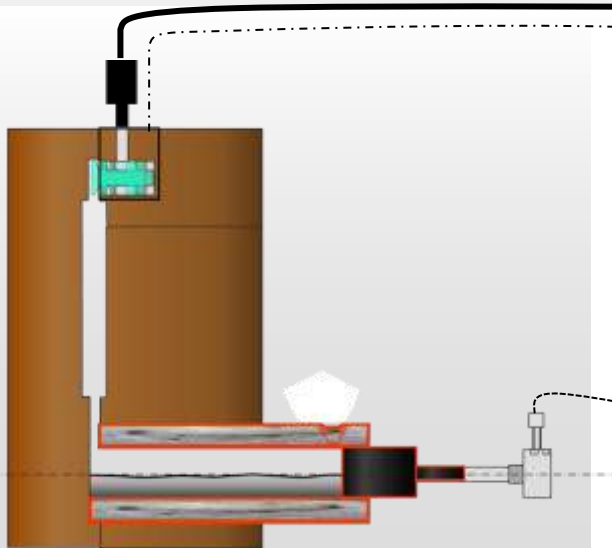
Without Vacuum



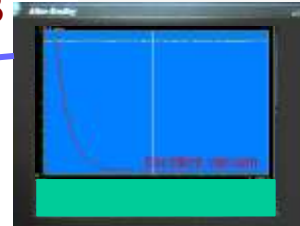
... with Vacuum

Clutch Carter , die with two cavities

Modern evacuation



Advanced monitoring
and archive on AB

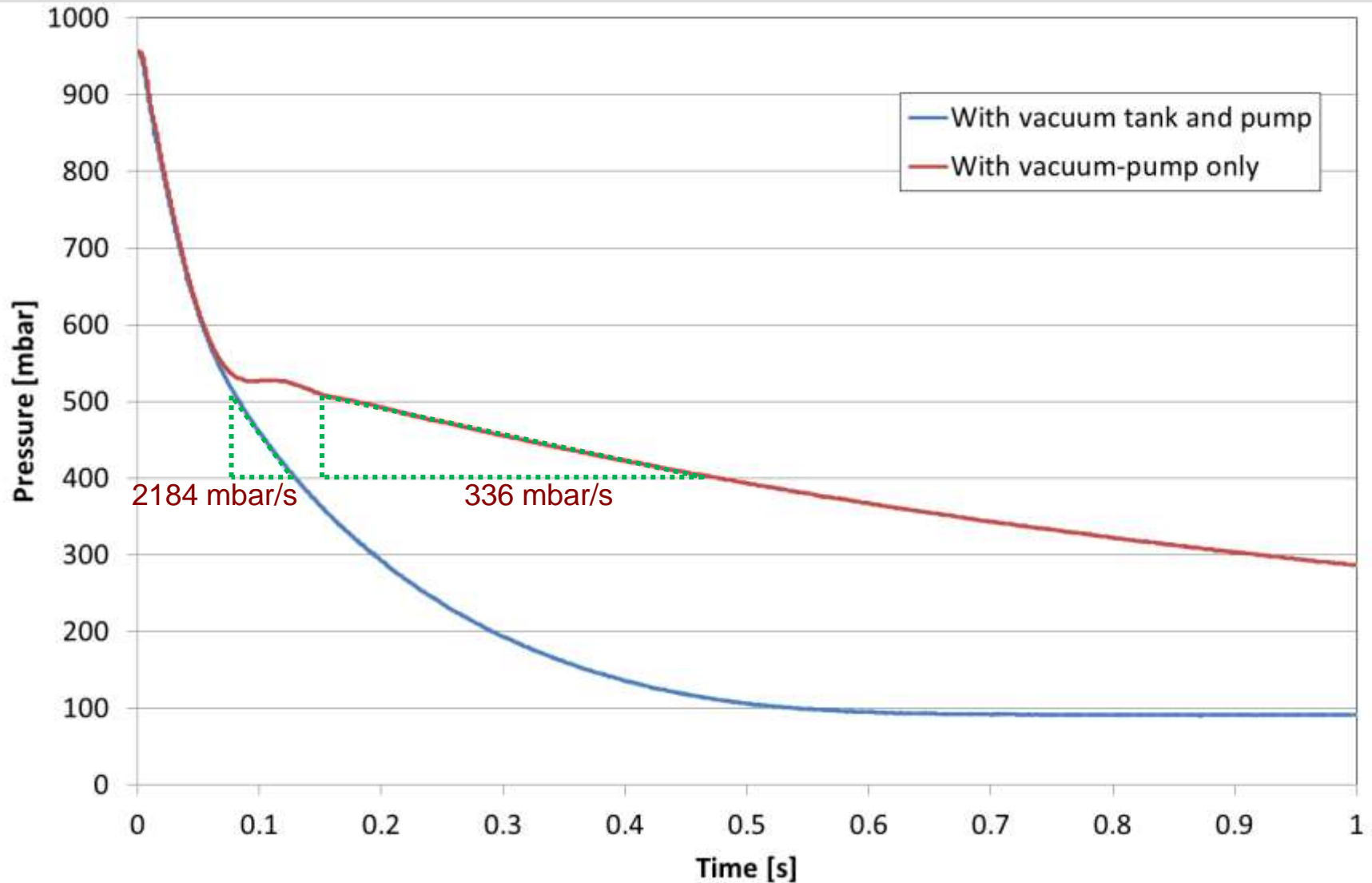


Hi-performance
vacuum pump

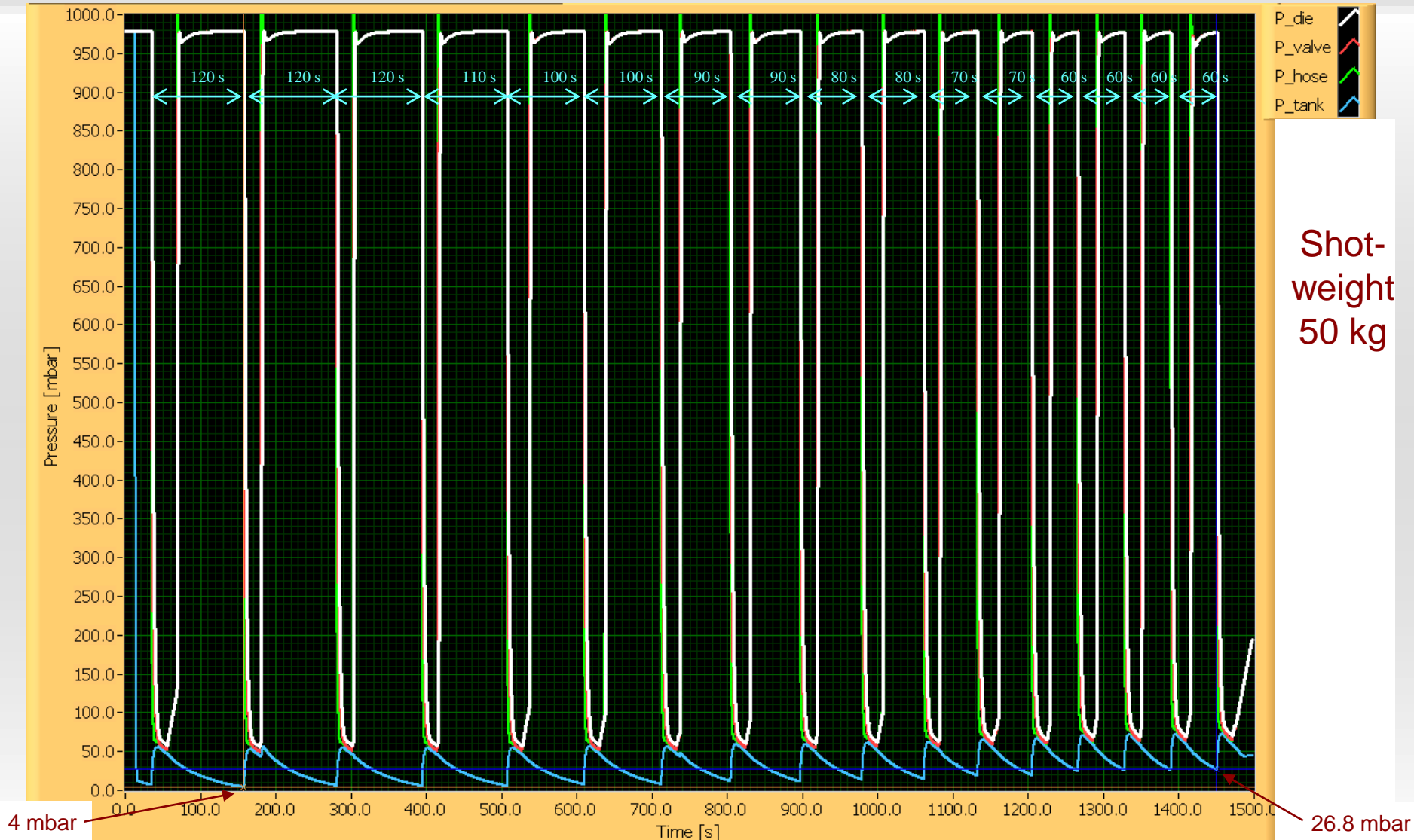


Very big tank

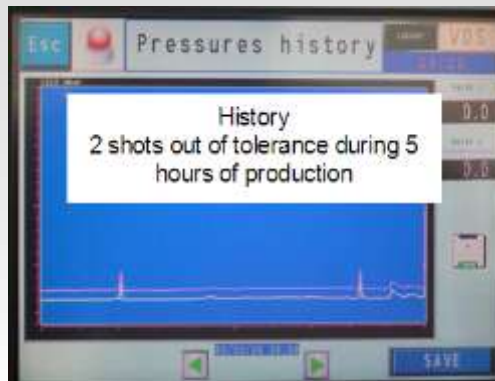
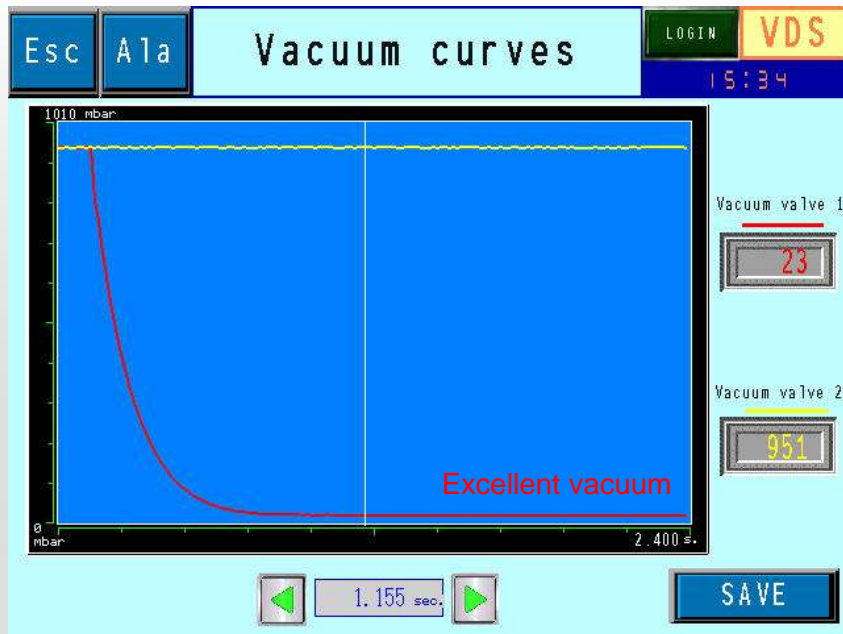
Vacuum with or without tank



Duty cycle and end-vacuum



Modern evacuation

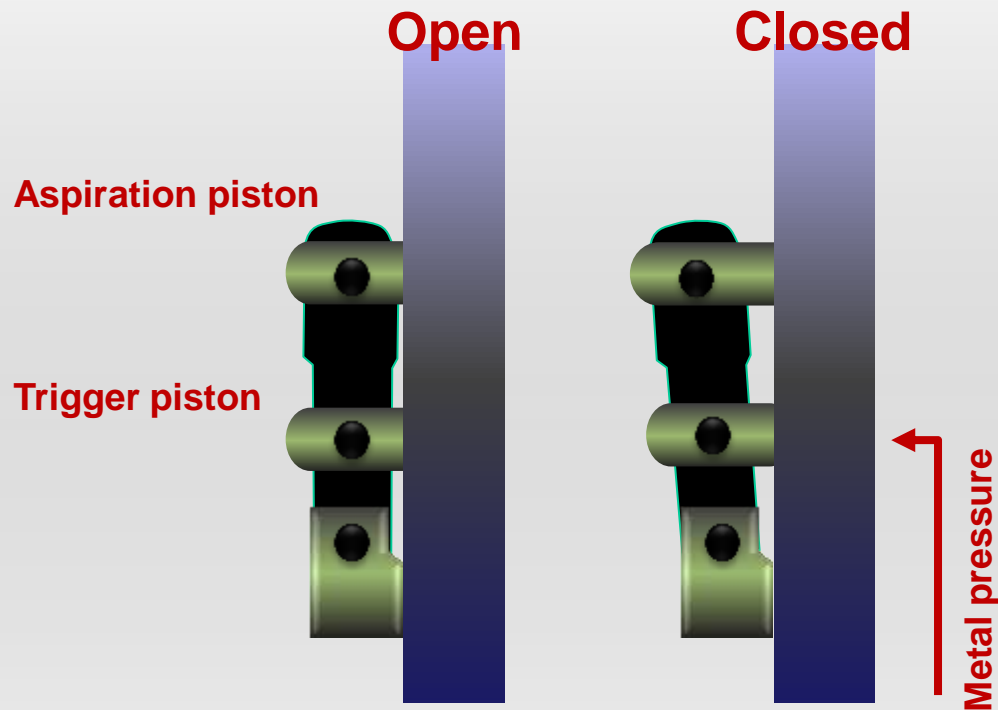


ProVac® Standard PLUS Valve

Triggered by metal



A mechanism of reference



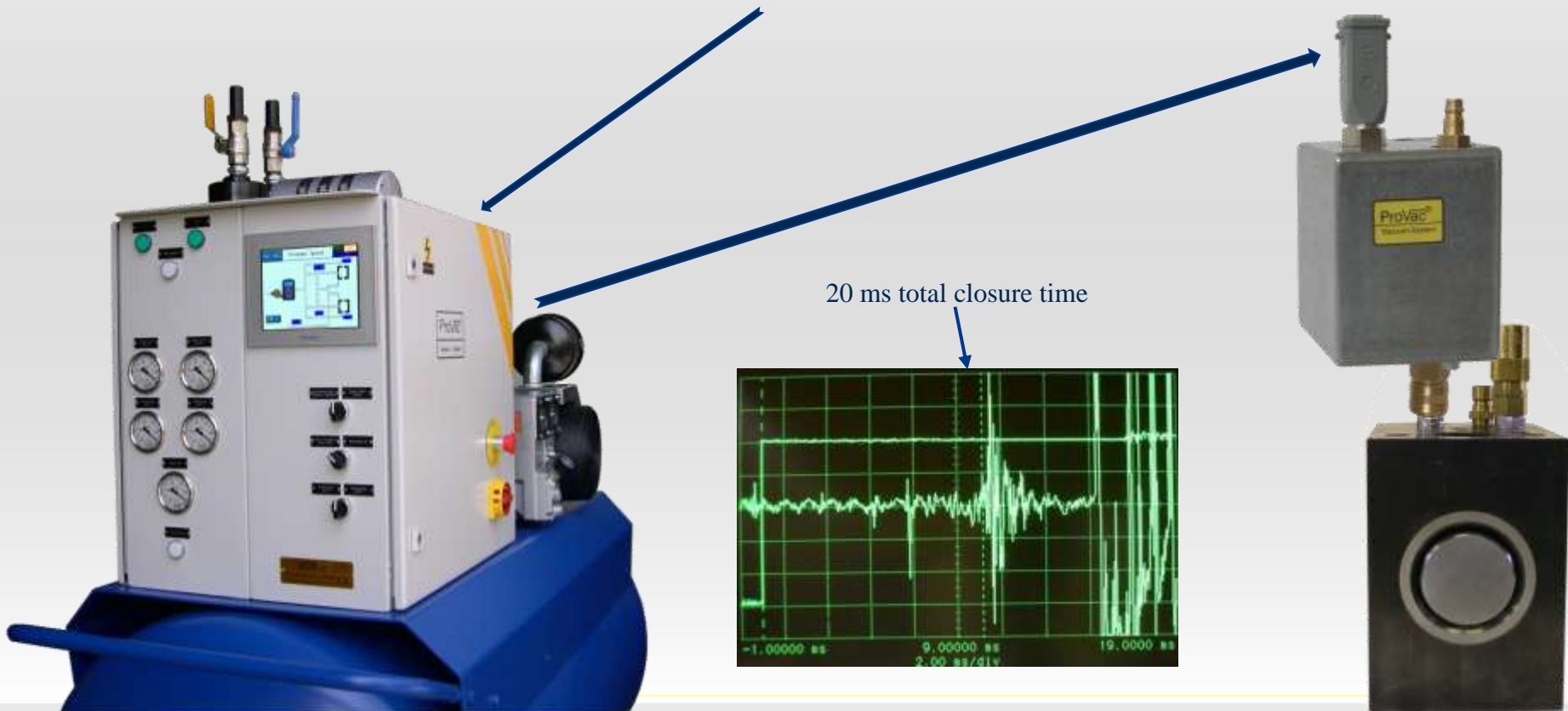
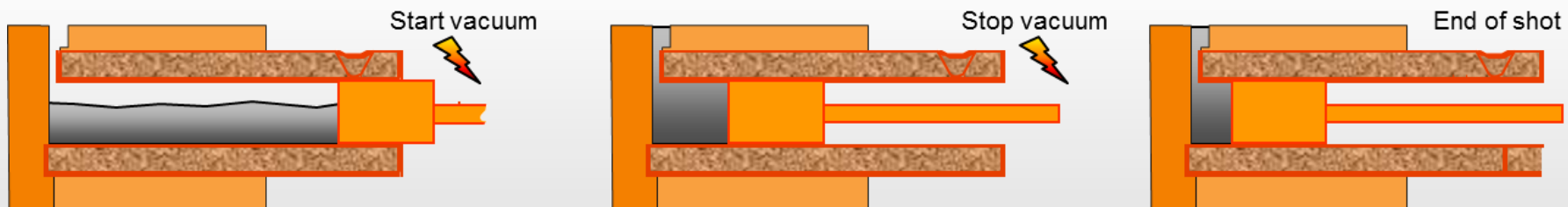
- Security,
- Stability,
- Low maintenance

ProVac® Ultra Valve Family



by **VDS**

Principle of ProVac[®] Ultra



20 ms total closure time



Ultra SONIC Valve

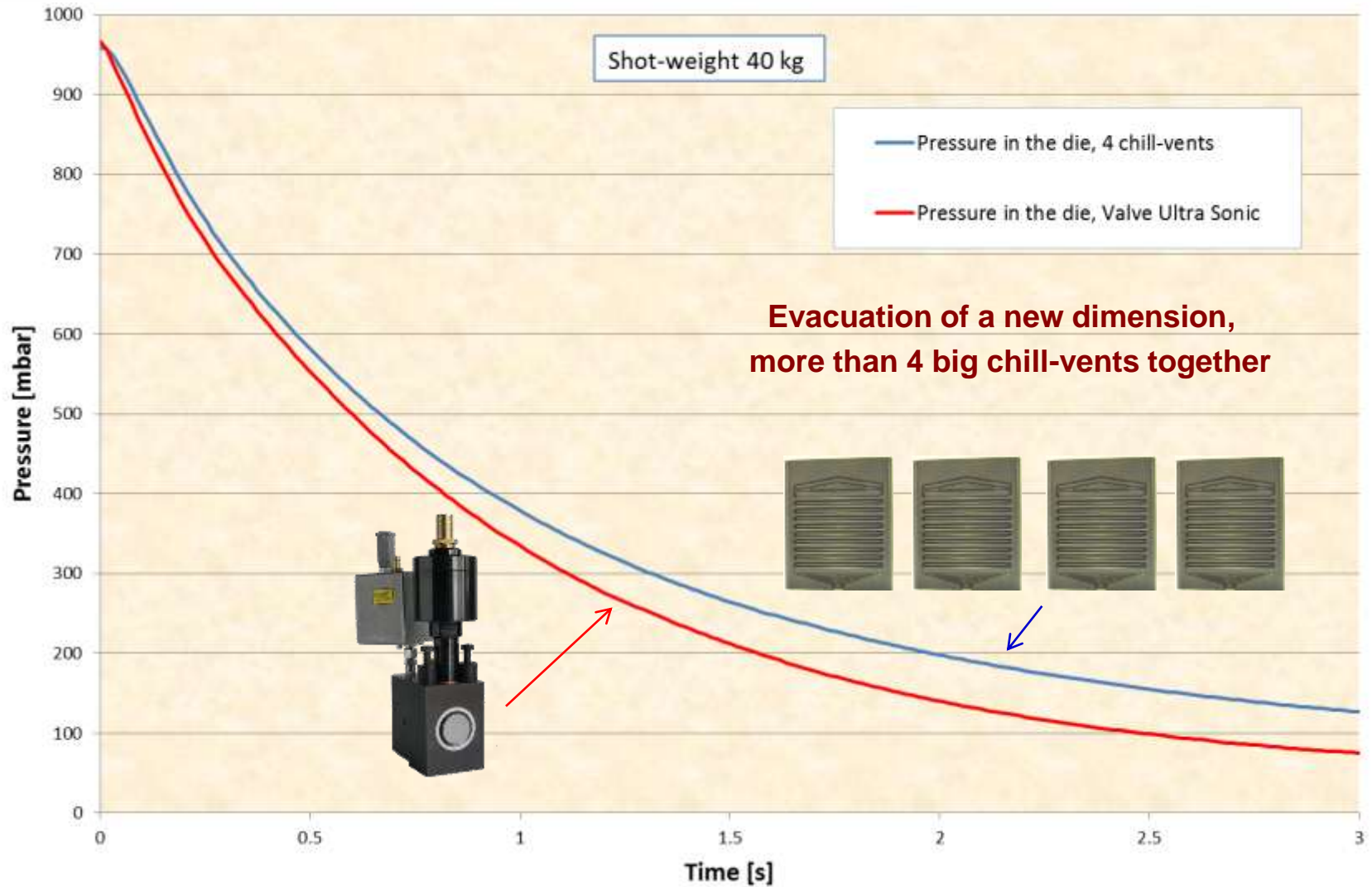
Structural parts



- Huge amount of air evacuated from the die at **SONIC** speed
- Huge power from 5 to 55 kg Al shot-weight
- **SONIC** fast closing time
- Extremely compact in size (width 100 mm)
- Much reduced projected-area
- Maintenance at **SONIC** speed



Aspiration capacity



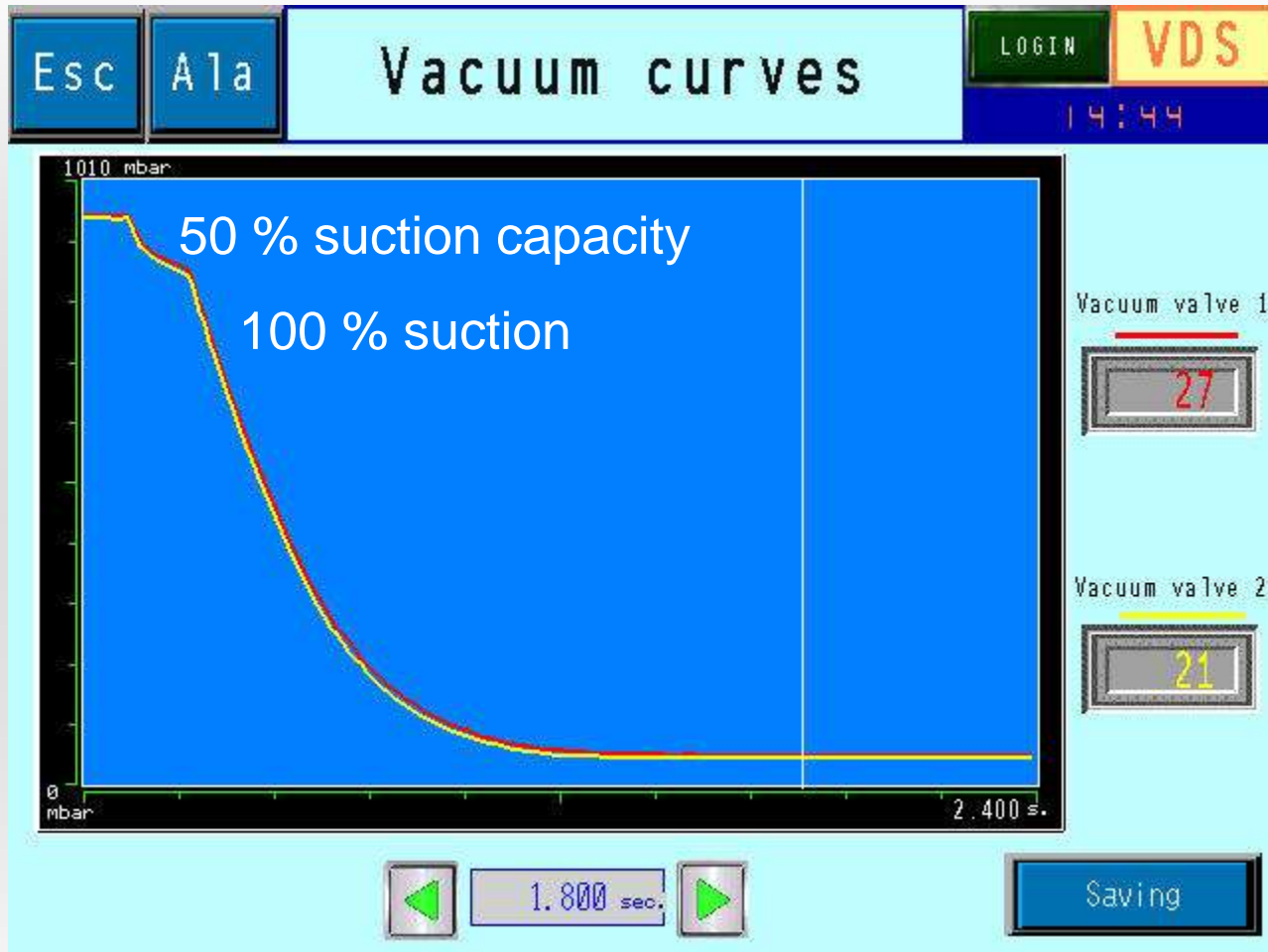
For the first time: the cavity pressure

The **pressure drop** through the ProVac® Ultra-Sonic valve is **insignificant**, because the evacuation section is enormous.

For evacuating very large cavities to less than 100 mbar cavity pressure, without sealing ring, in a very short time.



Reduced suction



European project



The aim of this project is to provide a **SOUNDCAST** technology package which allows the fabrication of sound and weldable vacuum-assisted HPDC (VPDC) components at low cost by using secondary alloys with enhanced mechanical properties and to establish a VPDC control system that assures casting quality.

Objectives and targets:

- To develop the know-how for producing sound and weldable high performance aluminium components by low cost vacuum assisted HPDC process (VPDC) taking into account the whole fabrication process
- **VDS (Switzerland)** manufactures highly innovative vacuum valves and supplies complete vacuum equipments to the HPDC industry, its participation and technological advice will guarantee the success of the project.

SOUNDCAST CONSORTIUM

RTD	AZTERLAN <u>Metallurgy</u> <ul style="list-style-type: none"> New alloy development. Melt treatment. Metallurgical control tool. Heat treatment. <u>Numerical Simulations</u> <ul style="list-style-type: none"> Die design. 	ASCAMM <u>HPDC Process</u> <ul style="list-style-type: none"> VPDC laboratory tests. Die specialist. VPDC process parameter optimization. PCA statistical analysis. 	TU-BS <u>HPDC Process</u> <ul style="list-style-type: none"> Lubrication optimization. VPDC laboratory tests. <u>Welding Process</u> <ul style="list-style-type: none"> Welding technique development.
	ALIASA <u>HPDC Foundry</u> <ul style="list-style-type: none"> Fabrication of a high mechanical properties demonstrator. 	VDS <u>Vacuum System Manufacturer</u> <ul style="list-style-type: none"> Technical advice in Vacuum technologies. 	DIACE <u>HPDC Foundry</u> <ul style="list-style-type: none"> Fabrication of a weldable demonstrator.
Additional Industrial Partner		CHEMTREND	<u>Lubricant Supplier</u> <ul style="list-style-type: none"> Technical advice in Lubrication technology.

3. "State of the art" vacuum valve

Very low vacuum levels of between 40 hPa (best state of the art for T6/T7 heat treated parts) and 100 – 150 hPa should be covered in the project in order to obtain castings free of porosity. Therefore, the recently patented VDS "Provac Ultra Sonic" valve available since June 2011 on the market, which is expected to gain market step by step, is used in this project. VDS adaptable vacuum technology is a revolution with a high innovative technology as demonstrated by two patents granted and another one applied for the novel construction-principle of the "Provac Ultrasonic" valve [11, P1- P3]. The VDS collaboration in the project is the guarantee to make the optimal use of this innovative vacuum system.

Conclusion

- Advanced controller for customer satisfaction
- Latest technology in Standard valves with TYPHOON
- Ultra Vacuum valves have clearly improved evacuation capacity, faster closing time and as much as 60% lower parting surface area
- High reliability and long life chill-vents
- Efficient R.& D. (Patents, Database, Measurements, Programming, special executions); European Project
- **VDS and VDS America**, for technical support for your **Structural Parts**

