





Welcome to a world of **thermal solutions** !



WattMobil



ThermalPower



QuickCheck



FlowMaster

Guillaume LEVACHER
President

Who are we ?

Lethiguel is a French company specializing in providing thermal technologies, solutions and services for the global light-metal casting industry. The family business was founded by my living father Michel Levacher in 1976, initially distributing furnaces and machine tools for the French metal casting industries.

Throughout our company's history, we have shown dedication and commitment to our customers, carefully listening to their needs while looking closely at the evolution of the industry. We believe that our capacity to adapt to changes, our long-term approach and our appetite for innovation has enabled us to grow from a local actor to a global group, exporting today 85% of our sales.

Our team is multicultural: we have over 14 nationalities and speak 13 different languages; this great asset allows us to promote a very open-minded approach in driving our globalized business.

With our HQ based in France, and international offices in Germany, Japan and Canada, we serve our customers globally with a strong local presence.





Cooling solutions

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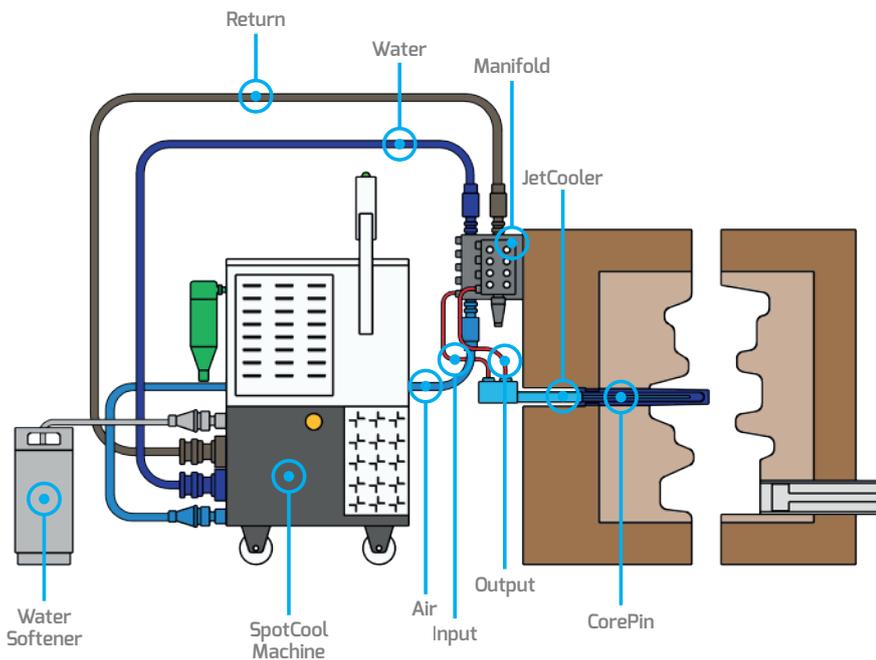
Principal scheme and benefits

Operation

A hydraulic unit ensures the circulation of pressurized cooling water (from 3 to 20 bars) for a given period of time in the circuits of small diameter injectors (\varnothing from 1,2 to 2,8 mm) inserted in the specific core pins.

At the end of the cooling period, a pneumatic distributor injects air in the injector's circuits and purges it. In this way, the cycle can be carried out in full safety without presence of water inside the circuits.

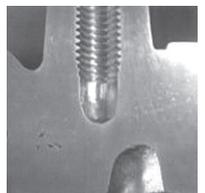
The cooling cycle is synchronized by adjustable temporizations with the die casting machine.



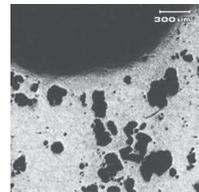
Jet Cooling is a technology that is dedicated to handling hotspots. Thanks to high pressure capacity and sequential cooling, it enables leveling the die temperature and removing any hot area by reaching core pins and inserts, preventing porosity and shrinkage problems.



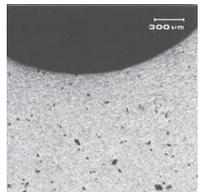
Casting without use of jet cooling technology : porosity occurs near thread



Casting when using jet cooling technology: decreased porosity



Chill zone without use of jet cooling technology



Chill zone with use of jet cooling technology for 10 seconds

In 2004, Lethiguel acted as a pioneer when the company decided to design and sell the first closed-loop jet cooling machine, equipped with its now-famous core-pin breakage control. At that time, jet cooling was a very confidential technology, however already strongly established in eastern-Asia foundries.

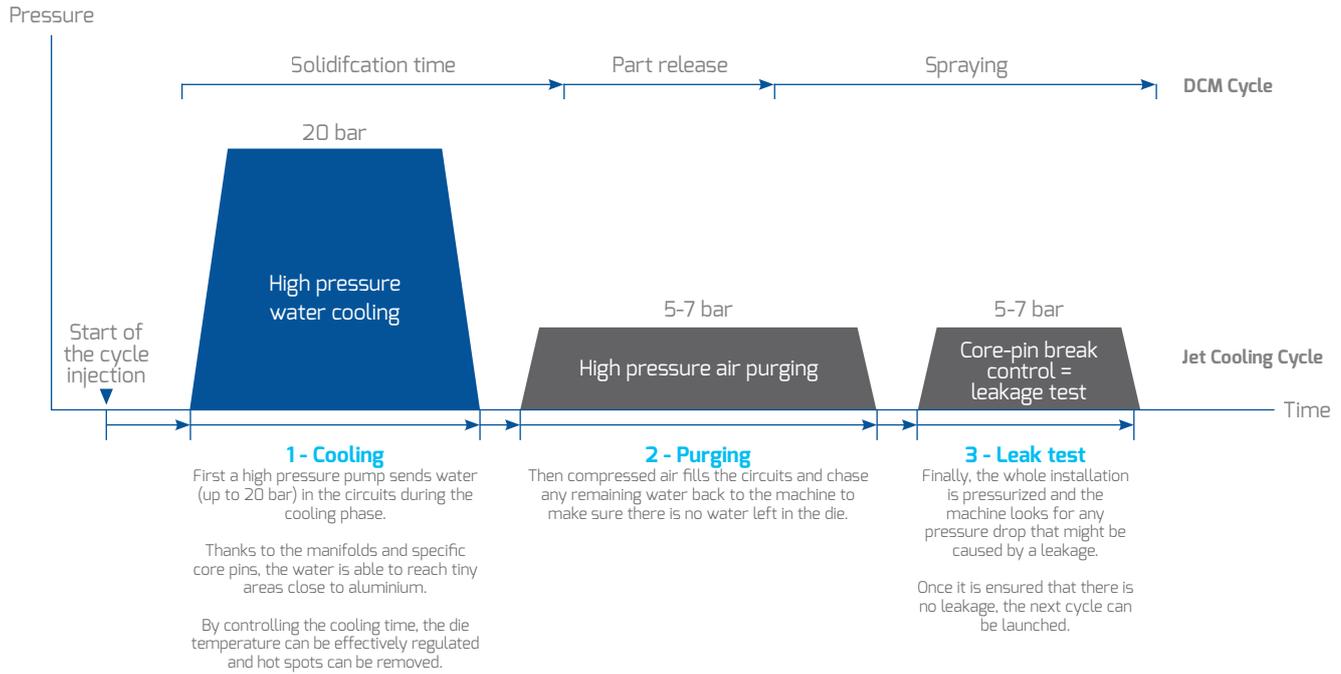
Lethiguel foresaw this high-added value system would soon have to become a standard in worldwide HPDC foundries. Why?

- Structural growth of automotive market
- Quick evolution of HPDC processes
- Shift of complex parts towards HPDC
- Increased expectations in terms of quality
- Increased pressure of competitiveness

LETHIGUEL INVENTOR AND LEADING EDGE OF CLOSED-LOOP JET COOLING

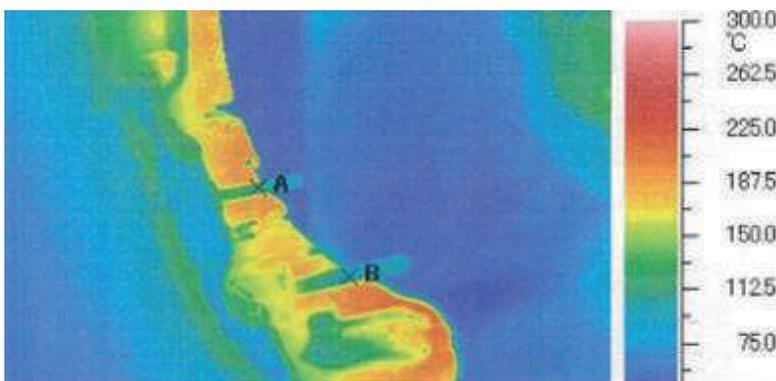
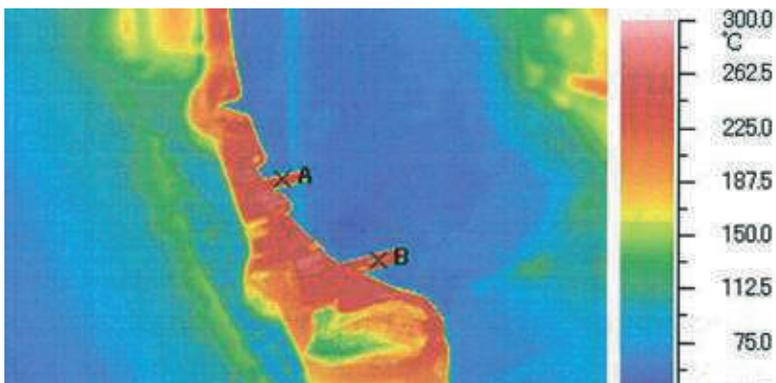
Lethiguel's understanding of the market leads to the development of a new range of machines in 2018:

- Cooling down more hot spots
- Ensuring better quality and meeting higher standards
- Improving in-depth expertise of die thermal process
- 100% adapted to foundries requirements



Case study: Cooling hot spots of a crank case

The use of thermal cameras allow us to point out the efficiency of the cooling on the core pins A and B. These pictures are taken before the spray-cooling phase. The consequence is a 150°C saving on the core pins. Furthermore, all the zone around the core pins equipped with jet cooling also benefits from the cooling impact, this impact being of 70°C. In this case, the cooling times lasts 10 to 15 seconds.



Jet Cooling technology allows

- Complex castings geometry
- Drastic cost reduction

Benefits

The thermal fatigue of non-ferrous metal die-casting dies becomes more severe at higher operating service temperatures, reducing die life significantly. Consequently, to extend die life, die design has to address efficient cooling methods. Jet cooling can be used to solve most of thermal related issues in non-ferrous die-casting.

- + Decreased cycle time
- + Scrap reduction
- + Porosity and shrinkage reduction
- + Enhanced durability of die elements

SpotCool





SpotCool Classic

SpotCool _Classic



Advantages of SpotCool Classic

-  4 circuits
-  30L/min
-  Average of 20 core pins
-  Screen size 7"
-  3 Measurement points

SpotCool Classic is the reference in terms of field expertise, with 10 years of customer experience and feedback. It is robust, it is reliable, and it is very competitive. This machine offers a basic and efficient level of equipment, and is ideal for a punctual or specific need not exceeding 20 core pins. It features our famous core-pin breakage control, it measures HP pump outlet pressure and water T°, and is compatible with our range of accessories.

SpotCool Classic, the icon!

SpotCool Classic

Réglages




Circuit 1	Circuit 2	Circuit 3	Circuit 4	
456	456	456	456	Retard départ cycle
456	456	456	456	Circulation eau
456	456	456	456	Retard soufflage
456	456	456	456	Soufflage
456	456	456	456	Retard test fuite
456	456	456	456	Temps montée en pression
456	456	456	456	Durée de contrôle

Autres réglages




SpotCool Evolution

SpotCool _ Evolution



SpotCool Evolution
Certified
UL
For American's market

Advantages of SpotCool Evolution

-  4 circuits
-  48L/min
-  Average of 32 core pins
-  Screen size 9"
-  15 Measurement points

SpotCool Evolution is Lethiguel's answer to market and technology's latest transformations. This machine integrates the very essence of innovation in M2M (machine-to-machine) communication, with DCM data transmission of eight measuring points, including flow-rate and pressure for each circuit, supply air and HP pump inlet pressure, water conductivity, filter inlet/outlet pressure. Through analysis of this information brings on machine learning, leading the SpotCool Evolution to safety optimization as well as clever understanding and management of productivity/ quality balance.

**SpotCool Evolution:
the smart!**



SpotCool Performance

Available
SOON



SpotCool — Performance

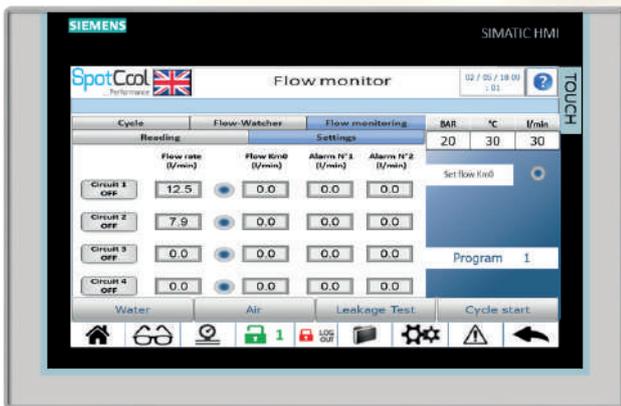
Advantages of SpotCool Performance

-  8 circuits
-  100L/min
-  Average of 64 core pins
-  Screen size 9"
-  23 Measurement points

Never seen before! SpotCool Performance features eight circuits, allowing to potentially cool down 64 pins. This machine was specially designed for big dies, structural and/or complex parts. The DCM installation will benefit from a great flexibility in terms of core pins distribution. The number of manifolds allows an appreciable precision in the cooling circuits' partition, as well as a better distribution of cooling power.

- Drastic reduction of scrap level
 - Quality of parts enhanced
- SpotCool Performance integrates every single feature of SpotCool Evolution in terms of communications and measuring points while offering double the capacity of pin cooling.

**SpotCool Performance:
the champion**



Range overview

SpotCool
— Classic

SpotCool
— Evolution

SpotCool
— Performance

Frequency	50 or 60 Hz		
Power	AC380-480V 3phase		
Max Power Consumption	2,5 kW	3,7 kW	5,5 kW
Cooling Circuits	4 independant circuits	4 independant circuits	8 independant circuits
Available Flow Rate	30L/min	48L/min	100L/min
Cooling control	high pressure intermittent cooling		
Cooling water Discharge Pressure	20 bar		
Average Number of Core Pins	20*	32*	64*
Water tank	60L	120L	200L
Water Filling	Automatic water filling	Automatic water filling + manual water inlet	Automatic water filling + manual water inlet
Water source conductivity	20µs/cm		
Integrated filters	Pump		
Air consumption	Max 500NL/min		
Supplied Air Pressure	5-7 bar		
Air Purge Pressure	5-7 bar		
Connections location	All connections to the side	All connections at the rear	All connections at the rear
Water supply connection Ø	3/4" external		
Water discharge connection Ø	M22 x 1,5 x 1/4" IG & M22 x 1,5 x 1/2" AG		
Water cooling connection Ø	3/8" external		
Return	NW 13 x 3/4" butterfly bolt		
Air supply connection Ø	1/2" internal		
Air discharge connection Ø	Quick connector NW 7,2 male 3/8" IG		
Start signal	Contact point signal		
Operation method	Touch screen		
Control panel	Mitsubishi*		
Screen dimensions	7" screen	9" screen	9" screen
Software	Classic software	New software	New software
Measurements points	HP Pump outlet pressure		
	HP Pump inlet pressure		
	Water temperature		
		Flow-rate for each circuit	Flow-rate for each circuit
		Pressure for each circuit	Pressure for each circuit
		Supply air pressure	Supply air pressure
Design	Classic Design	New Design	New Design
		Easy handling (strong wheels, handles, eyebolts)	Easy handling (strong wheels, handles, eyebolts)
Weight	170kg	280kg	320kg
Dimensions	1000 depth *650 width *1300 height mm	1230 depth * 640 width *1730 height mm	1300 depth * 740 width *1850 height mm
Features	Inverter		
	Lamp		
	Circuit selection on screen		
		Opening for washing the tank	Opening for washing the tank
		Detection of filter fouling	Detection of filter fouling
		Electrical socket (230V)	Electrical socket (230V)
	Auto/Manual switch	Auto/Manual switch	

FlowMaster System

FlowMaster system will help you move from preventive to predictive maintenance



The good performance of a Jet Cooling system greatly depends on the flow rate of water, which is injected in the small diameter cooling channels. Managing and ensuring the right amount of water flow, for every cooling position, allows to continuously maintain an optimal cooling effect, and therefore enhance the level of productivity and castings' quality. Thanks to its long experience in Jet Cooling technology, Lethiguel has specifically developed a FlowMaster system to enable the Jet Cooling users to precisely monitor the flow condition, in real-time, and for every cooling position. In this way, preventive maintenance becomes easier and highly predictive, thereby saving valuable resources for the die-casters, and allowing high productivity.

Operation and utility



Goal

Detect the fooling/clogging of the pipes



Why

Anticipate/plan the maintenance



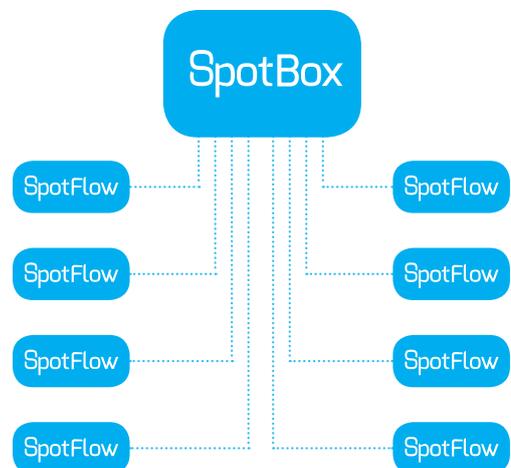
How

By measuring the flow drops

Principal scheme of FlowMaster solution

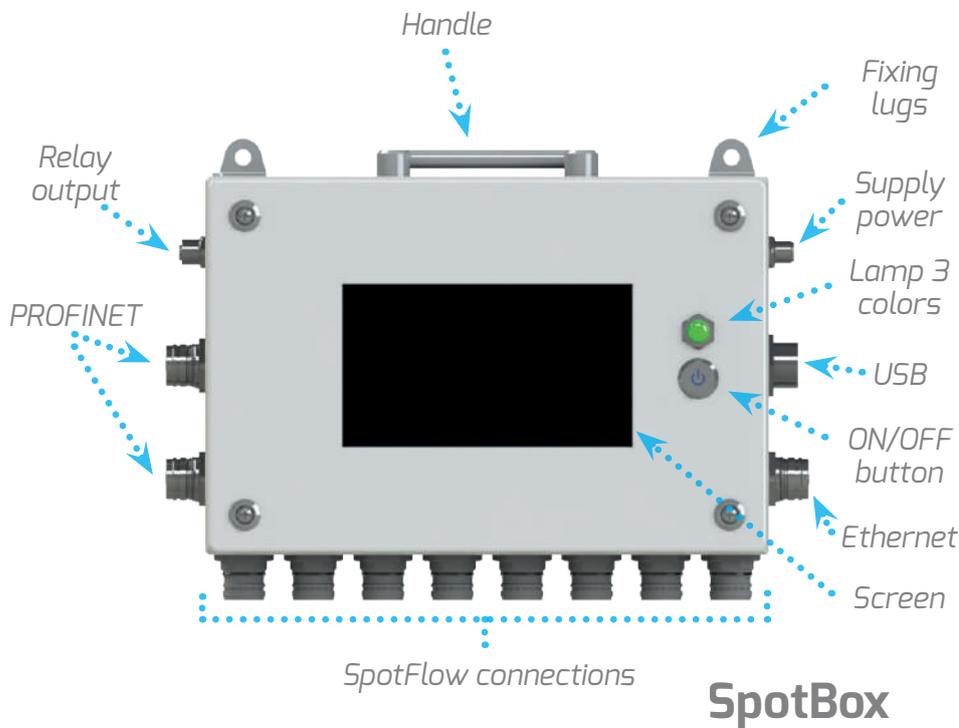
SpotBox monitoring system

Remote control screen displaying flow measuring in real-time
Connectable to 8 Spot Flows, which allows water flow monitoring for a maximum of 64 positions.



SpotFlow measuring system

8 flow sensing devices embedded in a foundry-proof casing, allowing measurement of water flows ranging from 0,5L to 10L per minute, in 8 independent Jet Cooling circuits.



SpotBox specifications:

Specific program allowing real-time water flow monitoring, with visual graphics and precise volume measurement

Possible to set up a "0 Km" nominal value, for every independent position, in order to define the optimal flow setpoint

Possible to program 2 different sets of alarms, for every position (either in Liter/minute, or as a % of a nominal value)

Possible to save up to 99 different flow patterns, for the 64 independent positions (enabling to save preset values corresponding to different dies or parts).

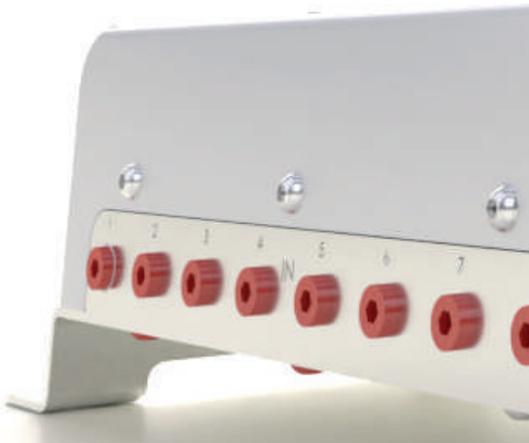
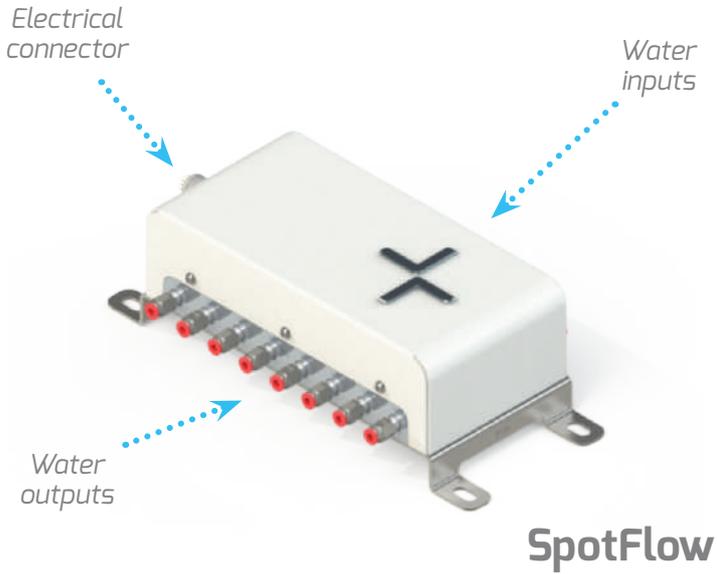
*Note: the profinet interface is currently available on a Siemens configuration.

The FlowMaster system can be used as a stand-alone product.

SpotCool Evolution and SpotCool Performance can be connected to the FlowMaster via a Profinet* interphase.

FlowMaster : the future

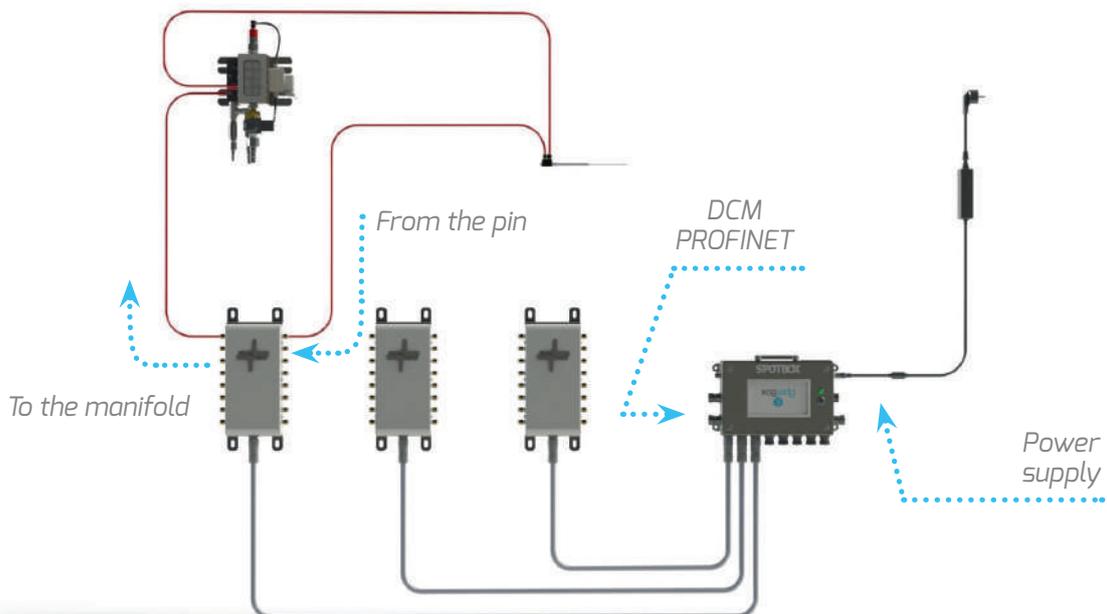
FlowMaster System



Technical features

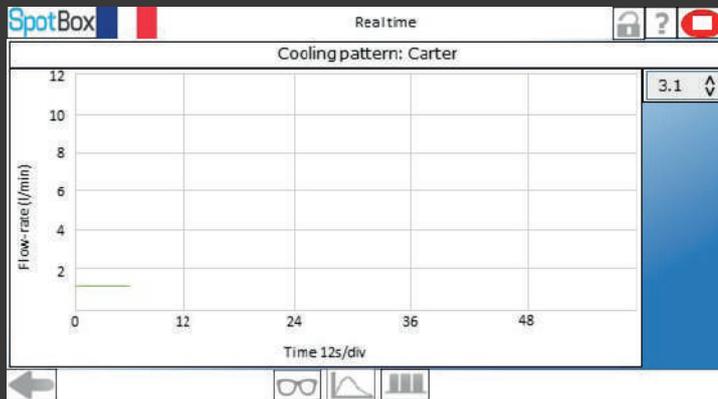
SpotFlow Features		
Main		
Number of measurements	/	Up to 64
Fluid	/	Water
Flow-rate	l/min	0,5-10
Maximum pressure	bar	12
Fluid temperature	°C	-40 to 125
Sound pressure level	dB(A)	<70
Supply voltage	VDC	24

Component	Function
SpotFlow	Measure the flow (up to 8 sensors) and send the signal to the SpotBox
SpotBox	Monitoring of the signal from the SpotFlow Signal analysis and fooling correlation Alarms Communication with other devices (PROFINET) (Optional)



Screens

Real-time Monitoring



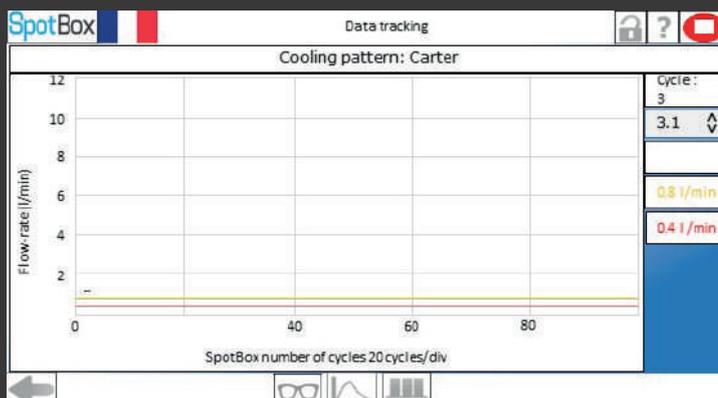
- Instant signal is shown, position per position
- Time scale can be adjusted

Status Monitoring

	SPF 1	SPF 2	SPF 3	SPF 4	SPF 5	SPF 6	SPF 7	SPF 8
1	2,3 2,3	1,7 1,7	1,3 1,3					
2	0,5 2,3	1,7 1,7	1,4 1,4					
3		1,7 1,7	3,1 3,1					
4	2,1 2,3	1,7 1,7	1,4 1,4					
5	2,3 2,3	1,7 1,7	2,5 2,6					
6		1,7 1,7	2,2 2,2					
7		1,7 1,7	1,2 1,2					
8	2,3 2,3	1,7 1,7	2,3 2,3					

- The left value is the nominal flow-rate from the previous cycle
- The right value is the initial flow-rate (Km0)
- 2 levels of alarm corresponding to a % of optimal flow available. The values get orange when the alarm 1 is reached ; red for alarm 2

Data follow-up Monitoring



- For each position, one Flow value is reported on the diagram
- The 2 alarm threshold are displayed

Corepins

As jet cooling's effectiveness relies on its ability to reach the die's hot spots, core pins must be properly designed and manufactured. Lethiguel provides state of the art core pins, with a large panel of surface treatment that will ensure the best lifespan possible.



	Surface Treatment
Gas nitrided (Gray)	- Hardened surface of steel - General duty - Low cost
«Cascoat» TiN (gold)	- PCVD process, oxidation temperature 500°C - Protection against soldering and erosion - Mid Cost
TD-VC (Gray)	- Thermal diffusion process - Vanadium carbide coating - Mid Cost
PCVD-TiAlN (Black)	- Oxidation temperature 700°C - Best protection against soldering and erosion - Higher cost
P20 (Violet)	- Better anti-oxidation property, temperature over 700°C - Multi layer film and good adhesiveness - Higher Cost

Designation	Treatment method	Chemistry	Treatment temperature (°C)	Heat resistance temperature (°C)	Coating hardness (HV)	Coating thickness (µm)	Wear resistance	Heat resistance	Seize resistance	Erosion resistance	Corrosion resistance	Adhesion	Mold releasability	Fatigue resistance	Oil film retention capability	Deformation
Cascoat	PCVD	TiN	550	600	2000~2400	2~4	✓		✓	✓		✓				
TiAlN	PCVD	TiAlN	550	800	2300~3000	2~4	✓	✓	✓	✓		✓				
TiAlSiCNO	PCVD	TiAlSiCNO	550	900	2300~5000	5	✓	✓	✓	✓		✓	✓			
CrN	PVD	CrN	500	700	1800~2200	2~3	✓	✓			✓					
TiN	PVD	TiN	550	550	1800~2200	2~4	✓									
TiAlN	PVD	TiAlN	550	800	2800~3300	2~4	✓	✓								
LUMENA	PVD	TiAlN	500	900	3400	10	✓	✓	✓	✓						
ALCRONA	PVD	AlCrN	500	1100	3200	6	✓	✓								
SX-H	PVD	TiSiN	500	1300	3600	3,5~4,5	✓	✓								
TD	Carbide coating	VC	1000	500	3200	10	✓		✓		✓	✓				✓
Gas nitrided	Gas nitrocarburizing	Nitriding compound	550	500	800~1200	-								✓		
Sursulf	Sulphoni-triding	Sulphoni-triding compound + Nitriding compound	565	500	800~1200	-	✓		✓					✓	✓	

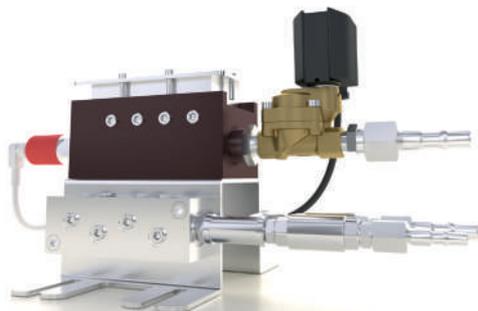
Alpha pin

Alpha pin (or long-life pin) can be used as replacement for pins which are breakable due to casting shrinkage. It is effective for dispersing concentrated stress on the stepped part of the pin. Tests have shown an average double life span compared to standard core pin, which means time lost for pin replacement is reduced, and trouble occurring when a pin breaks in the die is also minimized.



AHRESTY TECHNO SERVICE CORPORATION

Manifolds

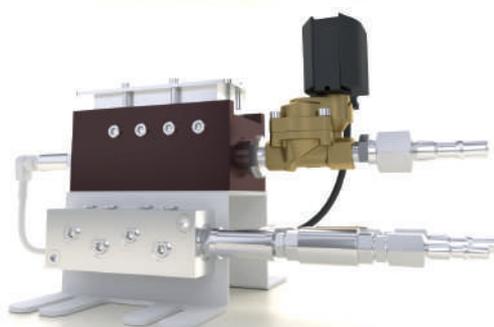


Manifold_pressure switch

Ref: RP8-SC-1.1-R0 - [1 piece](#)
8 entries, Core Pin Breakage, Visual Control

Ref: RP8-SC-1.0-P41 - [1 piece](#)
8 entries, Core Pin Breakage, No Visual Control, with Ø4 couplers

Ref: RP8-SC-1.1-P61S - [1 piece](#)
8 entries, Core Pin Breakage, Visual Control, with Ø6 couplers

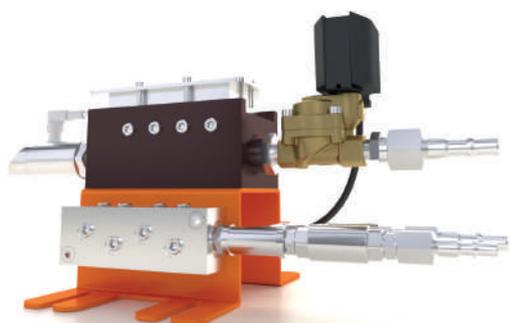


Manifold_pressure sensor

Ref: RP8-SC-2.1-R0 - [1 piece](#)
8 entries, Core Pin Breakage, Visual Control

Ref: RP8-SC-2.0-P41 - [1 piece](#)
8 entries, Core Pin Breakage, No Visual Control, with Ø4 couplers

Ref: RP8-SC-2.1-P61S - [1 piece](#)
8 entries, Core Pin Breakage, Visual Control, with Ø6 couplers



Manifold_pressure switch with visual display

Ref: RP8-SC-3.1-R0 - [1 piece](#)
8 entries, Core Pin Breakage, Visual Control

Ref: RP8-SC-3.0-P41 - [1 piece](#)
8 entries, Core Pin Breakage, No Visual Control, with Ø4 couplers

Ref: RP8-SC-3.1-P61S - [1 piece](#)
8 entries, Core Pin Breakage, Visual Control, with Ø6 couplers

Pressure monitor

Ref: RP-P3-M12 - [1 piece](#)
Pressure Switch, 3 bar, G1/4" M12 connector

Ref: RP-2130150 - [1 piece](#)
LED cable for Pressure Switch M12

Ref: RP-CAPT-PR - [1 piece](#)
Pressure sensor, 0-100 bars, G1/4" M12 connector

Ref: RP-CAPT-PR2 - [1 piece](#)
Pressure sensor with display, 1-10 bars, G1/4" M12 connector

Ref: RP-CAPT-CABLE - [1 piece](#)
Cable with femelle connector for Pressure Sensor M12

Couplers

Ref: AH-CO-P6-01MOF - [10 pieces](#)
Tube coupler, steel ring, for Ø6 fluorine tube

Ref: AH-CO-P4-01MOF - [10 pieces](#)
Tube coupler, steel ring, for Ø4 fluorine tube

Ref: AH-CO-P6-01MLOF - [10 pieces](#)
Tube coupler, steel ring, L-shape, for Ø6 fluorine

Ref: AH-CO-P4-01MLOF - [10 pieces](#)
Tube coupler, steel ring, L-shape, for Ø4 fluorine

Solenoid Valve

Ref: RP-EV_2 - [1 piece](#)
Solenoid valve, piston, for manifold

Connection pack SpotCool and connection pack for manifolds



Features:

Quick connectors

Ø6 – Ø8 – Ø11

The connection pack is part of the SpotCool manifold solution. It is composed with quick connectors used for water, air and return.

Ref. SC-RP-CPM-WARE

Water Quality

SpotCool

— Water Softener



Features:

CE certified

From 1500l up to 15000l filtering capacity

Output water conductivity range 0 - 20µS/cm

Easy change of the resin

The SpotCool Water Softener is a Water treatment cartridge able to deliver a pure water stream. It is a perfect fit with SpotCool installation as it delivers low conductivity water optimizing efficiency and life time of jet cooling equipment. Thanks to a wide range, SpotCool Water Softener can adapt to any type of jet cooling or regular cooling device.

Make sure the SpotCool installation is always using the best water quality!

Water Quality

SpotCool __Mini Water Check



Features:

- CE certified
- Mounted with battery AAA
- Suitable with all SpotCool conductivity sensors
- Mounted on SpotCool Water Softener
- Easy check with 3 level LEDs

The SpotCool Mini Water Check is a fixed measurement device mounted on the Water Softener. Thanks to a regular LED flash, it shows in the easiest way possible the water quality delivered by the SpotCool Water Softener. No power supply needed as AAA batteries are integrated for a more flexible solution.

Make sure your SpotCool installation is filled up with the best water quality without a single operation, just have a look!

SpotCool __Water Check



Features:

- CE certified
- Mounted with battery AAA
- Suitable with all SpotCool conductivity sensors

The SpotCool Water Check is a mobile measurement box able to connect to former and newest water conductivity sensor. Thanks to 3 AAA batteries it allows a quick check on all SpotCool Water Softener in the foundry.

Make sure your SpotCool machine comes with the best water quality in a single device!

Jet Cooler



JC-KRM

Ref: JCKRM-06-L760-E250-J510-M1.8 - 1 piece
Jet Cooler with revolving head



JC-HSR

Ref: JCHSR-06-L760-E250-J510-M1.8 - 1 piece
Jet Cooler with isolating revolving head
Allows replacement of needle without removing jet cooler from die!

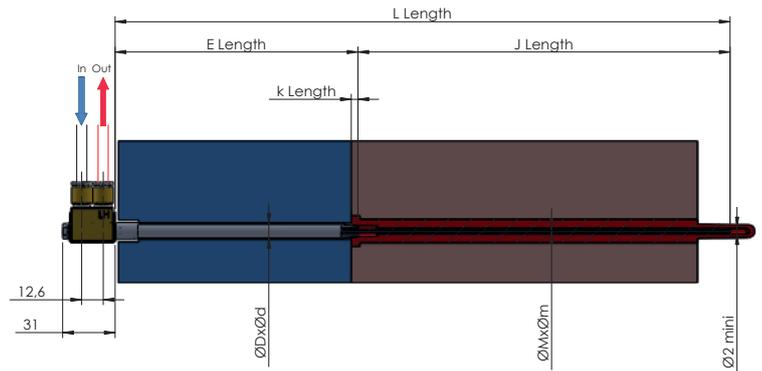
Couplers

Ref: AH-CO-P4-01MOF - 1 piece
Coupler for Ø4 fluorine tube

Ref: AH-CO-P6-01MS-OF - 1 piece
Coupler for Ø6 fluorine tube

O-ring

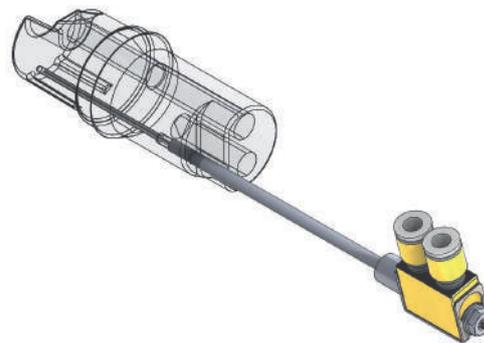
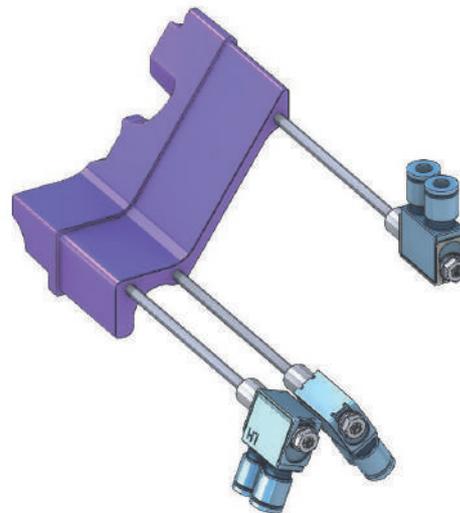
Ref: AH-CO-P7 - 100 pieces
O-ring for Jet Cooler



Isolated revolving jet cooler

New JC-HST and JC-HSR allow to pull out the tube to flexible direction, due to respective rotating heads. These JC can be attached to a die with connecting tubes, and because the base of the head comes in a semicircular shape, installation pitch is narrowed. Both types are available in Ø4, 6, 8 and 10mm, and maximum length of 1000mm.





Being the first company to ever have imported Jet Cooling technology in the European market, Lethiguel has built a strong know-how regarding thermal processes in non-ferrous die-casting, and has been offering turnkey solutions for over forty years now.

Our engineering office works side by side with our customers to develop the right solution for the right application. As historical inventor of closed circuit jet cooling, we use our great understanding of the cooling process to improve and optimize any casting application. Being a close partner of Ahresty Techno Service Corporation, our manufacturing team has been trained in Japan, to ensure that we meet with the quality requirement any Jet Cooling application requires.

**Our team is yours,
challenge us!**

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