

Catalogue



IMMERSION
HEATING SOLUTIONS
EUROGUSS 2018

Lethiguel
Quality Thermal Solutions

Who are we?

Lethiguel is a French high-tech brand.

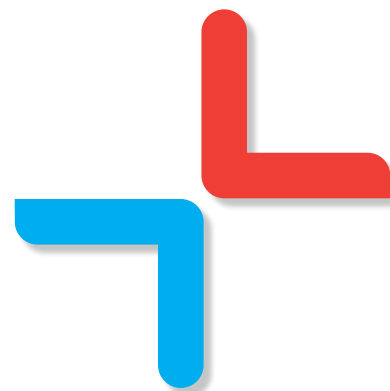
The company conceives, manufactures and supplies cooling and heating solutions to the light metal casting industry.

A team of 30 is fully dedicated to supporting and supplying challenging companies in a demanding market.

Follow us on LinkedIn



WELCOME TO A WORLD OF THERMAL SOLUTIONS



SUMMARY

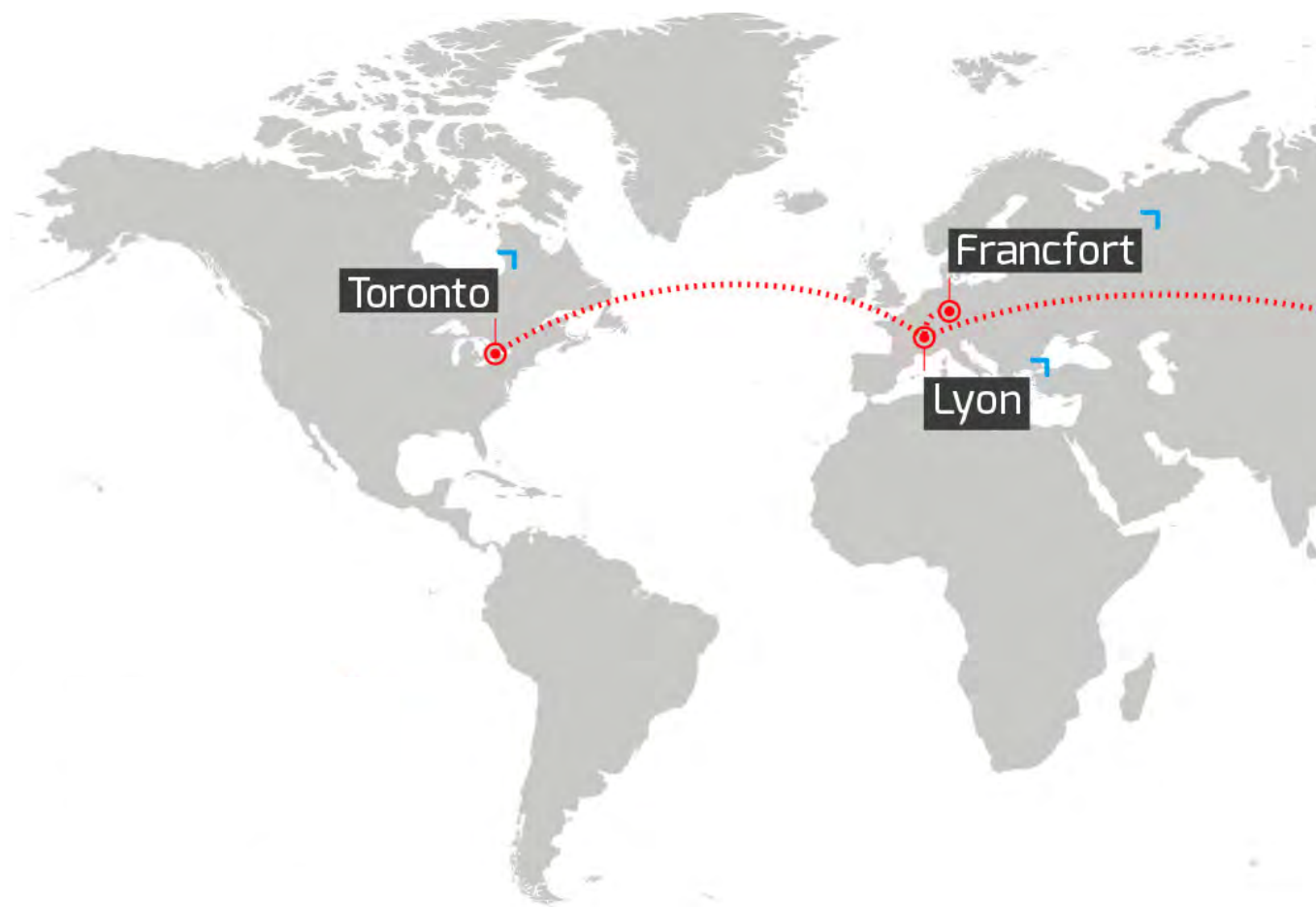
4 About us: quality Made in Europe

PRODUCTS

- 8 I-Type immersion heater
- 10 L-Type immersion heater
- 12 WattMobil®
- 14 Quickcheck thermocouple
- 15 Silicon nitride products
- 16 Electrical cabinets

INTEGRATED SOLUTIONS

- 18 Immersion heating furnace
- 20 Heating station
- 22 Al Serve transfer ladle



Evolution

Lethiguel was founded in 1976 by Michel **Levacher** and Marcel **Thiercelin**, for the initial purpose of selling German crucibles (**Tiegel**) to French foundries. You may notice the missing **U**, that was added to ease French pronunciation.

founded in 1976

External growth operations: in 2003, buy-out of Fitec Company, German numerical control machine-tools trading for machining and grinding industry. In 2007, buy-out of HiFast, immersion heater manufacturing company. The year 2010 sees a major turning point for Lethiguel with the relocation of productive, administrative and commercial functions in a new building. The company then settles down in Lozanne, west of Lyon.

In 2013, Lethiguel GmbH is set-up in Frankfurt, Germany, followed in 2015 by Lethiguel Inc. North America. Finally, in 2016 whilst the company celebrates its 40 years anniversary, Lethiguel Japan is launched in Nagoya, which brings the staff to 30 employees.

Lethiguel started as a heating and cooling solutions manufacturer. With our growing experience and knowledge of the industry, we are today proudly taking a step to another level, as a global integrator and partner for the die-casting industry. In 2018, Lethiguel supplies clients in 35 countries, thanks to an efficient and reliable supply-chain.

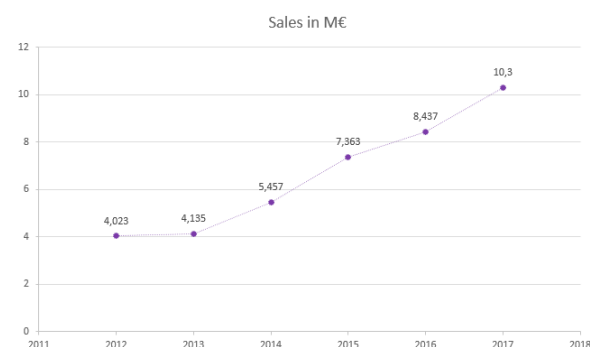
Key Figures

Lethiguel is a family-owned business, driven by a will of durability and a strong trust in its teams and business model. The company is independant on all levels:

- + Financial control led by will of durability
- + Sustainable customer relations
- + Autonomous decision making and adaptability
- + New products and openness to solutions.

As an expert in non-ferrous alloys temperature control, Lethiguel improves innovative solutions to back up demanding and efficiency-oriented clients. Therefore, the company is currently based in Europe (France and Germany), North-America (Canada) and Asia (Japan).

In addition, an international network of qualified sales agents and authorized resellers is dedicated to supporting and supplying our clients with the right solutions.



vision

Our responsibility:

- Commitment to our clients: our customers include the leading names in foundry and automotive industries worldwide. We believe it is our responsibility to exceed customer expectations by supporting and training their operational teams, and also by offering our expertise anytime, anywhere on the globe.
- Commitment to our teams: we believe it is our responsibility to put each team member in a position to act proactively and relevantly, for the benefits of our stakeholders. For that purpose, emphasis is put on top-down and bottom-up communication as well as training, so that everyone can find interest in working every day for an SME operating in a developing industry.



Michel Levacher
Founder and Chairman

Our goal is to become a benchmark and leader in conception and sales of electrical heating and temperature control technology for non-ferrous alloys. We are proudly doing our job every day, honouring ethical standards that are conditional in being part of Lethiguel's team:

- We demonstrate integrity, transparency and team spirit
- We improve quality in a continuous way, with due regard to environment and employee safety
- We encourage innovation at all level, but also autonomy, flexibility, adaptation, and absolute fulfilment of commitments.



Guillaume Levacher
President

Savoir-faire

Lethiguel provides global solutions: holding furnace engineering, immersion heating simulation, manufacturing, distribution and jet cooling implementation. High added-value systems that ensure foundries will optimize energy consumption, quality of critical parts, productivity and safety. A highly skilled team and four processes orchestrated by the quality manager are the driving forces of our Quality Management System. Not only Lethiguel's QMS is a certification that recognizes a functional quality department, its main purpose is regulating our innovation and growth to ensure flexibility and reliability to our clients and stakeholders.



Nagoya

Numbers that matter



125 000

The average number of kilometers traveled per month by the sales team



1

The number of round-trip from the Earth to the Moon flown by an export Sales Engineer in 18 months



825

The number in meters of ceramic sheaths in a year in order to manufacture our very own Immersion Heaters



21

The number of flags ready to be hoisted to welcome our customers and suppliers



142

The average number of time zones crossed every year by a Sales Engineer



48

The number in tons of goods handled by the Logistics Service in a year

PRODUCTS⁷

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Powerful savings

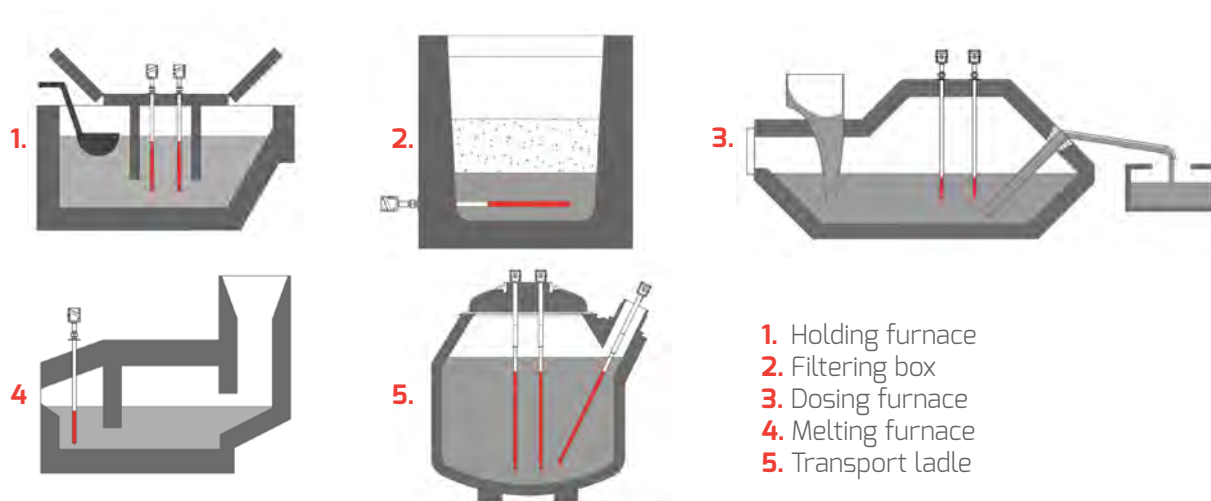
Are you holding molten metal in casthouse, foundry or recycling fields? With Lethiguel, be prepared to save energy and time while improving your metal quality and increasing your productivity.

Lethiguel's i-type immersion heater is an electrical heating system, specially designed for molten aluminium heating. It is intended to be directly immersed into liquid metal. The thermal power is directly brought to the heart of molten metal through conduction.

Advantages of immersion heater:

- + Heating efficiency rate >99%
- + Full power transferred to the melt in 30 seconds
- + Our know how allows us to diffuse 30 to 40 Watts/ square cm
- + Power: from 2 to 50 kW
- + Energy savings of 30 to 50% compared to traditional heating methods*
- + Flow temperature precision of $\pm 2^{\circ}\text{C}$ (or $\pm 36.5^{\circ}\text{F}$) guaranteed
- + No metal overheating = improved metallurgical quality
- + Enables a rapid raise of temperature, up to 800°C or 1562°F
- + High level of safety during operation
- + Quick installation and easy maintenance

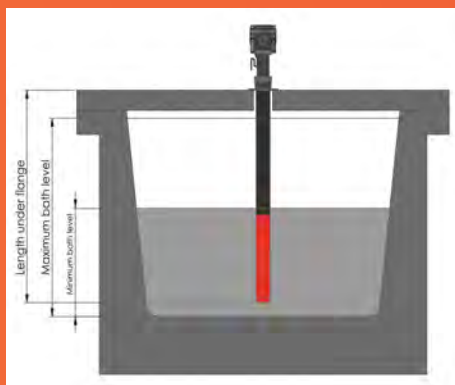
Main applications



* Gaz burner, SiC heater, heating lid, heating rods.

Positioning and calibration

Every single heater we install is designed according to our customer's needs in terms of heating power, application and purpose. This is why an immersion heater is identified by its unique ID number.



Lethiguel takes into account at least 10 parameters to calibrate an immersion heater. Our engineering bureau conceives the solution within both thermal and positioning constraints to deliver the best customized solution.

- | | |
|------------------------|-----------------------|
| + Alloy type | + Min bath level |
| + Bath T° | + Length under flange |
| + Power | + Immersed length |
| + Voltage | + Extension type |
| + Sheath \varnothing | + K-type thermocouple |

Extensions range

Four types of extensions available in our immersion heating product range. Possibility to attach a Quick-Type multipin connector to any cabled extension.

Elbow Type



Terminal Box Type



Cabled Type



Quick Connector Type



I-Type 32



I-Type 55



I-Type 55 in 300kg holding/melting furnace

Technical characteristics

Our immersion heater is the combination of two advanced materials:

1

A **silicon nitride sheath** with the following technical qualities:

- ✦ No sensitivity to thermal shocks
- ✦ High mechanical resistance
- ✦ Excellent thermal conductivity
- ✦ Optimum resistance to corrosion

2

A high watt density **electrical heating resistance** embedded in a highly performing isolating material, providing both electrical isolation and heat transfer.

Standard dimensions:

- ✦ Sheath diameter: 32 or 55 mm
- ✦ Length under flange from 500 to 1450 mm
- ✦ Immersed length can reach 1000+mm when allowed by depth of the bath and work capacity
- ✦ Connecting voltage from 36 to 600 V, mono/three phase, delivering up to 50kW.

An exclusive product for innovative foundries and casthouses!

Our latest innovative development is an L shaped heater, specially designed for shallow bath levels applications.

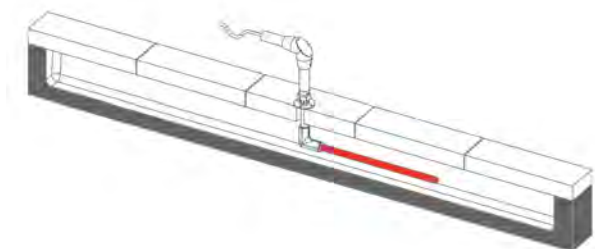
The L-Type is quick to install, and delivers the best metallurgical quality by regulating the flow temperature with a $\pm 2^{\circ}\text{C}$ accuracy.

We offer a whole range of customized solutions based on 2 standards:

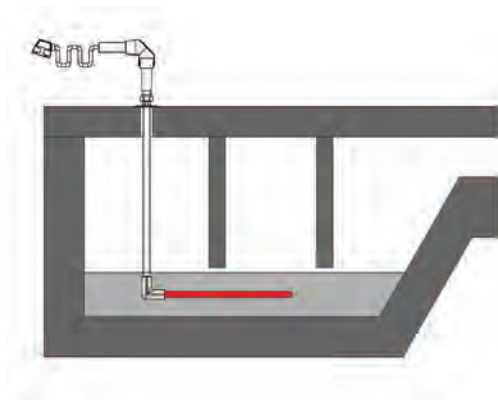
- + L-Type for transfer launder process: very short mast, to fit any standard of launder
- + L-Type for shallow bath level furnace: designed according to the pouring capacity

Applications :

- + Melting / Holding furnace
- + Low-pressure furnace
- + Degassing station
- + Additional heating solution
- + Transport ladle



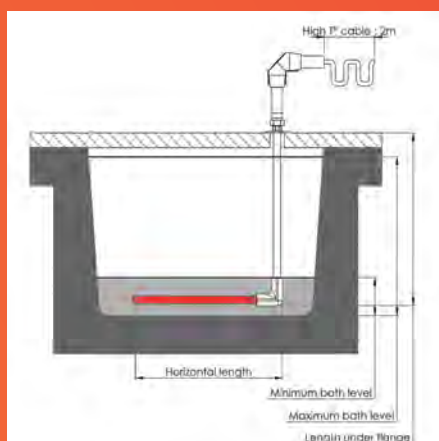
L-Type in transfer launder



L-Type in holding Furnace

Positioning and calibration

Every single heater we install is designed according to our customer's needs in terms of heating power, application and purpose. This is why an immersion heater is identified by its unique ID number.



Lethiguel takes into account at least 11 parameters to calibrate an immersion heater. Our engineering bureau conceives the solution within both thermal and positioning constraints to deliver the best customized solution.

- | | |
|------------------------|-----------------------|
| + Alloy type | + Length under flange |
| + Bath T° | + Immersed length |
| + Power | + Extension type |
| + Voltage | + K-type thermocouple |
| + Sheath \varnothing | + Horizontal length |
| + Min bath level | |

Extensions range

Three types of extensions available in our L-Type heater product range. Possibility to attach a Quick-Type multipin connector to any cabled extension.



Elbow Type



Terminal Box Type



Cabled Type



L-Type positioned inside a furnace



L-Type inside a launder



Using an immersed heating system is the most efficient way to **precisely monitor and manage the aluminium bath temperature**, and therefore take control over your metal quality, your productivity, and your energy savings.

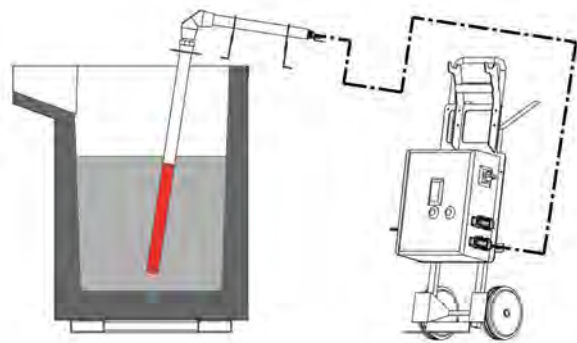


Optimized temperature maintenance during furnace critical stoppage periods.

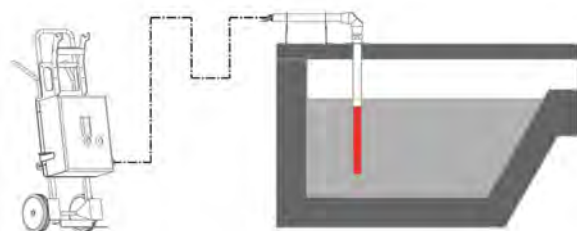
Watt Mobil® has been designed to **help in the following situations:**

- + Furnace maintenance
- + T° rising and monitoring
- + Furnace breakdown
- + Degassing time
- + Weakened furnace performance

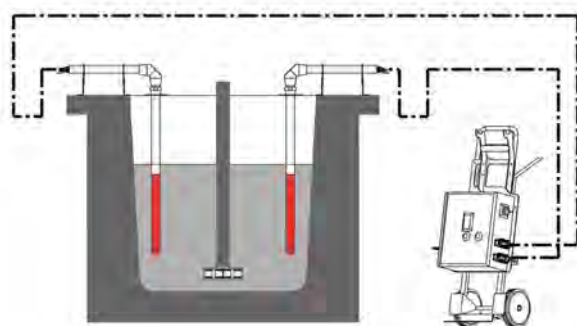
Applications:



Transport Ladle

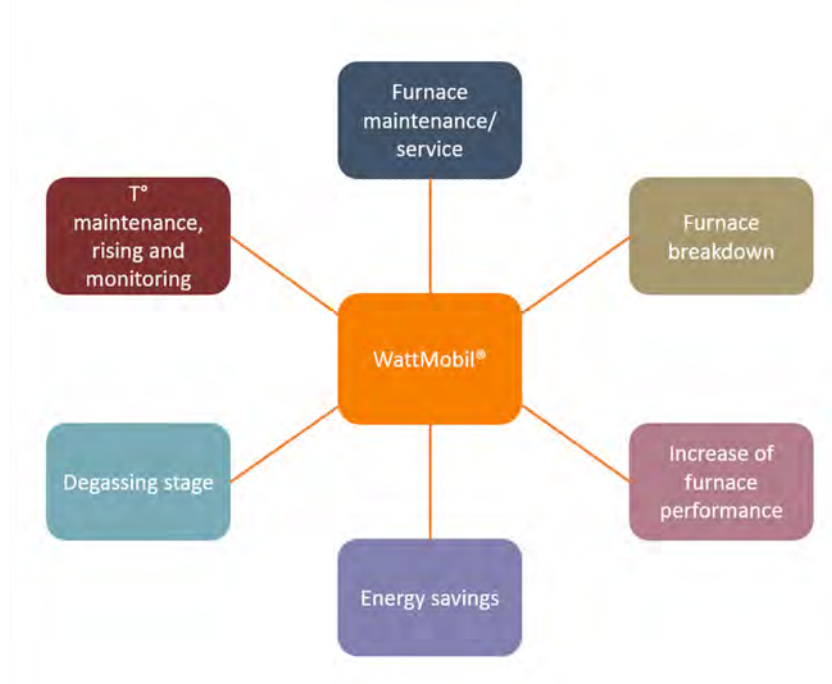


Furnace Maintenance



Degassing Time





WattMobil®

Designed according to foundry required standards, the WattMobil® is the perfect concentrate of an electrical high efficiency heating rod, or immersion heater, and a dolly with an integrated electric control cabinet.

Forwarding the power straight in the heart of molten metal, a WattMobil® ensures both efficient

maintaining and rising of the temperature, using 99% of IH power dissipation.

Continuous use allows relief of furnace heating roof, thus helping to notably save energy, reduce oxydation of the bath and eliminate the accumulation of corundum.

The WattMobil is available with I-Type 55, 850 or 1050mm under flange.

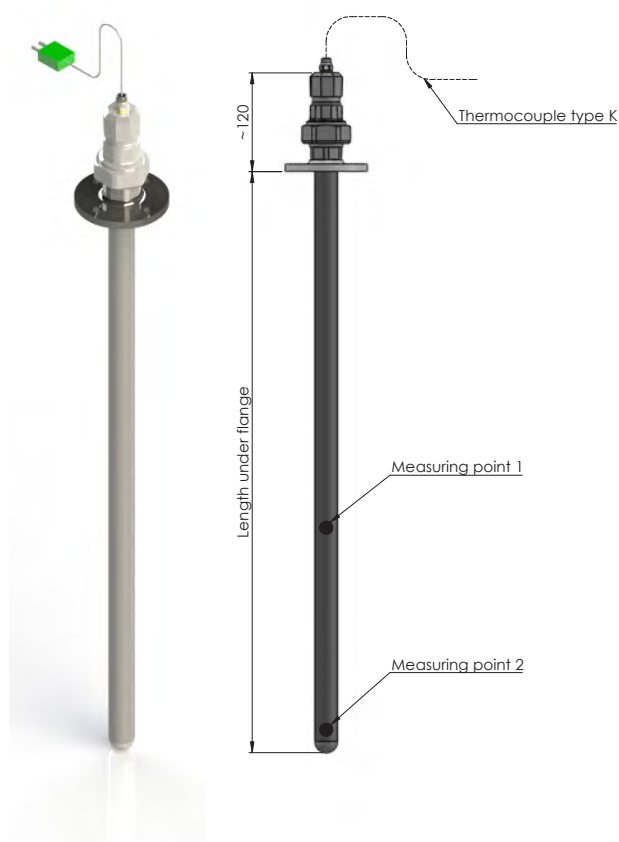


Long life thermocouple with instant response

Extremely high temperature is required to be maintained for the melting, refining and alloying of aluminum, so it requires the application of Quickcheck technology. Accurate and instant measurement of temperature in furnaces are needed for process control to improve product quality and production efficiency. Thermocouples are required for use in molten aluminum baths, especially where there are rapid temperature fluctuations. A quick check thermocouple prevents from temperature drop in the molten aluminum bath and greatly contributes to energy savings.

Product advantages :

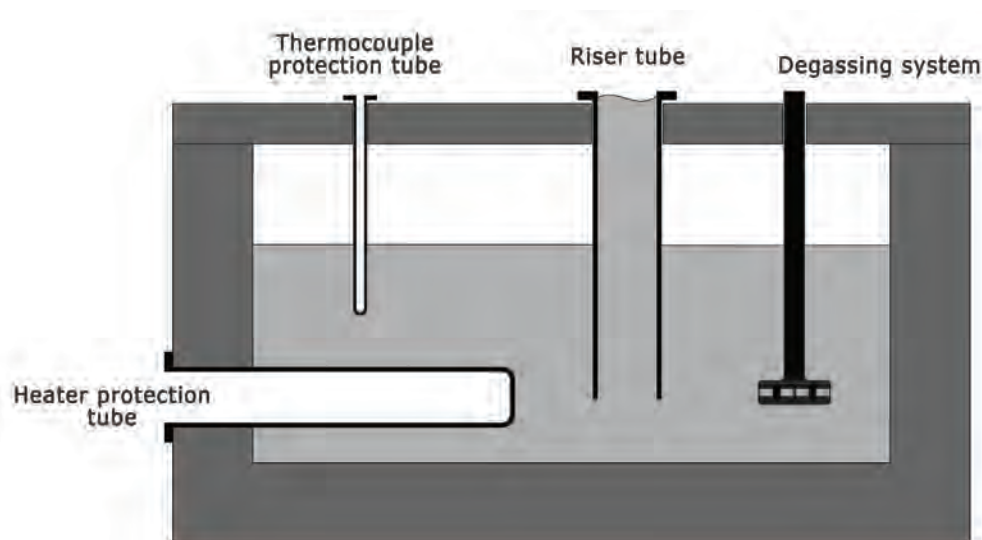
- + Instant T° measuring response. Even at start-up
- + Internal K-Type Thermocouple removable
- + One or two measuring points in one device
- + Long-life thermocouple: we warranty the sheath for 12 months (observed lifetime of over 2.5 years)
- + Length under flange available from 650mm to 1300mm
- + Non wetting SN sheath



Quickcheck28 can also be an added value to our WattMobil®!

Silicon Nitride Products at competitive prices for harsh operating conditions

Sialon sheaths feature high mechanical strength, high density, straightness and resistance to corrosion as well as an outstanding thermal conductivity and stability. These products have excellent proven chemical stability that prevents molten alloy to be contaminated by elution. The sialon we supply can be classified in several grades upon thermal shock resistance (up to $\Delta T 900^{\circ}\text{C}$) and flexural strength (up to 1020 MPa at 850°C).



Lethiguel supplies:

- + Riser tubes for low pressure casting
- + Thermocouple protection tubes
- + Heating tubes

Standard external diameters in mm: 28, 32, 55, 110, 120, 130, and up to 170mm.

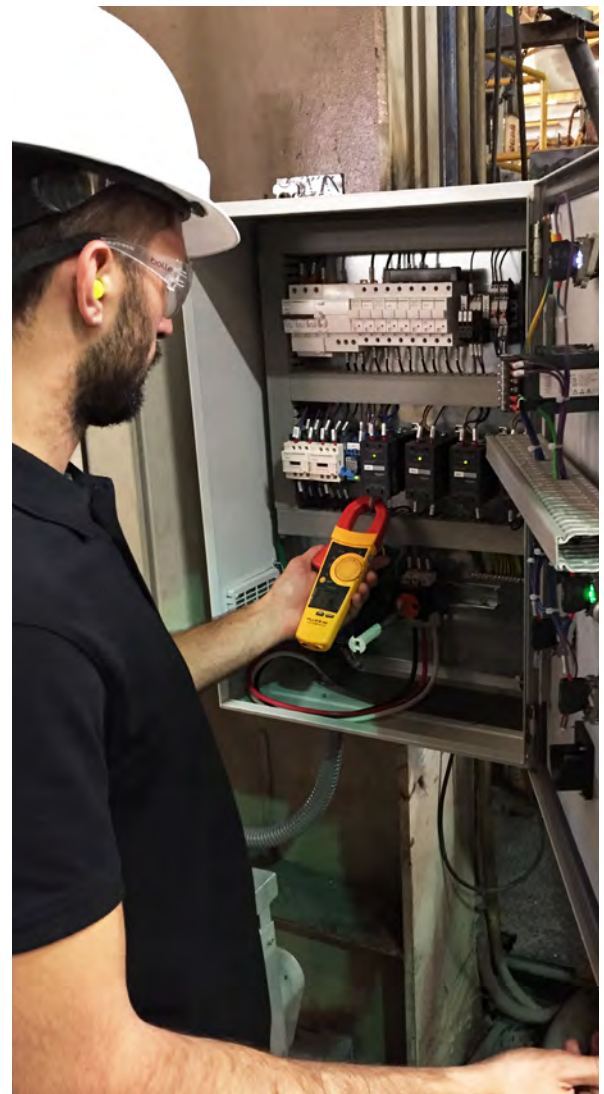


Note: Actual properties may vary on practical conditions of casting.

Electrical regulation for our immersion heating systems can be bought solo, or part of a global solution. Accuracy of regulation is a critical factor of success for immersion heating technology, and our panels are designed and built specially for our products.

We recommend this type of specific regulation as it optimizes our products' performances with following advantages:

- + Enhanced lifespan compared to non-specific regulation
- + UL and/or C€ norm compliance
- + Optimal regulation in scr or ssr type
- + Tailor-made compact product



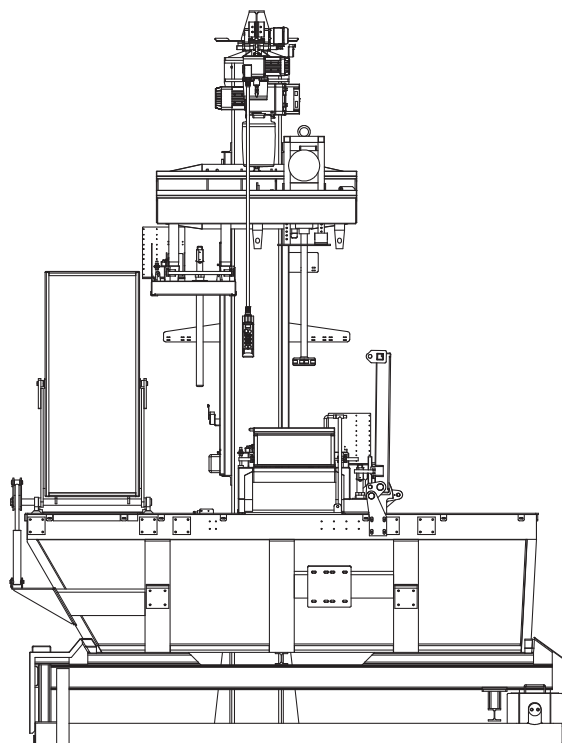
INTEGRATED⁷ SOLUTIONS

- 18 Immersion heating furnace
- 20 Heating station
- 22 Al Serve transfer ladle

Quality, efficiency, precision

Lethiguel designs and sells fully-customized furnaces, built around immersion heating technology, with or without an embedded degassing system. The useful capacity, thermal performances and immersion heater positioning are specifically designed for each customer.

Thanks to Lethiguel's savoir-faire, our immersion heating furnaces help reduce energy consumption and improve metal quality. Using heaters in a furnace boosts temperature rising while avoiding oxides. When used with a degassing system, immersion heaters ensure an optimum metal quality and density.



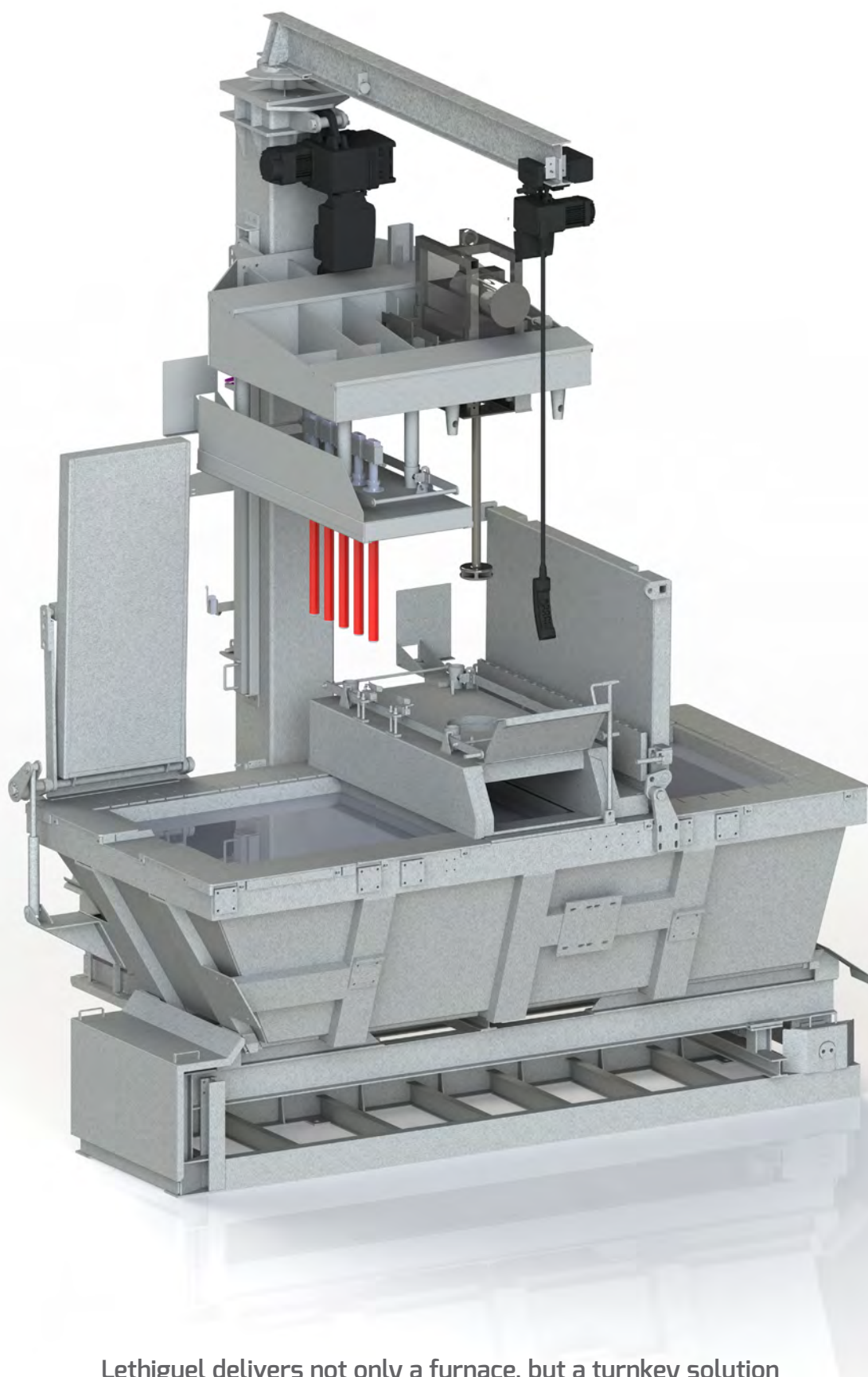
Technical specifications:

- + Working capacity: 1 to 10 Tons
- + Power: 10 to 150 kW

Options :

- + Degassing system
- + Filtering
- + Adaptation for automatic systems for more accurate pouring
- + scr or ssr type electrical regulation

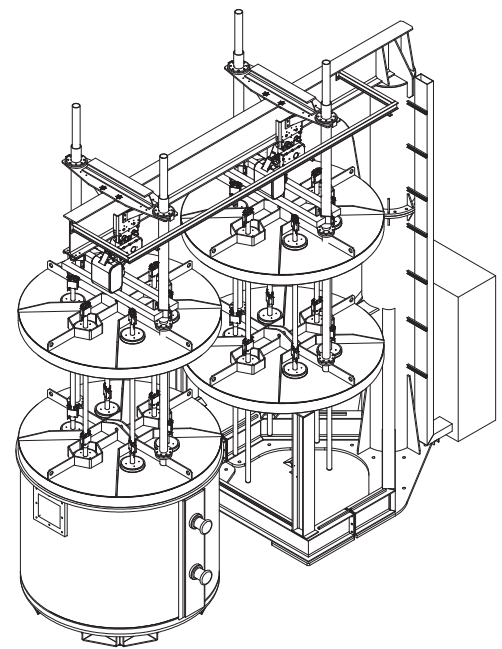




Immersion heating furnace

Lethiguel delivers not only a furnace, but a turnkey solution that can be instantly integrated in your casting process.

If you are expecting an integrated heating solution to upgrade your casting process, look no further.



Our engineering bureau, in close cooperation with our team of sales engineers, can build a 100% customized heating solution upon one's constraints. The whole project is led by a task force whose job is to deliver the right solution within a given deadline.

Lethiguel designs and sells immersion-heating stations equipment. Built around and integrating our core technology, the station comes equipped with state of the art mechanical and electrical control regulation.

✦ We can manufacture heating stations for both heating and/or rising temperature, that works for ladles from 500kg to 10tons with a 12kW to 150kW electrical power.





Heating station

Lethiguel builds the right solution around any kind of ladle

Vacuum filling and pressure dosing system for molten aluminium

The Al Serve System was developed by HOEI METAL Co., Ltd and is distributed on selected markets by Lethiguel. This system, incorporating a transport ladle, enables in-plant transportation of liquid aluminium and holding furnace refilling operations.

Overview of the pressure dosing system

Molten aluminium is transferred from a melting furnace into a dedicated pressurizing transport ladle and then to any die casting machine without any contact with air.

Pressure dosing system can be embedded on forklift or not, several configurations are available to arrange the right solution in the right place, for the right application.



Liquid metal transfer with a sealed ladle offers an important safety during transits (no splashes) and drastically brings down the oxide and dross formation.

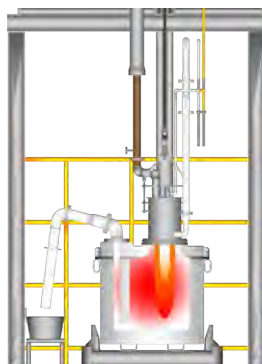


Potential metal savings range from 6 to 9 kg per ton (estimation based on field evaluations in European foundries)



Filling of transfer ladle generates an average of 5.2 kg/Ton of oxides with standard pouring system, down to 0.9 kg/Ton with Al Serve vacuuming system.

FOUR STEPS



Preheating of ladle

The ladle is pre-heated before use. Caution: in general, when pre-heating is neglected, thermal issues can occur! Lethiguel and Hoei have conducted tests to determine the perfect sintering process for Al Serve.

Filling molten aluminium from a melting furnace to a ladle

Molten aluminium from the melting furnace is drafted through a pipe by decompressing the inside of the transport ladle. This transfer is automatically stopped by detecting the level of molten metal in the transport ladle.



Transfer of molten aluminium from the transport ladle to a die casting machine

By pressurizing the inside of the transport ladle with compressed air, molten aluminium is discharged through a pipe. The applying pressure is controlled depending on the weight of molten metal inside the pot. Again, the low limit of molten metal inside the transport ladle is detected with a measuring device. Alternatively, the process can be automatically stopped with an alarm when the die casting machine reaches full capacity.

Pressure dosing of molten aluminium's assets

- + Safer system than a conventional tilted ladle: no lifting up high and no rotation needed.
- + Reduced amount of oxide inclusions as the metal's exposition to air is minimized.
- + Scrap drastically reduced (5kg/ton)
- + Easy operation that does not require skilled labour
- + Both filing and dosing operations are processed with one device which improves efficiency and productivity.





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