

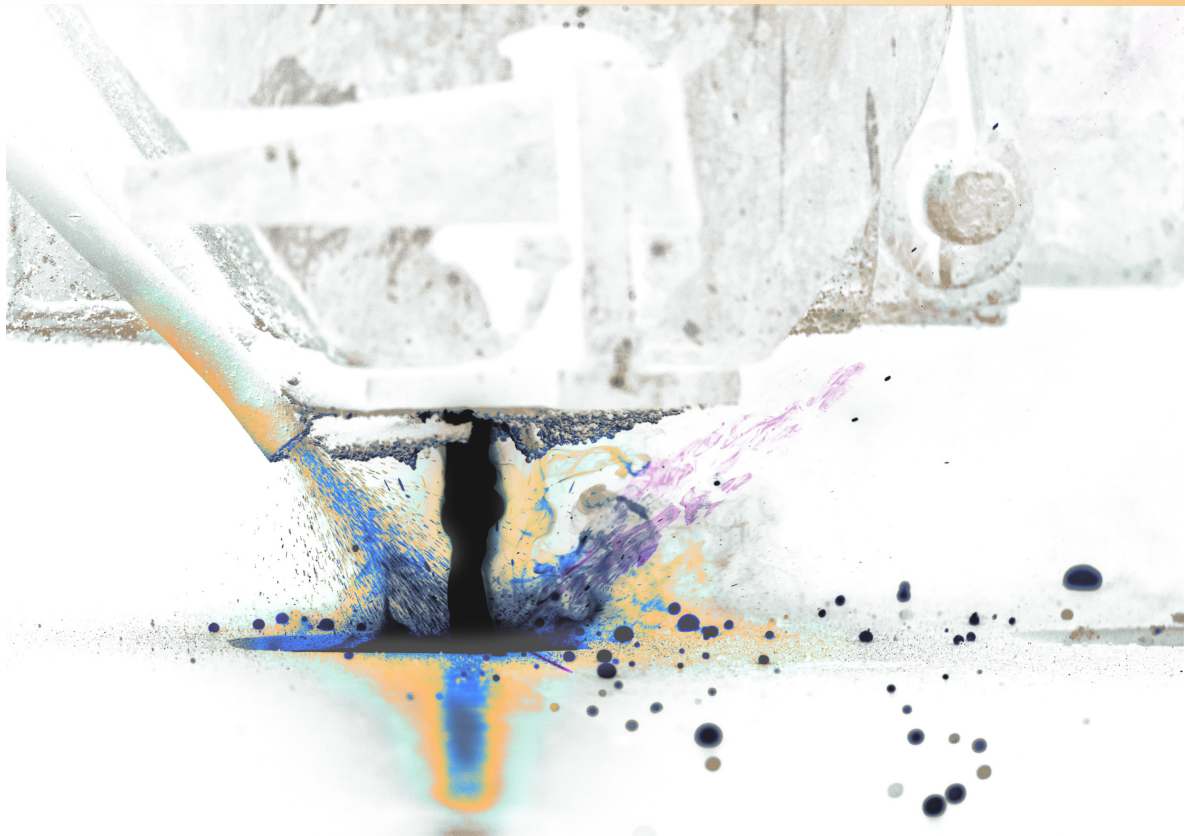


# pour-tech AB

WE DO  
AUTOMATIC POURING



# pour-tech AB



## THE AUTHORITY IN AUTOMATIC POURING

pour-tech AB staffs have more than 25 years experience from more than 450 installations of automatic pouring solutions world wide.

On 1st July 2011 the European organization became independent and is working from Gothenburg / Sweden as pour-tech AB.

Together with Viking Technologies in USA and KOINS Co. Ltd. in Asia, pour-tech AB has formed a very strong team; the pourTECH group.

At pour-tech AB, we focus on analyzing and understanding our customer's needs, drawing from decades of experience from foundry and other industrial areas. This enables us to provide the best and most cost effective solution for each application, giving our customers the competitive edge.

We have succeeded in building a strong relationship with our customers, exchanging new ideas, concepts, and always improving our technologies and ourselves. Thus allowing our customers to stay well ahead of their competition.

Keeping up with the latest technological advances, new generation pourTECH™ Systems are currently being installed around the world, designed with the latest Sensor technologies, I/O standards and system features.

Today, we provide pourTECH™ Systems to a customer base that spans the globe through local Sales and Service groups and an extensive network of partners.

The ultimate proof of pourTECH's success shows in the large number of repeat customers. Thanks to our quality equipment and superior support, our customers keep coming back, over and over again.

pourTECH™ has become the preferred automatic pouring system for the leading foundries around the world.

The pourTECH™ System is designed in Sweden and built in Germany!



## HIGH SPEED, CLOSED LOOP FLOW CONTROL SYSTEM

### Keeping an eye on the pour cup level

The eye of the pourTECH™ System is a high speed, real-time sensor used to constantly monitor the iron level in the pour cup during the pour.

The sensor is protected from the hostile environment over the mold by a double walled, stainless steel water-cooled jacket together with an air purge system for cooling and protecting the sensor optics.

### Making intelligent decisions

The real-time sensor sends the level information to the system controller – the brain of the pourTECH™ System. It contains the system I/O and a dedicated computer with software based on over 25 years of iron pouring experience.

The computer uses the constantly updated cup level information to determine if the iron flow into the mold should increase or decrease, i.e. whether the system actuator should open or close the stopper rod.

### The actuator does the work

Based on the computer's real-time calculations, the electric high speed servo actuator throttles the stopper rod, increasing or decreasing the iron flow through the nozzle, dynamically matching iron flow through the nozzle with the intake rate of the mold. The actuator is the muscle of the pourTECH™ System.

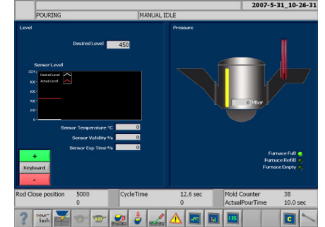
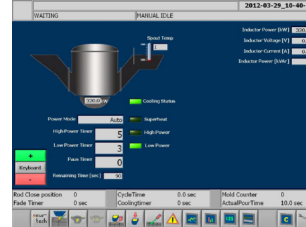
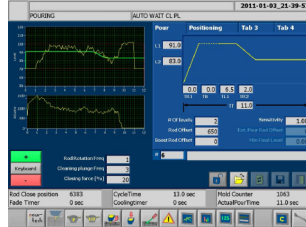
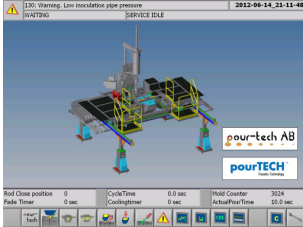
### Automatic positioning

When pouring molds on a flaskless, vertically parted molding line, it is necessary to determine where the next pouring cup will be located and move the pouring vessel to this location before the pour begins. pourTECH™ monitors and controls the position of the pouring vessel. By tracking the molds, the system will automatically position the vessel to meet up with the pour cup.



# pourTECH™ SCOPE OF SUPPLY

The pourTECH™ Automatic pouring control system from pour-tech AB is a real-time, high-speed, closed loop system designed to automatically and precisely regulate the level of molten metal in launders and pouring cups.



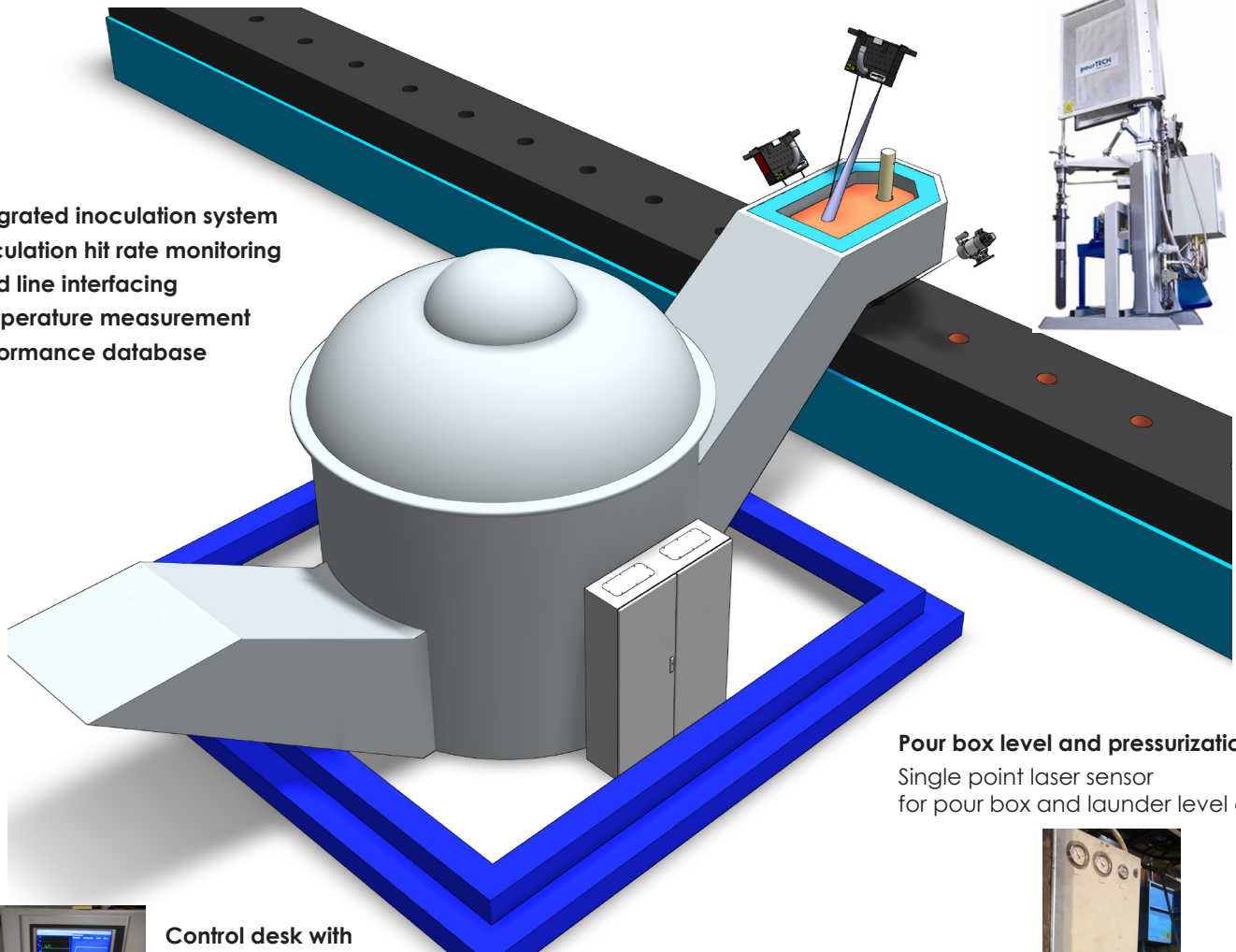
## Sensors for various applications

- Line laser sensor - High performance lines
- Single point laser sensor - Space restricted applications
- Vision technology camera - Flask lines application

## Stopper rod actuators

with twist and cleaning plunger

- Integrated inoculation system
- Inoculation hit rate monitoring
- Mold line interfacing
- Temperature measurement
- Performance database



## Pour box level and pressurization

Single point laser sensor for pour box and launder level control



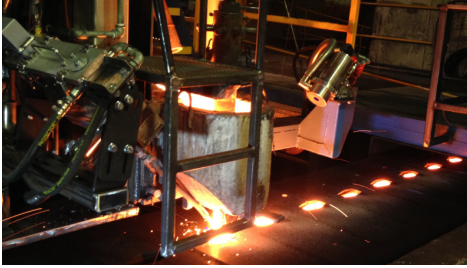
## Control desk with visualization

All pouring unit functions are centralized to the main controller and touch panel PC.





# pourTECH™ Benefits



## pourTECH™ PREVENTS OVER POURS

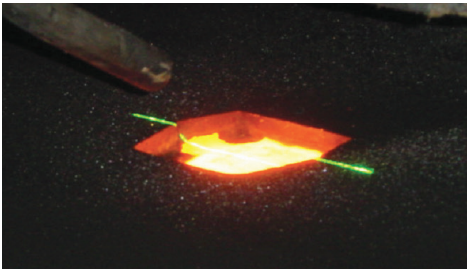
pourTECH™ is a high speed, closed loop control system using real-time level measurements to monitor and control the iron level in the pour cup.

As the level increases, the system actuator throttles the stopper rod, preventing overpouring of the mold.



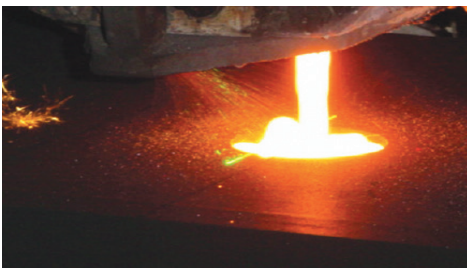
## pourTECH™ PREVENTS SHORT POURS

Using a high speed, fast response actuator, the pourTECH™ system is able to react quickly as level changes are detected in the pour cup. If the level drops below the selected set point, the system will instantly increase the iron flow, thereby maintaining the desired iron level in the cup.



## pourTECH™ SAVES IRON

pourTECH™ automatic positioning allows the use of smaller pour cups. At the end of the pour, pourTECH™ is capable of bringing the pour cup level down to a level set by the operator, reducing the total amount of iron poured, increasing the yield. Less iron is remelted, reducing energy, alloy and material handling costs.



## pourTECH™ REDUCES SLAG INCLUSIONS

By maintaining a high and accurate iron level in the pour cup throughout the entire pour, pourTECH™ ensures that slag is not pulled into the mold but stays floating on top of the iron.

The result is higher quality castings thanks to less slag inclusions.



## pourTECH™ FREES UP LABOR

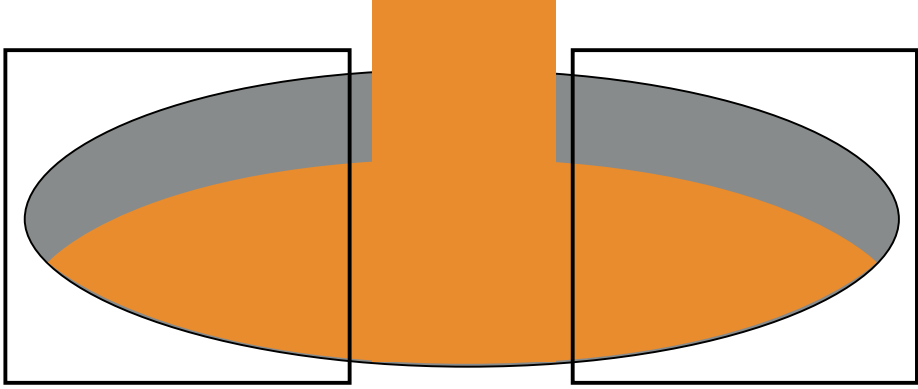
pourTECH™ is an automatic pouring system, requiring only minimal supervision. Therefore, there is no need for a dedicated pouring operator.



# SENSOR TECHNOLOGIES

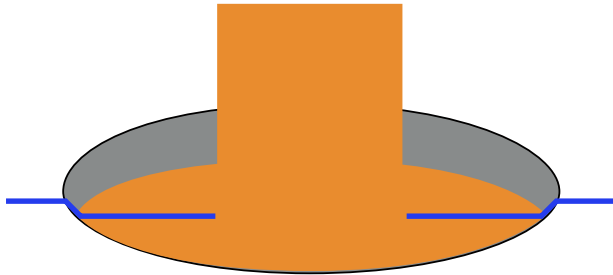
## VISION TECHNOLOGY

For Vision camera technology it is recommended that the pouring cup size is more than 4 times the diameter of the nozzle in order to get sufficient surface areas for measurement. For instance, when pouring from a 35 mm nozzle, a pour cup with a minimum of 150 mm should be used.



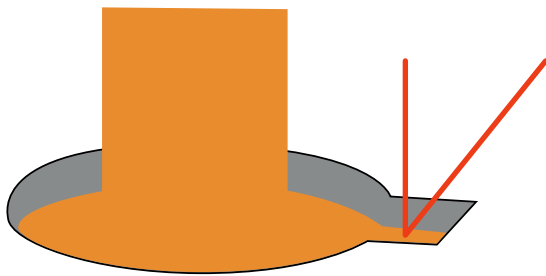
## LINE LASER TECHNOLOGY

With the Line Laser technology, the pouring cup is recommended to be two and a half times the nozzle diameter to allow for sufficient measurement data and high reliability.



## LASER TRIANGULATION VERTICAL APPLICATION

The laser triangulation measuring principle is extremely fast and accurate, mainly used together with vertical molding lines operating with pouring ladles with space constraints, hence the laser tail.

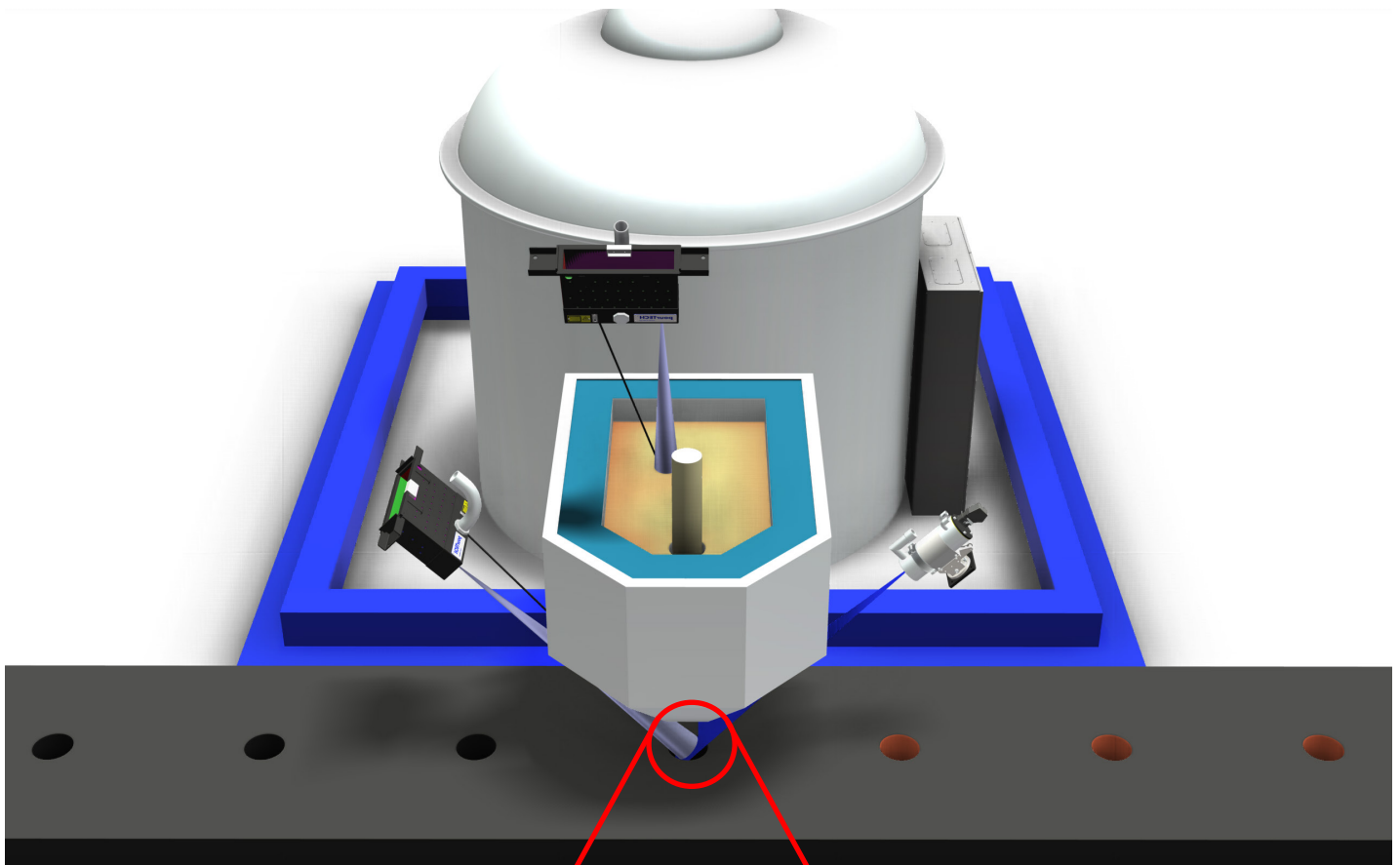




## THE LINE LASER SENSOR SYSTEM

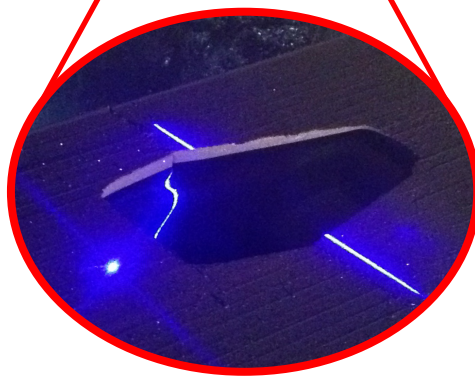
The pourTECH™ System features a Line Laser System, consisting of a Line Laser generator and a Line Laser Sensor.

The Line Laser unit, attached to one side of the pouring vessel, projects a line across the pour cup when the cup is located directly below the pouring nozzle. The Laser Sensor is mounted on the other side of the vessel, also aimed at the pouring cup, and uses a triangulation method to determine the iron level in the cup.



### LEVEL INFORMATION

By receiving laser light from multiple, extended points across the pour cup, the PTL3100 receives redundant level information, allowing for fast and accurate level regulation - without the need to modify the pouring cup.



### ENVIRONMENTAL PROTECTION

The Line laser and camera are protected from heat and smoke in the pouring area by water-cooled jackets, equipped with air purge that provides pressurized air cushions in front of the optics to keep them clean and cool.



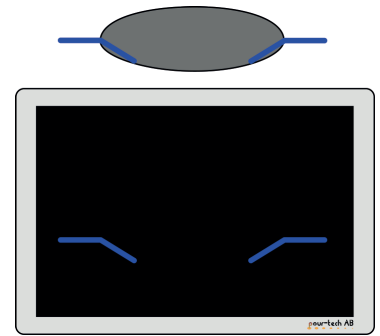
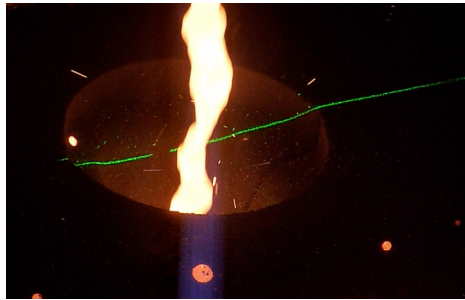
# LINE LASER TECHNOLOGY

## MOLD INDEX

During the mold line index, a spot laser detects the approaching cup, allowing the nozzle to be positioned over it.

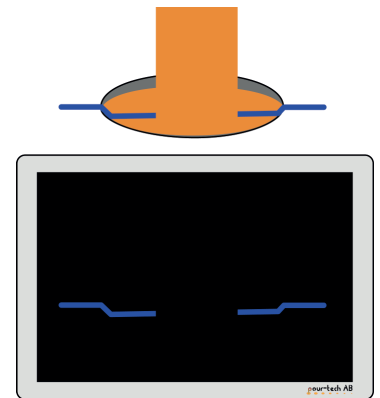
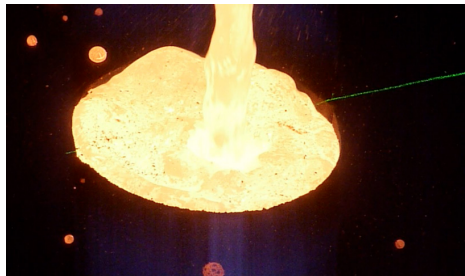
The line laser is then turned on to project a line across the cup.

The camera uses this line to determine the location and size of the cup.



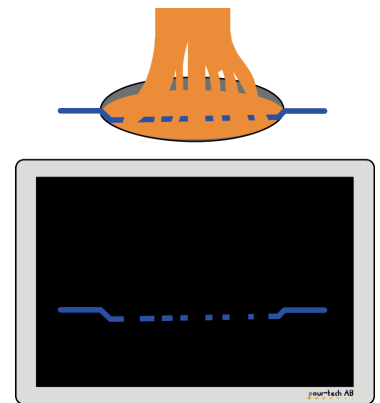
## LEVEL CONTROL

Once the pouring has begun and iron starts to fill the cup, the camera uses the line (reflected in the metal) to determine the level in the cup. Since the line laser is „behind“ the iron stream, the stream will „shade“ the line, making it possible to make the level measurement without any interference from the stream.



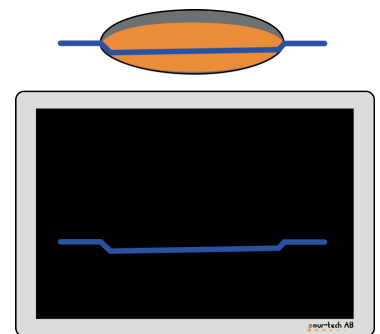
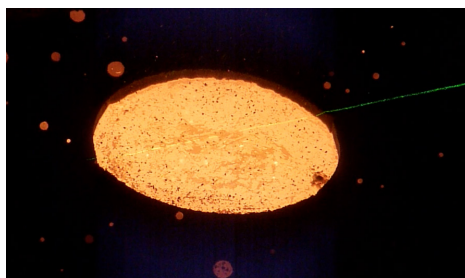
## FANNING IRON STREAM

After hours of production, it is common to see the iron stream starting to move from side to side or fan out – sometimes across the entire cup. As long as a few millimeters of the laser line makes it through to the line laser sensor, the pourTECH™ System can still make pouring decisions, keeping the production going.



## FINAL LEVEL

Once the pour is complete, before the mold is indexed out from the station, the line laser system will make a final level measurement, storing the data for statistical performance analysis.





## FURNACE RETROFIT

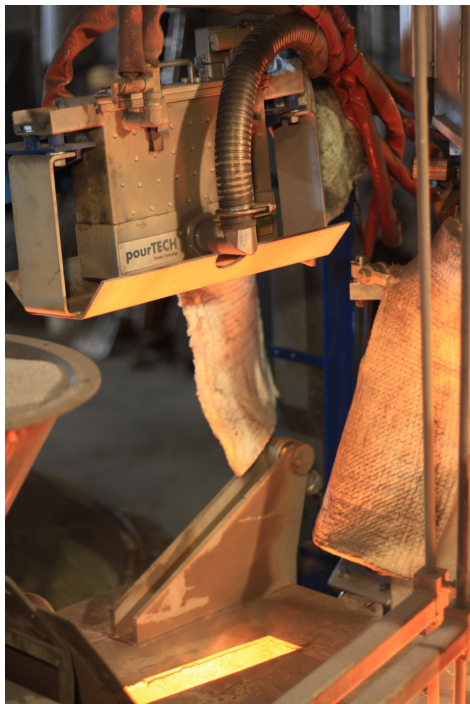
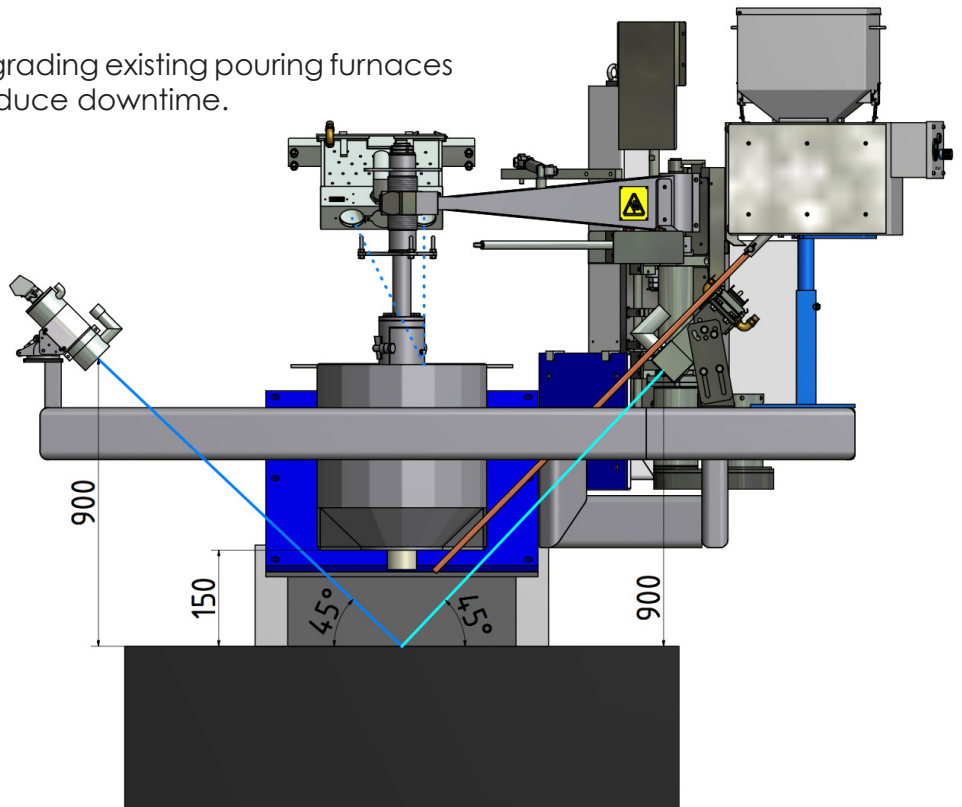
pourTECH™ provides solutions for upgrading existing pouring furnaces to improve the performance and reduce downtime.

## INTEGRATED CONTROLS

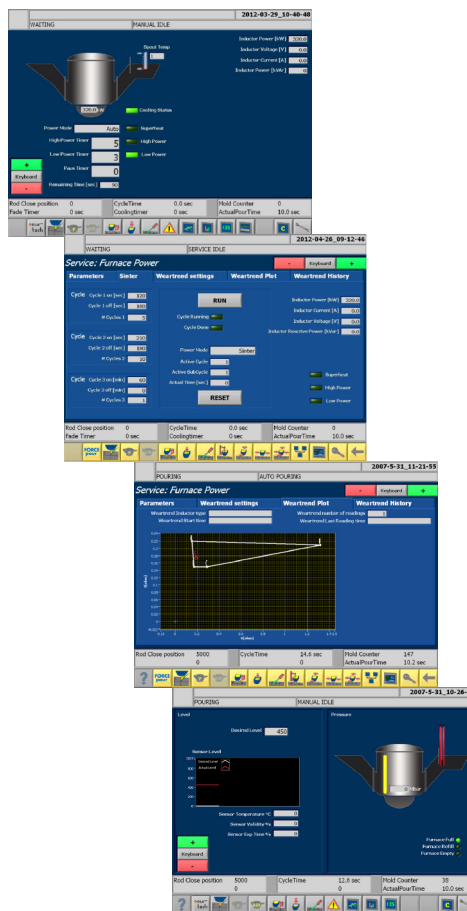
The furnace controls are integrated with the pourTECH system, making it possible to operate all aspects of the furnace from one operator's panel. From here, the operator controls the launder level, inductors and hydraulics, as well as the pouring.

## CONTROL UPGRADE INCLUDE:

- Automatic pouring
- Automatic positioning
- Induction control
- Pressurization
- Hydraulics control
- Cooling control



**Launder Level Laser in its Water Cooled Jacket**



## HARDWARE UPGRADE INCLUDE:

- Laser based pouring
- Stopper rod actuator
- Launder level laser
- Pressurization system
- Proportional positioning

## BENEFITS

- Improved pouring
- Reduce downtime caused by old controls
- Replace obsolete parts
- Improve pressure system response
- Improve launder level regulation
- Add automatic positioning
- Replace outdated stopper rod actuator
- Reduce inductor maintenance
- Intelligent operators' interface

# FORCEpour™ & TWINpour™

## MAXIMIZING PRODUCTIVITY

The fill rate of molds is determined by the runners and the ferrostatic pressure in the mold. By maintaining a high level in the cup throughout the pour, pourTECH™ achieves the shortest possible fill time.

Still, today's high speed molding machines are capable of producing molds in less time than it takes to fill them, making the pour time the factor that limits productivity.

**FORCEpour™** and **TWINpour™** are two high productivity solutions from pour-tech AB that increases the productivity in these cases.

## FORCEpour™

FORCEpour™ pre-starts the pour. It does not pour the molds faster. Instead, it uses up to 2 sec of the index for the initial pouring.

As the mold is indexes, FORCEpour™ monitors the cup movement and calculates where it will stop - and moves the pouring vessel if necessary.

The pouring cycle begins before the index is complete – timed so that just before the metal hits the top of the mold, the cup arrives.

As the mold comes to rest, FORCEpour™ measures the exact position of the cup and fine tunes the position of the pouring vessel and completes the pour.

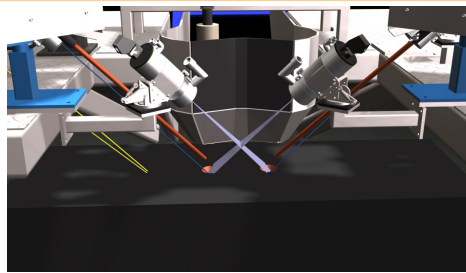


## TWINpour™

Some vertical molding lines are capable of indexing two molds in a double index. By indexing two molds together, the time to fill them will almost double.

To meet the challenges of double pouring, pour-tech AB has developed TWINpour™, a system dedicated for double indexing molding machines.

With several TWINpour™ systems already in operation, pour-tech AB is leading the way in developing this new technology.



## HIGH SPEED

By operating TWINpour™ on a high speed double indexing machine, mold rates of up to 500 molds/hr can be achieved.

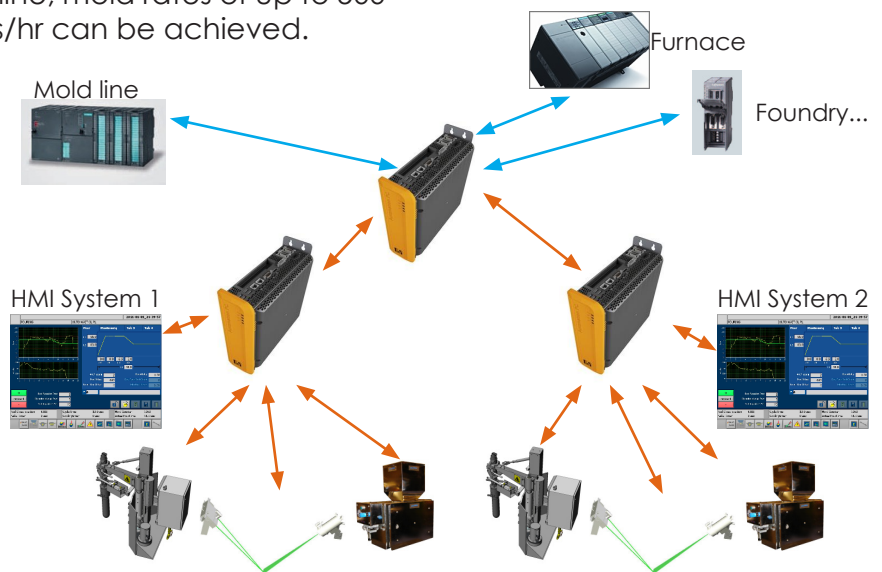
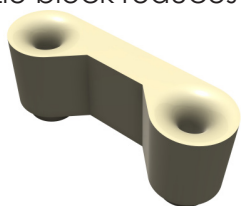
## FULLY AUTOMATIC POURING CONTROL

TWINpour™ is equipped with two independent pourTECH™ systems, featuring Line Laser technology for pouring. A Master controller provides synchronization with the two pouring systems, interfacing with the mold line and uses a point laser for positioning.

## FLEXIBLE

Molds as small as 250mm can be poured with this technology. The maximum size only depends on the molding machine.

A special nozzle block is used to make mold size changes fast and easy. The nozzle block reduces mis-alignment between the nozzles for molds up to 400mm.



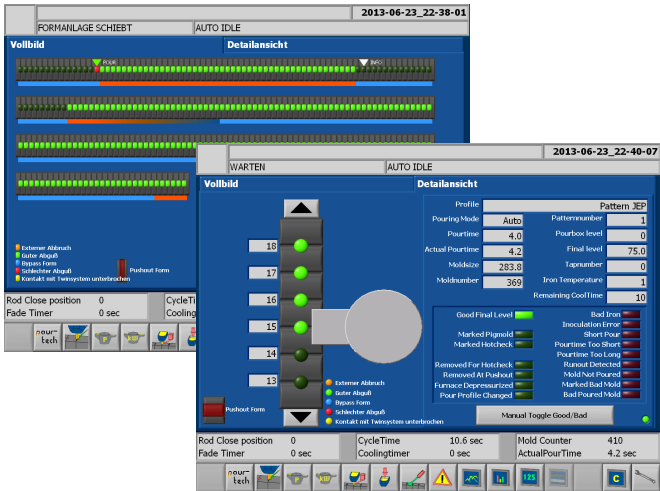


# pourTECH™ OPTIONS

## MOLD MAPPING & COOLING TIME CONTROL

pourTECH™ can tag every mold with vital process information, such as final cup level, part#, iron batch# and data provided from the plant. It can track the molds all the way from the molding machine to shake-out, and molds that need to be removed due to bad iron or other quality issues can be marked and removed at shake-out.

By entering a minimum cooling time, the system can automatically reduce the mold rate and speed the line up after a production stoppage - thereby recovering some of the production lost during that stoppage.

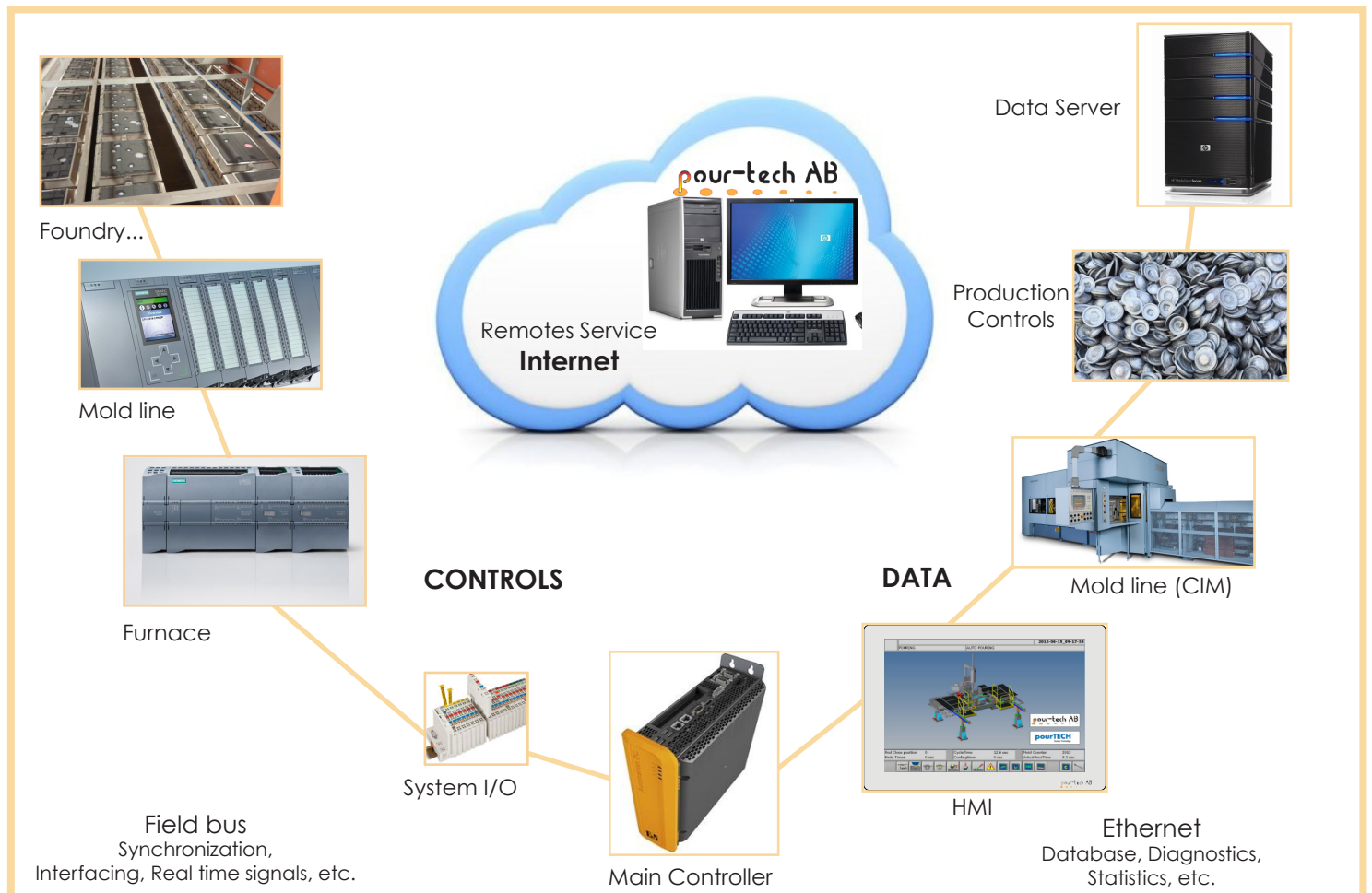


## STATISTICS AND PROCESS DATA

By communicating with other plant systems, such as the mold line, pouring unit and melt shop, the pouring data can be coupled with other data, such as iron chemistry, inoculation rates and pouring temperature. Together, these pieces of information can be gathered into one database and become the basis for a comprehensive quality record for every produced mold.

## REMOTE SERVICE

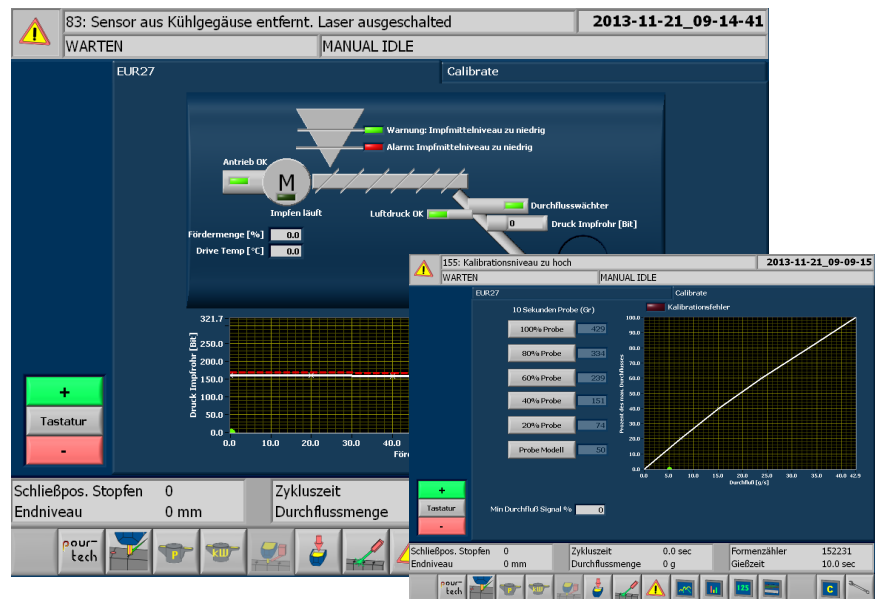
Using VPN access it is possible to provide remote system support.



# INOCULATION TECHNOLOGY

The inoculation device EUR-27, has been designed to automatically add inoculating powder to the metal stream and is fully integrated into the pourTECH™ control system

EUR-27 applies a dynamic and precise dosage of inoculant with precise repeatability of the process. With the integrated inoculation unit, the feedrate is set up as part of the pattern recipe or downloaded. To ensure proper operation, it incorporates a system of instant detection of faults at all times.



## Automatic Error Checking

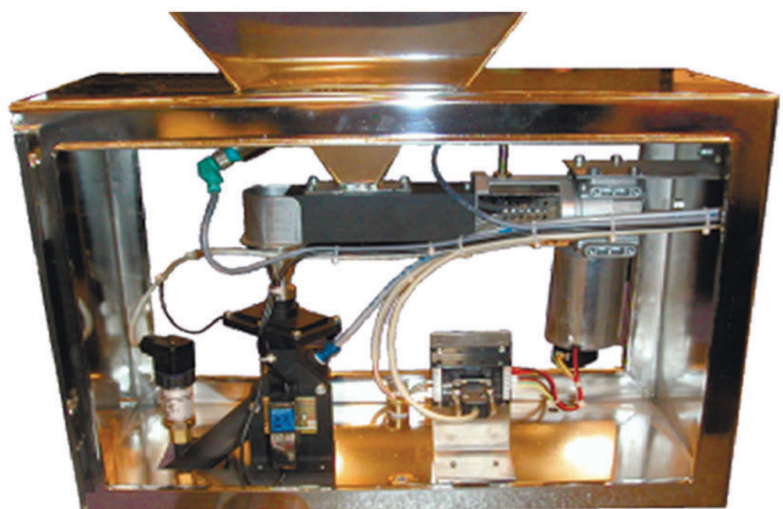
The dosing unit provides automatic error checking using a variety of sensors to check for:

- Low level in the hopper
- No (insufficient) air supply
- Feeder screw operation
- Incorrect injection pressure (pipe blocked)

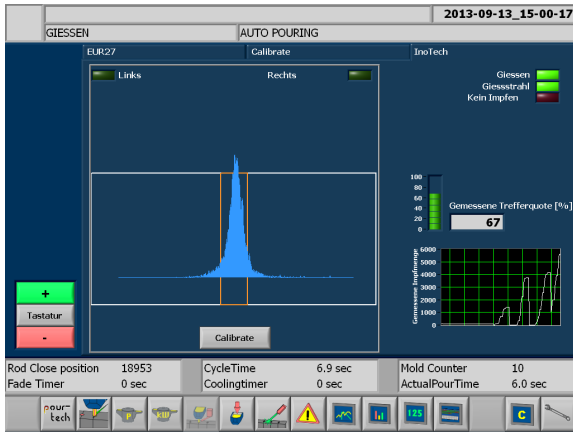


## Specifications

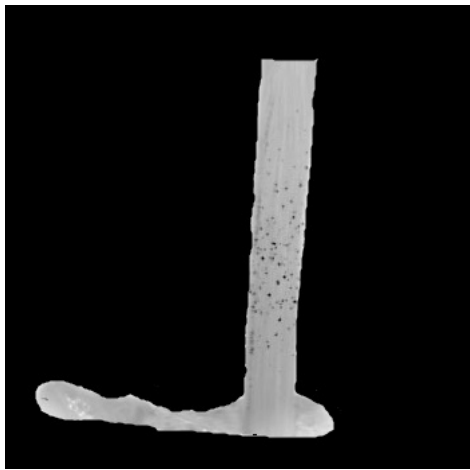
Feed ranges from	0,5 - 30 gr./sec.
Hopper capacity	30 & 50 l
Removable hopper	
Powder grain thickness	0,2 - 0,8 mm
Feed rate tolerance	< 2 %





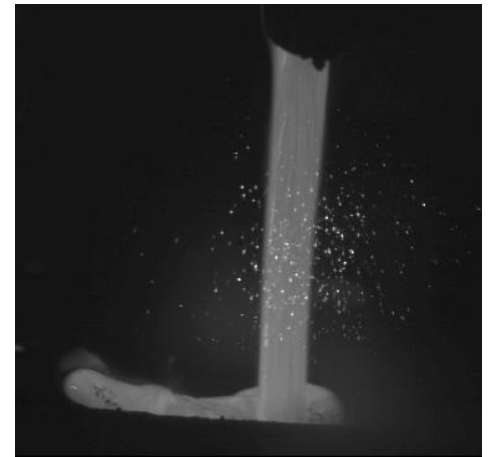


The inoTECH instream inoculation detection system gives the operator full control of the inoculation process. inoTECH detects the actual hit rate of the inoculation material going into the iron stream. The actual hit rate is calculated and displayed after each pour and will trigger alarms if the rate is too low. By viewing the screen, the operator can see where the inoculant hits the stream, so corrections can be made.



passive

inoTECH feature unique technology for inoculation detection. Unlike passive systems, inoTECH includes an active blue laser light to detect the inoculant as it approaches the iron stream. The active light source allows the inoTECH camera to see inoculant outside the iron stream (not only particles directly in front of it), making it possible to calculate the inoculation hit rate.

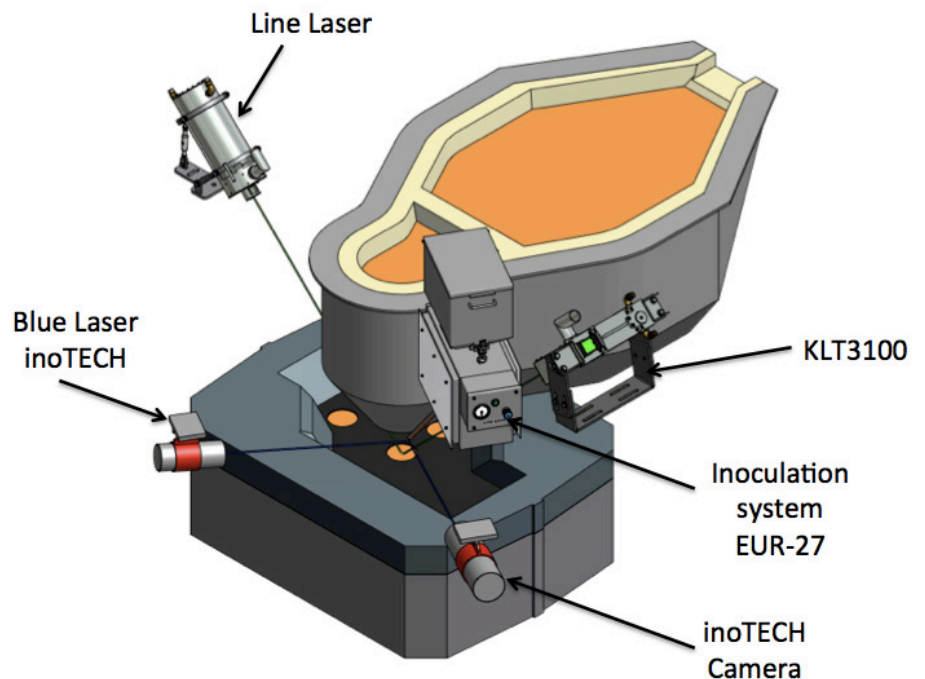


inoTECH

## BENEFIT

The system monitors the inoculation process and gives the following benefit:

- No castings with inoculation defects shipped to the customer
- Alarm if hit rate is too low
- Stopping production if hit rate is below minimum
- Possible to increase the inoculation yield
- Increased casting quality



# THE pourTECH™ GROUP

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