ITACA™ PRODUCTION AND DOSING SYSTEM

THERMAL ANALYSIS SOFTWARE

+ Dynamic control
+ Remote access
+ Robust
+ Easy to use
A modern foundry does not only depend on traditional means of control to steer their process. To minimise variations, and thereby maximise productivity, a broader approach is required. This involves integration of information created by different systems. By integrating all data into one system, knowledge is shared through all departments of the foundry. The purpose of the ITACA™ Production and Dosing System is precisely this, to be a platform of knowledge for better precision in your processes.

The ITACA™ Production and Dosing system consists of several individual systems that can be integrated and work as a single system to control and monitor various parts of the process, generally with a high degree of automation. This allows increased traceability and repeatability of the manufacturing process. Our unique concept offers precise and flexible control of the metallurgical process and combines robustly engineered mechanical solutions and analysis systems based on advanced thermal & chemical analysis.

By adding our Molten Metal handling systems and advanced foundry ladles the metallurgical process can be even further automated and carefully controlled from every aspect.

Different configurations of the ITACA™ Production and Dosing System are installed in over 130 foundries worldwide since it was launched over 10 years ago. Our customers are often found in the very highest level of industrial groups including companies such as Toyota, Daihatsu, Daimler-Mercedes, Renault-Volvo, Brembo, Infun, WHB, Usurbil & Continental with one thing in common. They know what is required to be competitive in the future.

ITACA™
Production and Dosing System
ITACA® and ITACA MeltDeck®

ITACA® family consists of two main models: ITACA® and ITACA MeltDeck®. Two different graphical interfaces devoted to the final iron (ITACA®) and to the base iron (ITACA MeltDeck®) with the same shared target: minimizing physicochemical variance of the final iron.

Minimising the variance means reducing costs and defects, improve yield and efficiency and be independent in the choice of charge materials.

ITACA® and ITACA MeltDeck now interact with sand preparation plants, moulding lines, laboratory, technical and quality departments, using new inputs (sand properties, moulding parameters, casting features and acceptability ranges, production schedule) to produce new outputs (mechanical properties on castings, nodularity, nodule counts, gas porosity, sintering, cold junction, …) and to control autonomously dosing machines on melting/holding furnaces, ladles, pouring furnaces.

Once connected, the systems are autonomous and adapt themselves to pattern plate changes and variations of process parameters maintaining consistent the physicochemical properties of poured iron.

ITACA® constantly exchanges information with the Quality department using the measurements done by the quality tester in a feedback logic to improve the predictive capabilities of the system.
Think about an intuitive system that optimises the correction operations by reducing the human interventions in order to minimise the variability of your base iron. That system is ITACA MeltDeck™.

ITACA MeltDeck™ is especially designed to help the foundries to control their base iron. It uses control procedures and an industrial interface that allows operators to quickly understand the real condition in the furnaces. Various metallurgical concepts such as nucleation potential, actual position in the Fe-C diagram, etc. are shown to the operators by user-friendly gauges.

To reduce work and to streamline the production also other vital information is ready to be integrated into ITACA MeltDeck™. Chemical composition from the spectrometer can be integrated and displayed in the interface. This makes running with notes a thing of the past and the risk of lost data is minimised, but the combined thermal & chemical analysis is also more accurate and allows more precise corrections of the base iron. Also melt temperature can be integrated and displayed in the interface of ITACA MeltDeck™. This further simplifies the process as three individual sources of information are reduced into only one, ITACA MeltDeck™.

Have you seen big differences in your base iron with every charge?
Now, this is a problem of the past. With the Corrections module included in ITACA MeltDeck™ you can consistently reach the same process targets required by your castings. Since variations in metallurgical quality can be seen it can also be counteracted and makes the process less sensitive to varying quality of the charge material. ITACA MeltDeck™ calculates the correction of ALL elements and provides it to the operator. The correction can be made directly to the ladle, or into a conventional vessel for corrections in the furnace.

Are you maintaining the quality in your base iron but wish to verify the iron that is poured into your moulds?
ITACA MeltDeck™ can also be extended to cover the pouring lines. This is a cost effective way to monitor the entire process with a minimum of hardware.

With this configuration ITACA MeltDeck™ receives feedback from the pouring lines with trends of metallurgical defects & trends of pouring temperature in real time. The process can be monitored from the ITACA MeltDeck™ unit itself or via global view from the production office.
ITACA8™ extends ITACA MeltDeck™ to the most comprehensive system for metallurgical process control on the market. It completes the picture of the process and provides advanced integration for knowledge transfer between departments in the foundry.

With ITACA8™ not only the iron quality is evaluated, but also the final metallurgical behaviour and properties of the casting that is being produced, in real time. The analysis is adapted on the basis of geometrical features and historical behaviour of the casting. An example, a heavy casting in ductile iron usually has a very small risk of forming chills on the surface, but has a higher risk for graphite flotation. For a thin walled grey iron casting the opposite behaviour could occur. This advanced “knowledge based” approach is implemented in ITACA8™ for the analysis of the final casting.

ITACA8™ does not just provide continuous monitoring of the iron quality. The information is used to minimise & stabilise process variation that leads to more constant and predictable physical properties. This is achieved by a continuous feedback loop for correction of the next ladle to be transferred to a pouring furnace, to ensure the final iron is poured with near constant conditions and full traceability.

Advanced Statistical Reports & Data Mining

ITACA8™ is key to integration of the manufacturing process. The combined integrated data generated in the process is an important source of information that can be transformed into knowledge that may provide a greater understanding of unexplainable events. This concept is known as Data Mining and in combination with the advanced statistical evaluation of ITACA8™ this becomes a powerful tool to understand the process. ITACA8™ automatically generates production reports with relevant statistical data based on the requirement of the foundry.

ITACA8™ can be embedded in industrial panels inside a current control room close to the pouring line, or be supplied in a similar industrial cabinet as ITACA MeltDeck™ for placement in the production. Complex system configurations can be made through dedicated Ethernet connections for maximum data security.

As all our systems ITACA8™ are scalable and can be extended as the knowledge & experience of the foundry increases.

An important area of integration is to provide detailed information of the iron behaviour as an input for casting process simulation systems.
With ITACA™ Production and Dosing systems the information is shared through the whole foundry, between different areas, from the melting shop to the quality check.

Each customised system solution is designed to allow the gained know-how to be available for everybody in an easy and fast way, with data storing and data mining: all the information collected by different departments becomes traceable.

Only the communication, the collaboration and the connection between ITACA™ systems allow you to automate your production process.

**System Integration benefits:**

+ Know-how available for everybody;
+ Share information between different departments;
+ Communication;
+ Data storing and data mining;
+ Traceability;
+ Collaboration;
+ Automation;
+ Customised solutions;
+ Connection between ITACA™ systems and foundries production plants;
ITACA™ advantages experienced in foundries

+ 90% reduction of shrinkage problems in castings in less than 3 months;
+ Reduce charge costs;
+ Improved yield and efficiency;
+ Greater process control;
+ Improved as cast mechanical properties;
+ Prediction of resonant frequency on gray iron;
+ Reduced heat treatment;
+ Improve inoculants efficiency by evaluation of best inoculation practice;
+ Solve the carbide problem;
+ Greater understanding of real position in the Fe-C diagram;
+ Reduced degenerated graphite in nodular iron and reduced Type D and E graphite in gray irons.