

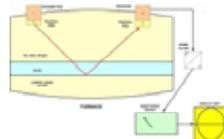
Smelting furnaces, including induction, arc or flash furnaces are amongst the most expensive process equipment items for many metallurgical treatment facilities. Consequently, furnaces are seldom installed with backup units, and a premature furnace failure generally means loss of cash flow for the business, increased re-build cost and hazardous conditions for the operators. Furnaces are expected, and designed to perform safely and reliably, with high productivity, under arduous conditions for extended periods, so the overall integrity of the furnace is of vital importance to all stakeholders including owners, operators and insurers.



XPS, with cumulatively many years of experience in collectively designing, operating, optimising and monitoring furnaces can assist you with reliable techniques to confidently monitor critical aspects of furnace integrity.

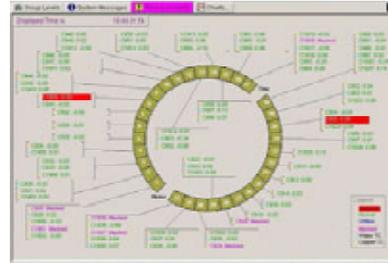
In our experience three issues are of critical importance with respect to monitoring furnace integrity and minimising the likelihood of a premature furnace failure:

1. Monitoring of the refractory lining integrity in general.
2. Monitoring of the integrity of tapholes and the areas adjacent to tapholes.
3. Accurate and reproducible monitoring of the slag/metal, slag/alloy or slag/matte interface.

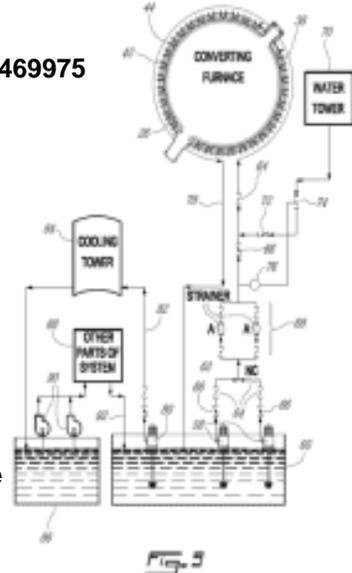


With respect to monitoring of refractory lining integrity XPS can offer a reliable monitoring system, custom designed to suit your particular process application, based on sound engineering principles and supported by sophisticated, yet reliable, measurement techniques as well as skilled technical advice, assistance.

Furnace Integrity Patent # CA2469975
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System & Method For Furnace Monitoring & Control



An example of a system installed and co-developed by XPS utilises a **Multivariable Statistical Process Control (MSPC)** methodology to provide early warning of changes in refractory condition, based on temperature measurements, well before irreversible damage occurs, thereby providing operating personnel with the opportunity to take timely corrective measures to fully restore lining integrity before it is compromised. Alternative techniques and sensing methods are available, and the level of control and intervention desired is at the owner/operator's discretion, *or can be automated*.

With respect to on-line monitoring of taphole integrity, XPS can offer a system based on the experience gained in a long-term successful development which has been monitored for several years and is reducing the risk of run-outs at a Glencore smelter - where it is installed.

The Glencore system is able to use proven sensing techniques matched with the MSPC data analysis system to detect small deviations from predicted behavior and provide the necessary early warning before irreversible and potentially catastrophic taphole failure occurs. The increased safety of personnel working in the vicinity of the tapping area results in improved working conditions and morale.

