FERROTRON

A MINTEQ DIVISION

Optimized Productivity with Scantrol

Scantrol® is *MIN*TEQ's world leading fully automatic measurement and maintenance system for EAF's, BOF's and Ladle's.

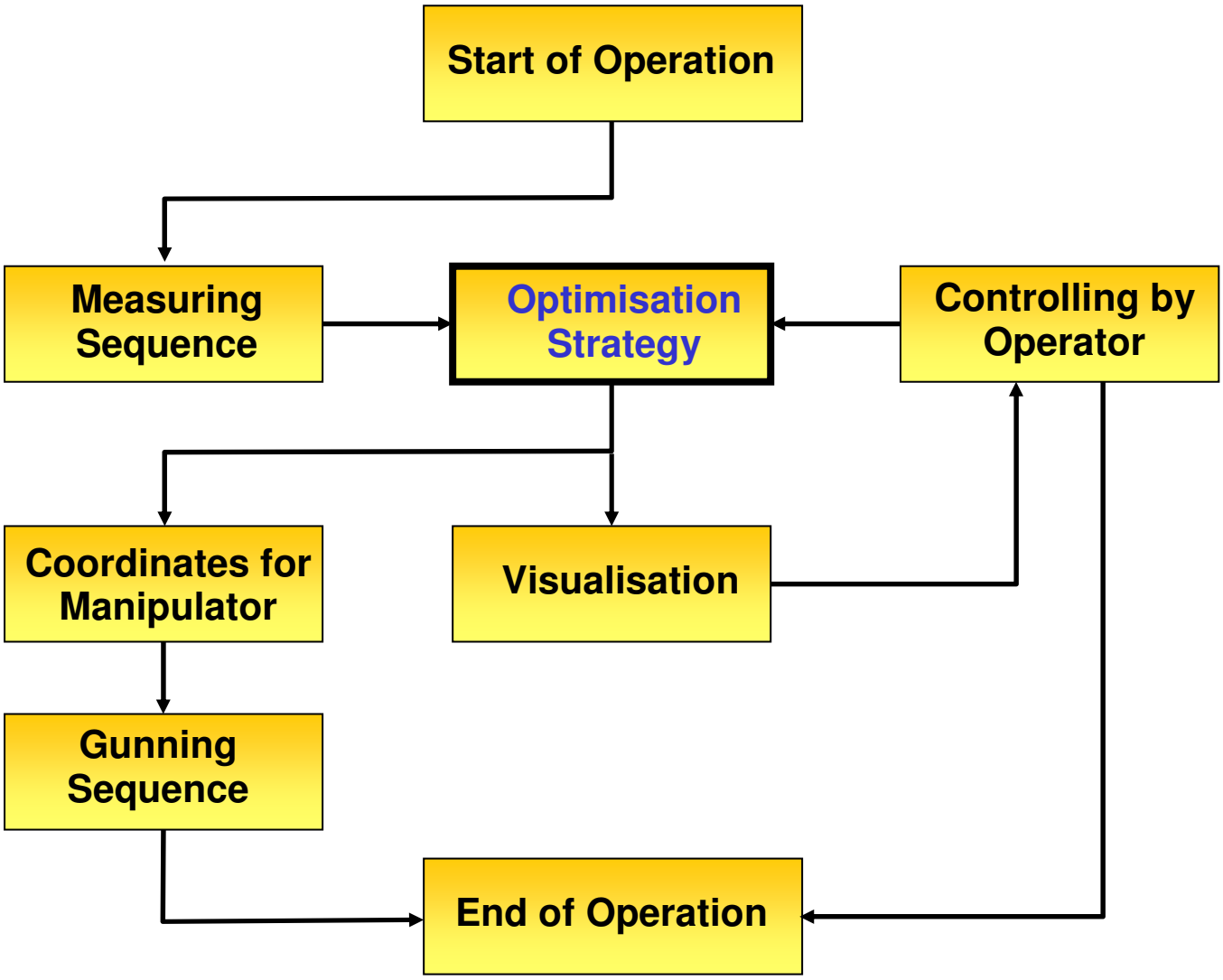
Scantrol® combines the benefit offered by individual, high performance components with their effectiveness as a system:

- Fully Automatic Refractory Maintenance
- Simple and Easy Maintenance Sequences
- High Speed Automatic Processes
- Optimized and Reduced Refractory Consumption
- Relieves Personnel of Heavy and Hazardous Work
- Productivity Increase due to Higher Furnace Output
- Safe and Documented Operation

MINERALS TECHNOLOGIES

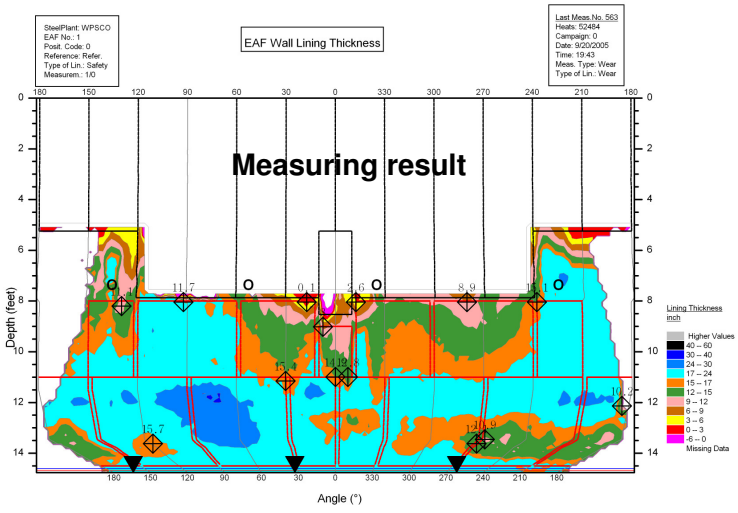
MINTEQ

Control Flow Scantrol®



1. Measuring Sequence

- Scanner moves from parking position into measure position above center of furnace
- Shutter of laser enclosure opens
- Scanner records a single scan (20 sec.)
- Shutter of cooling box closes
- Scanner moves back into park position
- Scan is evaluated – lining thickness is calculated



2. Optimisation Strategie

Targets: Production

Gunning Material

Manipulator

Steps: Definition of high priority areas

Binarisation

Evaluation and determination of maintenance concept

Targets regarding production:

Minimisation of total gunning time
Minimisation of amount of gunning material
Maximisation of degree of lining rebuilding

Targets regarding Gunning Material:

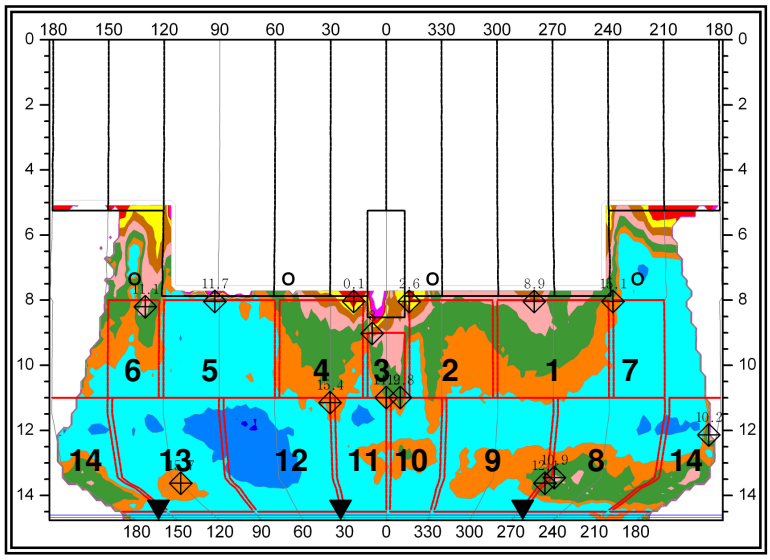
- Selection of material type depending on furnace areas
- Keeping the material dependent application thickness
- Considering the hardening time of material for stacked layers
- Building up the material from lower to upper wall areas for static stability
- Optimisation of gunning angle and distance in relation to the furnace wall

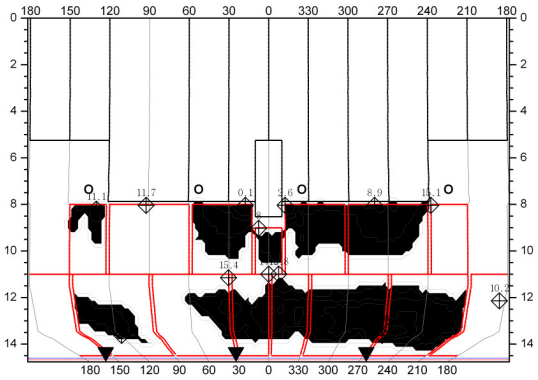
Targets regarding Manipulator:

Avoiding to gun prohibited zones like tap holes and service doors
Considering the mechanism of movement
(E:G: Manipulator guns only rectangular areas)

Definition of "High Priority Areas"

Together with the customer the Minteq/FT team discussed the areas with high priority

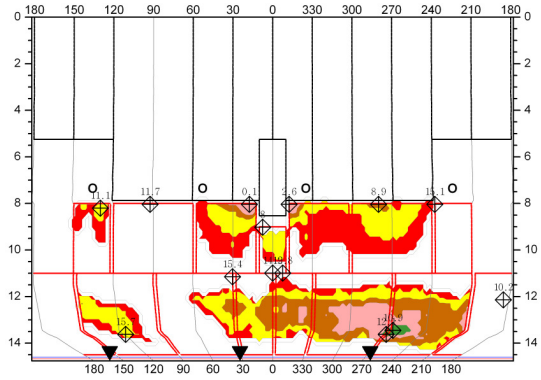




BINARISATION

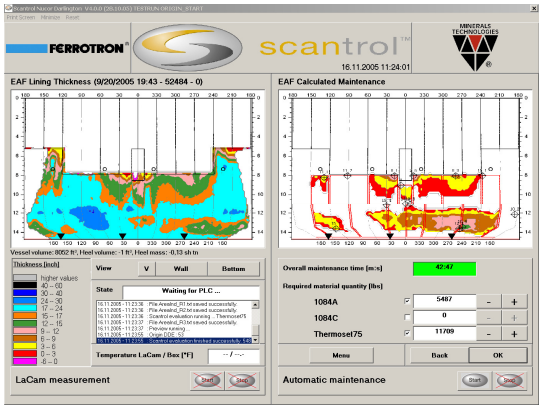
Binarisation of lining thickness compared to threshold which is automatically adapted to the selected optimisation strategy (-> controlling by operator)

Black colour indicates areas below threshold



Evaluation and determination according to priority maintenance strategy

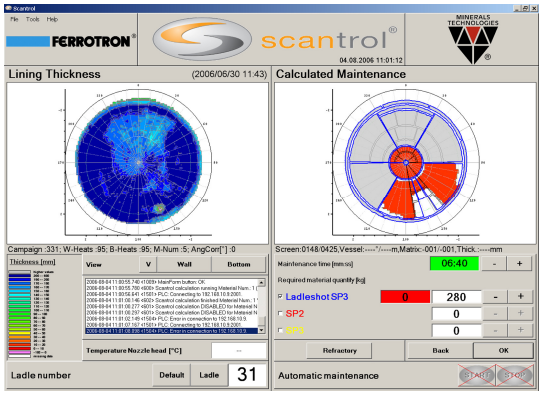
To guarantee a fast gunning process the Scantrol®-program controls the whole process in an efficient way



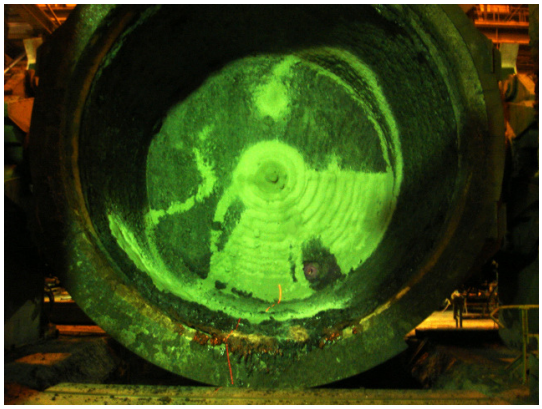
VISUALISATION

Presentation of results related to optimisation strategy

- Estimated gunning time, type and amount of material
- Graphical display of results
- Operator can adjust the optimisation strategy parameters (-> controlling by operator) until the visualised results meet his requests



Scantrol® mask: Bottom Areas

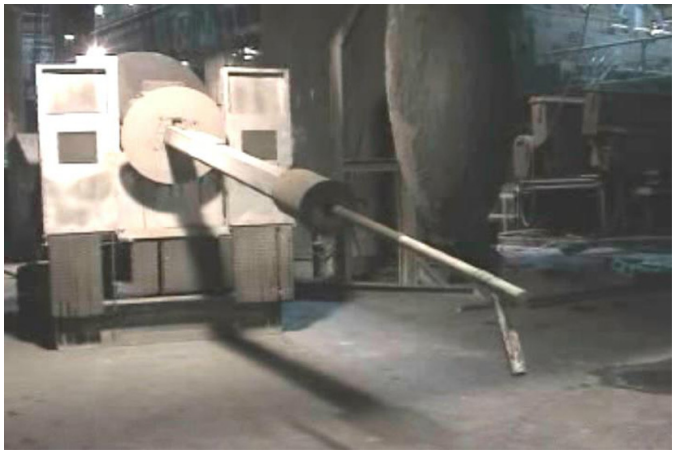


Gunning result

ONE COMPLEMENTS THE OTHER!

The fully automatic MINTEQ measuring and maintenance system for electric arc furnaces

Steel production in electric arc furnaces is a hot affair that wears down the furnace refractory lining. The lining material is exposed to extreme conditions. Time and money melt away on care and maintenance, unless you have the fully automatic electric arc furnace measuring and maintenance system from MINTEQ. It comprises perfectly matched, individual, high-grade components whose performance potential increases as a system. Speed, precision, quality, cost efficiency - one complements the other! Even the smallest lining deficiencies are detected and remedied through precise application of the maintenance materials. Early detection avoids time-consuming repairs later on, increasing the production times and prolonging the life of the furnace, hence reducing the overall costs.



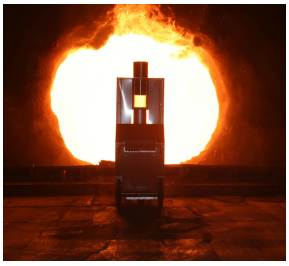
Tornado Shooter for BOF maintenance

The Tornado Shooter has been designed with compact dimensions for easy operation in narrow BOF shops. It is based on a standard crawler chassis with chains for rough platforms. The item is fully hydraulic controlled and driven by a water cooled diesel engine with a water cooled boom. It is equipped with wireless remote control to coordinate operation of all functions of movement, boom and lance operations.

ALL YOU NEED!

1. - The right measuring system for your vessel

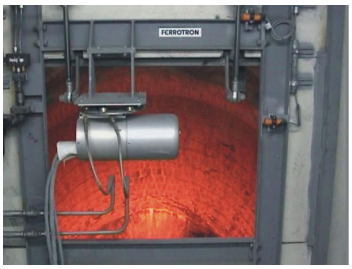
LaCam® M
for converters
or ladles



LaCam® CI/CIE
for converters

LaCam® EAF
for electric arc
furnaces

LaCam® LI/LIE
for ladles



2. - The control modul Scantrol®

scantrol®

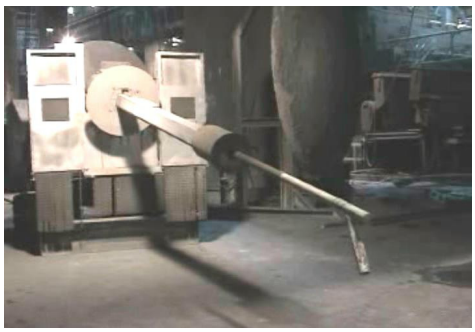
The Brain

The combination of measurement and maintenance

By simply pushing a button the gunning robot then precisely and rapidly follows the commands of Scantrol®

With a fully automatic process Scantrol® applies the correct repair material to the correct place at the required amount, taking into consideration the high priority areas. In addition, the maintenance process can be flexibly adjusted by an operator if the current furnace situation requires this. This option allows the operator to easily and quickly control the automatic maintenance process.

3. - The gunning robot for your kind of vessel

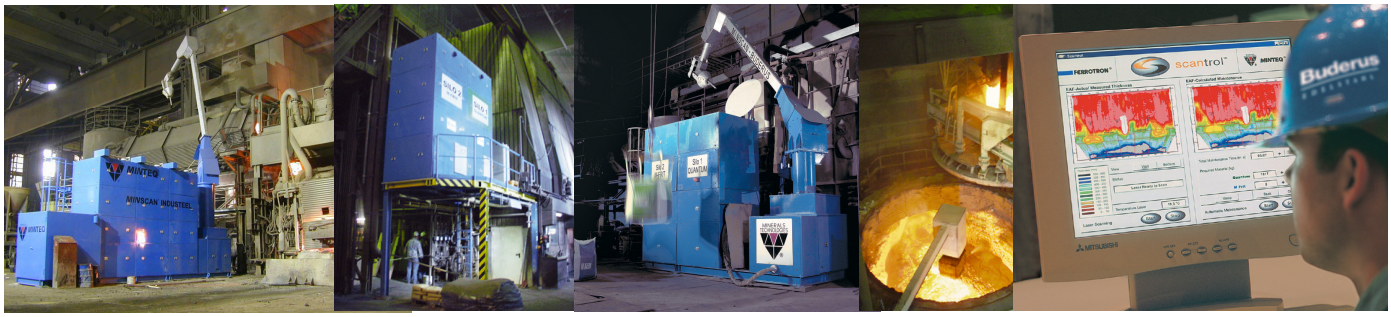


Tornado Shooter
for converters

Minscan for EAF´s

Lego Manipulator
for ladles

4. - The gunning material



The basis of cost effective maintenance and furnace productivity improvement ArcLine, Quantum and M-Frit

Every system is only as good as its constituents parts. Our Research Department has therefore concentrated their efforts on further developing the refractory maintenance products as effective constituent parts of our fully automatic maintenance system. Today we can therefore offer high quality products for the maintenance of all refractory linings, ensuring the most cost effective maintenance. Our materials demonstrate high durability, excellent application characteristics at all temperatures, and their perfect synchronization with our robotic systems.

Quantum and our next generation, high durability product, ArcLine, are our gunning materials for arc furnaces, these products contain a revolutionary binding system whose highly complex reactions ensure both rapid build-up on application, and immediate setting of the material in very thick layers. M-Frit is a dry repair material for the maintenance of extremely steep banks in electric arc furnaces, while M-Frit KK is designed for relining furnace bottoms. High quality raw materials result in a very rapid burn-in and guarantee an extremely high resistant to hot erosion.

These three refractory products are indispensable constituents of the Minscan system for arc furnace maintenance. Their excellent adhesion and rapid application characteristics are the basic requirements for an efficient, quick and fully automatic maintenance system.

OPTISHOT 85 Ladle Lip Ring Benefits

- No joints
- Tighter brick key
- Castable strength with no form to set or remove
- Reduced installation time
- Multiple installations daily
- Patching opportunities during block change
- Low porosity and excellent strengths
- Excellent slag resistance


scantrol®
For a fully automatic system for the refractory maintenance of metallurgical vessels.
Steel production is a global business with performance measured against competitors on a worldwide scale. On the highly competitive steel market, success depends on ever increasing your productivity and constantly optimizing the production processes.
But where within today´s steelmaking process can the application of advanced technology actually result in improved productivity and reduced costs?
We have the answer:
MINTEQ International and FERROTRON Technolgies GmbH have developed a fully automatic refractory maintenance system for metallurgical reaction and transport vessels.
The most advanced technology worldwide. A system both efficient and time saving. A technology "MADE IN GERMANY" that enables you to compete successfully on the global market.
FERROTRON® and LaCam® are registered trademarks of Minerals Technologies Inc. or its subsidiaries in the United States and Germany.
Minscan® and Scantrol® are registered trademarks of Minerals Technologies Inc. or its subsidiaries in Japan, the United States and Germany.
Minteq International GmbH, FERROTRON DIVISION, Dr. Alfred-Herrhausen-Allee 24, 47228 Duisburg,
Ferrotron@minteq.com
Tel.: 0049-(0)2065-4236-500, Fax.: 0049-(0)2065-4236-501, Homepage: www.ferrotron.com
MINTEQ International GmbH, Dr. Alfred-Herrhausen-Allee 24, 47228 Duisburg
Tel.: 0049-(0)2065-4236-720, Fax.: 0049-(0)2065-4236-721