

LaCam[®] - EAF laser profile measuring unit
for non-contact measurements of refractory linings in
metallurgical reaction and transport vessels

LaCam[®] - EAF refractory lining measuring system (electric arc furnace)

New laser profile measuring system based on a laser scanner of the new generation.

The **LaCam[®]** profile measuring system has been developed for non-contact measurement of refractory linings in metallurgical reaction and transport vessels. **LaCam[®] - EAF** refractory lining measuring system (EAF installation) is a model of the **LaCam[®]** series profile measuring systems. This new system generation is designed for installation at Electric Arc Furnaces.

The graphical user-interface permits detailed investigations of the wear development as well as automatically printed reports of the measurements.

The **LaCam[®]-EAF** refractory lining measuring system (EAF installation), including laser measuring head and the appropriate coupled electronic units, is stationary-installed at the EAF and can be remoted from the control room. Connection to a control and measuring unit as well as to an optional workstation is realized by a local computer net.

If measurement is necessary, start and monitoring of results will be made at the operator desk (console and monitor). After automatic scanning of the surface, the results are available within a few seconds on all PCs connected to the net.

The **LaCam[®] - EAF** refractory lining measuring system (EAF installation) determines:

- Residual brick thickness of the refractory lining.
- Brick development of the refractory lining.
- Rate of wear of the different refractory materials.
- Volume of EAF.
- Deformation of EAF shells.

Furthermore, the **LaCam[®] - EAF** refractory lining measuring system (EAF installation) enables:

- maximizing EAF life time.
- control of gunning material consumption.
- specific application of gunning material.
- area dependent optimization of lining material quality.
- trend analysis and forecast of the durability of EAF lining.

Specifications

1. Laser measuring system

Principle of measurement	single shot time-of-flight
Real number of range points per frame	200,000
Measuring time per frame	20 s
Measuring range	2 – 20 m
Repeatability	± 5 mm
Max. surface temperature	1700°C

Technical data of the scanner (Laser measuring head)

Vertical scan angle	80° fixed
Horizontal scan angle	0° - 345° selectable (80° standard)
Laser wavelength	0.9 µm (near infrared)
Cooling of the head	Water cooling
Eye safety	class 1 laser product

2. Control and operator unit

The control and operator unit reads-in the measuring data of the laser measuring head and controls it. The distance between control and measurement unit and laser measuring head is – depending on local situation – up to 10 m. For each laser measurement system, one control and measuring unit is designated. A measurement can be made directly at this unit or via remote control from a workstation at the control room. Furthermore, all measurement results are represented and can be evaluated. A modem for remote service is included.

Industrial-type computer	CPU Pentium® ¹ P4/3GHz (latest model) 512 MB RAM, PC 400 3.5" floppy disk drive, DVD-RW Harddisk 80 GB (latest standard) VGA 64MB, AGP network connections, 100 MBit Ethernet
Display unit	TFT 17"
Operating system	WINDOWS® 2000 Professional ²

3. Engineering

For mounting by yourself, instruction details will be furnished to the customer prior to commissioning:

- Construction of the mechanical components.
- Wiring/cable plans for all connections.
- Position of the requested air and water connections.
- Plans for the mounting of the single components.

Execution of the above instructions is the customer's responsibility. Ferrotron Technologies GmbH assumes no liability.

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²A registered trademark of Microsoft Corporation.

4. Documentation

The documentation of the unit will be threefold which will be given to the customer when the unit is placed into operation. The documentation includes the technical description of the system, an installation description, and a description of the software installed. Documentation on data mediums, e.g. disks, is **not** included in the scope of supply.

The following components are also included:

- Operating systems for all units.
- Installation disks/CD ROMs of the system software.

5. Software

The system package of **LaCam**[®] refractory lining measuring system includes all software needed for operation of the unit (measuring and evaluation software, Microsoft Windows NT[®] operating system³, all as licensed original versions).

³Windows NT is a registered trademark of Microsoft Corporation.