

Laser profile measuring unit model LaCam® - CI
for non-contact measurements of refractory linings in
metallurgical reaction and transport vessels

Technical scope of supply

LaCam®-CI

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®-CI (Converter installation) is a model of the ***LaCam®***-series. This new system generation is designed for installation at converter processes.

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

The ***LaCam®-CI***-system including laser measuring head and the appropriate coupled electronic units is stationary installed at the converter to be measured and can be remoted from the control room. Connection to a control and measuring unit as well as to an optional workstation is realised by a local computer net.

If a 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 on all PCs connected to the net within a few seconds.

The ***LaCam®-CI*** determines:

- Residual brick thickness of the refractory lining
- Wear of the refractory lining
- Wear speed of the different refractory materials
- Volume of converters
- Bath level for optimal lance positioning
- optimal tapping angle
- Deformation of converters

Furthermore, the ***LaCam®-CI*** enables

- the maximising of converter life time
- control of gunning material consumption
- area dependent optimisation of lining material quality
- trend analysis and forecast of the durability of converter lining

Laser profile measuring unit model LaCam® - CI
for non-contact measurements of refractory linings in
metallurgical reaction and transport vessels

Technical scope of supply

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 – 25 m
Accuracy	± 5 mm
Resolution	1 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	internal cooling system
Laser safety class	class 1 laser product (total system is eyesafe)

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 the local situation.

For each laser measurement system, one control and measuring unit is designated. A measurement can directly be made at this unit or via remote access from workstations at the control room.

Industrial-type computer

CPU Pentium 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, power supply

Laser profile measuring unit model LaCam® - CI

for non-contact measurements of refractory linings in
metallurgical reaction and transport vessels

Technical scope of supply

Display unit	TFT 15"
Operating system	WINDOWS 2000 Professional

3. Workstation at the control room

Industrial-type computer with a TFT monitor 17". By means of the workstation, measurements can be made via remote service and for representation of the measured values.

Industrial-type computer	CPU Pentium 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, power supply
---------------------------------	---

Display unit	TFT 17"
Operating system	WINDOWS 2000 Professional

Additional resources

For each converter vessel, one FTE-INC is required and is included in the delivery.

4. Engineering

For a self-reliant mounting, 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

The execution of the above stated instructions has to be made by the customer and Ferrotron Technologies GmbH cannot be held responsible.

Laser profile measuring unit model LaCam® - CI
for non-contact measurements of refractory linings in
metallurgical reaction and transport vessels

Technical scope of supply

5. Documentation

The documentation of the unit will be in three fold, which will be handed over to the customer when the unit is put into operation. The documentation includes the technical description of the system, an installation description as well as the description of the software installed. A documentation on data CD, is included in the scope of supply.

The following components are also included:

- Operating systems for all units
- Installation disks/CD ROM of the system software
- Backup "Image" of the harddrive

6. Software

The system package of LaCam® includes all software, which is needed for operation of the unit, that means measuring- and evaluation software, as well as the operating system Windows 2000 Professional, all as licensed original versions.

Laser profile measuring unit model LaCam® - CI
for non-contact measurements of refractory linings in
metallurgical reaction and transport vessels

Technical scope of supply

LaCam® - CIE (Converter installation extension) is a model of the **LaCam® - CI** series. The unit is designed for the extension of an existing **LaCam® - CI** installation at further converters. The **LaCam® - CIE** requires at least one existing **LaCam® - CI** installation.

LaCam® - CIE has the same laser unit as the **LaCam® - CI** but does not include the complete software tools of the **LaCam® - CI** installation.

If a 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 on all PCs connected to the net within a few seconds.

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 – 25 m
Accuracy	± 5 mm
Resolution	1 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	internal cooling system
Laser safety class	class 1 laser product (total system is eyesafe)

Laser profile measuring unit model LaCam® - CI
for non-contact measurements of refractory linings in
metallurgical reaction and transport vessels

Technical scope of supply

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 the local situation.

For each laser measurement system, one control and measuring unit is designated. A measurement can directly be made at this unit or via remote access from workstations at the control room.

Industrial-type computer

CPU Pentium 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, power supply

Display unit

TFT 15"

Operating system

WINDOWS 2000 Professional

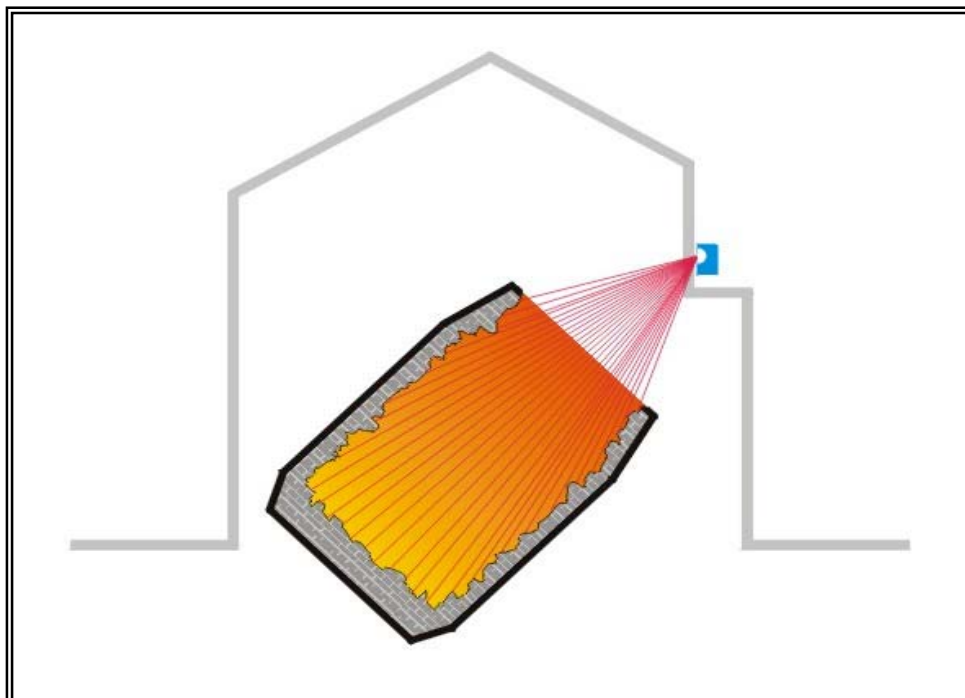
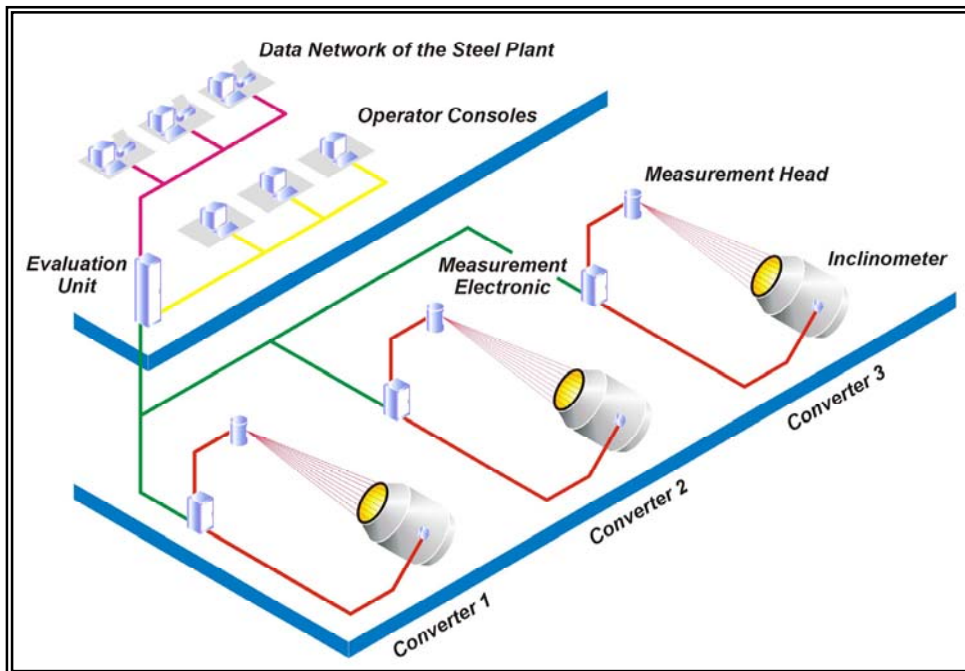
Additional resources

For each converter vessel, one FTE-INC is required and is included in the delivery.

3. Software

The system package of the LaCam® includes all software, which is needed for operation of the unit, that means measuring- and evaluation software, as well as the operating system Windows 2000 Professional, all as licensed original versions.

Laser Profile Measurement System LaCam[®] -CI /-CIE



Laser Profile Measurement System LaCam[®] -CI /-CIE, SSAB Lulea

