Infrared-Rotary Kiln-Temperature-Monitoring
IR-OMT
**Problems:**
Temperature-Hot-Spots on the kiln-shell give informations about defects of the kiln brick lining. Low-temperature zones within the brick lining range of the sinter zone permit conclusions on beginning of caking inside the rotary cement kiln.

**Task:**
- Recognition and visualization of Hot spots and beginning caking-rings
- Integration of the measured values into a primary Control system

**Solution:**
Thermal kiln-shell monitoring on rotary kilns with infrared line camera

**Components of the IR-OMT:**
- High efficient infrared line cameras for rough industrial environment
- Robust housing with heating and cooling
- Industrial control cabinet for the camera supply
- PC system with integration into the customized control system
- Software „IRT KilnMonitor“ for the monitoring, evaluation and analysis

**Advantages:**
- Pyroelectric sensor with drift stability
- Multi-camera solution also for in-house rotary kilns
- During multi-camera solution no shadowing, no additional pyrometers necessarily
- Line string with lens optics (maintenance-poor, high life span)
- Optimized measuring line by the use of objectives, optimum tuning on the rotary kiln
- Small absorption of H₂O (water vapour or fog) in the measuring wavelength 8 - 14 µm
- Network-able by fast ethernet interface
IRT KilnMonitor® is the full featured computer system that allows you to monitor, process and trace data from several kilns at once. It includes Scanners control, module for real-time temperature acquisition; Input/output control module; Kiln visualization module (2D and 3D); Thermographic analysis module and Historical storage module.

IRT KilnMonitor® is the industry-leading environment for real-time kiln data acquisition, analysis and control.

**Features (choice):**
* Several kilns
  Representation and processing up to 4 kilns per evaluation unit.
* Bricks and coating thickness calculation
  Bricks and coating thickness is estimated using the actual kiln shell temperatures and the kiln development history stored in the database.
* Hot-Spot-Finder
  If a Hotspot in the infrared image develops, this is put out in accordance with their coordinates at the kiln shell and as zoom shot picture. This Hotspot is then represented in a trend representation in dependence of the temperature rise. External blower fans could be placed targeted and controled by the IRT KilnMonitor-Software.

**Worst case** image
Image that shows maximum temperature at every kiln shell spot over some selectable period of time.

**Alarms**
On-screen display, beeper, external hardware alarms and OPC alarms;

**History**
Kiln state (scanned infrared image, bricks and coating thickness, alarm state) is continuously recorded in a database.

**Client-server model**
Server is the computer collecting data from the scanners. Client is any computer in the local network (or as an option – in the Internet).

**Rotary-slip-monitoring**

**Analysis objects on the 2D image**
All analysis objects are with labels containing selectable information.

- **Spots:** temperature, position, brick thickness, coating thickness, averaging. Unlimited number of spot objects.
- **Slices** (kiln sections): min, max, average temperature, brick thickness, coating thickness, averaging. Unlimited number of slice objects.
- **Intervals:** min, max, average temperature, brick thickness, coating thickness, averaging. Unlimited number of interval objects.
- **Lines:** min, max, average temperature, averaging. Unlimited number of line objects.
- **Areas:** min, max, average temperature, averaging. Unlimited number of area objects.

**History reference**
Possibility to recall any kiln state from the history and display it on the screen for reference: as kiln shell image, as envelope profile or as a difference map between the current and the history image.
Infred - Monitoring for rotary kilns

Supply voltage: 11...36V DC
Interfaces: Fast Ethernet (optional optical fibre)
Camera housing: Protection to IP 65 standard
Camera - weatherproof case
Transfer size: 2000 m with optical fibre
Number of monitored kilns: 2 kilns per evaluation unit
Client connection: unlimited
Internet connection: optional

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