IR Application Note

Flame Temperature Distribution 2D (FTD-2D)

Measurement of Temperature Distribution in Furnaces

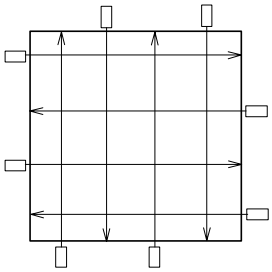
Task:

Continuous online-measurement of temperature distribution in furnaces for optimizing firing operation:

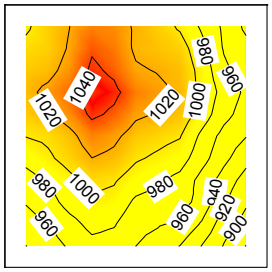
- Monitoring average and maximum temperature at furnace exit to avoid slagging of convective heat exchangers or to give alarm if the temperature falls below the minimum temperature
- Correction of strong flame-asymmetries to avoid asymmetric thermal stress and/or slagging of heat exchangers
- SNCR-control.

Principle of Measurement:

- Measurement of radiation intensity of CO_2- absorption band or measurement of radiation intensity of luminous flames at two different wavelengths in Near Infrared
- Tomography determination of temperature distribution by sensors positioned in net shape



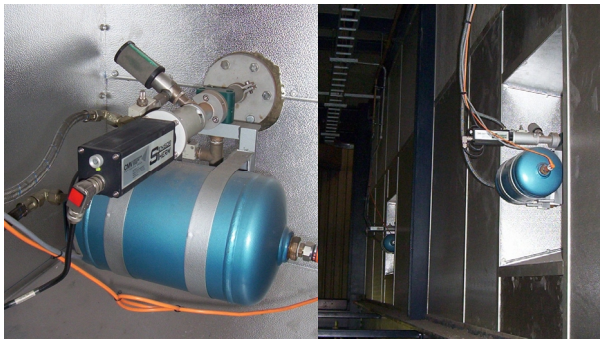
Positions of pyrometers



Temperature distribution

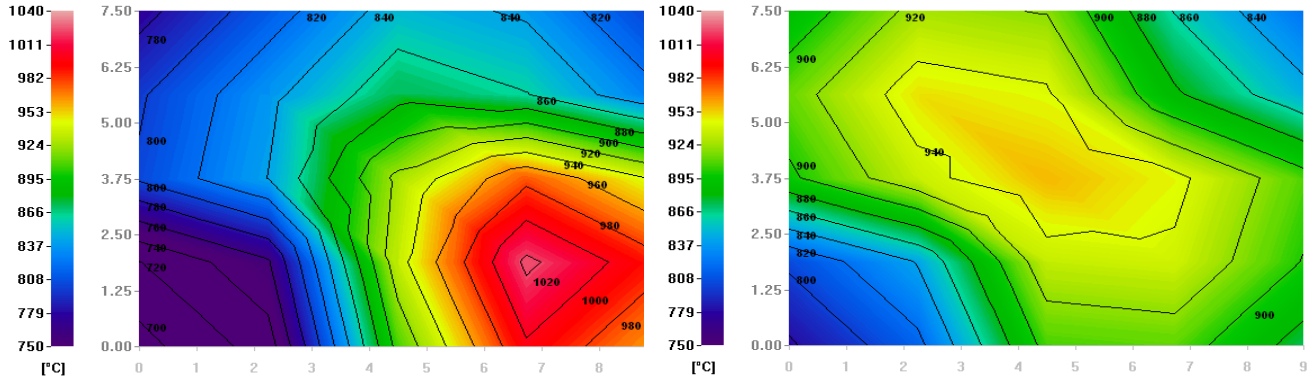
Solution:

- 6-12 pyrometers *Metis MF11* or *Metis MY45* distributed around the furnace
- Industrial-PC for data acquisition, tomography computations, visualization, giving alarms and interface to process control
- Small optical access to furnace (30-40mm)
- Low air-consumption (approx. 2 m³/h per sensor)
- Measurement without any time-lag, t_{90} adjustable (≥ 0,2 s)



Pyrometer with air purge tube and shock blower

Results:



2D-temperature distribution of flue gas, waste incinerator, fixed bed.
Left: Without control.
Right: With control of wall-air basing on online-measurement of temperature distribution.

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