

Temperature-Range-Probe

▶ Tube

▶ Identify Potentials

Early and individual use related to building components, material, fuel and mode of operation.

▶ Reduce Corrosion and Fouling

Recognize the opportunities provided by the boiler design, optimize material and protective layer, change the mode of operation and fuel as required.

▶ Avoid Corrosion and Fouling

Evaluate effects of unavoidable changes in the working process in a timely manner.

▶ Assessment

◦ Morphological Evaluation

Visual evaluation of corrosion phenomena

Typical application: discover temperature thresholds for dew points, selection of suitable materials or protective layers

◦ Determination of Corrosion Rate

Corrosion rate related to temperature and position

Typical application: test series with several probes and various protective layers/materials

◦ Evaluation of Deposit Characteristics

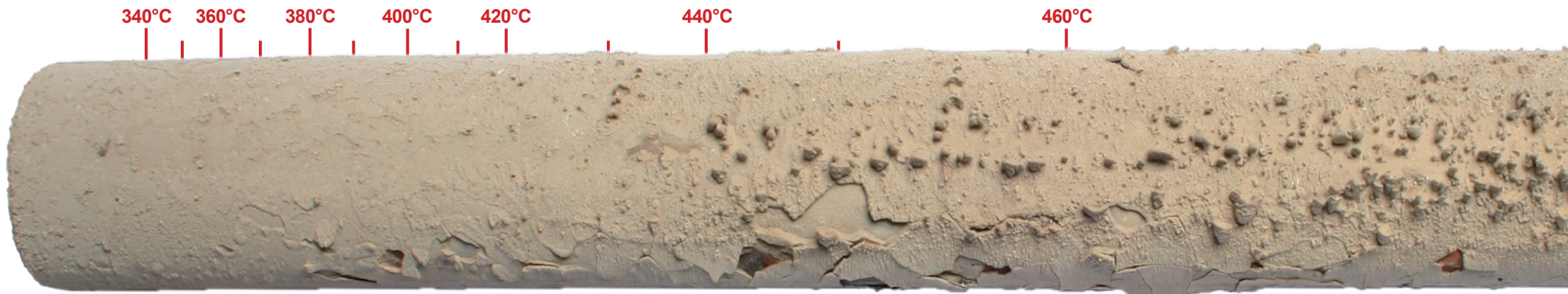
Deposition of "fresh" deposits in order to examine deposit characteristics

Typical application: investigation into reasons for intense fouling

◦ Evaluation of Mechanisms and Reasons for Corrosion

Preparation of sections at relevant temperature positions and chemical analysis

Typical application: support of process optimization



► Construction of a Probe

- test tube (boiler tube)
- inside tube to conduct cooling air to the probe tip
- inner thermocouples (in most cases 5 to 10 units)
- control to ensure a constant temperature profile on the probe body
- recording of the temperature signals
- remote monitoring

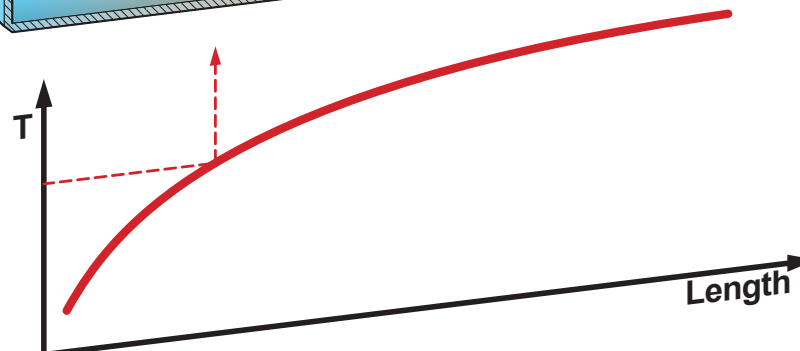
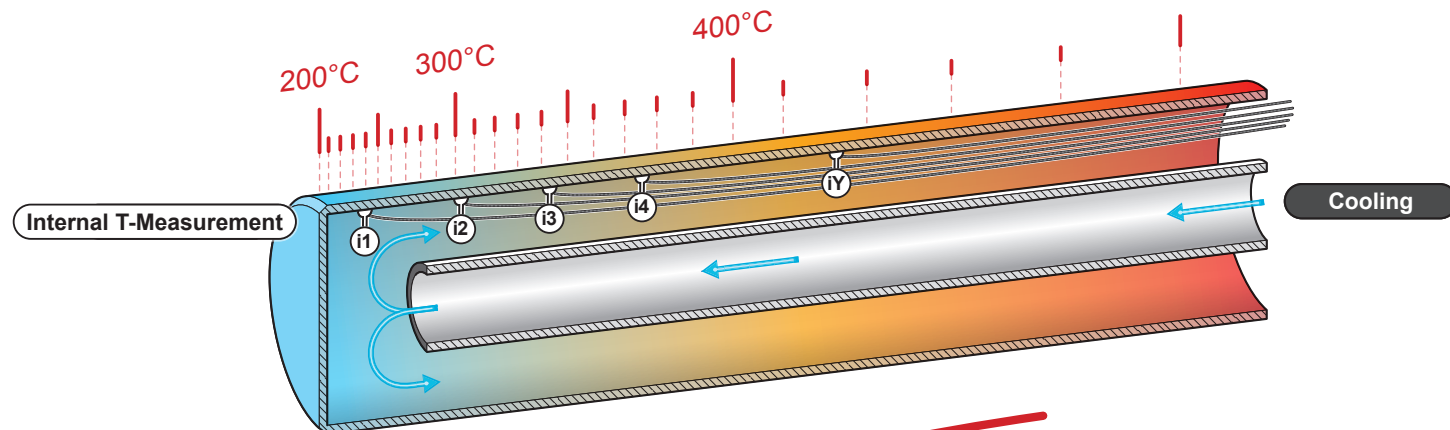
► Each Probe is Customized

Adjustment of

- material including applications
- the temperature range
- the number of thermocouples
- the position of thermocouples (axial or radial arrangement)
- place and time of application
- length and diameter of the probe

► Application of the Probe On-site

installation and removal during operation or outage



Temperature frame is kept at a constant level (control), irrespective of fluctuating load

► Present Applications

location	fuel	environment	probe temperature	issue
furnace	lignite	1200° C	300 – 500° C	slagging
superheater	lignite	1100° C	350 – 550° C	erosion
furnace	"cement"	950° C	480 – 700° C	material test
1st pass	substitute fuel	900° C	350 – 550° C	material test
1st pass	waste	800° C	250 – 450° C	material test
superheater	waste	650° C	300 – 500° C	material test
superheater	biomass	650° C	350 – 500° C	variation of fuel
3rd pass	biomass	650° C	400 – 500° C	corrosion
economizer	gas	350° C	80 – 150° C	corrosion (deliquescent)
air preheater	biomass	250° C	80 – 150° C	corrosion (deliquescent)
chimney	waste	140° C	70 – 110° C	corrosion (dew point)
fabric filter	waste	130° C	110 – 130° C	corrosion (deliquescent)