



Tempsens expands further

For more than 2 decades Tempsens has been supplying temperature sensing equipment and solutions. These sensors were being calibrated in our Calibration Lab; we are proud to announce the commencement of our new facility "Tempsens R&D Center" fully dedicated to high precision calibration of temperature sensors. This 'Temperature Calibration Lab' with state of art Calibration furnaces, measuring instruments and accurate master sensors shall serve the customers buying the new sensors from us for repeat calibrations and for other third party calibrations.



The laboratory is scheduled to be accredited very soon from National accreditation board for test and calibration for laboratory, (NABL). The laboratory functions as per ISO 17025 standards, with instruments traceable to national/international standards. All calibration personnel are experienced technical people who have learned their crafts 'hands-on' and have undertaken intensive internal and external training for this specific task. All the records of calibration are maintained in database for record and archiving. A proprietary software is used to generate reports cross-checks various fields in the calibration record.

Contact Temperature sensors

The calibration can be made in the temperature range -15 °C to 1200 °C for Thermocouples and RTDs. The reference thermometers are regularly calibrated, to secure accordance with the International Temperature Scale, ITS-90. The

laboratory is equipped with a set of liquid baths, and dry block baths, along with very accurate temperature indicators traceable to National and International Standards.

Non Contact Pyrometers

The calibration for non contact pyrometers can be made from 50 to 1500 °C in the laboratory through black body calibration units, digital calibrators, and master pyrometers.

On Site Calibration

"Tempsens R&D Center" also offers "on site" calibration, both for contact as well as non contact temperature sensors. Our trained engineers help provide fast and accurate calibration with the lowest downtime of your sensors.

Best Measurement capability

Contact Temperature Sensors

| Range | Uncertainty |
|---------------|-------------|
| -15 to 10 °C | 0.21 °C |
| 50 to 100 °C | 0.25 °C |
| 100 to 300 °C | 0.36 °C |
| 300 to 650 °C | 1.57 °C |
| 650 to 1100°C | 1.19 °C |

Non-Contact Infrared Pyrometers

| Range | Uncertainty |
|---------------|-------------|
| 50 to 500 °C | 2.75 °C |
| 500 to 1500°C | 4.81 °C |

WHY CALIBRATION

A thermometer with a traceable calibration route to recognized National Standards provides confidence to the user for the characteristics of the sensor. Although, we as a reputed manufacturers carry out calibration checks of all incoming material in our calibration laboratory with complete traceability to national / international standards. A 'test and Conformance certificate' accompanies all sensors dispatched from our factory. But, to be dead sure a calibrated sensor provides a direct traceability to the national / international standard.



DRY BLOCK CALIBRATION FURNACE 50... 1100 °C



Highly Stable Highly Accurate



MASTER SENSORS
Traceable to National & International Standards



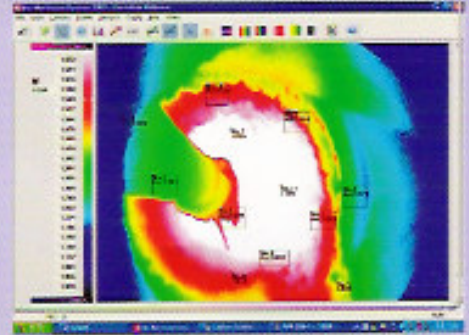
TEMPERATURE INDICATOR
High Precision, Traceable to National & International Standards



BLACK BODY FURNACE
UPTO 1500 °C



BLACK BODY FURNACE
UP TO 500 °C



Furnace Monitoring System

Ra-Ne Vision

CEMENT KILNS & COOLERS

The rotary kiln in a cement plant is the heart of the cement plant. The operating cost and quality of the product depends directly on the operating conditions of the kiln.

There are many specific areas where the Young Kook Ra-Ne Vision Camera can help in control of cost and quality.

Specific Benefits for the Cement Kiln Fuel Cost

The cost of fuel is one of the major expenses in the making of cement. To ensure the most efficient use of fuel, there are many variables to monitor inside the kiln. Among the variables that can be monitored are:

- Material temperature
- Length, shape and direction of the flame
- Burning zone temperature (Thermal view)

NOx Emissions

In the context of NOx emissions, the flame temperature is a critical parameter. The thermal view is used in this case to monitor the temperature of the feed and help in deciding the proper fuel/air mix to provide lighter control of emissions.

Refractory Life

The Ra-Ne Vision can be helpful in the monitoring of the refractory. With the Thermal view Hot spots can easily be pinpointed with the maximum temperature feature displayed. This will help to alert to possible early failure of the refractory. The formation and loss of coating depends directly on the temperature of the feed, the coating already present, and the flame itself. The ability to monitor temperature at more than one place can help in making a diagnostic on a kiln that is too hot or too cold, and to keep a good amount of coating on the shell. A good coating can help prolong the life of the refractory thus reducing costs.

STEEL INDUSTRY

Reheat Furnace

Both batch and continuous reheat furnaces have camera and pyrometer requirements. The Ra-Ne Vision camera provides a high resolution view of the steel slabs progression through the furnace and the burner performance. The cameras are mounted near the exit of the furnace on opposite sides above the product. The combined view from two cameras provides a full 360° view.

The camera has also proven very useful when mounted just below the height at which the steel slabs travel. This aids in viewing the burners in the lower region of the furnace and allows operators to observe the level of scale deposits beneath the steel. Too much scale causes production problems if permitted to accumulate. These cameras easily survive in furnace temperatures up to 1750°C.

In addition to direct viewing needs, the reheat furnace operator has a need for temperature measurement. The thermal view provides an excellent tool to optimize the monitoring and measurement functions because of the unique

combination of video imaging with flexible infrared pyrometry. As the product moves through the furnace, the furnace burners are pointed in the opposite direction of the slab travel. Consistent temperature measurement of the slabs is imperative since the reheat furnace can become a production bottleneck. The slabs are constantly traveling within the furnace, and contact temperature measurement by thermocouple can be difficult to perform.

In addition to the reheat furnace, other processes like rolling mill in the steel industry have a need for furnace monitoring system with a thermal view.

GLASS INDUSTRY

The Ra-Ne Vision helps in extending the life of glass furnaces while improving the quality of the glass, reducing energy costs, and increasing the safety of the operator. The possibility of thermal view combines a live video image of the furnace with flexible infrared pyrometry. This allows operators to take temperature measurements from many areas within the field of view.

Specific Benefits for the Glass Industry

- The ability to monitor the refractory for cracks and wear which can assist in extending the life of the furnace.
- Provide monitoring of the refractory temperatures by ensuring measurement of the exact same target areas each time.
- The ability to monitor the size and shape of the flame to reduce the flame-to-wall impingement.
- Increased process quality by giving the operator a view inside the furnace allows better control of the furnace, ensuring even melting distribution by monitoring the molten glass surface.
- Increased operator safety.

To develop a good model to calculate the life expectancy of the refractory bricks, a consistent and repeatable source of data is necessary. The thermal view allows precise positioning of the temperature measurement zones, and once the desired positions are determined, the zones can be locked in place. This gives a consistent and reliable way to measure and monitor the bricks.

For oxy-fuel furnaces it is often impossible to see the flame with most cameras. In this case, the

Ra-Ne Vision provides a solid state color image sensor that allows the flame to be seen, along with the ability to measure the temperature of the refractory.

The Ra-Ne Vision is specially designed to:

- Collect reliable, repetitive and consistent data on the status of the refractory.
- Monitor the furnace for flame impingement.
- Automatically measure refractory brick temperature between reversals in a regenerative tank.
- Survive the difficult environment of the glass manufacturing process.
- Monitor material flow and avoid furnace freeze-up; and
- Measure the uniformity of the melt surface to ensure quality.

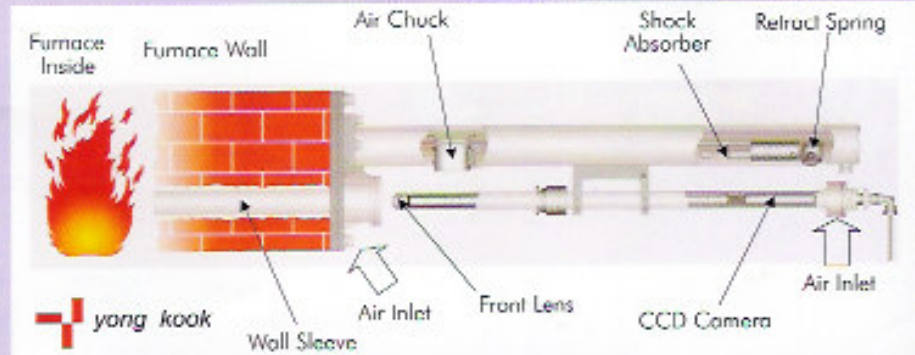
POWER PLANTS

Cameras have been used to view inside coal and oil-fired power utility boilers for decades to facilitate startup or "light-off". The potential for explosions inside the boiler exists when the fuel does not light as it should, thus viewing this process helps prevent this type of unwanted reaction. In the past, flame detectors were used to assist in light-off but were not as reliable as necessary. Black and white cameras were also used for assistance but often pulled out once the boiler was on full load, since they rarely performed well across the full dynamic range of the boiler.

The System is flexible and easy to install on the boiler wall and incorporate a 68° horizontal and 50° vertical field of view; giving an overall better view. The traditional straight view lens tube is typically used for most wall-fired boilers. The offset angle lens can be used in smaller tangential-fired (corner-fired) boilers.

The camera is positioned relatively low above the top row of burners while obtaining a full view of the entire boiler (all four corners). This is critical when the operator wants to see the entire "fireball". The fireball is formed by the combustion process of all four corner burners. As the fuel is injected and ignites, a circular motion takes place and as heat rises, created a fireball reaction in the center of the boiler. Being able to see this fireball aids the operator in controlling overall burner performance and fuel costs.

Also available is the Thermal View camera with a possibility of providing the average temperature display of any 32 points / area. The data can be used for control or can be recorded for further analysis.



SPECIAL PYROMETER FOR FOUNDRIES IS 8-GS plus



The Portable infrared radiation pyrometers IS 8-GS plus is specially designed for non-contact temperature measurement of molten metals in the range of 1000.....2000 °C. The specially selected wave-length in the near infrared facilitates this accurate temperature measurement as molten metals have their maximum emissivity in this spectral range. Additionally the influence of changing emissivity is reduced in this range as well as interference of the measurement by atmospheric absorption is avoided. A longer response time of 0.5 second prevents the possible influence of hot sparks. Even for long measuring distances the easy focusable

precision optics achieves small spot sizes (e.g. at a distance of 5 meter the spot is only 16 mm) to allow larger safety distances between operator and pouring stream. The IS 8-GS plus is equipped with a switchable filter in the view finder to protect the eyes against the extremely bright radiation of the pouring stream.

- with spot indication and built-in digital display
- Carrying loop
- Digital display
- ON/OFF switch for continuous operation
- Interface RS232 / printer connector
- Thru-lens view finder with dioptre correction



IS 8+

High Accuracy fully Digital Economic Pyrometers



IGA 200

Application :- Metal, steel, glass, ceramic, glass mould, alloys, heat treatment, annealing, welding etc.

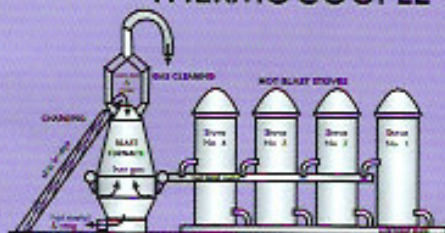
- Digital
- Economic
- Two wire system
- Wide temp. range 300... 2500°C
- Small spot size
- Continuous LED
- High accuracy
- Rugged Cooling & Mounting Accessories

Remote parameter selection, data storage, graphs, charts, user selectable temperature sub range etc.



impac
Germany

THERMOCOUPLE FOR BLAST FURNACE STOVE DOME/HOT BLAST



A Blast furnace consists of four main areas

- Blast furnace
- Charging equipment
- Gas cleaning equipment
- Hot blast stove

Stove dome/ Hot blast is one of the most critical section in the Steel Industry. The hot blast has 3 stage operation either on gas, on blast or bottled up (ready and waiting to be put on-blast)

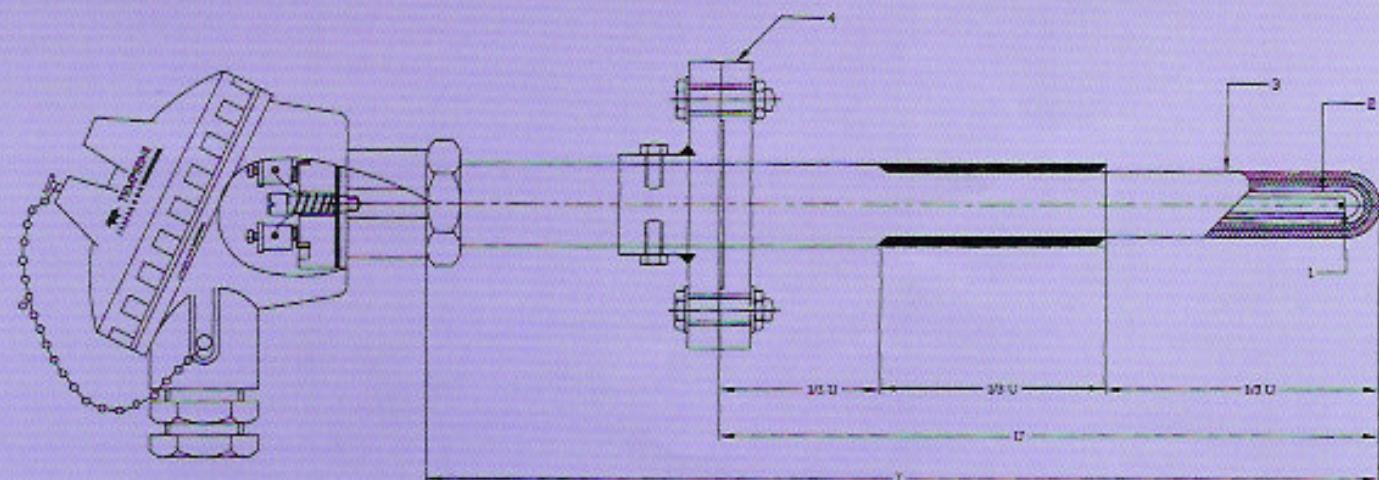
Temperature is one of the major parameter for controlling of this critical process. As the temperature inside the blast furnace is about 1100°C and a high pressure, it makes the assembly of the Thermocouple very critical.

We are one of the pioneers in the country for providing the solution with high precision Thermocouples. Our sensors are being manufactured by using raw material from

world repute manufactures and with workmanship of more than 3 decade experience. Our sensors are being used by most of the Steel customers in the country and abroad.

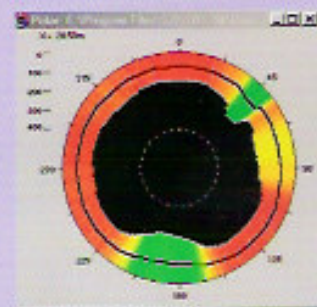
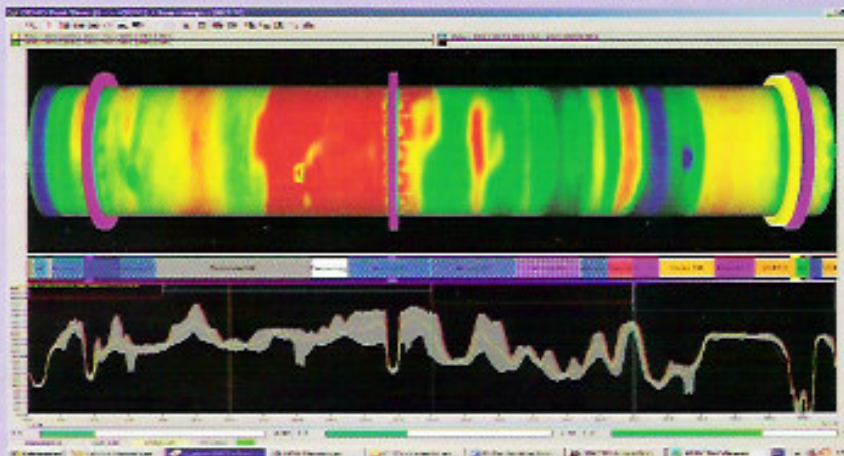
The critical Component of Blast furnace Stove dome thermocouples are

- (1) Element :- "S" Type / "R" Type / "N" Type
- (2) Inner protection :- Recrystallized Alumina KER 710 / C-799 Ceramic Tube
- (3) Outer protection Tube :- INCONEL 600, Recrystallized Alumina KER 710 / C-799 Ceramic Tube , Silicon carbide.
- (4) Process Connection :- Leak proof Flange



FOR YOU VERY SOON !

Line Scanner for Rotary Klin shell Temperature Monitoring
Don't wait until a BIG PATCH happens on your Klin



Temperature profiles/Brick and coating thicknesses

The conventional Klin shell scanners covers a big spot size and only be able to locate the hot spot once a big patch happened or heavy rings formed inside the Klin. Line Scanner measures very small spot to detect fall of single brick.

Benefits of Line Scanner

Refractory Supervision :-

Detects a fallen brick, Detects extreme wear in a limited zone, detects normal wear.

Coating Supervision :-

Conservation of optimum coating thickness, Detection as soon as it happens, of ring formation or coating changes

Maintenance cost reduction. Operation cost reduction in crease productivity. Operational safety Management capacity improvement. Historical analysis of Klin. World best, user friendly software absolutely **FREE OF COST.**

Maximum, average, minimum thermal envelope profiling.

- Thermal image synchronised with klin rotation.
- Temperature reference profile for entire klin length.
- Zoom image and zoom profile.
- Manual selection of two pre-programmed temp. scales.

- Up to 20 alarms thresholds with display of each.
- Time tracking for temperature zones with intervals defined by end user.
- Histograms, analysis of historical data
- X and Y thermal profiles, coating and brick thickness, polarview.
- Statistical calculations.
- Tyre slip monitoring.
- Atmospheric absorption correction
- Refractory management
- 3D thermal imaging.
- Personalised klin parameters according to brick quality, tyre position etc.



ST 8812
Order now !

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Noncontact Pyrometer

-50... 500 °C
Laser pilot light
Ex-stock available

ARE YOU LOOSING YOUR MONEY AND VALUABLE TIME DUE TO ELECTRICAL / MECHANICAL SHUT DOWN ?

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MOST AFFORDABLE THERMAL IMAGERS

This is one of the most powerful, fast and one of the most cost-effective condition monitoring technique that has wide application in any industry in detecting incipient faults, which if left unattended, would not only lead to loss in productivity and quality but also increase Operation and maintenance cost.

APPLICATION

- Reducing motor failure, Reducing electrical flash-over
- Determining condition of transformers
- Determining refractory condition
- Determining effectiveness of thermal insulation
- Determining energy loss of furnaces

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buy IRISYS Thermal Imager
or get thermography service from us

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- Condition apply



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We have published a temperature hand book which provide technical details and acts as reference manual. You can make request for free copy.



Inauguration

New Facility - 16th Oct. 04

