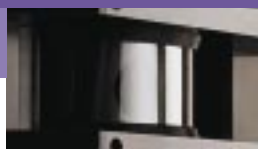
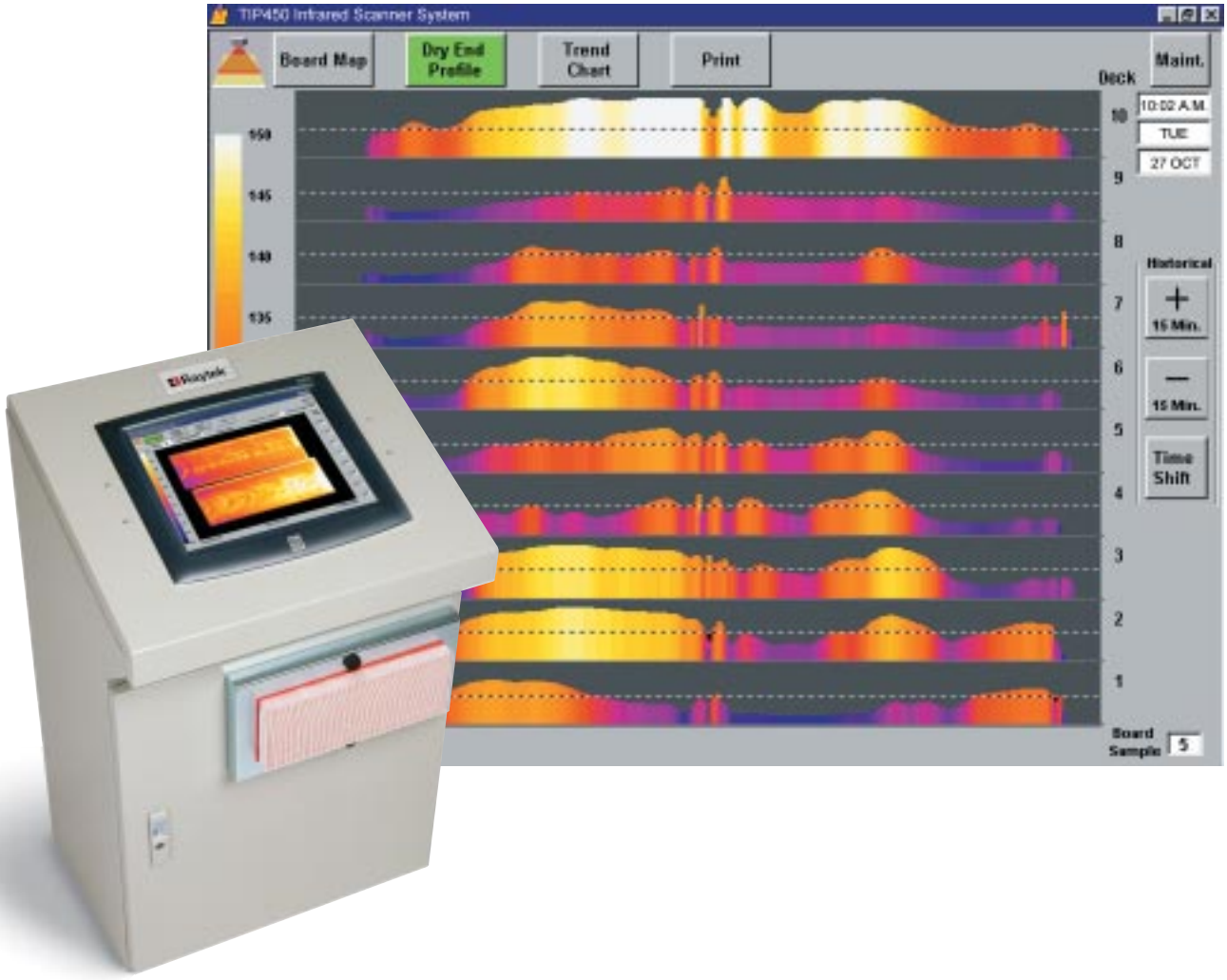
RAYTEK PROCESS IMAGING SERIES



TIP450

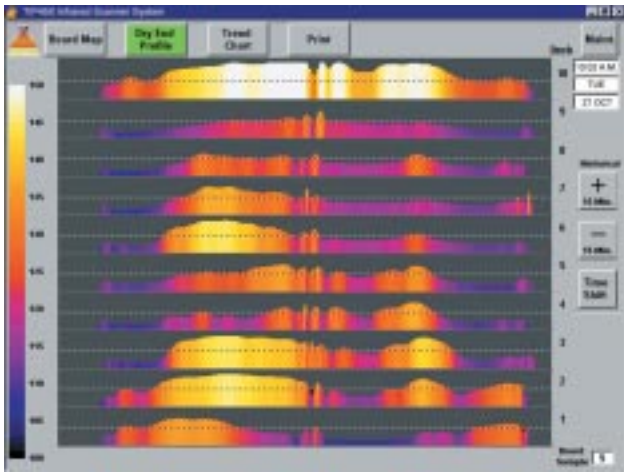
Thermal Imaging and Profiling System for Wallboard Applications



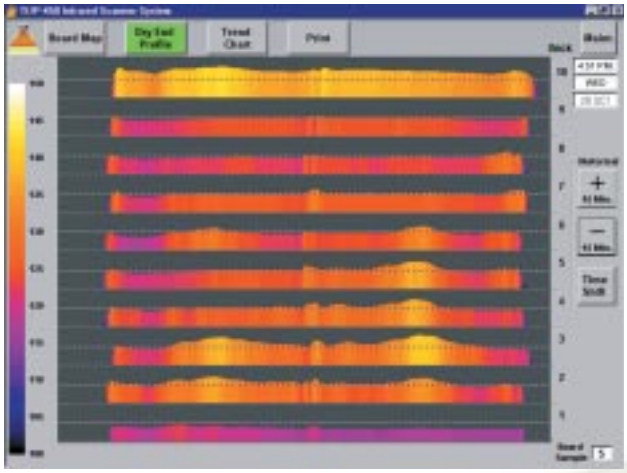
Raytek®

Accurate, Reliable Kiln Balance Surveys

- Fuel Savings
- Quality Improvements
- Increased Production
- Fast Dryer Setup
- Labor Reduction



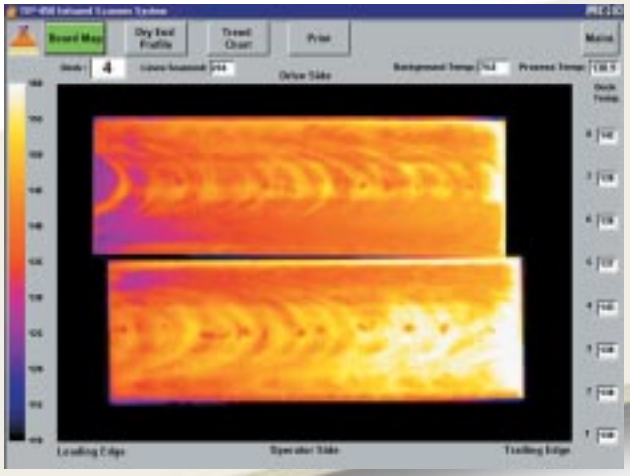
BEFORE: An actual *dryer profile image* running 1/2" (12mm) board before the dryer was balanced with the TIP450. This screen clearly shows the top deck is burned (lighter), while wet streaks (darker) occur on other decks.



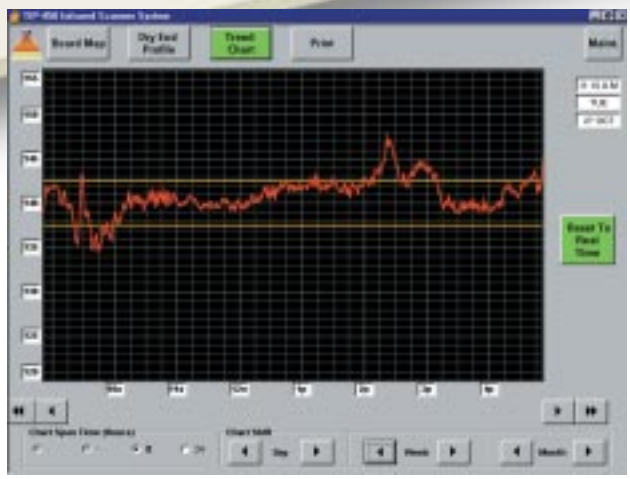
AFTER: The same dryer running the same product after adjustments to the decks using TIP450 data. This optimization saved 5% on fuel usage and gained 6% on line speed.

Detailed, Continuous Board Quality Monitoring

- Real-time Board Quality Monitoring
- Defect Detection
- Reject Board Detection
- Simplified Dryer Process Monitoring and Control
- Quick Dryer Operator Training



Real-time board map displays a thermal image of each board as it leaves the dryer, providing comprehensive board quality information.



Real-time and historical trend charts offer a precise view of the board dryness over time.

The TIP450 System

The TIP450 system is comprised of 4 main components:

- **A Main console cabinet**
- **B MP50 infrared process imager**
- **C Remote I/O assembly**
- **D Fixed infrared sensor assembly**

The main console cabinet houses the software, PC, touch-screen monitor, power supply, data acquisition electronics, and field wiring terminals. This console should be located where the dryer operator can easily view it and make dryer process changes.

The infrared process imager is mounted into a small enclosure with a scan port in the bottom. The enclosure is located over the conveyor section just past the outfeed cascade rolls.

The remote I/O assembly is used to monitor the drop gate signals at the dryer outfeed section. This small DIN rail mounted assembly is designed to be located inside the existing drop gate I/O cabinet.

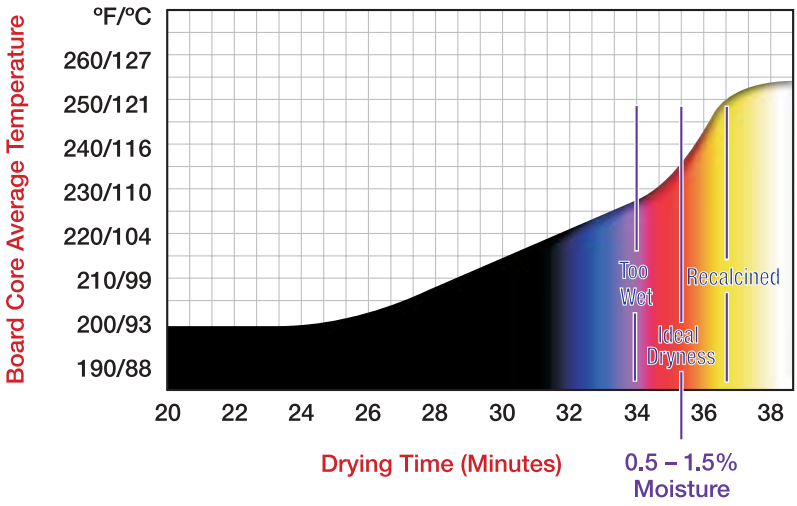
The fixed infrared sensor assembly is used to monitor the board temperatures right at the dryer exit. This information is used in the software to compensate for ambient air temperature variations. The infrared sensor is mounted inside a heavy duty telescoping mechanical arm.

Infrared Process Imager

The highly accurate MP50™ infrared process imager monitors the smallest changes to the board making and drying processes.

The imager scans the boards 48 times a second with 256 individual temperatures taken on each scan. This results in 12,288 temperature points measured every second.

This data is used to create board thermal maps, dryer profile images, and historical trend charts.



The temperature of the board changes as the drying progresses. Scanning the board temperature with the TIP450 has proven to be the most accurate means of indicating the dryness of the board.

System Electrical Specifications

Power Input	120VAC/60Hz or 240VAC/50Hz
Power Consumption	5A @ 120VAC or 2.5A @ 240VAC
Signal Inputs at RIO from Drop Gates	120VAC, 240VAC, or 24VDC (sourced)
Signal Input from Outfeed Conveyor	120VAC, 240VAC, or 24VDC (sourced)
Signal Outputs for Alarms	120VAC, 240VAC, or 24VDC

Infrared Process Imager Spec.

Scan Speed	48 Hz
Scanning Resolution	256 temperature points per scan
Temperature Range	20 to 350° C (68 to 662° F)
IR Spectral Response	3 to 5 microns
Scan Angle/Field of View	90 degrees
Accuracy	+/- 2% of measured value or +/- 2° C (4° F) whichever is greater
Repeatability	+/- 1% of measured value or +/- 1° C (2° F)
Focus	1.52 m (60 in)
Emissivity	0.1 to 1.0 digitally adjusted
Optical Resolution	100:1 @ 90% energy or 300:1 @ 50% energy
Input Voltage	24VDC (provided from power supply in main console)
Environmental Housing	Installed in ported Rittal® enclosure with fan and filter
Scan Motor MTBF	40,000 hours

Main Console Specifications

Enclosure	Rittal operator console with 30 degree slanted top (30 in x 38 in x 24 in) (72 cm x 91.2 cm x 57.6 cm)
Environmental Rating	NEMA-12 (IP55)
PC	Dell® Pentium III®, 128MB RAM, 10GB HDD, CD ROM
Operating System	Windows 2000®
Monitor	Industrial 15 in monitor LCD with acoustic wave touchscreen and 1/4 in (0.64 cm) plate glass. Flush mounted in lid of console.
Cooling/Ventilation	Fan and filter

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