



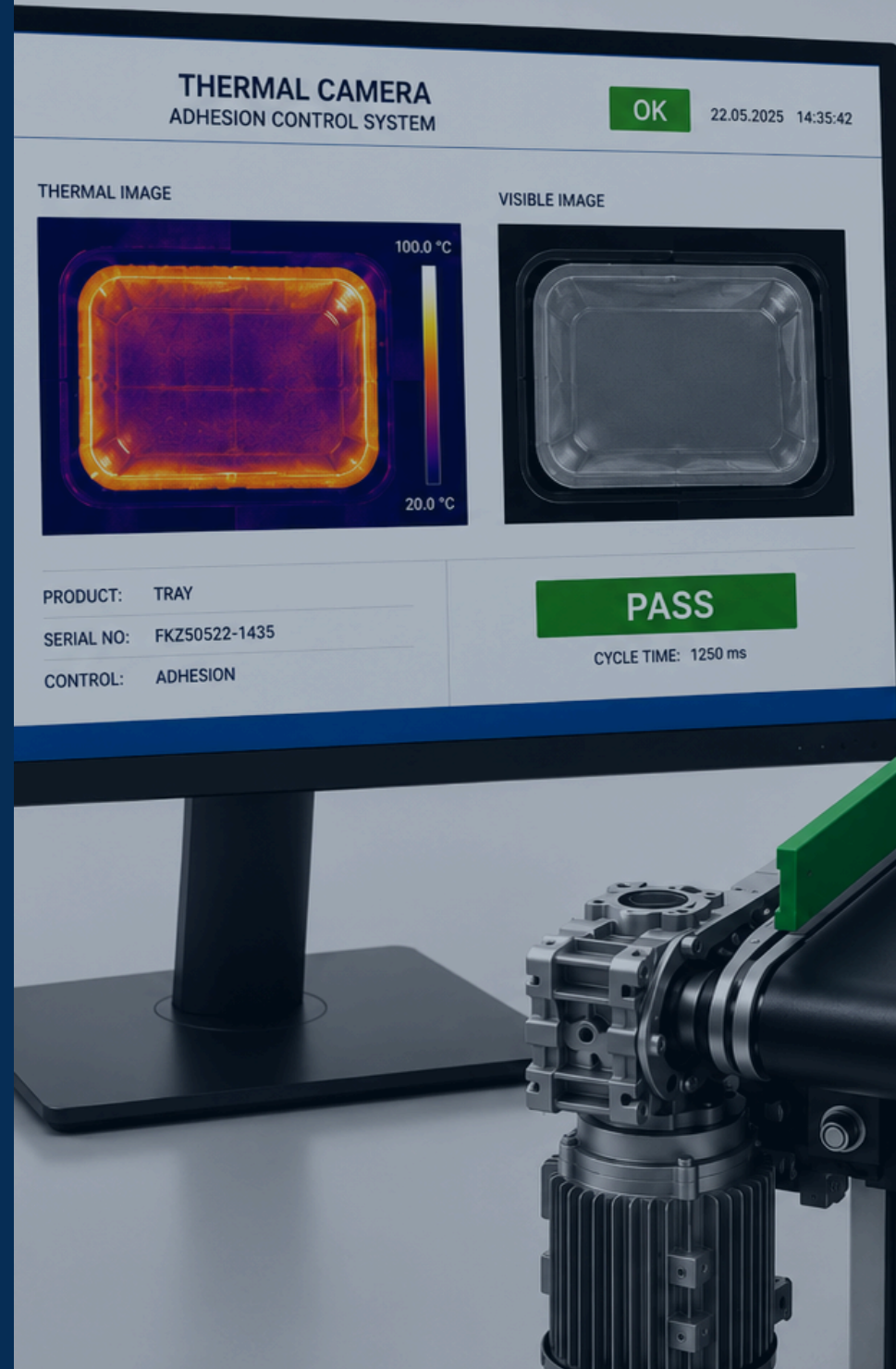
# THERMAL CAMERA QUALITY CONTROL SYSTEMS

Real-time, non-contact, and automated thermal imaging solutions for food production and packaging lines.

Seal Control

Liquid Fill Control

Cooking Process Control



# Thermal Camera Quality Control System

The SMT Teknoloji thermal camera system combines live imaging, thermal imaging, analysis, recording, and OK/NG decision-making on a single platform. Products on the production line are inspected without contact and evaluated according to application-specific criteria.

## Real-Time

Continuous analysis while products move along the conveyor.

## Automatic Decision-Making

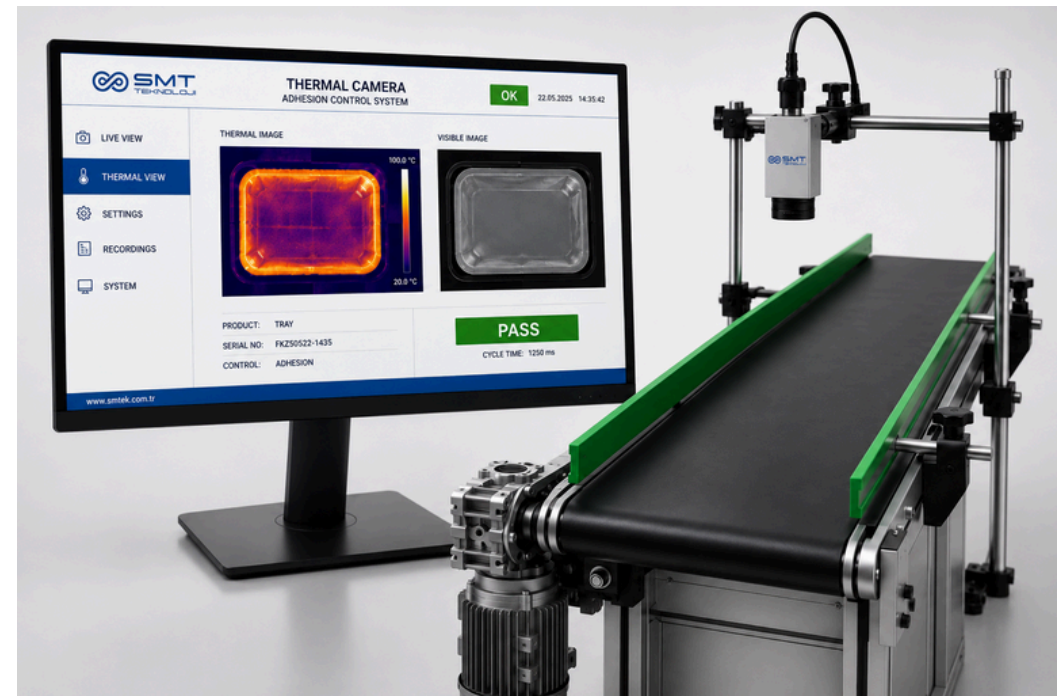
OK / NG classification based on predefined criteria.

## Recording

Inspection results and images can be stored for traceability.

## Integration

Designed for seamless integration with PLCs and product rejection mechanisms.



# Seal Integrity Control

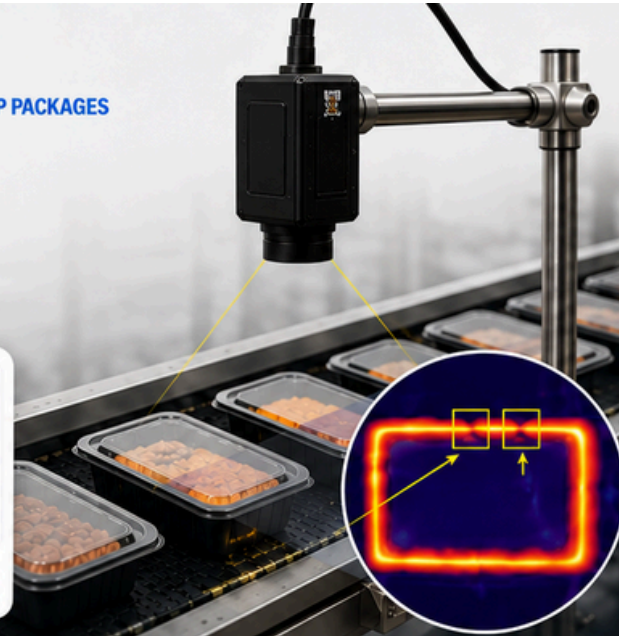
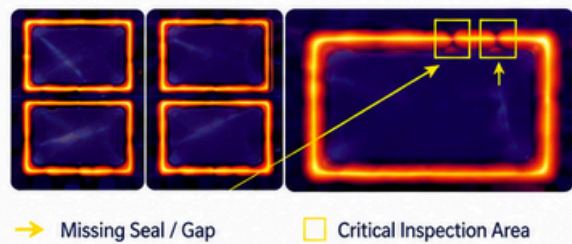
The thermal continuity along the seal line between the lidding film and the tray is analyzed to detect gaps and defective sealing areas.

## SEAL CONTROL

### THERMAL IMAGING FOR SEALING AND LEAK DETECTION IN MAP PACKAGES

Thermal cameras inspect the sealing quality of MAP (Modified Atmosphere Packaging) packages quickly and contactlessly.

Missing seals, gaps, wrinkles or seal defects are detected in real time.



### HOW IT WORKS?



#### Thermal Scanning

The camera scans package lids in MAP packages and captures thermal images.



#### Seal Analysis

Heat distribution is analyzed to evaluate seal quality and detect lack of seal.



#### Defect Detection

Missing seals, gaps, wrinkles or seal defects are detected and reported.

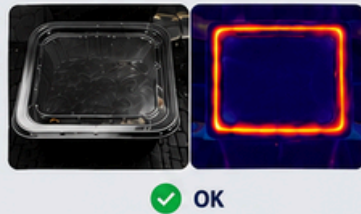


#### Quality Assurance

Consistent seal quality is ensured for every package, protecting product safety and shelf life.

### SEAL CONTROL EXAMPLES

#### GOOD SEAL (OK)



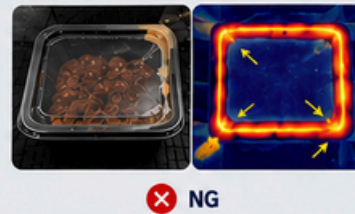
✓ OK

#### MISSING SEAL / GAP



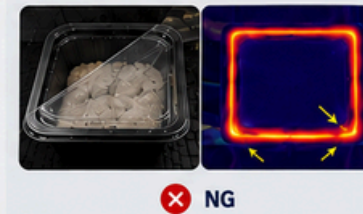
✗ NG

#### WRINKLE



✗ NG

#### INCORRECT CLOSURE



✗ NG

### APPLICATIONS



Dairy Products



Meat & Poultry Products



Ready Meals



Fruits & Vegetables



Seafood Products



Bakery Products



#### HIGH SPEED

Real-time analysis at high line speeds



#### CONTACTLESS

Non-contact inspection



#### EFFICIENCY

Reduces product waste and rework



#### RELIABILITY

Protects product safety and extends shelf life

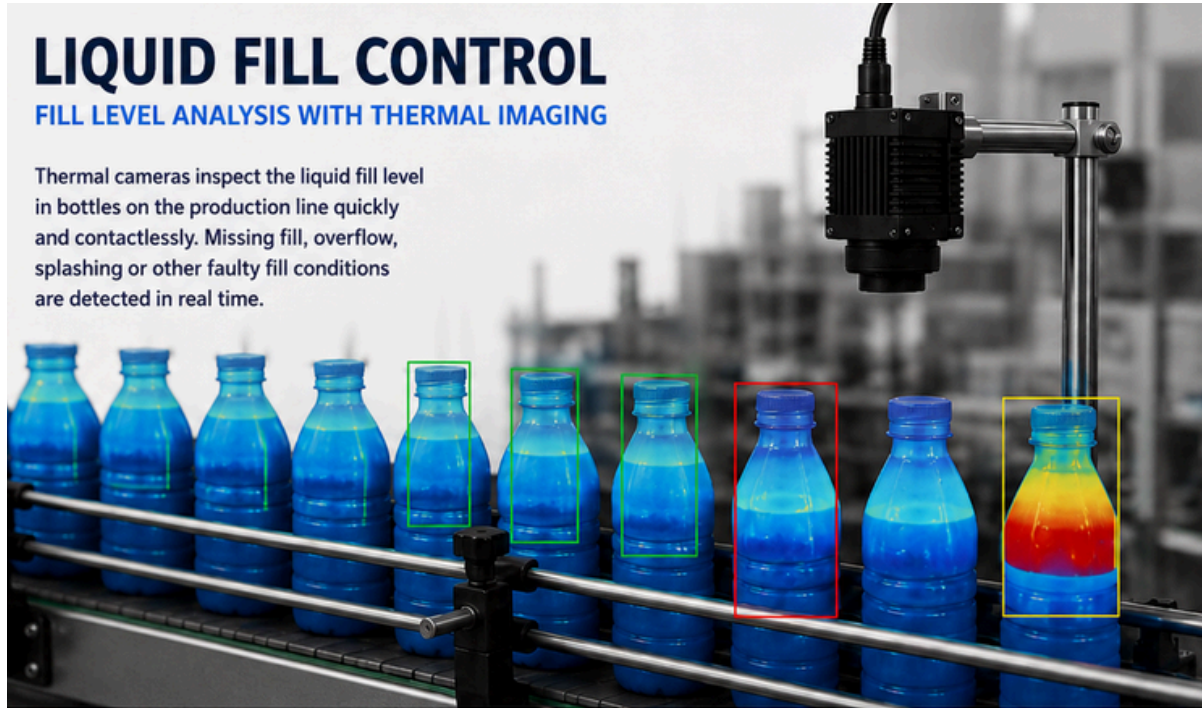
# Liquid Fill Control with Thermal Imaging

The thermal difference between the liquid and the packaging is used to evaluate fill levels and process deviations in real time.

## LIQUID FILL CONTROL

### FILL LEVEL ANALYSIS WITH THERMAL IMAGING

Thermal cameras inspect the liquid fill level in bottles on the production line quickly and contactlessly. Missing fill, overflow, splashing or other faulty fill conditions are detected in real time.



### HOW IT WORKS?



#### Thermal Scanning

The camera scans the bottles on the production line and captures thermal images.



#### Level Analysis

The temperature differences of the liquid are analyzed to determine the fill level.



#### Defect Detection

Missing fill, overflow, splash or other faulty fill conditions are detected and reported.

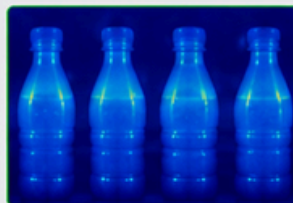


#### Quality Assurance

The fill level of each product is checked to ensure quality and maintain production standards.

### LIQUID FILL CONTROL EXAMPLES

#### CORRECT FILL



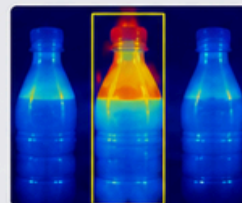
✓ OK

#### UNDERFILL



✗ NG

#### OVERFILL / SPLASH



✗ NG

#### CAP ERROR



✗ NG

### APPLICATIONS



Beverage Industry



Milk and Dairy Products



Liquid Food Products  
(Sauces, Oil, Syrup, etc.)



Chemical and Cosmetic Products



Pharmaceutical and Medical Products



**HIGH SPEED**  
Real-time inspection  
at line speed



**NON-CONTACT**  
Inspection without touching  
the product



**ACCURATE**  
Precise fill level analysis  
with thermal imaging



**RELIABLE**  
Consistent quality control  
and traceability

# Cooking Process Control at the Oven Exit

## BAKING CONTROL

### THERMAL ANALYSIS ON THE CONVEYOR

Products coming out of the oven are analyzed by a thermal camera while moving on the conveyor. Surface heat distribution is analyzed and deviations in the baking process are detected.



### HOW IT WORKS?

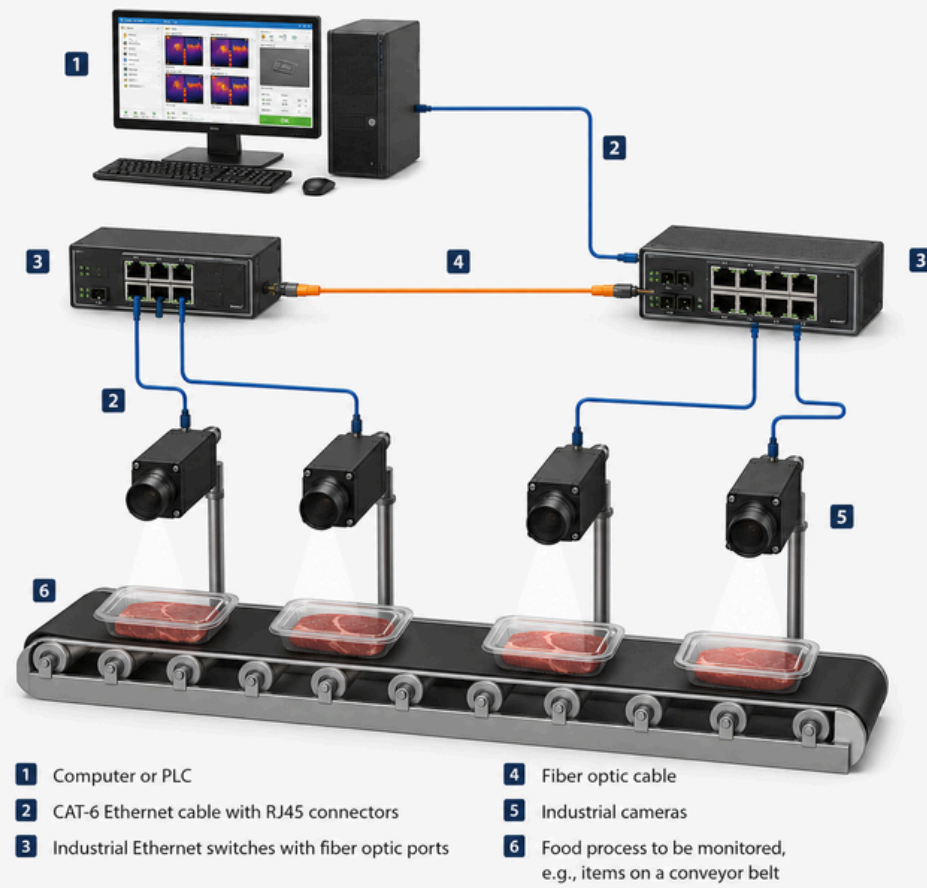
- 
**Thermal Scanning**  
 The camera scans the products on the conveyor and captures continuous thermal images.
- 
**Temperature Analysis**  
 Surface temperature distribution is analyzed to evaluate the baking level.
- 
**Defect Detection**  
 Underbaked or overbaked products are detected and reported, and the operator is notified.
- 
**Quality Assurance**  
 Consistent baking quality is ensured for every product, reducing waste and minimizing defect rates.

### BAKING CONTROL EXAMPLES

| IDEAL BAKING                                                                           | UNDERBAKED                                                                             | OVERBAKED                                                                                | APPLICATIONS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|----------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|     |    |     | <b>APPLICATIONS</b><br><ul style="list-style-type: none"> <li> Oven Products</li> <li> Bread and Pastries</li> <li> Snack Foods</li> <li> Ready Meals</li> <li> Frozen Products</li> </ul> |
|  OK |  NG |  NG |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |

# Single- or Multi-Camera Industrial Architecture

Scalable systems can be configured using a computer or PLC, industrial Ethernet infrastructure, and multiple cameras. The number of cameras and network architecture are designed according to the requirements of the production line.



# Thermal Inspection for Production Lines

Camera placement, field of view, and analysis criteria are determined according to product geometry, line speed, and process requirements.

## Non-Contact Inspection

Inspection without physical contact with the product.

## High Speed

Continuous analysis without interrupting the production flow.

## Consistent Quality

Standardized inspection criteria.

## Waste Reduction

Helps detect process deviations at an early stage.

## Easy Integration

Adaptable to existing conveyor and automation systems.

## Recording Infrastructure

Images and inspection results can be stored.



# SMT TEKNOLOJİ

**FOOD TECHNOLOGIES • R&D**

Thermal imaging and production line quality control solutions.

## CONTACT

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