

# การทดสอบแบบไม่ทำลาย ด้วย แอคทีฟเทอร์โมกราฟี

Active Thermography with Automation and AI



# โรงงานต้นแบบการขึ้นรูปขนาดใหญ่ และการตรวจสอบแบบไม่ทำลาย



Auditorium & Exhibition Hall

Co-working Space

A

Plant Cell Technology & Tissue Culture Laboratory

Wet Laboratory

F

Smart Greenhouse

Phenomics Greenhouse

Plant Factory

S

Biorefinery Pilot Plant (Upstream Process & Green Chemistry)

R

Biorefinery Pilot Plant (Downstream Process)

Q

Large-scale Additive Manufacturing & Non-destructive Testing Pilot Plant

P

Battery Pilot Plant for Safety and Security

Sustainable Manufacturing Center (SMC)

Office Space  
Meeting Room

C

High Bay Area  
Canteen

B

ARI Space

E

Sustainable Manufact Center (SMC)

D

เขตนวัตกรรมระเบียงเศรษฐกิจพิเศษภาคตะวันออก  
วังจันทร์วัลเลย์ จังหวัดระยอง



# Large-scale Additive Manufacturing and Non-destructive testing Pilot Plant

Connecting Design, Manufacturing, and Inspection through  
Advanced Technologies for the Future of Thai Industry





## Our Purpose

The high cost of investing in advanced manufacturing technologies remains a major barrier for many Thai industries. EECi addresses this challenge by providing shared access to world-class equipment and expert researchers who work closely with industry partners. Through this integrated platform, manufacturers can rapidly develop innovative, high-efficiency, and low-waste production solutions without the burden of large upfront investment. By transforming technological barriers into competitive advantages, EECi empowers Thai industry to move toward higher-value, smarter, and more sustainable manufacturing.



# About us

- We provide large-scale and high-performance additive manufacturing solutions for rapid prototyping, tooling, and functional parts.
- Our services help industries accelerate product development, reduce lead time, and enhance design flexibility.
- We offer advanced non-destructive testing and inspection services to ensure product integrity, reliability, and compliance with industrial standards.

# Core Technologies

01

## **Additive manufacturing (AM)**

We provide large-scale and high-performance additive manufacturing solutions for rapid prototyping, tooling, and functional parts. Our services help industries accelerate product development, reduce lead time, and enhance design flexibility.

02

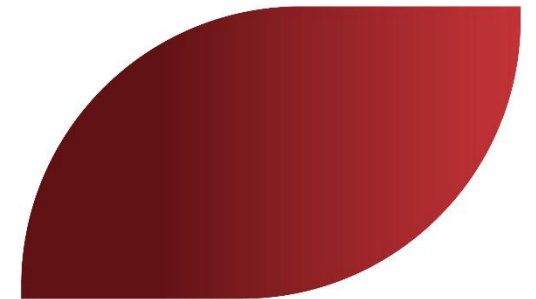
## **Non-destructive testing (NDT)**

We offer advanced non-destructive testing and inspection services to ensure product integrity, reliability, and compliance with industrial standards. By integrating modern inspection technologies, we help manufacturers improve quality control and reduce operational risks.

03

## **Automation and AI development**

We develop intelligent automation and AI-driven systems to optimize manufacturing processes and inspection workflows. Our solutions enhance productivity, enable data-driven decision-making, and support smart factory transformation.





### **Additive Manufacturing (AM) Large-Scale & High- Performance Production Solutions**

*With robotic and wire arc additive manufacturing, we enable the production of large, complex, and high-strength components with high efficiency and design flexibility. Our platform supports rapid prototyping, tooling development, and low-volume production for industrial applications.*

### **Large Prototype Fabrication Service**

We provide rapid fabrication of full-scale and functional prototypes using large-scale additive manufacturing. This service enables manufacturers to validate designs, test performance, and accelerate product development with reduced cost and lead time.

### **Automated Repairing System**

We offer automated repair and refurbishment solutions using robotic additive manufacturing and advanced process control. This system helps extend component life, reduce material waste, and lower maintenance costs while ensuring consistent repair quality.



## **Non-Destructive Testing (NDT) Advanced Inspection & Quality Assurance Solutions**

**We provide comprehensive non-destructive testing solutions to evaluate material integrity, detect internal defects, and ensure product reliability without damaging components. Our integrated inspection platform supports process validation, quality control, and compliance with international standards for industrial applications.**

### **Thermography**

We provide advanced infrared thermography for non-contact inspection and real-time defect detection. This technique enables early identification of subsurface flaws, delamination, and thermal abnormalities, supporting preventive maintenance and process optimisation.

### **Ultrasonic testing/ Phased Array**

We offer high-resolution ultrasonic and phased array inspection for accurate internal defect detection and thickness measurement. This method ensures structural integrity, supports standard compliance, and enhances reliability in critical components.

### **Computed Tomography (CT-scan)**

We utilise industrial CT scanning to generate high-resolution 3D images of internal structures without damaging the part. This technology enables comprehensive defect analysis, dimensional inspection, and reverse engineering for complex components.

# Integrated Digital Manufacturing Workflow

*From Design to Continuous Improvement*



## Design

We support product and process design using advanced CAD, CAE, and simulation tools to optimise performance, manufacturability, and material usage. Virtual validation helps reduce development time, minimise errors, and ensure readiness for production.



## Build

We utilise large-scale additive manufacturing and robotic systems to produce high-quality components and tooling with high efficiency. Automated and flexible production enables rapid prototyping, customisation, and scalable manufacturing.



## Inspect

We integrate non-destructive testing and real-time monitoring to detect defects and verify product integrity throughout the production cycle. This ensures consistent quality, regulatory compliance, and reduced risk of failure.



## Improve

Inspection and production data are analysed to refine designs, enhance processes, and improve overall system performance. This closed-loop feedback approach enables continuous optimisation, waste reduction, and long-term competitiveness.

## Collaboration & Service Model

Bridging design, production, and inspection with advanced technologies to accelerate industrial innovation in Thailand

**01**

**Contract Manufacturing**

**02**

**Technology Validation,  
Upskilling & Training**

**03**

**Joint R&D Projects**

**04**

**Prototype Development &  
Industrial Partnership**

# Thank you



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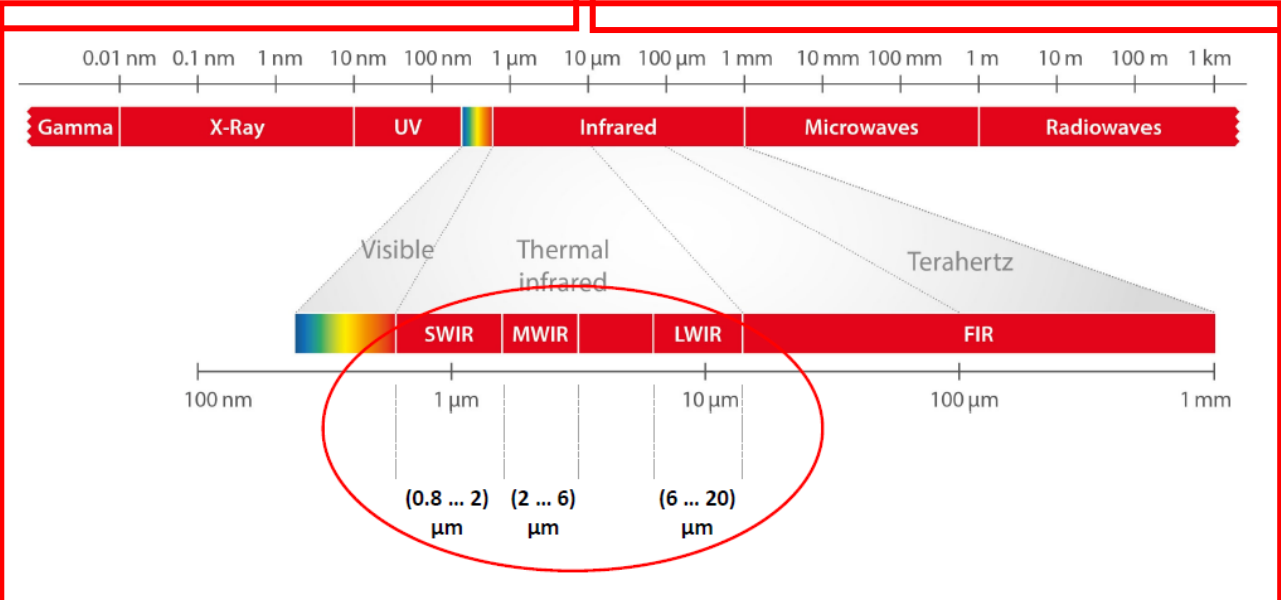
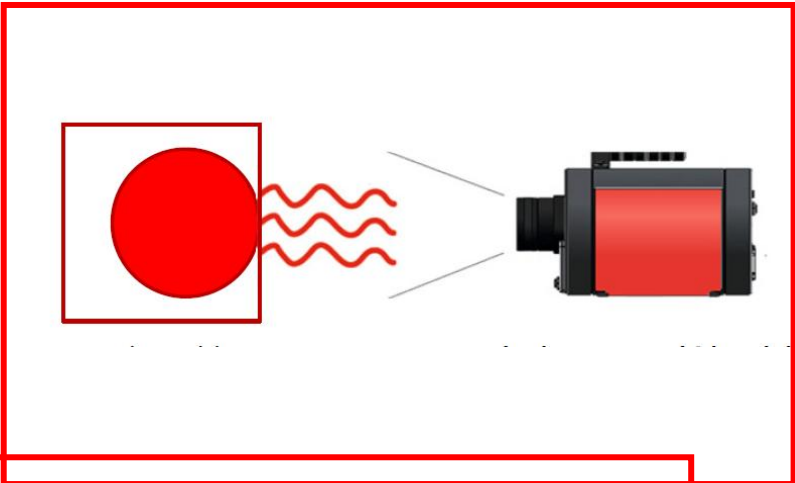
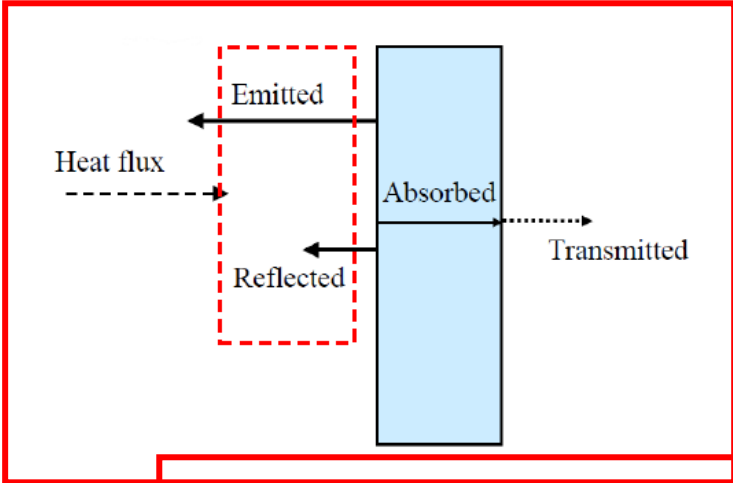
[www.eci.or.th](http://www.eci.or.th)



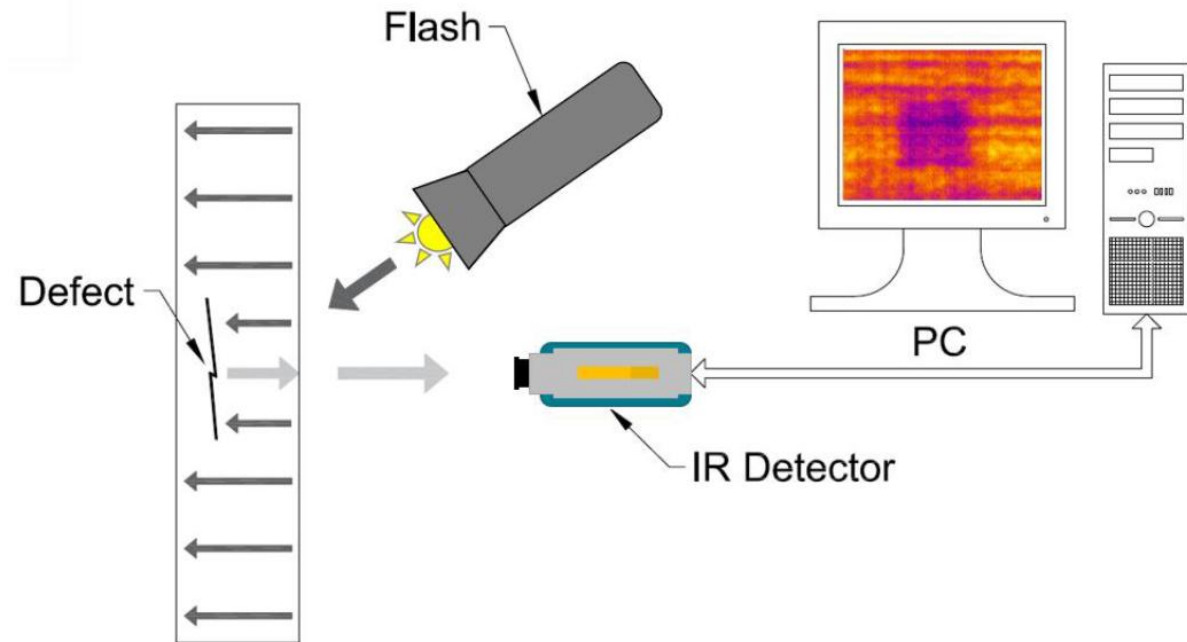
# **Workshop**

Active thermography

# What is Thermography?



## What is Active Thermography?



**Question :**

What is the most popular application for infrared cameras?

Electronics

Landscape/Building

Automotive parts

Composites (Carbon Fibre)

Health sector

Research

## What is application for it?

Electronics

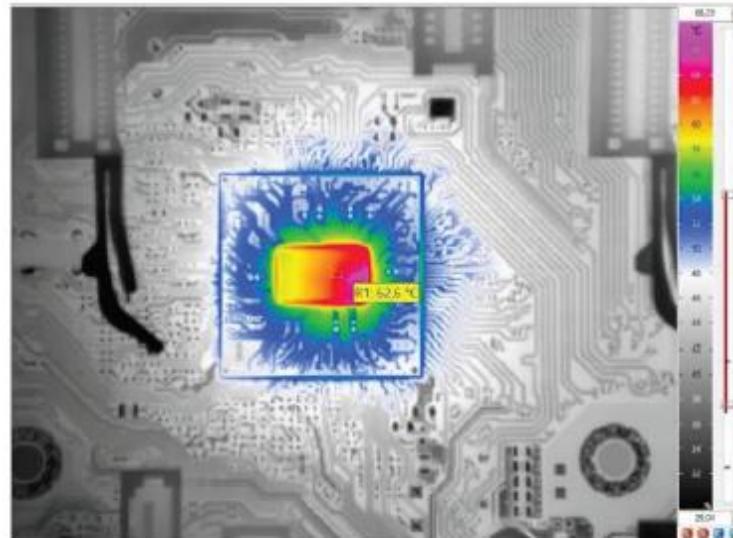
Landscape/Building

Automotive parts

Composites (Carbon Fibre)

Health sector (Surgery)

Research



**More than 50%**

## Is it automated?

### Why Automation Is Crucial in Modern NDT

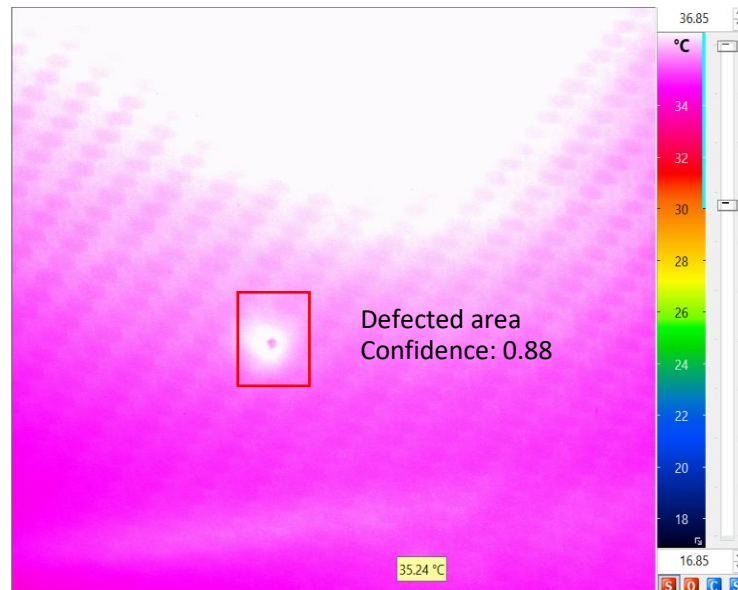
- Increasing complexity and size of industrial components
- Limitations of manual inspection (time, consistency, accessibility)
- Need for repeatable and reliable inspection results

### Benefits of Automated NDT for Industry

- High repeatability and reduced operator dependency
- Faster inspection and higher throughput
- Full and consistent inspection coverage
- In-line / near-line inspection capability
- Digital data acquisition and traceability
- Readiness for Industry 4.0 and smart manufacturing



## From human decision to automated system



### AI & Machine Learning

System can adopt machine vision from repeatable detection system using robot arm which is reliable and well constructed.

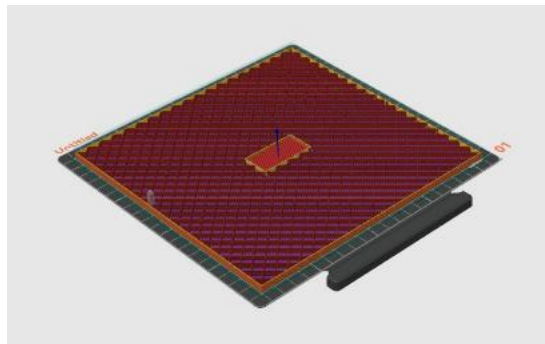
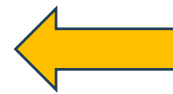
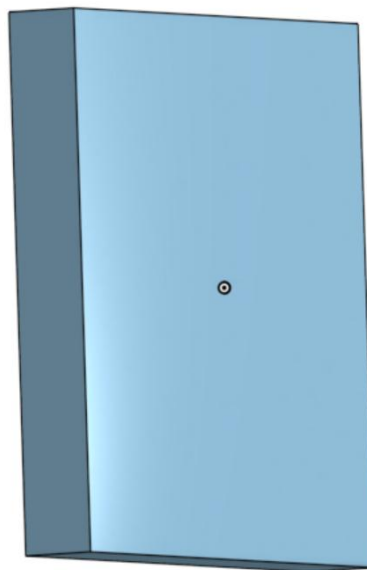
### Fully Automated Detection System

Not only can the hardware operate without human intervention, but the software can also run automatically using machine vision for data interpretation.

### Reduce the cost

Costs can be minimised in many aspects by reducing human-related errors and inconsistencies.





Hz  
Duration  
Resolution  
etc.



Hz  
Duration  
Power  
etc.

# Workshop



# **Workshop**

Active thermography