



# SYSTEM

자동화시스템 Automation Systems

## Radiographic Testing Equipment

엑스선(x-ray), 감마선(r-ray) 등의 방사선을 시험체에 투과시켰을 때, 엑스선 필름에 향상된 상을 판독하여, 시험체 내부의 결함을 검출하는 검사방법입니다. 내부결함을 검출하는 비파괴검사 방법중 현재 가장 널리 이용되고 있습니다.



거의 모든 재질을 검사할 수 있습니다. 검사 결과를 영구적으로 남길 수 있습니다. 용접 결함에 대한 검출 능력이 높습니다. 내부 결함의 실상을 그대로 한눈에 볼 수 있습니다. 방사선에 대한 보호 장치가 필요하고, 훈련된 전문 용원만 취급할 수 있습니다.

### 적용분야

- 우주항공분야
- 항공분야
- 주조분야
- 군수품분야
- 원자력분야
- 실험실 분야
- 용접분야
- 파이프라인분야
- 조선분야
- 기타제조물

### Applications include

- Aerospace
- Aircraft
- Foundry/Castings
- Munitions
- Nuclear components
- Testing laboratories
- General welding
- Investment castings
- Pipeline
- Shipbuilding
- Other applications demanding high and productivity



NDT TOTAL SOLUTION

# CONTENTS

- Castream INDUSTREX Product
- 케어스트림 산업용 방사선 촬영제품
- PICO RAY Industrial
- PICO RAY 공업용 X-ray
- Industrial X-ray Equipment
- 공업용 X-ray 장비
- Gamma Ray Radiography Equipment
- 방사성동위원소 촬영
- Exposure Accessories
- 촬영 기자재
- Darkroom Equipment
- 암실 장비
- Film Viewers
- 필름 판정 제품
- NDT Educational Kit
- 교육용 용접부 결함시편
- Radiation Measurement Equipment
- 방사선 측정 장비
- Radiation Shielding, Safety Equipment Storage Bin & Facilities
- 방사선 방어 및 안전용품, 방사선 차폐, 저장용기, 시설

## PAUT SYSTEM



# ERW Tube In-Line Inspection System

### Diameter ranges :

range : from 60.3 to 244.5 mm

Large size range : from 114.3 to 406.4 mm

### Wall thickness range : from 3 to 16 mm

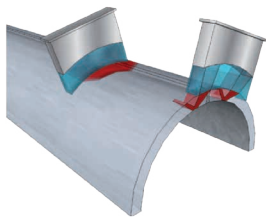
### References defects (API):

Longitudinal Notches (N5 or N10), 1/2 or 1 inch length

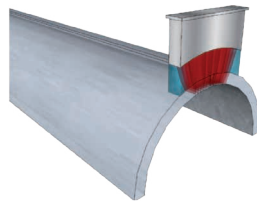
Thru Drill Hole 1/8, 1/16 and 1/32 (TDH)

Flat Bottom Hole 1/4 or 1/8 (FBH)

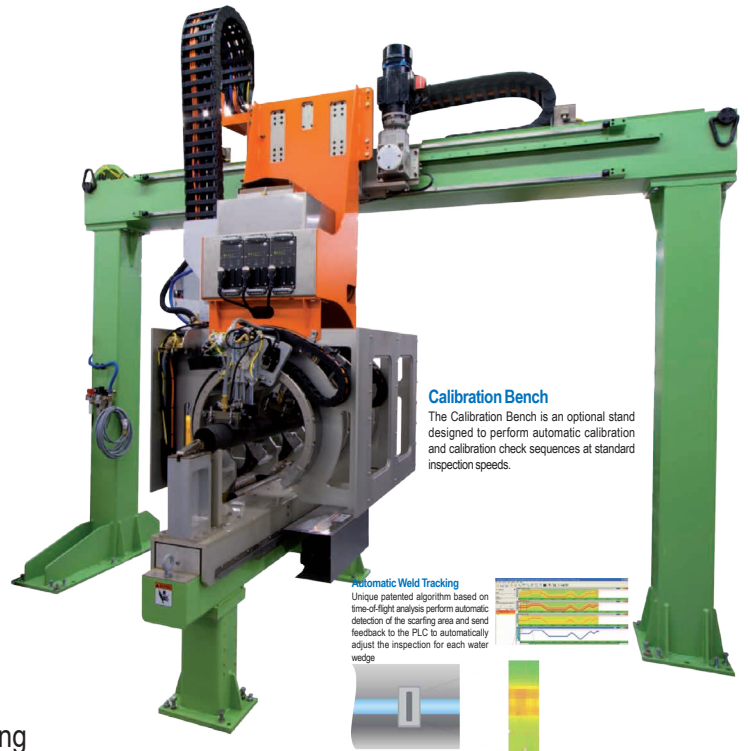
Side Drill Hole 1/8 (SDH)



Flaw Detection



Weld Profiling and Tracking

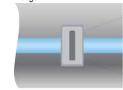
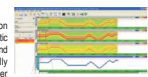


### Calibration Bench

The Calibration Bench is an optional stand designed to perform automatic calibration and calibration check sequences at standard inspection speeds.

### Automatic Weld Tracking

Unique patented algorithm based on time-of-flight analysis perform automatic detection of the scarfing area and send feedback to the PLC to automatically adjust the inspection for each water wedge



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## PAUT SYSTEM



# Tube Inspection System

### Designed for:

Seamless, welded, and upset pipes

Carbon, Stainless, and 13% Chrome pipes

OD range: 60.3mm (2 3/8") to 508mm (20")

WT range: 3mm (1/8") to 51mm (2")

### References:

Longitudinal (L), transverse (T), oblique 11°/22°/45°/68°(O),

Lamination (LAM) and wall thickness (WT) measurement



**RTIS**  
Integrated Inspection Systems



## Bar Inspection System



**Type 1 :** Diameter 10 to 60 mm

**Type 2 :** Diameter 15 to 120 mm (Round only)

Diameter 20 to 120mm (Round & Square bars)

**Type 4 :** Diameter 50 to 254 mm (Round and Square bars)

### Longitudinal Wave Inspection

1. Flat Bottom Holes(FBH)

FBH 0.8mm up to 120mm

FBH 1.2mm up to 150mm

FBH 1.6mm up to 200mm

FBH 2.0mm up to 230mm

FBH 2.5mm up to 254mm

2. Side Drill Hole(SDH)

Orientation : Longitudinal(axial direction)

Diameter : 0.8mm

Length : 15mm

### Shear Wave Inspection

1. Side Drill Hole(SDH)

Orientation : Longitudinal(axial direction)

Diameter : 0.8mm

Length : 15mm

Longitudinal notches

- Depth 0.3mm



## Seamless Pipe Off-Line System



### Diameter ranges :

range : from 60.3 to 244.5 mm

Large size range : from 114.3 to 406.4 mm

**Wall thickness range :** from 5 to 25 mm

### References defects (API):

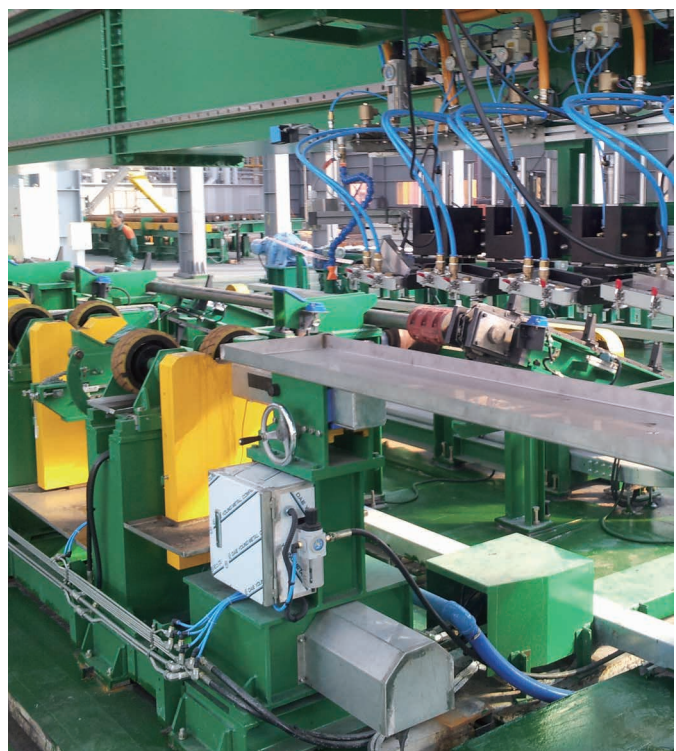
Longitudinal Notches (N5 or N10), ½ or 1 inch length

Thru Drill Hole 1/8, 1/16 and 1/32 (TDH)

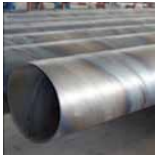
Flat Bottom Hole ¼ or 1/8 (FBH)

Side Drill Hole 1/8 (SDH)

T+, T-, L+, L-, Lamination, WT

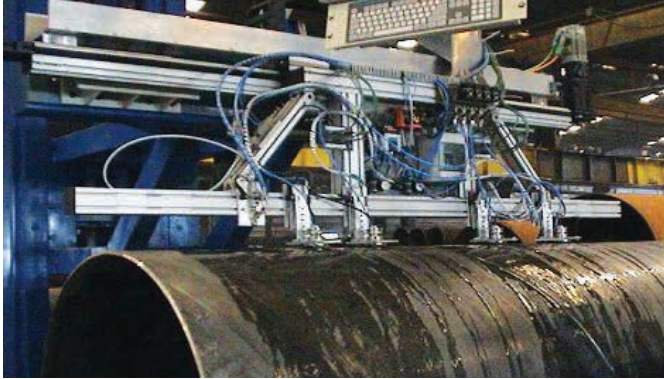


## UT SYSTEM



# Saw Spiral Pipe Inspection System

### Helical SAW-Tubes



**Diameter ranges :** from 300 to 3600mm  
**Wall thickness range :** from 3 to 30mm  
**Strip width :** from 200 to 2000mm  
**Width of weld seam :** from 8 to 30mm  
**Specifications :** API, DNV, ISO

### longitudinal seam SAW-Tubes



**Diameter ranges :** from 400 to 3600mm  
**Wall thickness range :** from 4 to 70mm  
**Strip width :** from 200 to 2000mm  
**Width of weld seam :** from 8 to 70mm  
**Detectable flaws :**  
longitudinal and transverse defects in the weld  
laminations in the heat affected zone besides the weld

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## UT SYSTEM

# Immersion UT System






# 항공용 복합소재 Squirter Inspection System

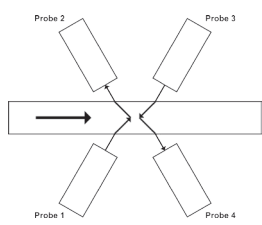


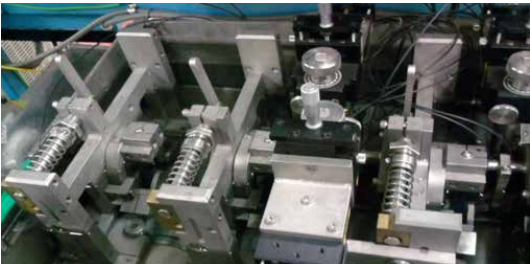
## 스프링 강 내부 검사 장치

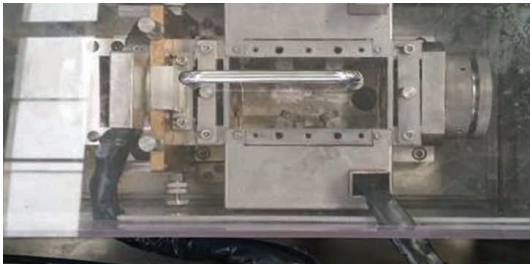


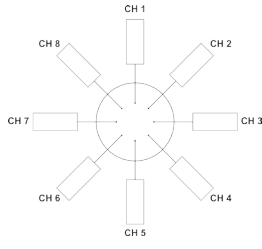


**Line Speed : 80~122m/min**  
**Diameter: 8 ~ 16mm**  
**적용채널 : 10Channel**  
**Chevron Detection 2ch :**  
**4 probes 2 transmission probes x 2**  
**Detection performance : 0.7mm $\phi$ FBH**  
**Longitudinal detection 8ch : 8 probes**  
**Detection performance : 0.5mm $\phi$ FBH**









## UT SYSTEM



## KTX 차축 베어링, 베어링 탐상 시스템



Cycle Time : 8min/4EA

References defects :

(KS B0817, ASTM E1001-04, NF A09-340)

Flat Bottom Hole : 0.5mm(FBH)

중심편차 : 0.2mm이내

회전속도 : 100rpm

위치 분해능 : 0.1mm이하

4축 서보 제어

Water 공급시스템

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## UT SYSTEM

## 환봉 끝단부 검사장치

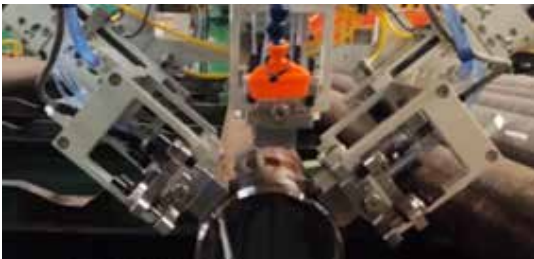
Designed for:

Inspection range of end : 50mm

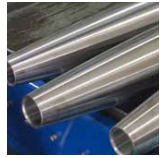
Carbon steel of Inner defect

Round diameter range: 85 mm to 185 mm

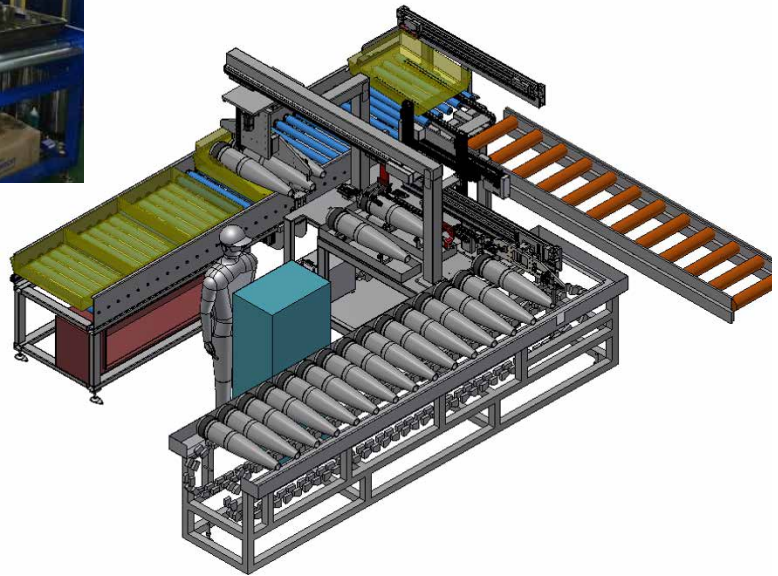
References: Side-drilled hole (SDH) 2.0







## 탄체 표면 내부 결함 검출 System



Cycle Time : 1min/EA

References defects : KS B 0817, KS D 0232)

적용채널 : UT 4CH, ECT 3CH

### UT 결함정보

측면 0.2(W) X 0.64(D) X 10.57(L)

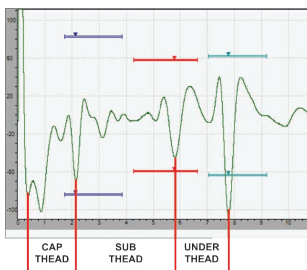
미부 1.57(W) X 10.7(D) X 1.57(L)

### ECT 결함정보

두부 0.3(W) X 0.33(D) X 0.91(L)



## Tire Multi Layer Gauge System



생산중 IN-LINE 검사

측정 가능 LAYER : 2~3층

(일부 제외)

측정 오차 : +/- 0.2mm

2축 서보 제어

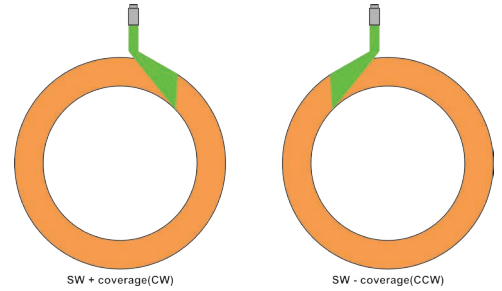
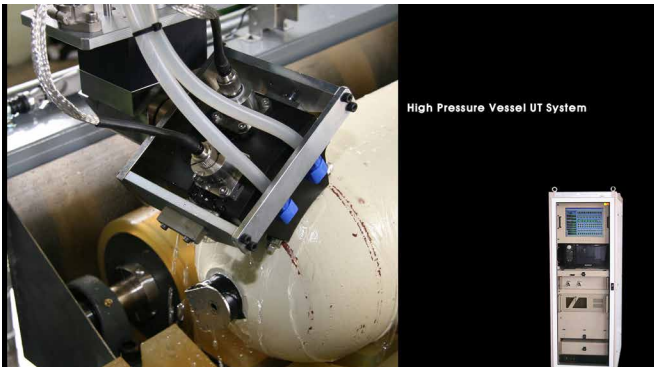
Water 공급시스템



## UT SYSTEM



## 고압 가스 실린더 On-Line System



**Cycle Time :** 3min/EA

**제품 크기 :** 232mm(둘레) X 1430mm(L) X 6.2mm(T)

**적용채널 :** 8Channel

**Thickness measurement :** 1channel

**Flaw detection Longitudinal wave 0° :** 3channel

**Flaw detection Transverse wave T+, T- :** 2channel

**Flaw detection Transverse wave L+, L- :** 2channel

**References defects :**

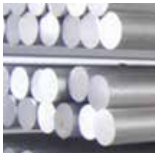
( ASTM 및 KS 고압가스 안전관리법 규정에 의한 UT 검사법)

내, 외 표면 두께대비 5%의 노치

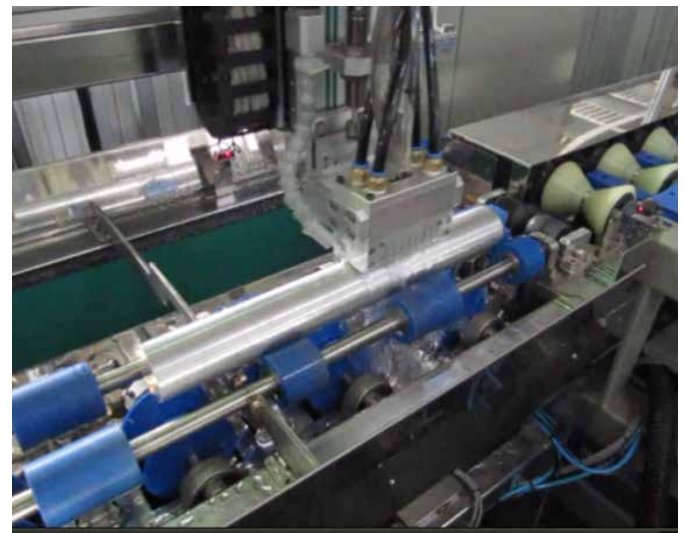
(Longitudinal Notches (N5))

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## UT SYSTEM



## Aluminum Bar Off-Line System



**Diameter ranges :**

range : from 40 to 90mm

Large size range : from 100 to 350mm

**References defects :** ASTM B594-90

CLASS AA(0.79mm), A(1.19mm), B(1.98mm), C(3.18mm)

**Flat bottom holes(FBH)**

Class AA(0.79mm) up to 100mm(Diameter)

Class A(1.19mm) up to 150mm(Diameter)

Class B(1.98mm) up to 250mm(Diameter)

Class C(3.18mm) up to 350mm(Diameter)

## 자동차 Gear 전자빔 용접부 검사 장치

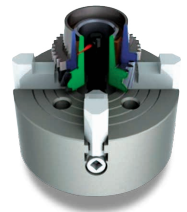


**Cycle Time : 40 Sec/EA**

용입 부족 검출  
기공 검출  
균열 검출

**References defects :**

**KS D 0252 , ISO 9765 : 1.6mm FBH**



## 자동차 소결 부품 초음파 검사 장치



**Cycle Time : 32 Sec/EA**

기공 검출  
균열 검출

**References defects :**

**KS D 0252 , ISO 9765 : 1.6mm FBH**

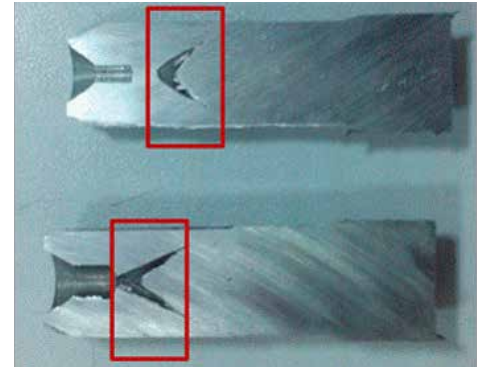




## UT SYSTEM



## 자동차 Shaft 내부 검사 장치



**Cycle Time : 7 Sec/EA**

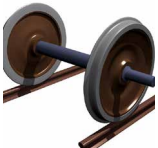
내부 Chevron Crack

**References defects :**

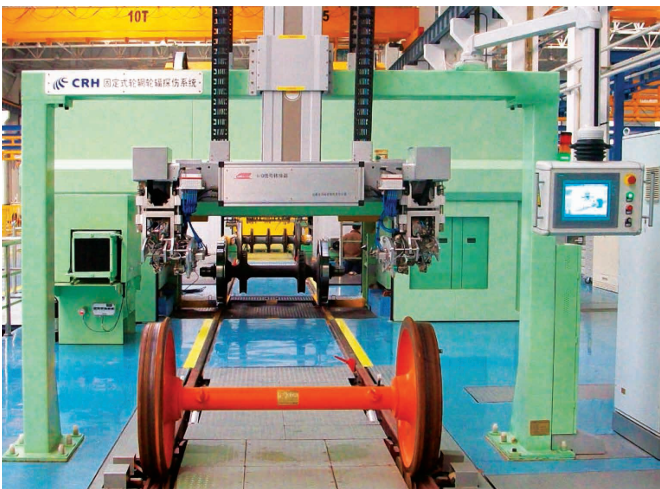
**KS D 0252 , ISO 9765 : 1.6mm FBH**

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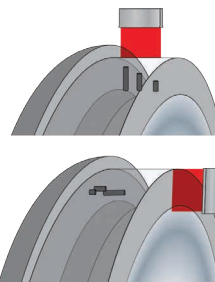
## PAUT SYSTEM



## Automated Train Wheel Inspection



### Manufacturing Inspection



#### Requirements

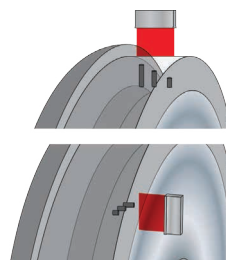
##### Radial Defects:

- 2.0 mm FBH for high speed train wheels.
- 3.2 mm FBH for freight train wheels.
- Various depths from tread surface.

##### Axial Defects:

- 2.0 mm FBH for high speed train wheels.
- 3.2 mm FBH for freight train wheels.
- Various depths from rim surface

### In-Service Inspection



#### Requirements

##### Radial Defects:

- 1.0 mm FBH for high speed train wheels.
- 2.0 to 3.2 mm FBH for freight train wheels.
- Various depths from tread surface.

##### Axial Defects:

- 3.0 or 5.0 mm FBH in the web section.
- Up to 3 defects at different depths.

### 항공기/방산/자동차 부품 침투 탐상 장치



### 방산 부품 침투 탐상 장치





**PT SYSTEM**

**항공기 부품 침투 탐상 장치**



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**PT SYSTEM**



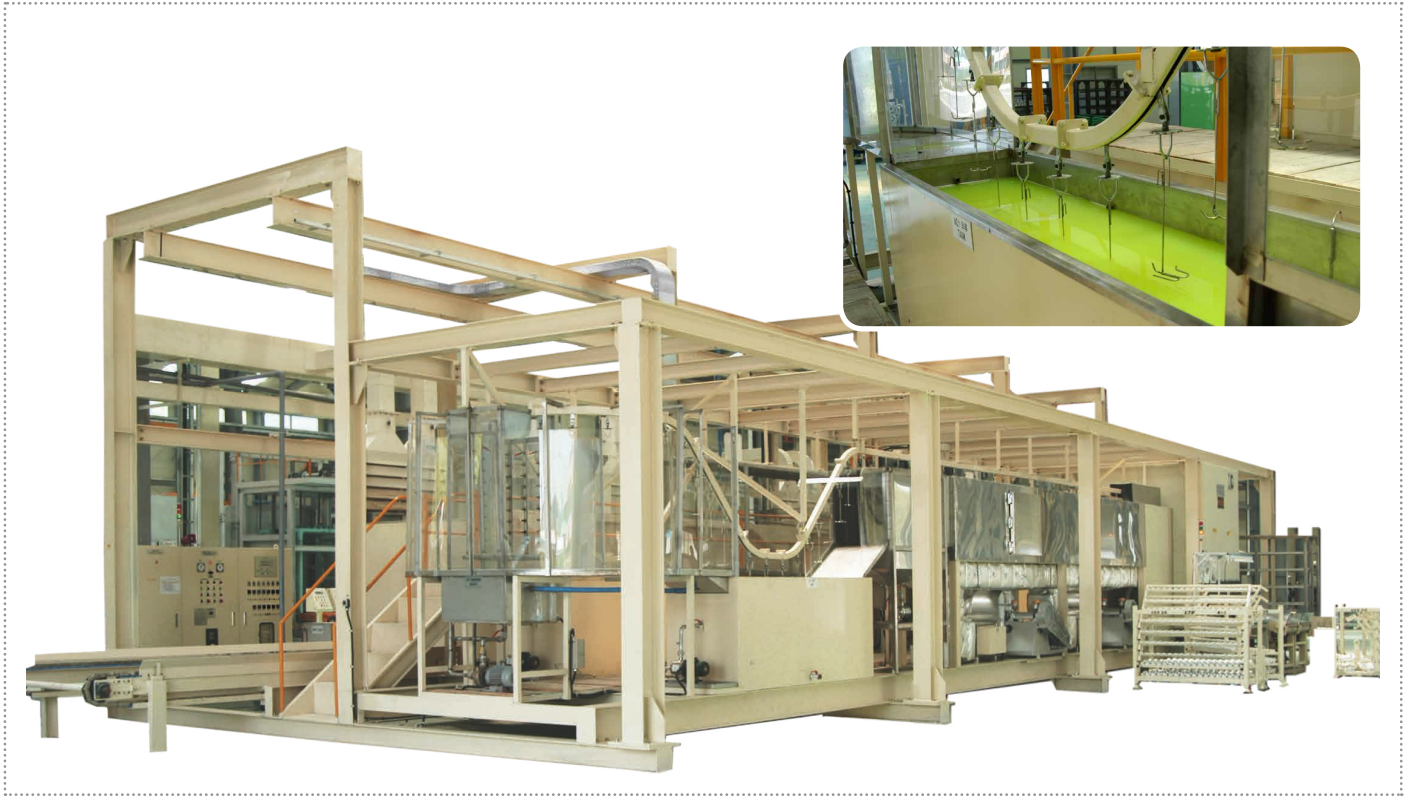
*Automobile Component PT System*





PT SYSTEM

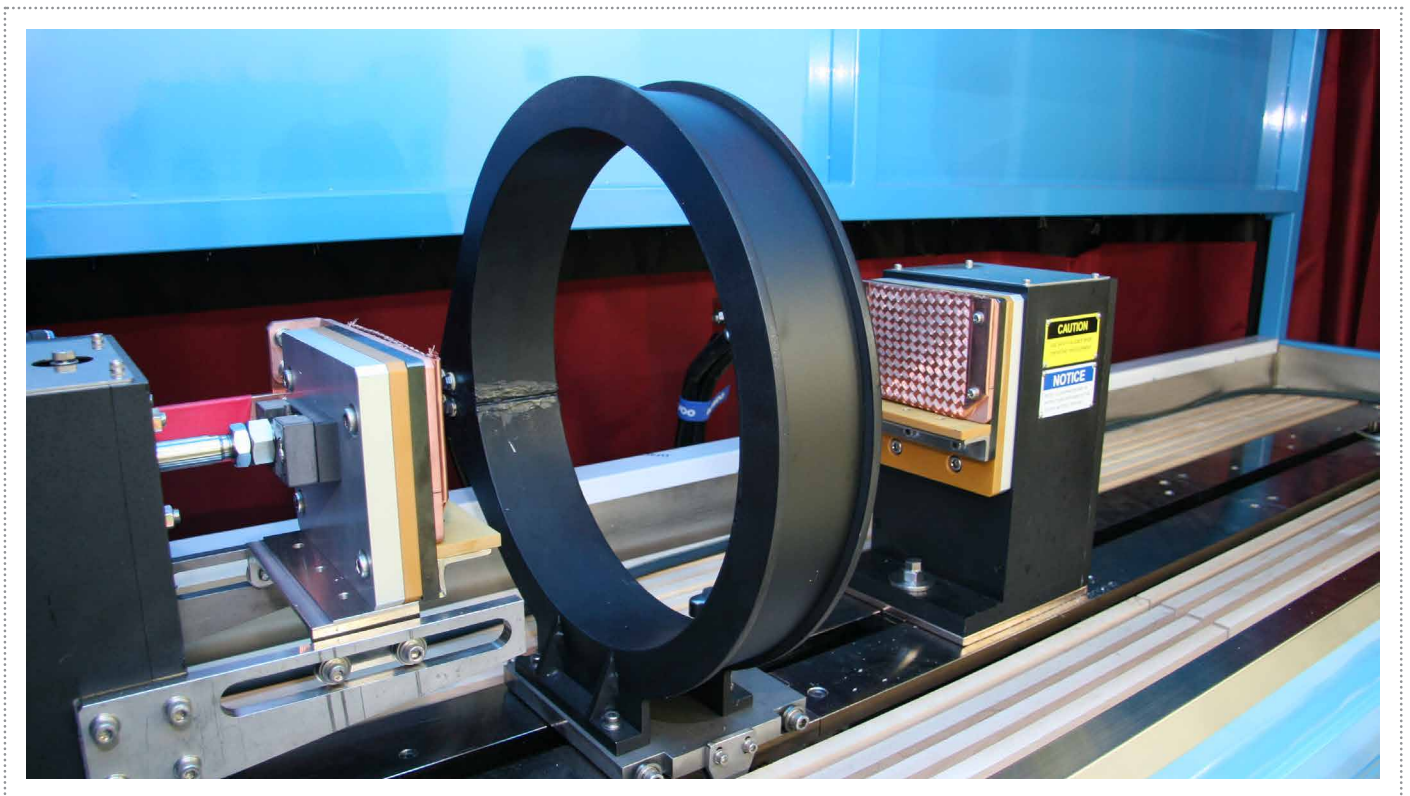
Automobile Component PT System



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MT SYSTEM

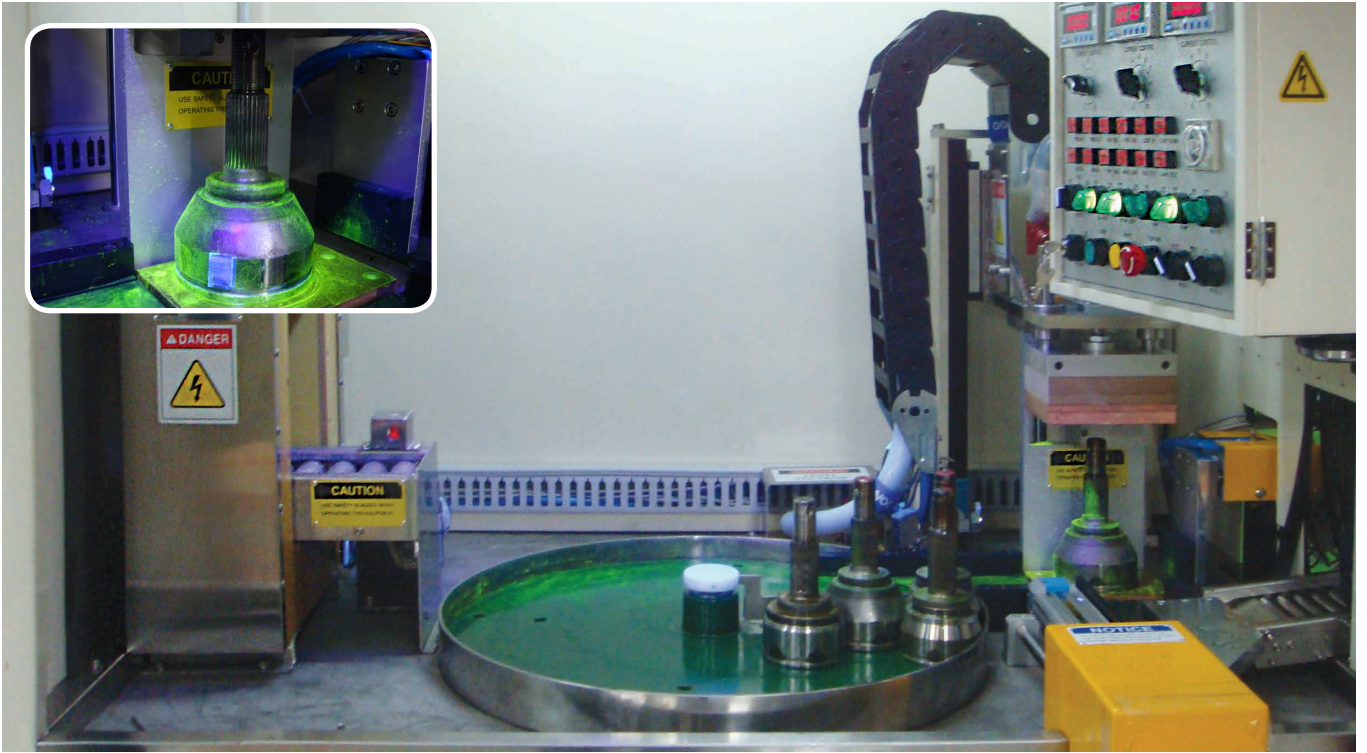
대형 볼트 자분 탐상 시스템



## MT SYSTEM



## CV Joint 자분 탐상 시스템



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## MT SYSTEM



## 밸브 자분 탐상 시스템





### Round/Square Bar 자분 탐상 시스템



### 감속기 샤프트 자분 탐상 시스템





## MT SYSTEM



## 탄체 표면 자분 탐상 시스템

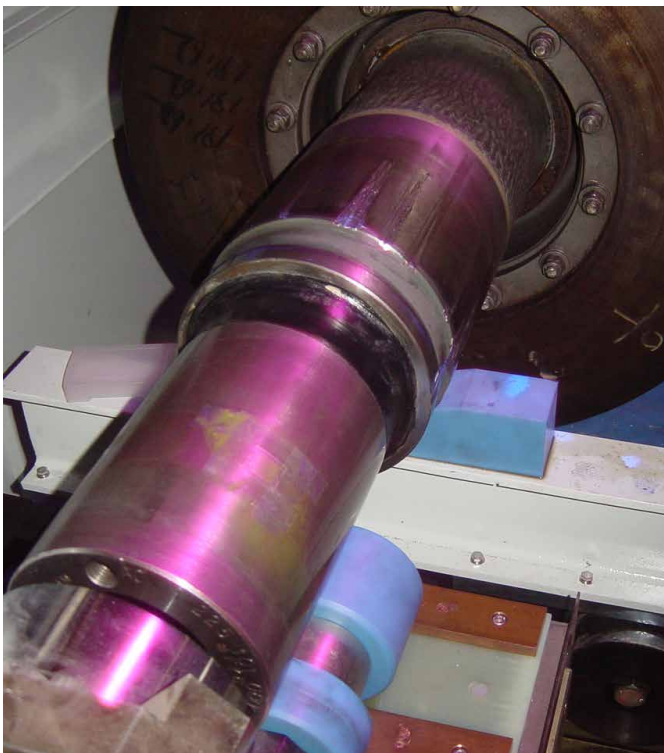


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## MT SYSTEM



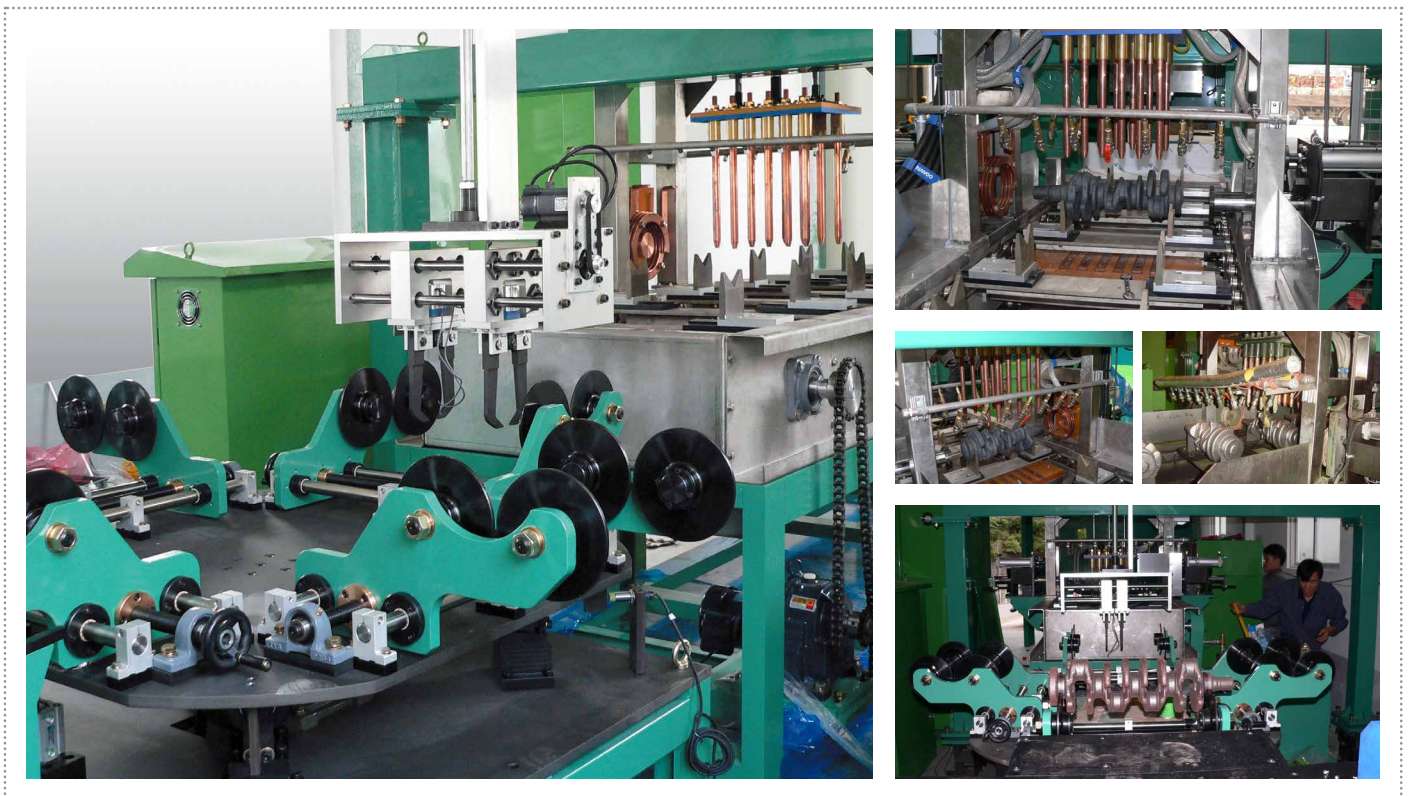
## KTX차축,베어링 탐상 시스템



# 자동차 Shaft 자분 참상 시스템



# 자동차 Crank Shaft 자분 시스템





## MT SYSTEM



## Reaction Arm 자분 탐상 시스템

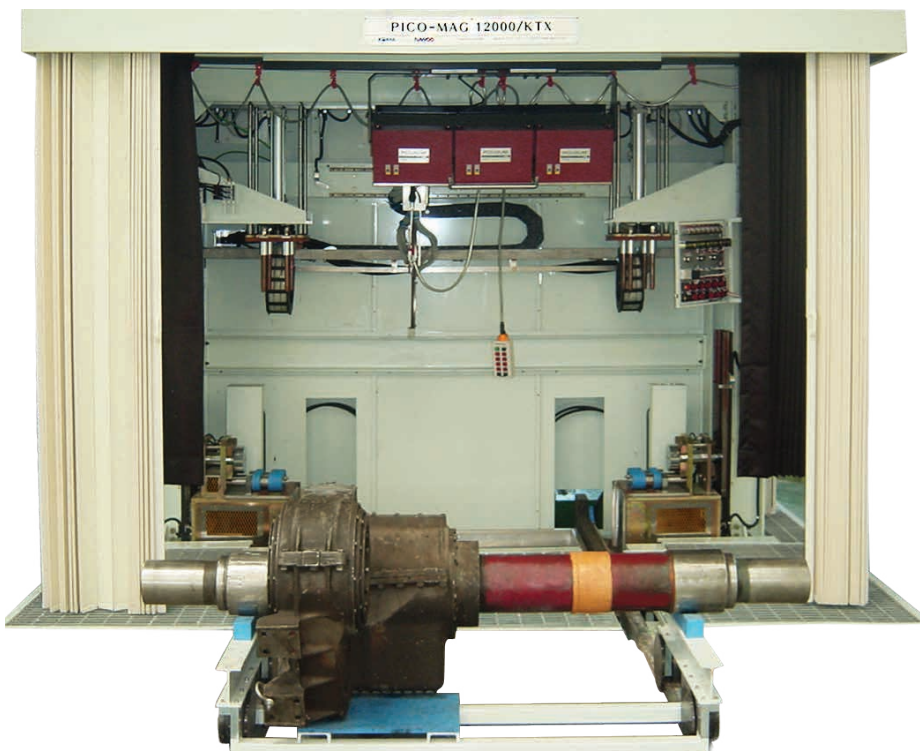


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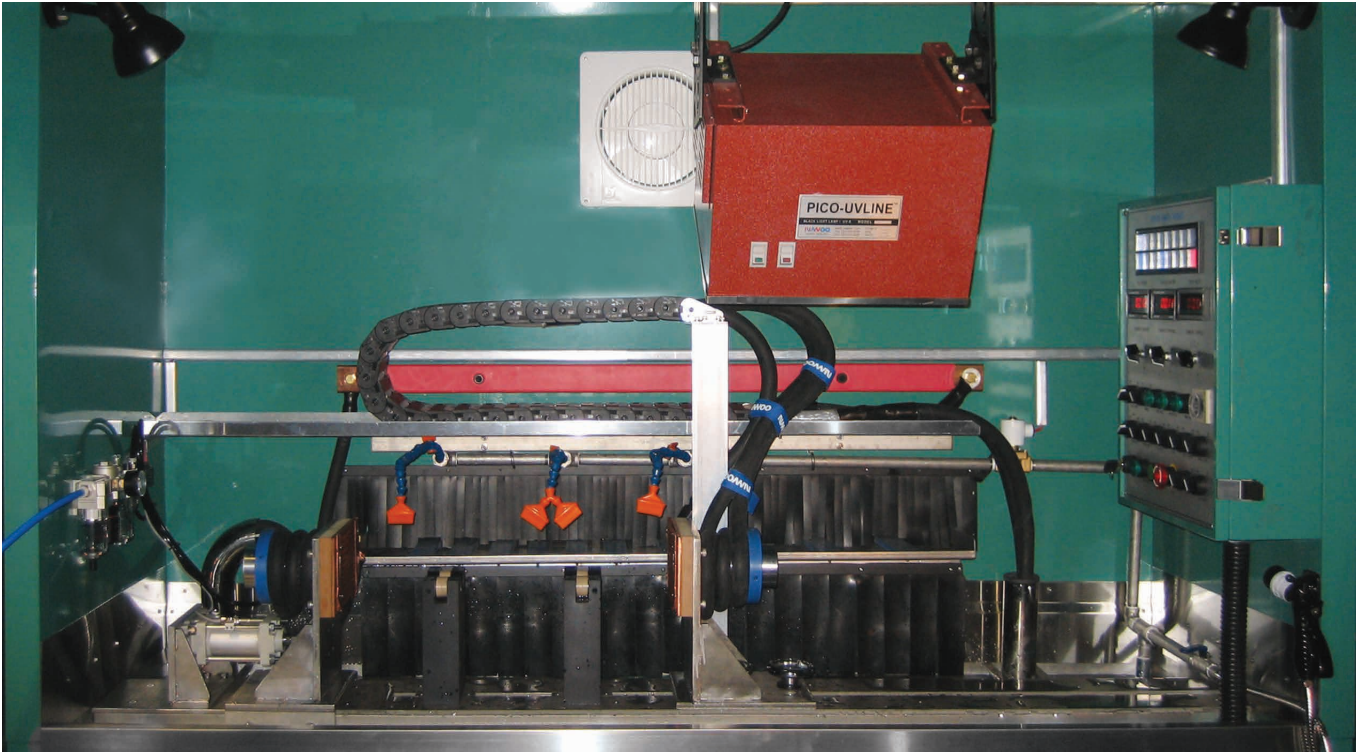
## MT SYSTEM



## AXLE 자분 탐상 시스템



Horizontal Station 탐상 시스템



Turbin Disk Hole 탐상 시스템



**Cycle Time : 3Sec**

반자동검사

**검출영역 : Hole**

**적용방식 : Rotating Probe**

**결함종류 : Crack**

**crack specification :**

0.2(W) X 0.2(D) X 2(L)



## ET SYSTEM



## Engine Block 탐상 시스템



적용 장비 : Nortec 500  
Cycle Time : 5Sec 수동검사  
검출영역 : 실린더 내부  
적용방식 : Surface Probe  
결함 종류 : Crack  
crack specification : 0.3(W) X 0.2(D) X 5(L)

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## ET SYSTEM



## 자동차 부품 클러치 패드 탐상 시스템



적용 장비 : Nortec 500  
Cycle Time : 5Sec  
검출영역 : 상단부 표면  
적용방식 : Surface Probe  
결함종류 : Crack  
crack specification :  
0.5(W) X 0.2(D) X 5(L)







## 스테인레스 강관 반자동 탐상 시스템



## 알루미늄 환봉 탐상 시스템



적용 장비 : Nortec 500

Cycle Time : 5Sec

검출영역 : 알루미늄 바 표면

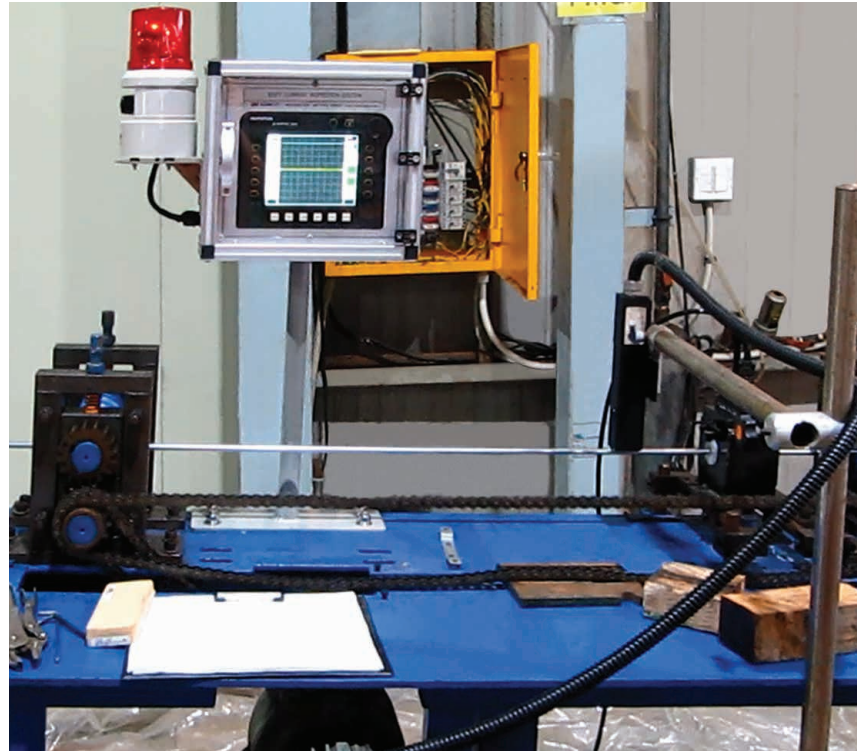
적용방식 : Encircling Probe

결함종류 : 감육 상태

## ET SYSTEM

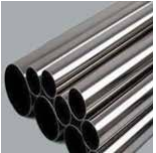


## 스테인레스 강관 탐상 시스템



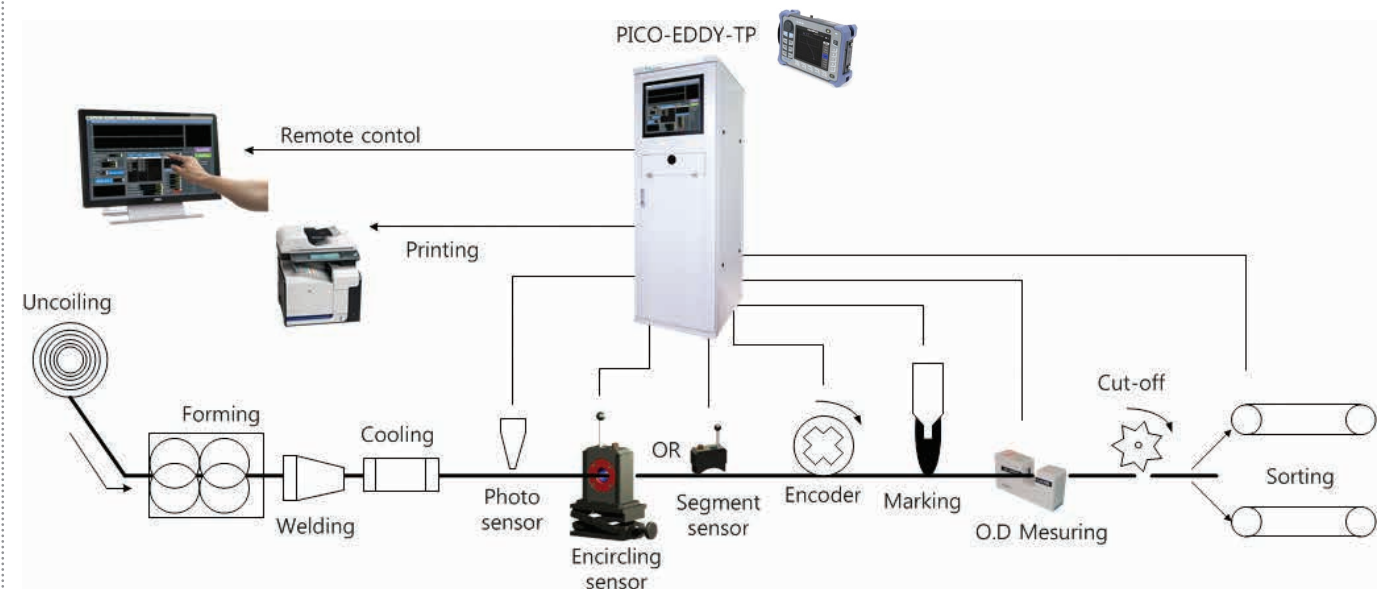
적용 장비 : Nortec 500  
 Line Speed : 60m/min  
 Diameter: 8~14mm  
 Probe Type : Encircling Probe  
 References defects :(KS D ISO 9304)

## ET SYSTEM

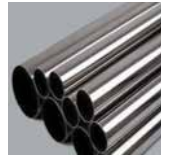


## 파이프/튜브 와전류 탐상 시스템 1

In-line testing of welded tube/pipe

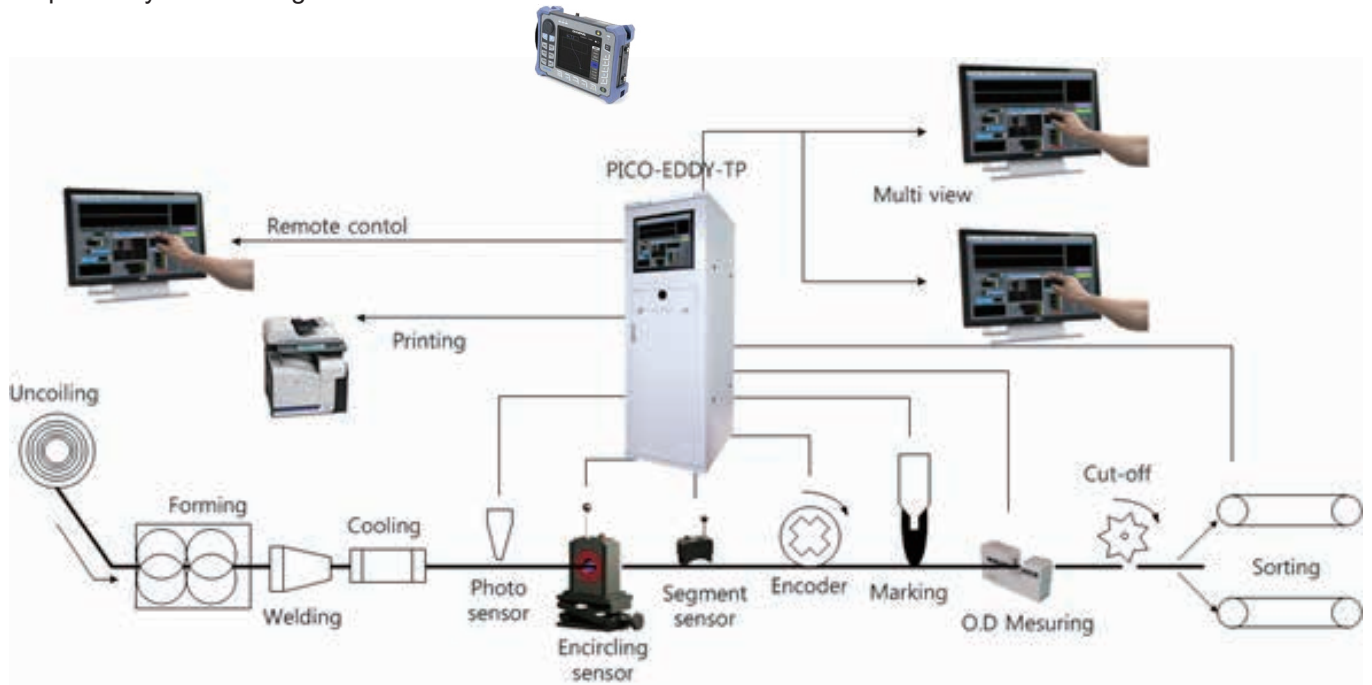






## 파이프/튜브 와전류 탐상 시스템 2

Inspection system for using two sensor



## 자동차 부품 열처리 탐상 시스템

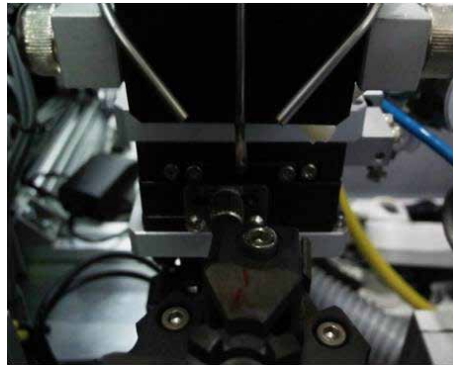


적용 장비 : Nortec 500  
 Cycle Time : 7 Sec  
 검출영역 : 국부부위  
 적용방식 : Surface Probe  
 결함 종류 : 열처리 유/무

## ET SYSTEM



## 자동차 부품 용접부 탐상 시스템

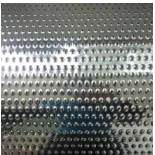


적용 장비 : Nortec 500  
 Cycle Time : 15 Sec  
 검출영역 : 국부부위  
 적용방식 : Surface Probe  
 결함 종류 : 용접부 결함



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## ET SYSTEM



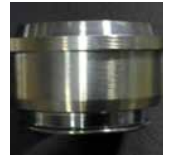
## 세탁기 드럼 용접부 탐상 시스템



적용 장비 : Nortec 600  
 Cycle Time : 20Sec  
 검출영역 : 용접부  
 적용방식 : Surface Probe  
 결함 종류 : 용접 불량 및 Crack  
 crack specification : 1Ø







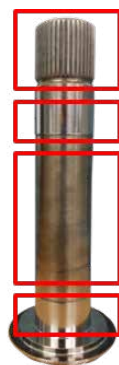
### 자동차 부품 Housing 탐상 시스템



적용 장비 : PICO-Eddy-AP  
**Cycle Time** : 5Sec  
 검출영역 : 표면  
 적용방식 : Surface Probe  
 결함 종류 : Crack  
**crack specification** :  
 0.1(W) X 0.1(D) X 2(L)



### 자동차 부품 Gear Shaft 탐상 시스템



적용 장비 : PICO-Eddy-AP  
**Cycle Time** : 12Sec  
 검출영역 : 4 Point  
 적용방식 : Surface Probe  
 결함 종류 : Crack  
**crack specification** :  
 0.5(W) X 0.2(D) X 2(L)  
 0.25(W) X 0.2(D) X 2(L)



## ET SYSTEM



## 자동차 부품 Warm Shaft 탐상 시스템



적용 장비 : Nortec 500  
**Cycle Time** : 8Sec  
 검출영역 : 기어부  
 적용방식 : Surface Probe  
 결함 종류 : Crack  
**crack specification** :  
 0.5(W) X 0.2(D) X 2(L)



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## ET/UT SYSTEM



## Roll Inspection System



### Eddy Current

- 8-channel testing
- Surface cracks, pores, inclusions, pinches
- Bruise sensor

### Ultrasonic

- 1~2-channel testing(surface, straight)
- Surface, Sub-Surface cracks, bonding
- Up to 8-channel testing(30mm)

### Program

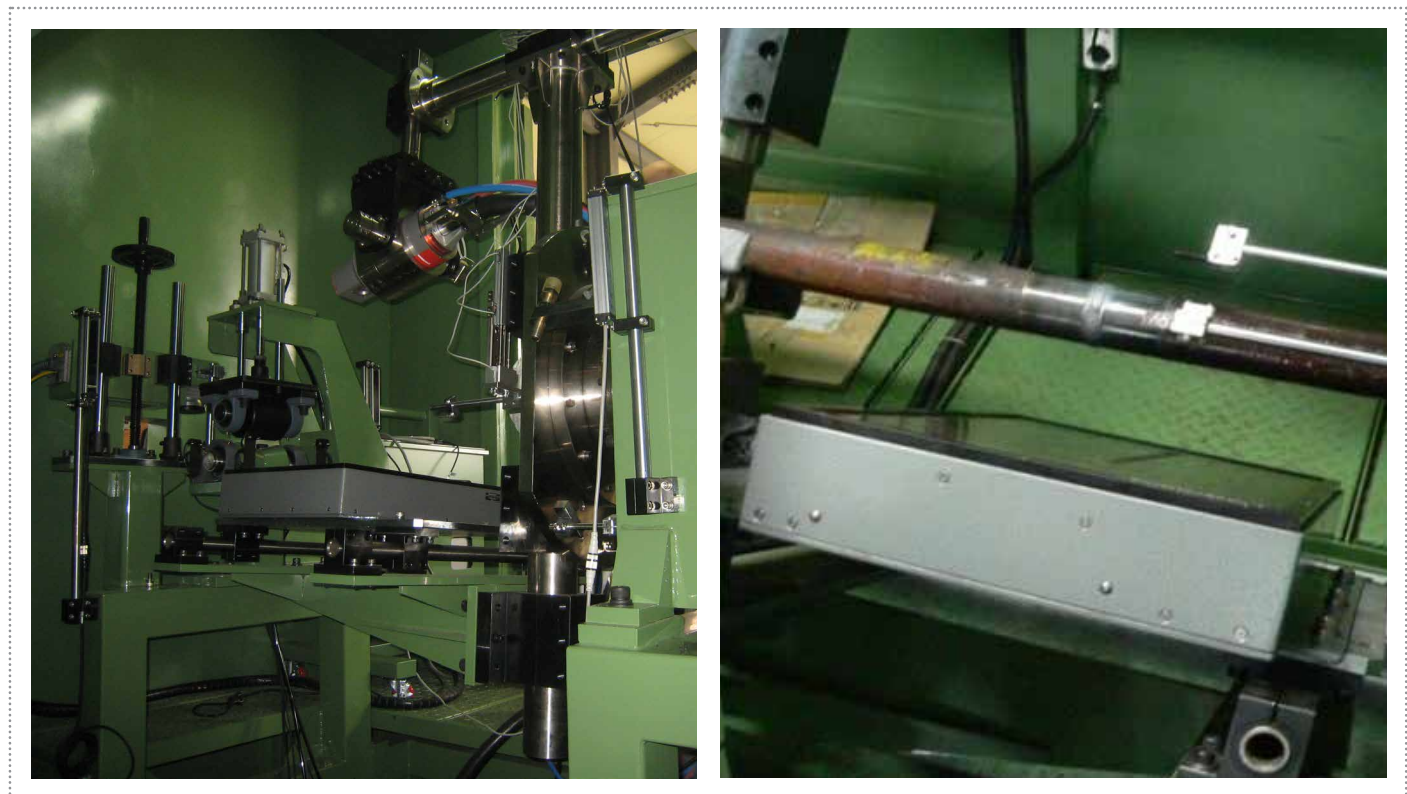
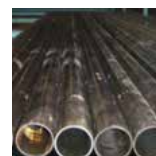
- Real-time display
- A-scan and C-scan Display
- Overlap
- Report for test result



# 절연체(PMJ)검사 시스템



# Digital RT(보일러 Tube)검사 시스템



# RT SYSTEM



## Digital RT(Pipe)검사 시스템



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# RT SYSTEM

## 방사선 투과 검사 차폐룸





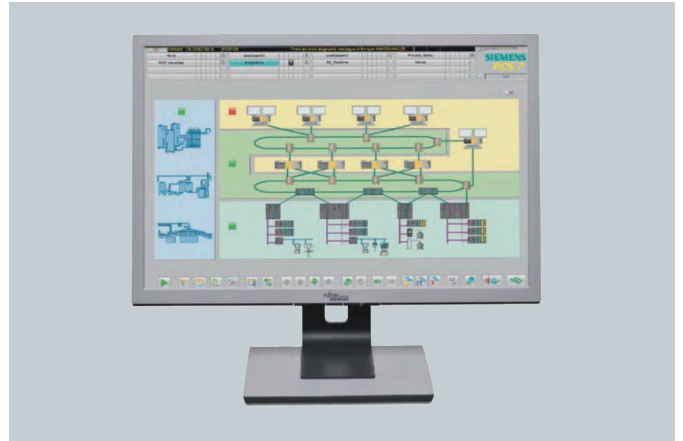
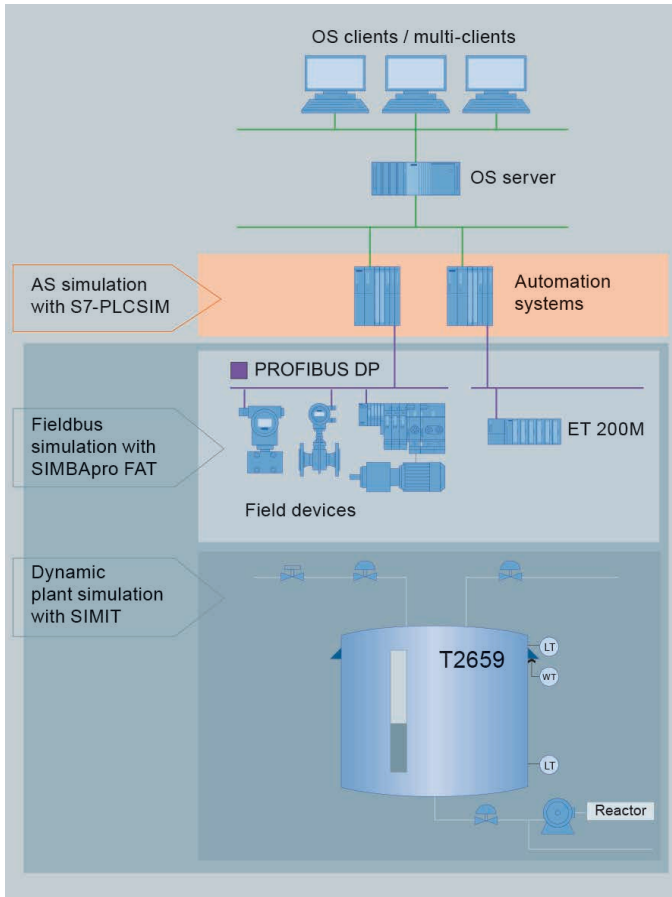
# 자동 제어 시스템



(주)인팩트오토메이션

InFACT Automation Co.Ltd.

[www.infact.co.kr](http://www.infact.co.kr)



## SIEMENS SOLUTION PARTNER (2000년부터 지멘스 정식 대리점)

### 사업분야

**계장시스템**

SCADA  
컴퓨터 네트워크  
PLC 프로그래밍  
테스트 및 시운전

**컨트롤 패널**

PLC  
판넬컴퓨터  
MCC, PDB  
일반 계장제어반

**HMI**

Siemens WIN-CC 외  
PC기반 자동화 S/W  
CUSTOM S/W  
REPORT 프로그램

### 적용분야

**PROCESS AUTOMATION**

수처리공정  
석유화학 중화학 공정  
제지/제약/식품료 공정  
소각로제어

**FACTORY AUTOMATION**

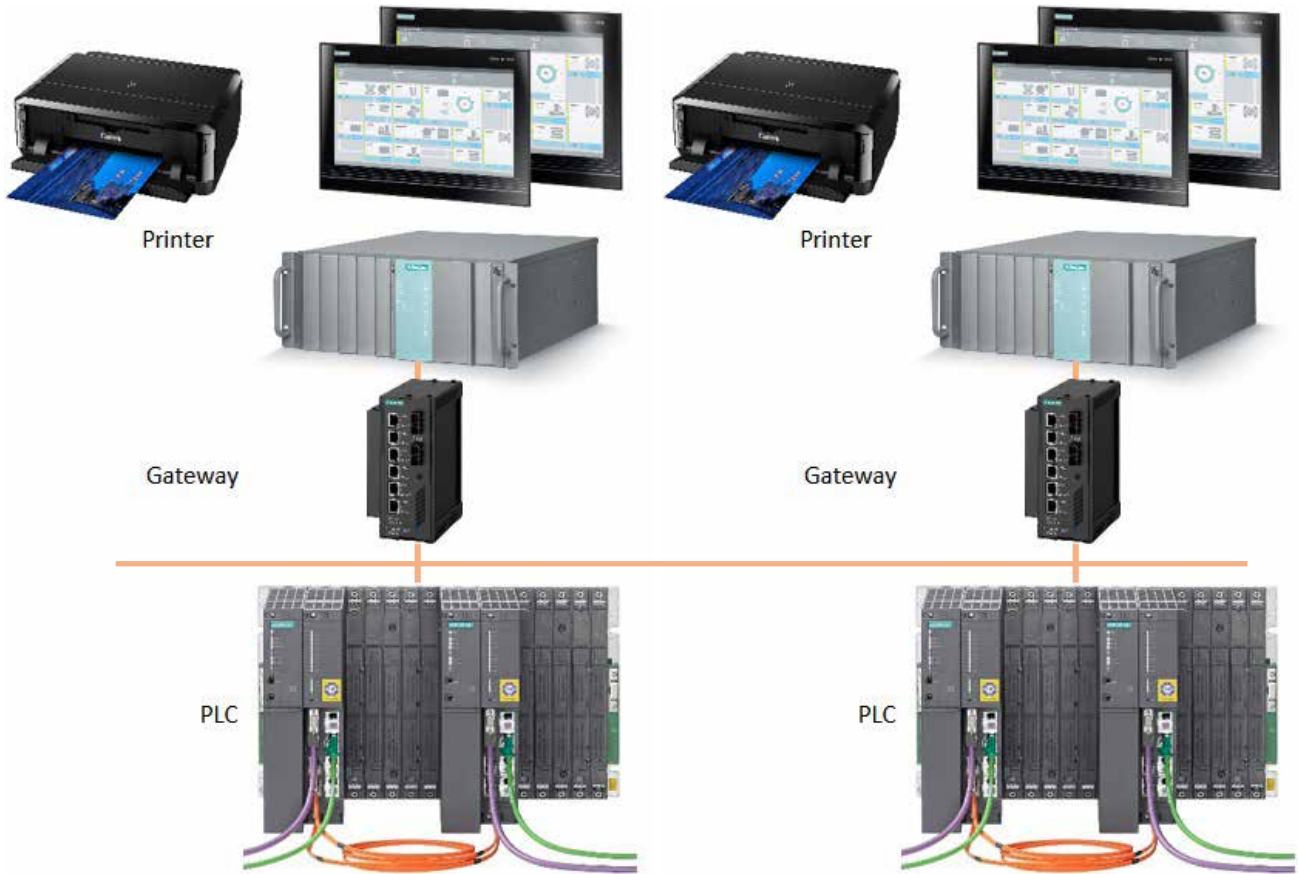
물류 자동화  
검사/계측 자동화  
반도체 공정  
연구/ 실험 장비

**MONITORING & MANAGEMENT**

환경설비  
전력/조명 감시  
빌딩 제어



# 수처리 시스템 구성 사례



## 시스템의 개요

- 각 설비에 대한 제어 및 모니터링
- 지시 및 모니터링과 운전로직의 분리(안정화)
- 실시간 알람, 트렌드, 과거 경향 표시
- 각 설비의 데이터는 보고서로 출력 및 기록됨

## InFACT의 솔루션

- 운전 소프트웨어 부분
- HMI 소프트웨어로 그래픽 처리
- 컴퓨터 만을 가지고 운전이 가능하도록 설계
- 보고서 프로그램 작성
- 제어 부분
- PLC로 로직 및 PID 제어
- PLC, 모터 제어, 계기를 위한 판넬 제작



프로젝트명	현장명
CSU(Continuous Ship Unloader)	두산중공업㈜
집진설비(Dust Collector System)	두산중공업㈜
석탄운반설비	두산중공업㈜
화력발전소 탈황처리시스템	두산중공업
열병합발전소	한화에스엔씨㈜
40MW 디젤발전기(DPP)	현대중공업㈜
촉매시스템	포스코엔지니어링
공장자동화시스템	SK이노베이션㈜
석유화학플랜트	SK건설
액화 탄산 공장	㈜ 동광화학
제약사용 동결건조기	동국정밀
UF/RO 수처리시스템	웅진코웨이

