



# ASSEMBLY AUTOMATION SOLUTION













Ver: 01

**ETEK**  
TOTAL AUTOMATION SOLUTIONS

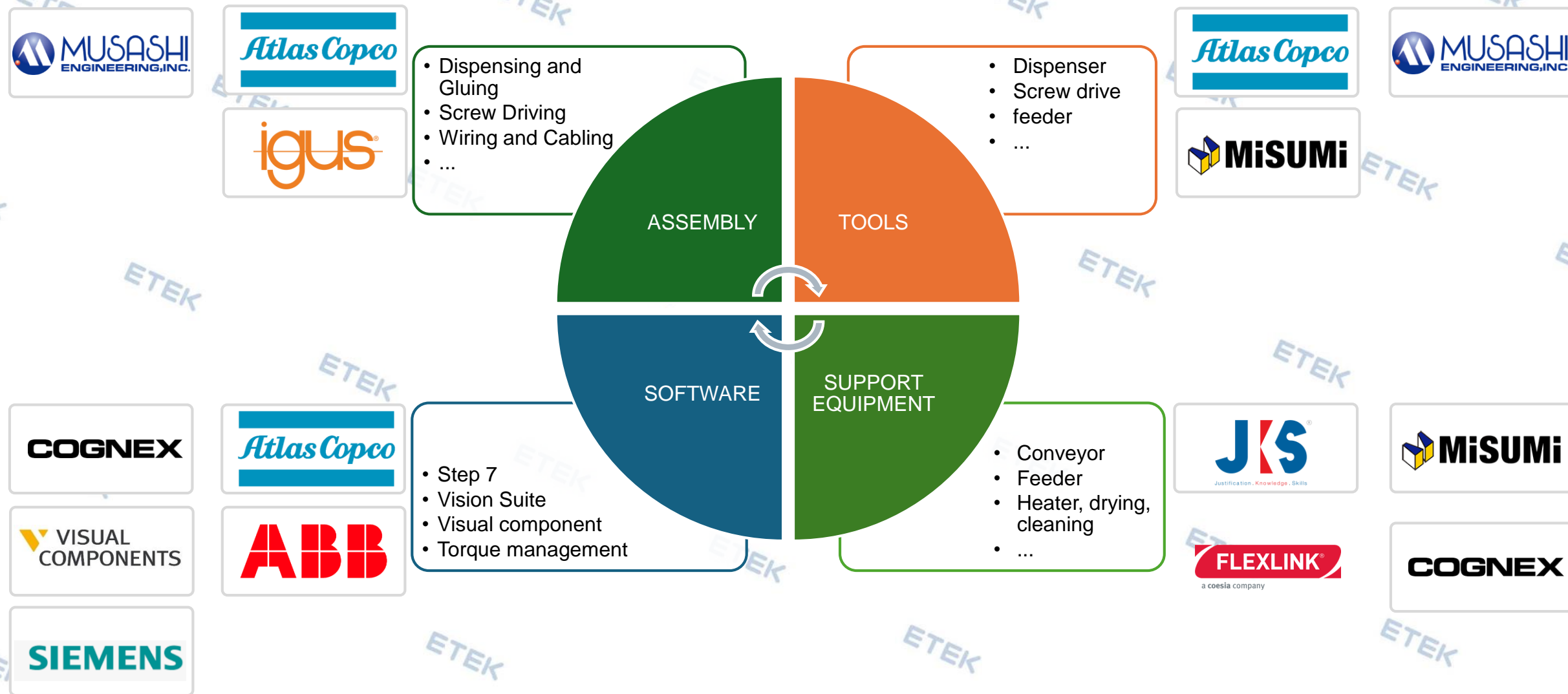
# Agenda

1. Assembly Overview
2. Assembly Method
3. Industrial Assembly
4. Assembly production line



Solution	Technology	Industrial target
 <ol style="list-style-type: none"> <li>1. Dispensing and Gluing</li> <li>2. Fastening &amp; Bolt &amp; nut</li> <li>3. Riveting</li> <li>4. Nailing and Stapling</li> <li>5. Screw Driving</li> <li>6. Click Fitting</li> <li>7. Clinching</li> <li>8. Press Fitting</li> <li>9. Wiring and Cabling</li> <li>10. Other: Soldering, Clamping, ...</li> </ol>	 <ol style="list-style-type: none"> <li>1. Robot</li> <li>2. Automatic dispensing</li> <li>3. Force control</li> <li>4. Anti-jet</li> <li>5. Image processing</li> <li>6. Feed nails and screws automatically</li> <li>7. Wave soldering</li> <li>8. Auto soldering</li> <li>9. Control product quality and assembly process</li> </ol>	<div>  <div>Home Appliances</div>  </div> <div>  <div>Automotive &amp; Components</div>  </div> <div>  <div>Energy</div>  </div> <div>  <div>3C Computer Communication, Consumer Electronics</div>  </div> <div>  <div>Medical</div>  </div>

# Assembly Eco-system



# Assembly Overview

## Industrial

## Customers

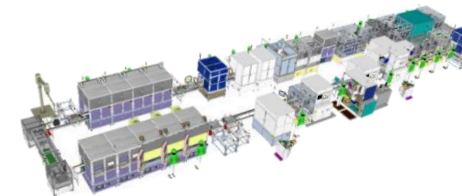
## Projects



### Automotive



**DENSO**



EV control box  
assembly line



### 3C

Computer  
Communication,  
Consumer  
Electronics

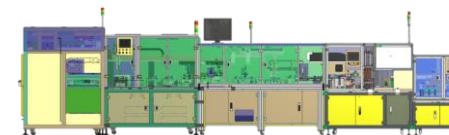
**SAMSUNG**

**Canon**

**FOSTER**

**molex**

**FOXCONN**



Power source  
assembly line



### Home applicant



**Kangaroo**

**Panasonic**

**BRAUN**

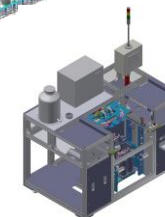


Water heater  
assembly line



### Medical

**TERUMO**



Needle  
assembly line

## 3C



- Computer
- Communication,
- Consumer Electronics

## Vehicle



- Car
- Motorbike
- Electric bicycle

## Home application



- Television
- Air conditioning
- Fridge
- Washing machine
- Microwave oven, ...

## Industrial equipment and components



- Relay
- Circuit breaker
- Buttons
- Controller, ...

## Industrial tools and instruments



- Power tools
- Industrial robot, Cobot
- Circuit board

## Lamps and lighting equipment



- LED
- Chandelier
- Street lights, ...

## Energy equipment



- Solar panel
- Wind turbine
- Batteries

## Industrial machinery



- CNC machine
- Die casting machine
- Cutting machine
- Welding machine, ...

## Medical equipment and instruments



- Medical equipment
- Testers, ...

## Measuring tools and equipment



- Electronic scale
- Microscope
- Telescope, ...

## Stationery



- Scanner
- Printer
- Ballpoint pens
- Pencil case, ...

## Toy



- Electricity toy
- Model, ...

## Military machinery and equipment



- Machine gun
- Radar
- Unmanned aerial vehicle
- Perforated nib

## Recreational sports



- Roller skates
- Skateboard
- Tread
- Mill Mic, ...

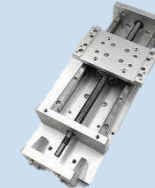
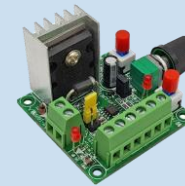
## Products



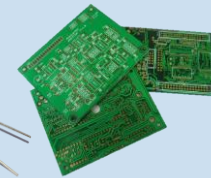
## Equipment



## Units



## Components





# Assembly Method

# Dispensing & Gluing Solution



## Overview

### Pain-point

Customers need high-precision gluing and gluing for equipment, and common gluing joints need to be tight and leak-proof. Bonding requires a level of aesthetics

### Solution

Glue injection system, precise moving robot,

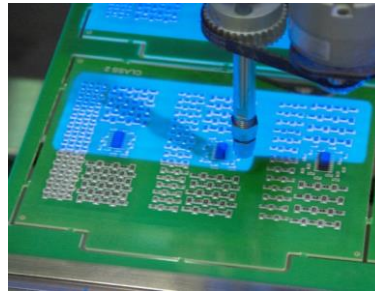
### Benefit

Fully automotive, High productivity. Uniform quality, save raw materials



## Industry

- Home application
- 3C- Computer- Communication, Consumer Electronics
- Automotive
- Medical



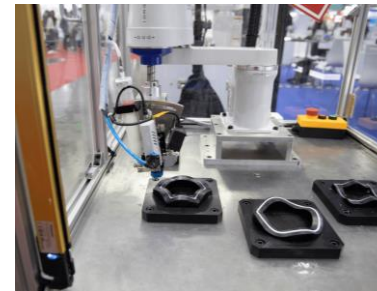
Dispenser



Porting



Taping



Gluing



## Machine

- Gluing heed
- Glue mixer
- Taping machine
- Drying and curing
- Cleaning
- Appearance check



## Customer



## Partner



# Pressing Solution



## Overview

### Pain-point

Customers need to assemble by pressing method, requiring precision in pressing force and pressing stroke  
Save the pressing parameters

### Solution

Hydraulic pressing, Electrical Joint, Pneumatic hydraulic hybrid press, Pneumatic press

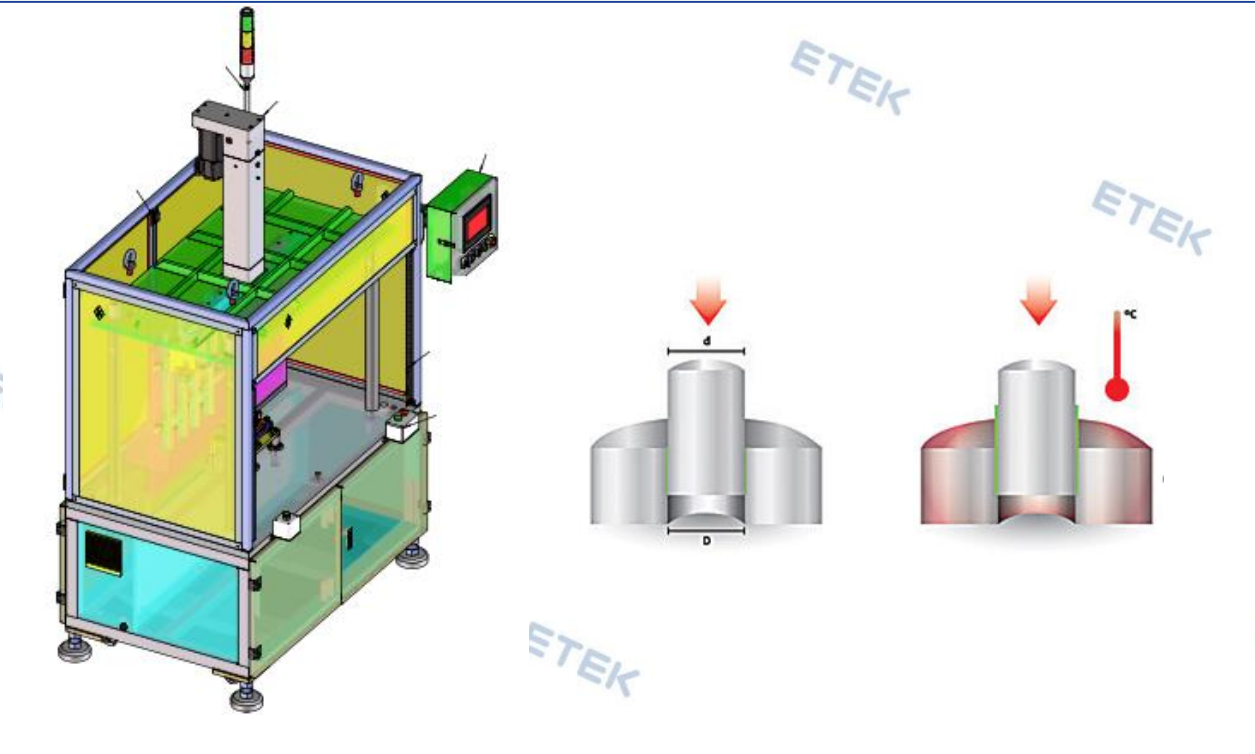
### Benefit

Fully automatic, High productivity.  
Uniform quality, Press force control  
Control the pressing stroke



## Industry

- Home application
- 3C- Computer- Communication, Consumer Electronics
- Automotive



## Thiết bị

Pressing joint

Control system

Jig fixture, tool

Measure system

Auxiliary system

Measure system



## Customer



## Partner



# Screw Driving Solution



## Overview

### Pain-point

Install regular screws, Assembly requires controlling the tightening force, Assembly requires controlling the number of tightening turns, need to automatically evaluate the quality of screw joints

### Solution

Automatic screw tightening controls force, tightening angle, and sequence

### Benefit

Fully automatic, High productivity.  
Uniform quality,



## Ngành nghề

- Home application
- 3C- Computer- Communication, Consumer Electronics
- Automotive
- Medical



## Thiết bị

Screw driver

Screw feeder

Moment control

Angle control

Sequences control



## Khách hàng



## Đối tác



# Riveting Solution



## Overview

### Pain-point

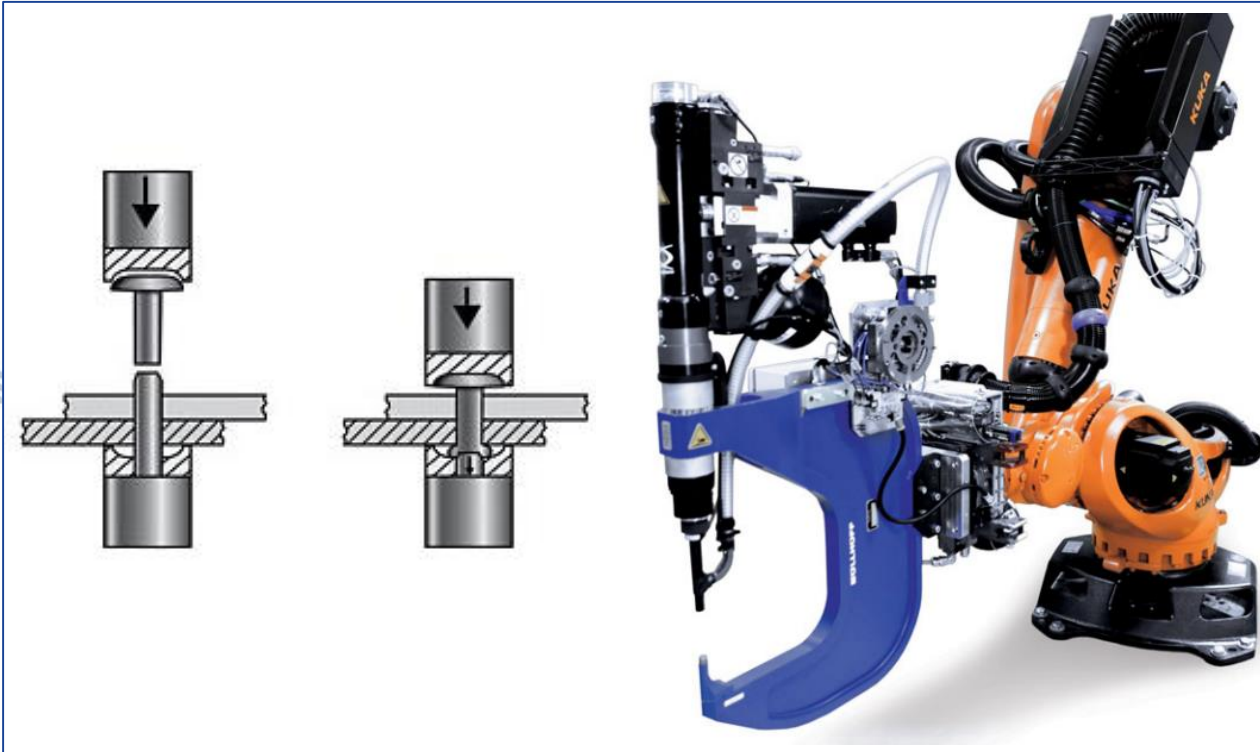
Customers are in need of an automatic riveting system for products with large sizes, a large number of riveting joints, and need high precision and quality of riveting joints.

### Solution

Using a 6-axis robot and a screwdriver mounted on the robot

### Benefit

Fully automatic, High productivity.  
Uniform quality,



## Machine

Riveting feeder

Riveting heat

Riveting Robot

Auxiliary system

Appearance check

Control system



## Industry

- Home application
- 3C- Computer- Communication, Consumer Electronics
- Automotive



## Customer



## Partner



# Soldering Solution



## Overview

### Pain-point

Need to connect electronic components and devices The connection ensures good signal transmission and electrical conductivity

### Solution

Using solder, create connections that can transmit electrical signals well. Often used in circuit boards and electrical equipment

### Benefit

Does not affect electronic components  
Good signal transmission and electrical conductivity

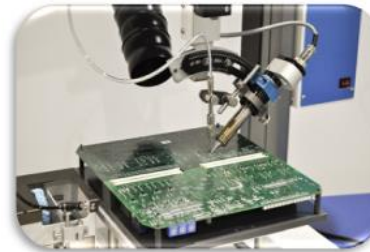


## Industry

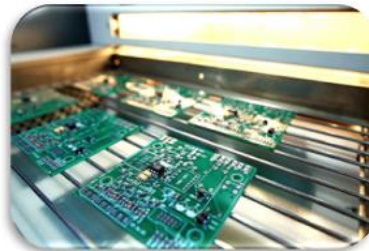
- Home application
- 3C- Computer- Communication, Consumer Electronics
- Automotive



Laser soldering



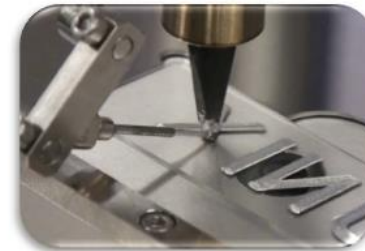
Spot soldering



Head over



Wave soldering



Ultrasonic soldering



## Machine

Heating

Tin provider

Smoke treatment

Cleaning

Quality check



## Customer



VINFAST



NISSAN



TANA DAITHANH



Canon



SAMSUNG



PIAGGIO



## Partner



MISUMI



JAPAN UNIX



JAPAN UNIX



ABB

# Assembly Project

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EV controller box  
assembly line



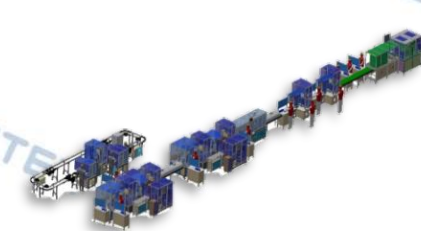
EV Battery Pilot pack



Electric car backup  
battery pack line



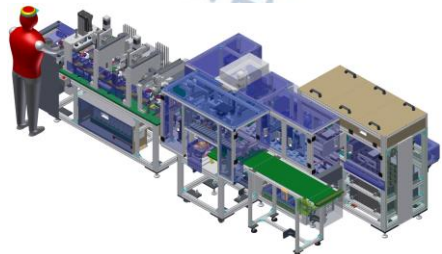
Water heater assembly  
line



Speaker assembly line



Source power printer  
assembly line



Radiator fan assembly  
line



Wheels assembly line



Ô tô và phương  
tiện vận tải



VINFAST

NISSEI  
technology

Canon



TOYODA GOSEI



3C  
Máy tính  
Viễn thông  
Điện tử tiêu dùng



Điện tử dân  
dụng

VinES

Canon

TANA  
ĐẠI THẠNH  
Phấn vinh cuộc sống Việt

Pioneer

HOYA

# EV Controller Box Assembly Line

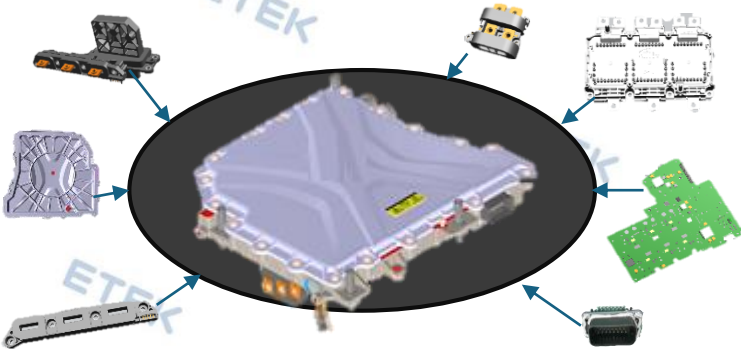


## Overview

- Applications: Loading, Applying Glue, Tightening Screws, Mounting,...
- Output: 40 Products/Hour
- Size: 8x32 (m<sup>2</sup>)
- Details: Circuit board, battery cell,...
- Automation rate: 65%

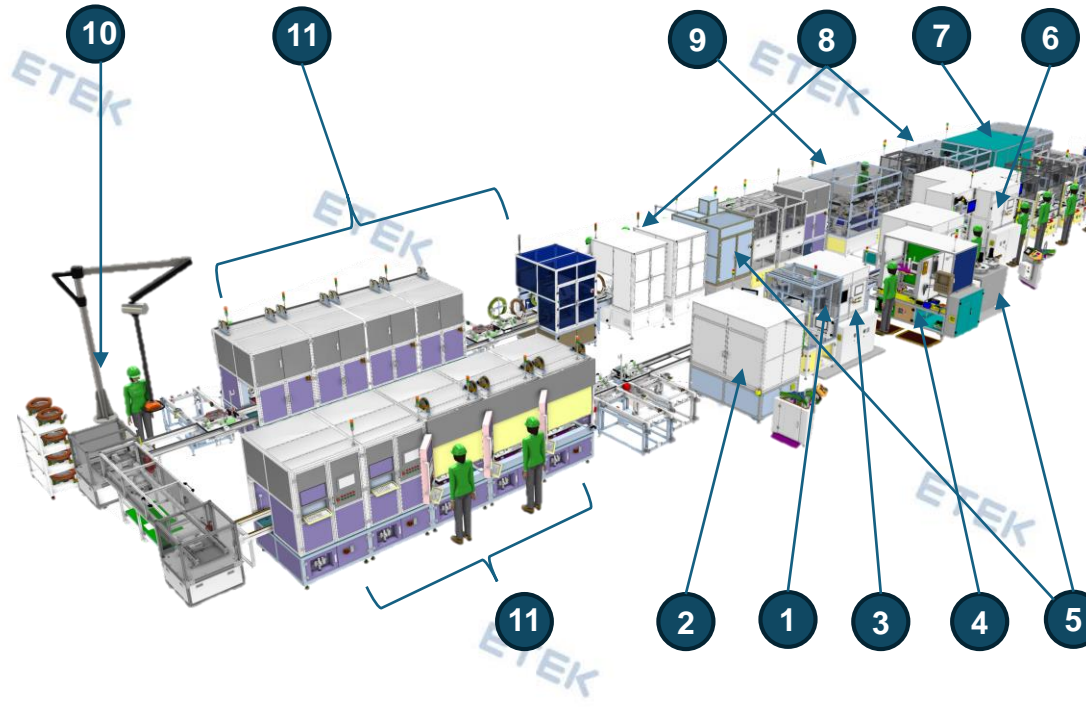


## Products



## Industrial

- Automotive
- Electrical



## Process

1. Loading
2. Gluing 1st
3. Laser marking
4. Pressing, screwing
5. Gluing 2nd
6. Assembly and porting
7. Mounting
8. Screwing
9. Soldering
10. Loading/unloading
11. Aging



# EV Battery Pilot Pack line



## Overview

- Applications: Sorting, Inserting, Welding, Screwing, Testing
- Output: 3 - 5 Products/Shift
- Dimensions: 42 x 15 (m<sup>2</sup>)
- Details: Cell Battery, Cold Pipe, Factory connect

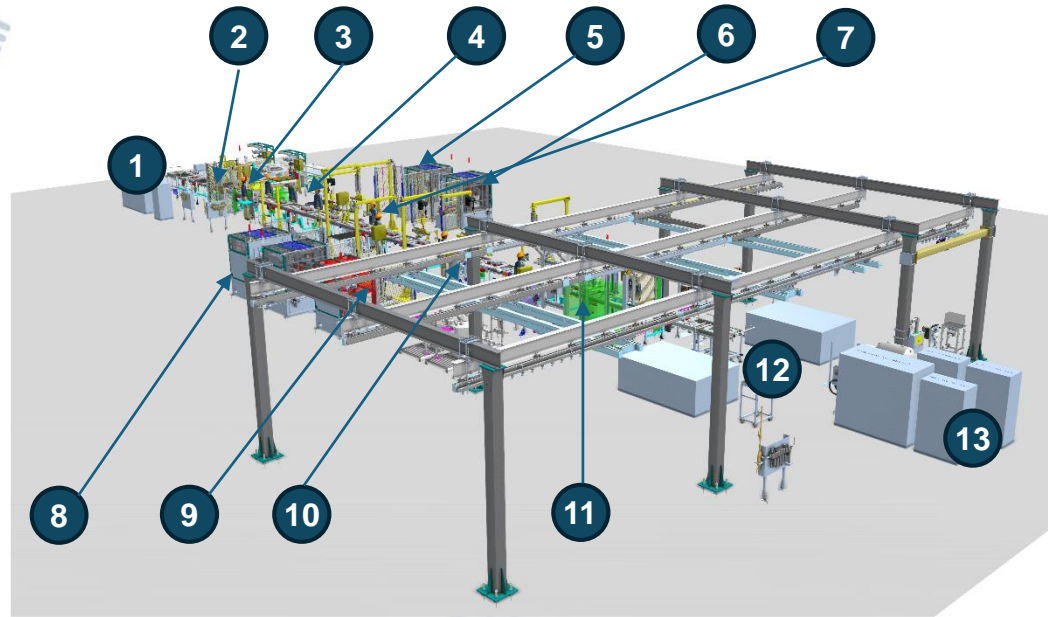


## Product



## Industry

- Automotive, E-vehicle
- Electrical
- Power



## Process

1. Cell sorting
2. Label tape
3. Cell insert
4. Cooling pipe press
5. Leak test
6. Vision pope check
7. Cleaning
8. Bus bar insert
9. Sport welding
10. Gluing
11. Screwing, BMS assembly
12. Function test module
13. Pack modules
14. Final Function test, leak test



# Scooter Battery Pack line

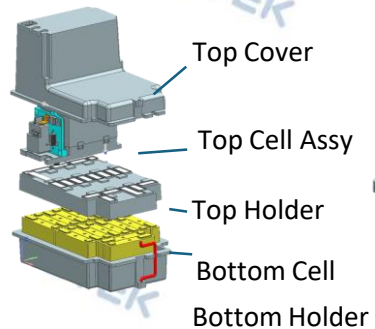


## Overview

- Application: Sorting cell, insert, laser welding, soldering, screwing, pressing, leak test, Battery function test.
- Output: 37 Products/hour
- Layout size: 15 x 50 (m<sup>2</sup>)
- Cycle time: 96.1 (s)



## Products



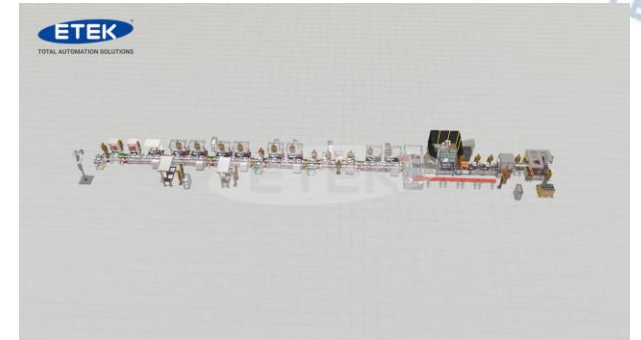
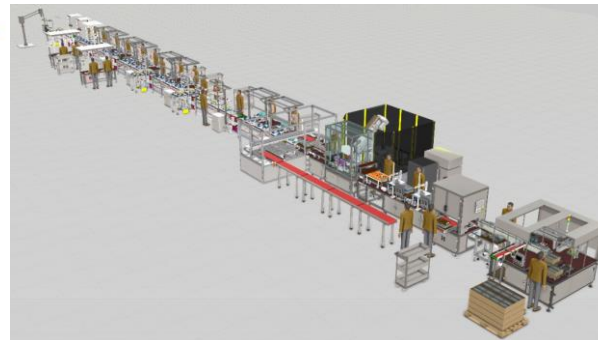
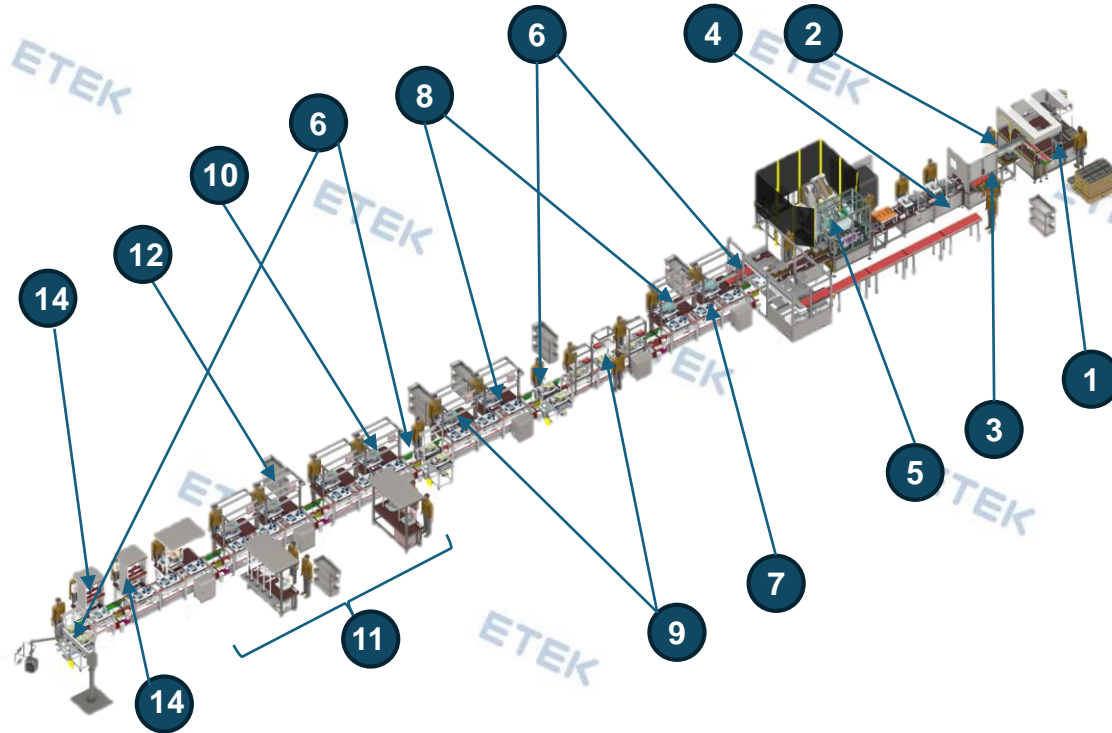
## Industry

- E-Vehicle
- Electrical



## Process

1. Cell sorting
2. Cell insert
3. Vision pope check
4. holder assembly
5. Laser welding
6. Appearance check
7. Sensor wiring layout
8. Gluing
9. Soldering
10. Screwing
11. Cover assembly
12. Safety check
13. Leak test and subsides assembly
14. Final function check



# Electric Car Backup Battery Pack Line

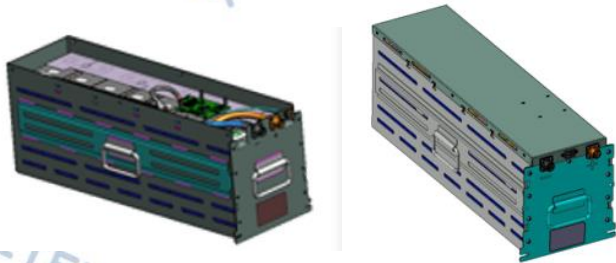


## Overview

- Application: Sorting cell, insert, laser welding, soldering, screwing, pressing, leak test, Battery function test.
- Output: 30 Products/hour
- Layout size: 25 x 60 (m<sup>2</sup>)
- Cycle time: 90 (s)

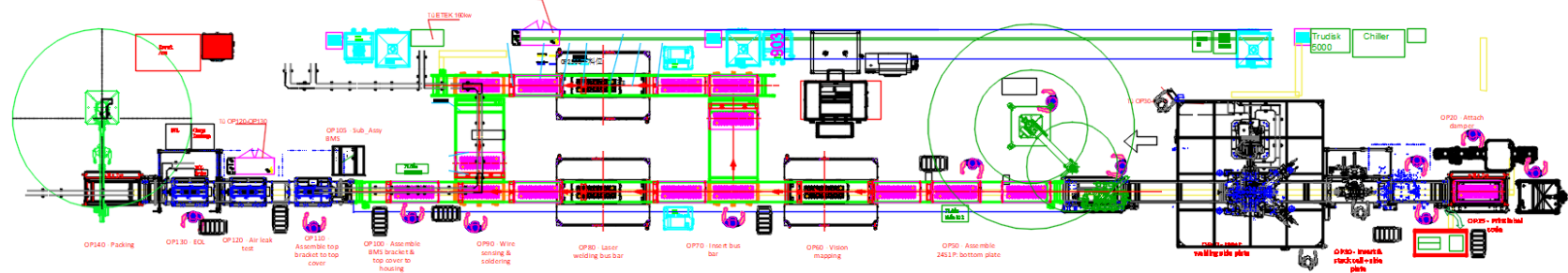


## Products



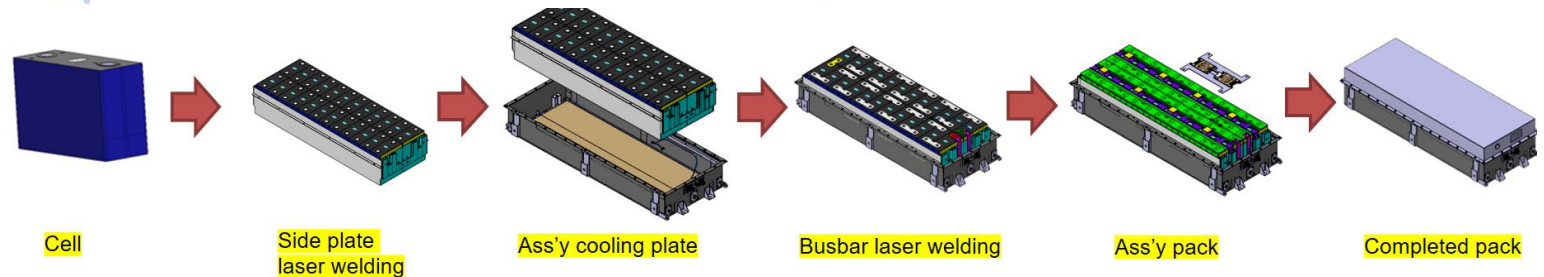
## Industry

- E-Vehicle
- Electrical



## Process

1. Cell sorting
2. Cell insert
3. Vision pope check
4. holder assembly
5. Laser welding
6. Appearance check
7. Sensor wiring layout
8. Gluing
9. Soldering
10. Screwing
11. Cover assembly
12. Safety check
13. Leak test and subsides assembly
14. Final function check



# Water Heater Assembly line

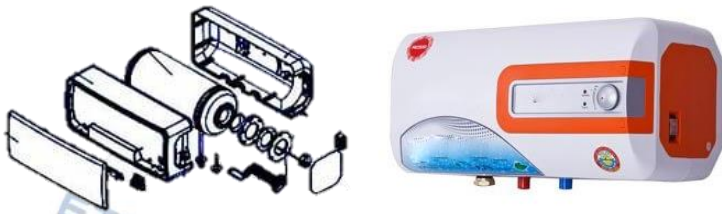


## Overview

- Applications: Tightening screws, Labeling, Applying glue,...
- Output: 288 Products/Hour
- Size: 26 x 60 (m<sup>2</sup>)
- Details: Plastic shell, Anode bar, Conductor,...
- Total number of stages: 28 stages

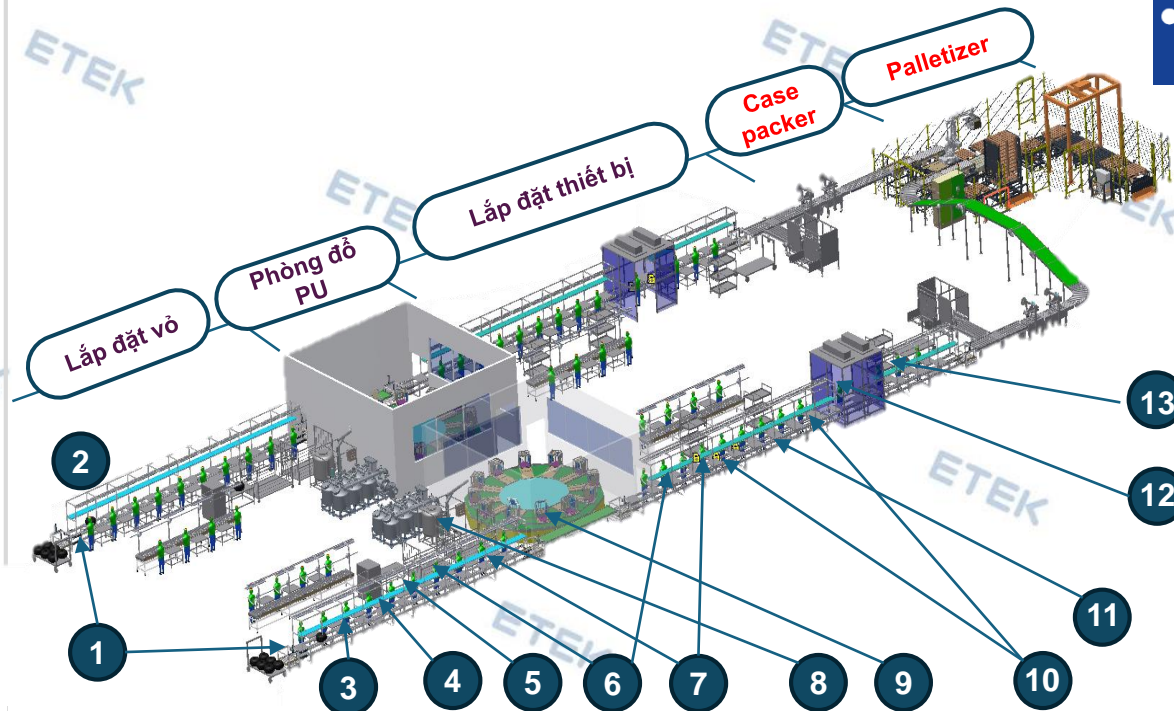


## Products



## Industry

- Home application



## Process

1. Check the inner tank
2. Install the heat bar and anode bar
3. Labeling
4. Leak test
5. Tighten the outer cover screws
6. Screwing
7. Remove burrs
8. PU foaming
9. Curving foam
10. Screwing
11. Screwing
12. Final test
13. Clean



# Speaker assembly line



## Overview

- Applications: Welding, Gluing, Pasting,...
- Output: 37 Products/Hour
- Details: Yoke, Magnet, Spider, Diaphragm, Voice Coil
- Automation rate: 85%

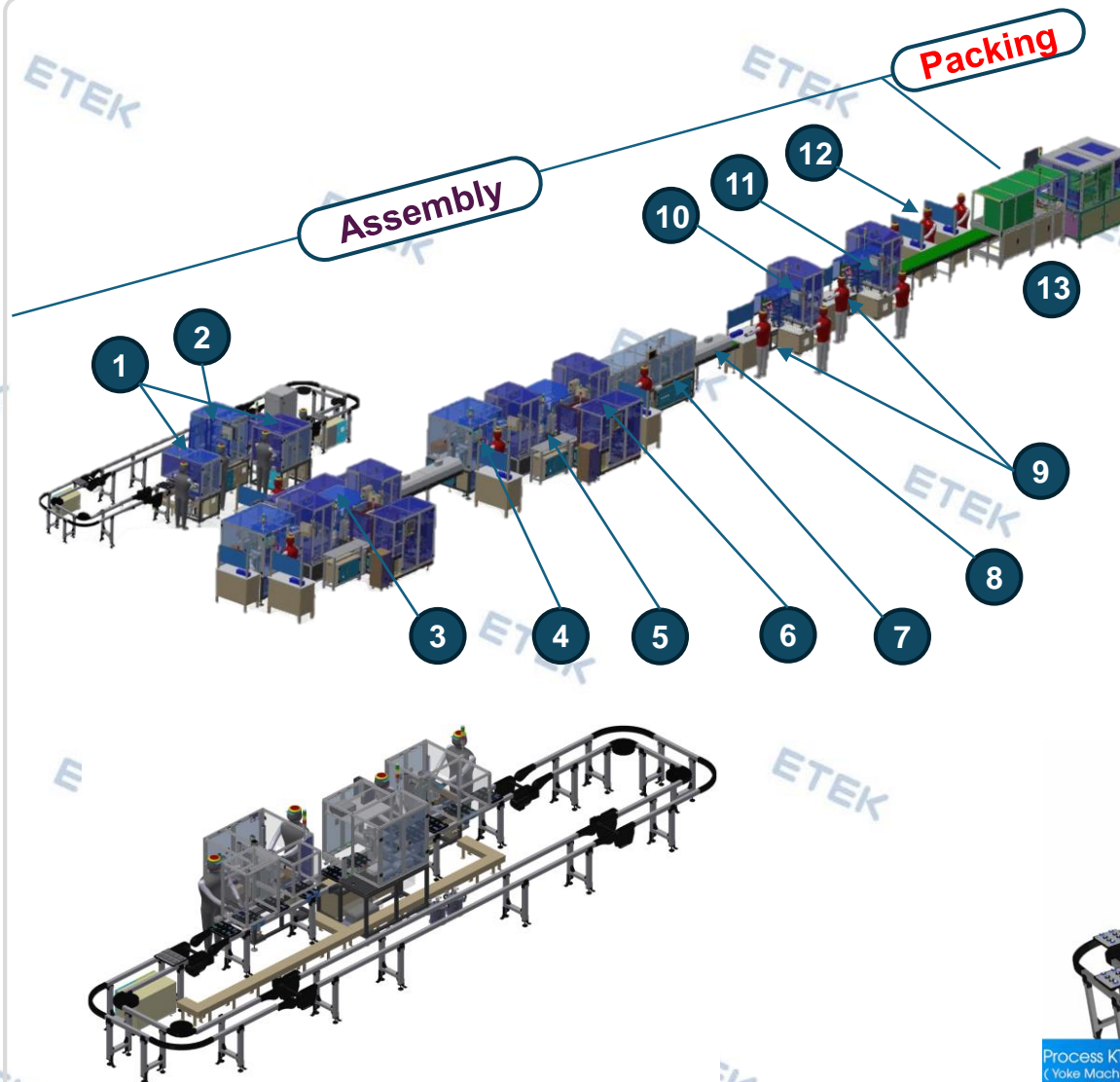


## Product



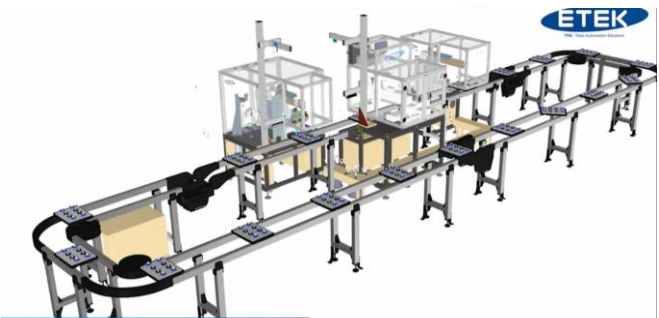
## Industry

- 3C (Computers, Telecommunications, Consumer Electronics)
- Electronic, Automotive



## Process

1. Insert Yoke, Magnet
2. Apply Yoke and Magnet glue
3. Install Terminals
4. Coil
5. Stick Spider
6. Spray glue
7. Stick to Diaphragm
8. Heat drying
9. Soldering
10. Adhesive Center Cap
11. Stick Dust Cap
12. Paste foam
13. Check



Process KTK  
(Yoke Machine, Dosing Machine, Magnet Machine)

# Printer Power Source Assembly Line

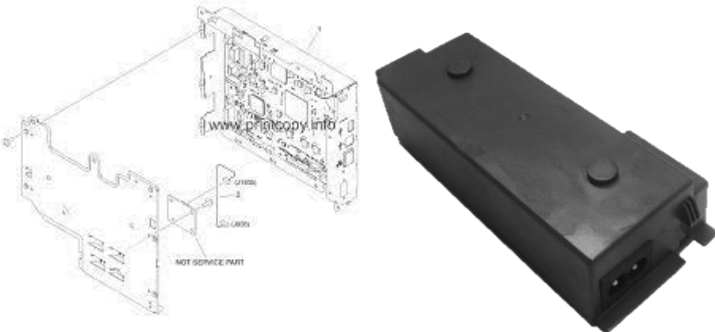


## Overview

- Applications: Circuit board cutting, Circuit board mounting, Tightening, Screw tightening, Aging testing
- Output: 1200 Products/Hour
- Dimensions: 9 x 2 x 1.8 (m<sup>2</sup>)
- Details: PCB circuit board, Plastic case, Screws
- Period: 3 (s)
- Automation level 85 %



## Product



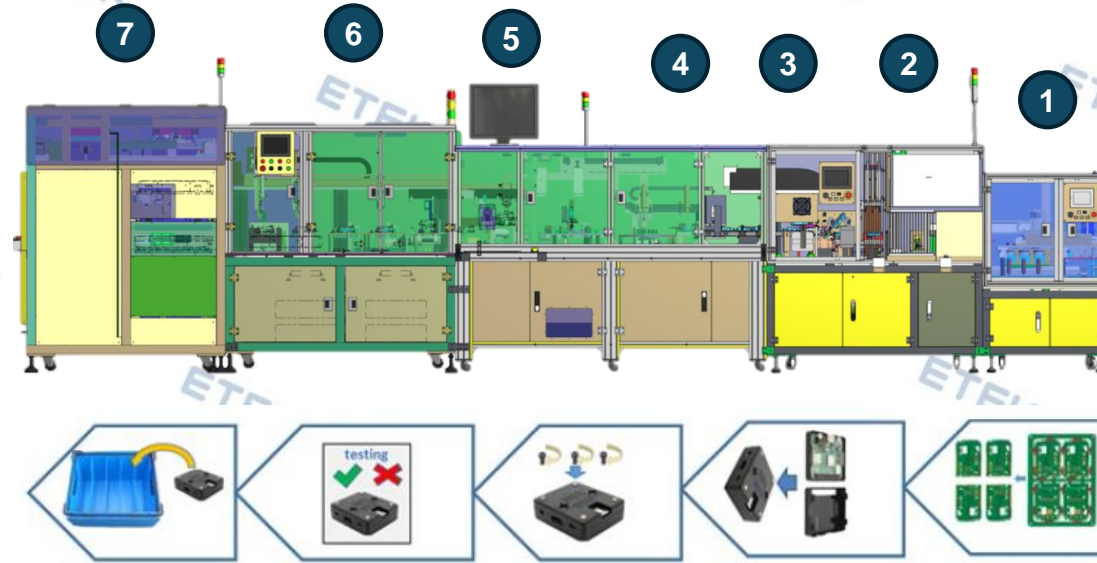
## Project

- 3C (Computers, Telecommunications, Consumer Electronics)
- Electronic



## Process

1. Cut Router
2. Attach the circuit board
3. Install tightly
4. Laser engraving
5. Tighten the screw
6. Aging test
7. Pack



# Radiator Fan Assembly Line



## Overview

- Output: 600 Products/Hour
- Dimensions: 3936 x 1649 x 1444 (mm)
- Details: Housing, Swing, Washer, C-Ring
- Period: 6 (s)
- Voltage: 380 (V)



## Product



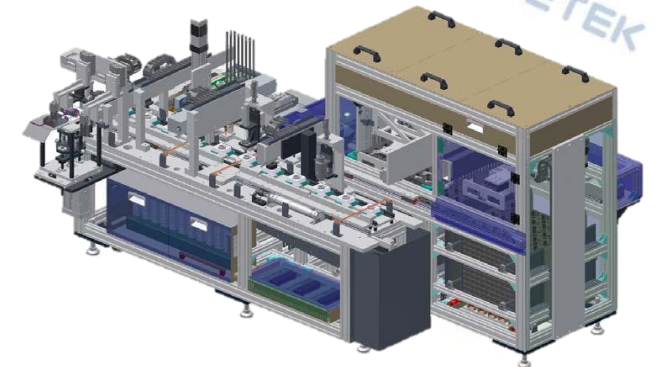
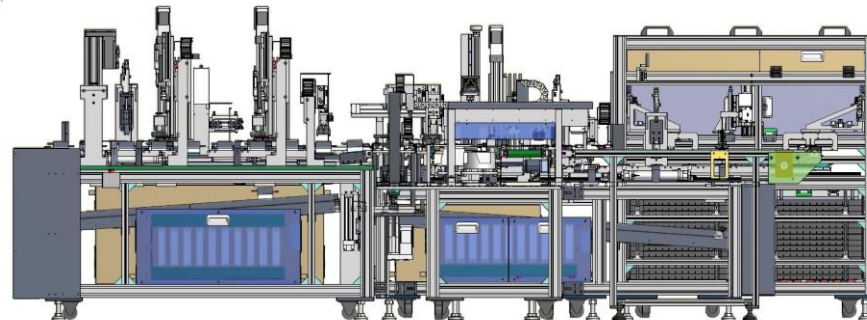
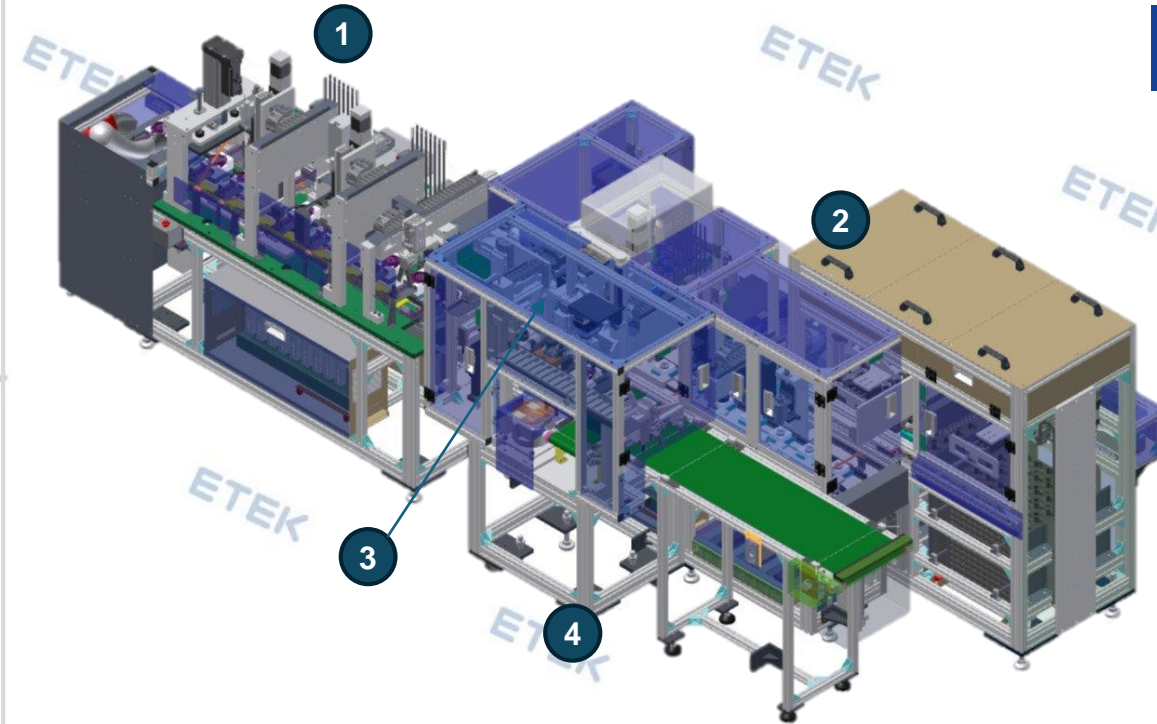
## Industry

- 3C (Computers, Telecommunications, Consumer Electronics)
- Electronic



## Process

1. Check circuit and bearings
2. Install the warping pad and bearings into the component
3. Fix the casing and impeller
4. Appearance Check



# Wheel Assembly Line



## Overview

- Applications: Barcode stickers, tire and rim mounting, etc.
- Output: 200 Products/Hour
- Dimensions: 69.5 x 28.4 (m<sup>2</sup>)
- Details: Rims, tires
- Period: <18 (s)
- Voltage: 380V – AC, 50Hz
- Capacity: 513.48 KW

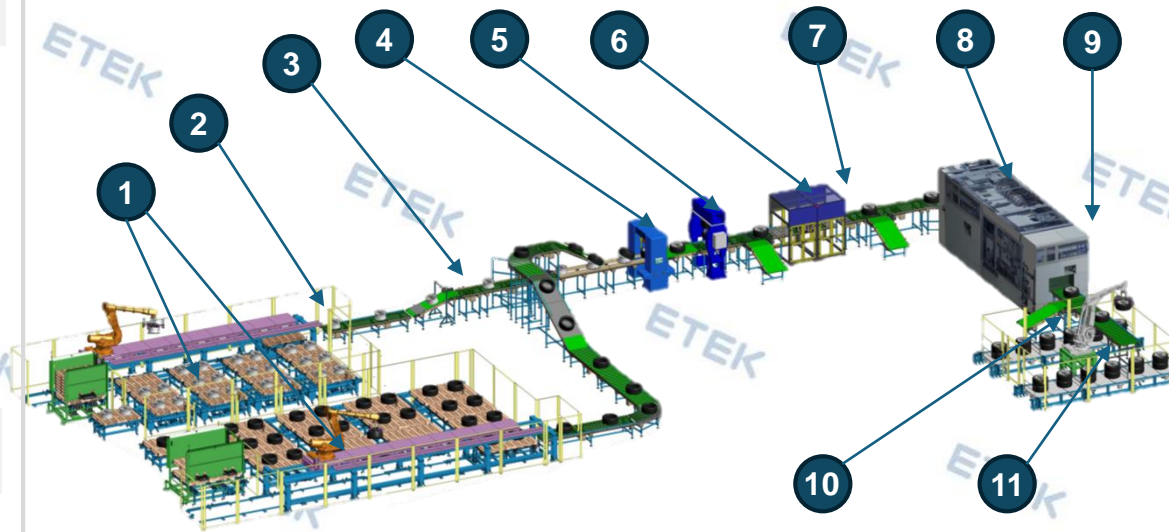


## Product



## Industry

- Automotive & vehicle



## Process

1. Loading
2. Paste the Barcode
3. Read Barcodes
4. Attach rims and tires
5. Adjust rim and tire position
6. Inflatable
7. Check assembly
8. Adjust tire structure evenly
9. Check balance
10. NOK Unloading
11. Unloading



# PCB Components Insertion Machine



## Overview

### Problems

- Narrow installation area
- Low accuracy, lack of safety

### Solutions:

- Robot Scara with clamping tool picks product and place it on the mold. Gantry system takes product from the mold and place it on PCB
- PCB installed fully will be transfer to next station. Vision system will check the entire process

### Advantages

- High accuracy, safety, easy to oversee with camera system
- Saving more 60% installation area than workers



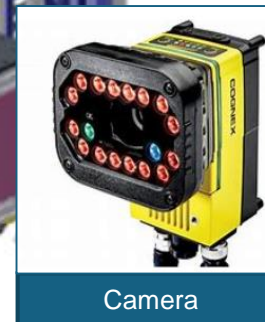
Software



Scara Robot



Gripper



Camera



## Specifications

- Dimension: 1500 x 1800 x 1650 mm
- Capacity: over 1000 JpH
- Product size: 300 x 100 x 4 mm
- Accuracy:  $\pm 0,1$  mm



## Equipment

1. Robot SCARA (QKM, Epson, ABB ...)
2. Gripper (SMC, Zimmer)
3. Camera (Cognex, omron)
4. Conveyor



## Product



## Industries

- Electric-Electronic



## Specifications



### Robot SCARA

- Payload: 10 kg
- Work zone: 0.8 – 1m
- Speed: 2300mm/s



## Customers

**Canon**

# Laser Engraving Machine



## Overview

### Problems

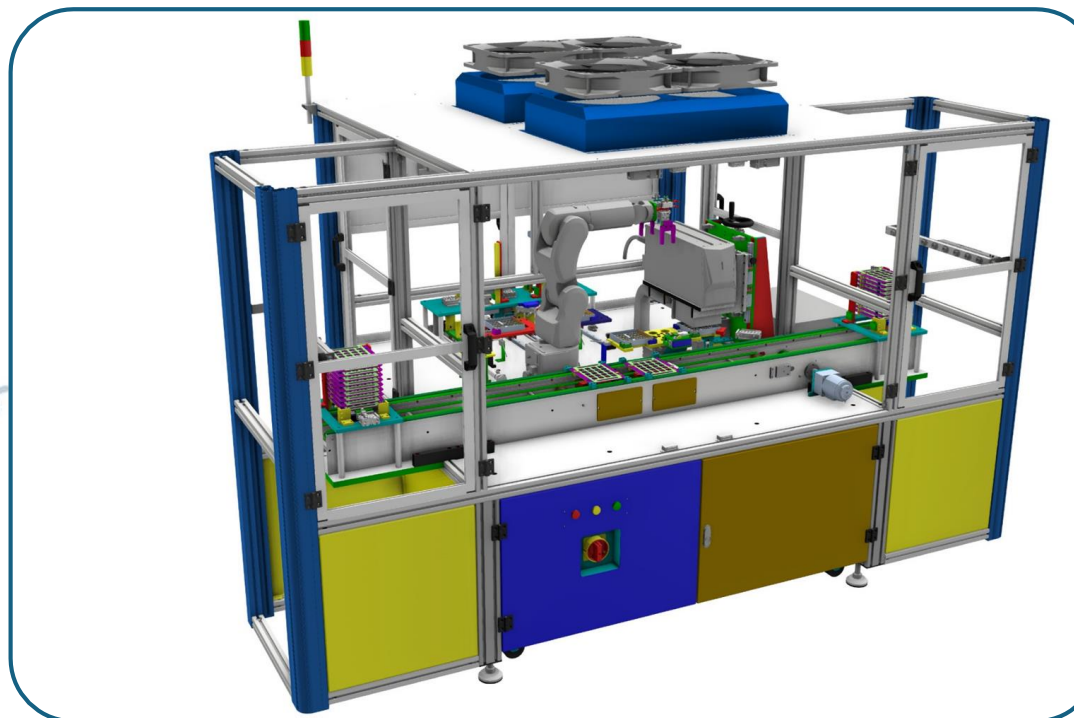
- Need classifying product by QR code
- Low productivity, output
- Storing product QR information on the system

### Solutions

- Transfer product tray to pick position
- Robot pick tray into engrave position
- Product position check system – Engraving QR
- Checking mistake - Read QR
- Robot picks up trays – puts products on the conveyor belt

### Advantages

- Storing information, classifying product
- Improving productivity, quality of QR code
- Autochecking, reducing mistake in production process



## Station Specifications

1. Dimension::2814 x 1580 x 2004 mm
2. Period: 765 product/hour
3. QR storage time:: 3 years



## Machines

1. Laser engraving cluster
2. Robot picking
3. Vision check
4. Controller, HMI screen
5. Hoover, fan



## Product



## Industries

- Automotives and components
- Mobile devices
- Computer, Camera
- Home appliances



## Specifications



### Laser engraving cluster

- Zone-engraving: 125 x 125 x 42 mm
- Measure distance : 189 mm
- Resolution: 2  $\mu$ m



## Customers



# Auto Smartphone Sensor Film Taping Machine



## Overview

### Problems

- Manual paste – poor productivity
- A lot of product are not enough quality

### Solutions

- The equipment is fed through the conveyor belt into the machine
- The camera check product then the 4-axis robot transfers product into the installation position
- Robot supply and take off piece paste film, paste film
- Robot transfers device pasted on the conveyor belt

### Advantages

- Improving productivity – output
- Automatic system, reducing labour
- High accuracy, reducing defective product



## Station Specification

1. Dimension : 2710x1551x2345 mm
2. Capacity: 3 kw
3. Compressed air pressure: 0.4 – 0.6 MPa
4. Output: 900 product/hour



## Machines

1. Film gluing structure
2. Product supply Robot
3. 1-axis product pick-up structure
4. Jig equipments
5. Roller conveyor



## Product

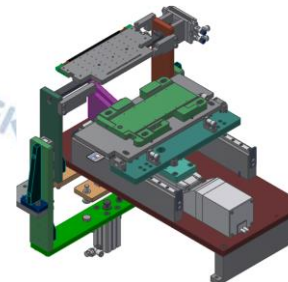


## Industries

- 3C ( Computer – Communication – Consumer-Electronics )



## Specifications



### 4 Axis Robot

- Payload: 6 kg
- Work-zone: 550 mm
- Speed: 8300mm/s
- Vacuum head



## Customers



# Auto Phone Screen Taping Machine - 01



## Overview

### Problems

- Manual taping not efficient
- Several low quality products

### Solutions

- Product get positioned on jigs
- 180° rotating table moving product from waiting location to taping location
- Taping system on product's surface
- Dispense taped product to waiting location

### Benefits

- High stability and efficiency
- Consistent product quality
- Easy to launch, monitor and control



## Station Specification

1. Dimension: 1238x710x1858 mm
2. Voltage: 1-phase 220V, 50Hz
3. Air pressure: 0.4 - 0.6 MPa
4. Output: 900 products/hour

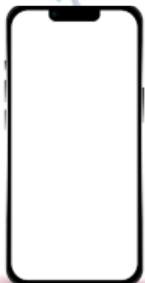


## Machines

1. Rotating table, taping station
2. Product-gripping robots
3. Product inspection system
4. Electric, cylinder, air panel system
5. Jig



## Product

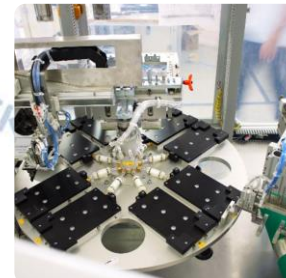


## Industries

- 3C ( Computer – Communication – Consumer-Electronics )



## Specifications



### 6-axis Robot

- Load: 4 kg
- Step Motor
- Reach: 580 mm
- Pneumatic clapping tool head



## Customers



**SAMSUNG DISPLAY**

# Auto Gluing Machine



## Overview

### Problems

- Not enough efficiency
- Lack of workers
- Demands of lowering product price

### Solutions

- Pallette containing product moves to gluing location
- Machine glues product
- Pallette moves product to next phase
- Placing magnets on product

### Benefits

- Reduction of worker
- Increase product efficiency and quality
- Consistent products without much errors



## Product



## Industries

- 3C ( Computer – Communication – Consumer-Electronics )



## Specifications



### Automatic gluing gun

- Pressure < 580 spi
- Accuracy: 0.2mm
- Mixing rate: 1:1 – 10:1



## Station Specification

1. Dimension: 1260x1200x1902 mm
2. Voltage: 1-phase 220V 50Hz
3. Power: 2 KW
4. Pressure: Mpa: 0.4 - 0.6 MPa



## Machines

1. Gluing machine
2. Glue container
3. Jig
4. Camera
5. Controller system, HMI



## Customers



# Auto Tungsten Soldering Machine



## Overview

### Problems

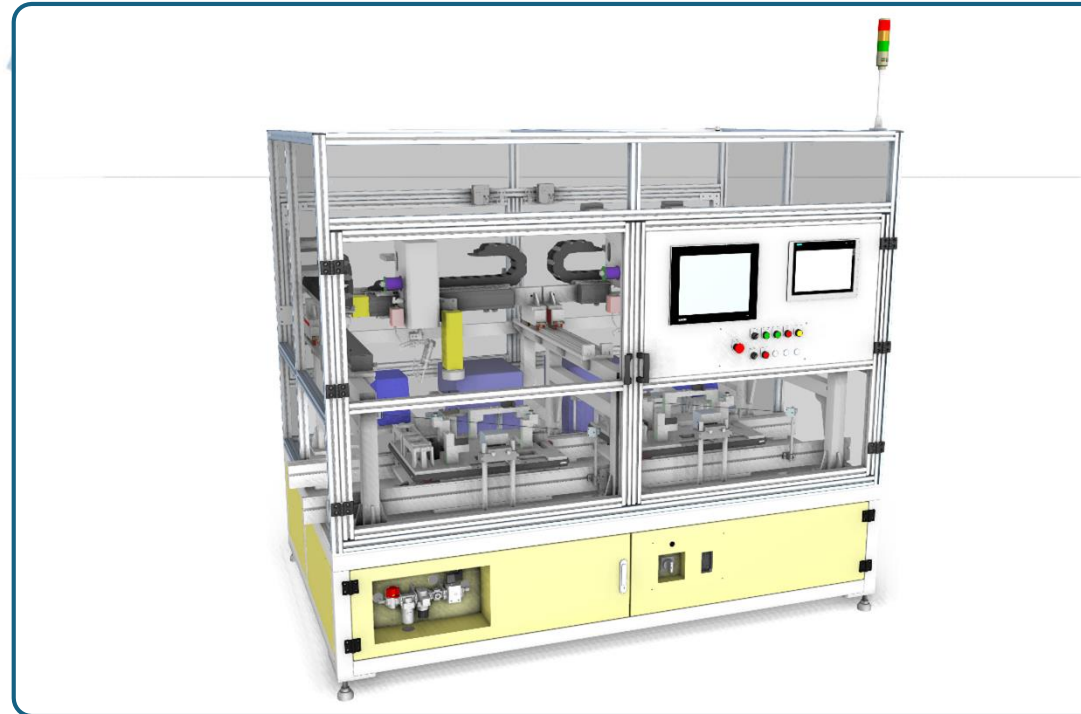
- Joint quality not guaranteed
- Soldering speed not efficient enough
- Dependence on worker's skills

### Process:

- Conveyor moves product to soldering location
- Scara robots 1 initiates a soldering process
- Pallette descends, moving products to next station
- Camera captures axes, initiates soldering process
- Camera inspects soldering joint quality

### Lợi ích:

- Increase product quality
- Increase output
- Reduce worker fee



## Station Specification

1. Dimension: 1360 x 1000 x 2560 mm
2. Period: 81 (s)

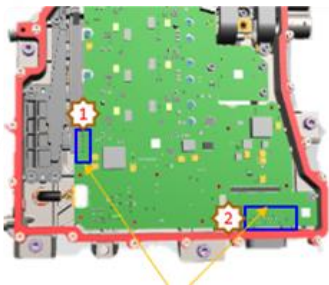


## Machines

- Soldering head
- Sensors
- Conveyor systems
- Soldering robot (Scara)
- Vision
- Jig



## Product



## Industries

- 3C ( Computer – Communication – Consumer-Electronics )



## Specifications

- 4-axis robots
- Load: 6 kg
- Step Motor
- Voltage 180-250 V



## Customers



# PCBA Circuit Board Inspection Machine



## Overview

### Problems:

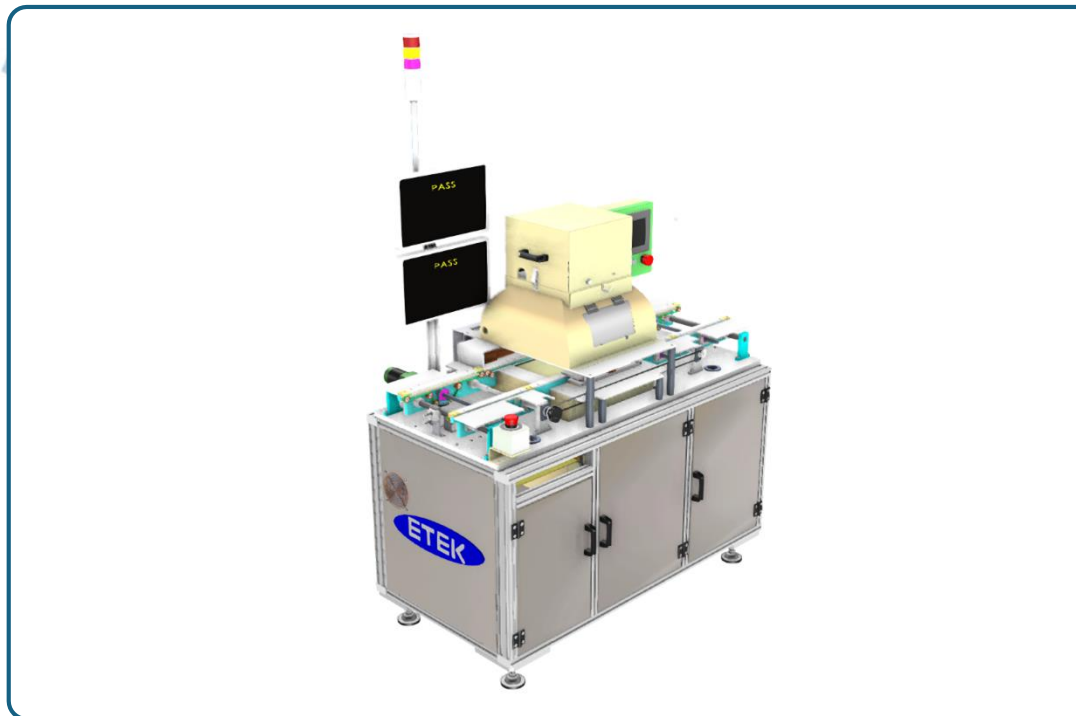
- Products not meeting quality demands
- Inconsistent product quality
- Incapable of doing eye inspection

### Solutions:

PCBA moves to inspection area on conveyors. Vision captures and inspects product, displaying information on screen

### Benefits:

- Accurately inspect products that met required quality
- Quickly retrieves error products
- Increase output and product quality



## Station Specification

Dimension: 1300 x 750 x 1981 (mm)

Product dimension: 20 - 50 (mm)

Accuracy: 0.15 (mm)

Period: 5 - 14 (s)



## Machines

1. Vision + illuminations(light)
2. Conveyors
3. Display screen
4. Machine frame



## Product

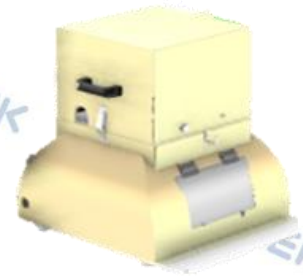


## Industries

- 3C ( Computer – Communication – Consumer-Electronics )



## Specifications



### Vision

- Resolution:5MP
- Voltage: 24 VDC
- 34 fps



## Customers

**Canon**

# Auto Gate Cutting Machine



## Auto Gate Cutting Machine

- Machine Layout(LxWxH): 2014x1004x1819mm
- 3Phase, 380 - 400VAC, 50Hz for main source



## Specifications

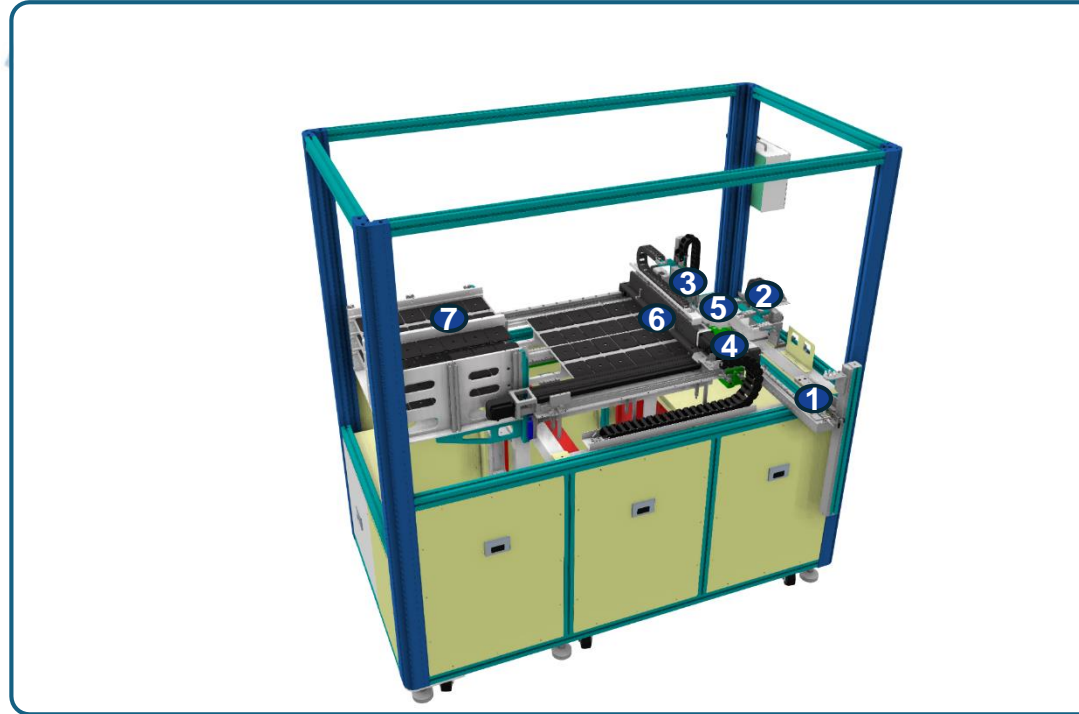
- Product from panel pressing machine gripped by robots move to group (1) in Lens cutting machine
- Group (1) sets empty space for group (2).
- Group (2) receives billet and divides to cutting areas K(4). Cut gate from empty space using Lens cutting mechanism (4)
- Gate gets sucked and billet gets divided into strays. After billet cutting, product gets ejected to billet exit area and exits the machine. After the stray gets full, it gets transported outside.



## Products & Customers



**Nissei**  
technology



## Machines and devices

1. Billet importing group
2. Blank transporting group
3. Blank rotating group
4. Gate cutting group
5. Blank ejection area
6. Gate transporting group
7. Stray feeding group

WATCH VIDEO



# Optics, Semi-conductors Cleaning System



## Overview

- ❖ **Product code:** CT05-AQ-ST00015-XL
- ❖ **Description:**
  - Function: Cleaning, removing dirt
  - Technology: Ultrasonic cleaning+drying in vacuum station
  - Feature: Complete sealed multi-tanks cleaning system with 7 wet stations and 2 dry stations.
  - Near-high pressure makes final cleaning process better and vacuum drying parts, products faster



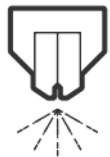
## Công nghệ & Tiêu chuẩn



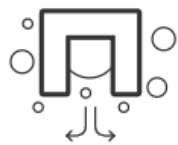
Nước



Làm sạch siêu âm



Xịt nước



Hút chân không tiên tiến

**VDA**

19.1



16232



D2578



T698



## Specifications

- ❖ **Dimension:** 480mmW x 610mmD x 480mm LL
- ❖ **Station 1 & 2: Cleaning substance dipping+ultrasonic vacuum**
  - Volume: 100 L
  - Frequency: 40/132 kHz
  - Ultrasound power: 1,600W (800Wx2)
  - Temperature: 30-60°C
- ❖ **Station 3: Final water deep cleaning**
  - Volume: 93 L
  - Temperature: 30-60°C

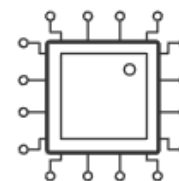
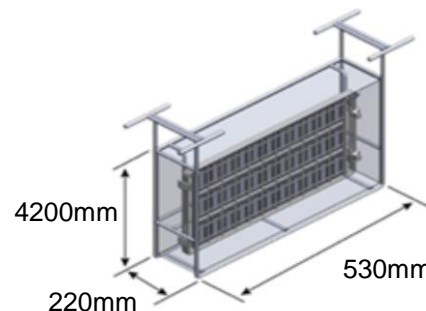


## Ứng dụng ngành công nghiệp



## Khách hàng

Giỏ đựng



Phụ trợ bán dẫn



Quang học



# Components Assembling Robot Guides



## Overview

### Problems:

- High accuracy requirement
- Time-consuming manual process

### Solutions:

- Camera captures and sends coordinate data of assembly area
- Robot placing components accurate to the received data

### Benefits:

- Reduce adjusting time
- Increase efficiency



## Station Specification

- Output: 2 products/s
- Illumination requirement: 300-1000 lux
- Communication: TCP/IP, Modbus TCP



## Machines

1. Camera 2D
2. Robot
3. Cables
4. Ethernet wires



## Product



## Industries

- 3C ( Computer – Communication – Consumer- Electronics )



## Specifications



### In-sight 7802:

- Acquisition speed: 53 fps
- Resolution: 2MP
- Lens: C-mount A
- Nguồn: 24V

# Connector Pin Inspector



## Overview

### Problems:

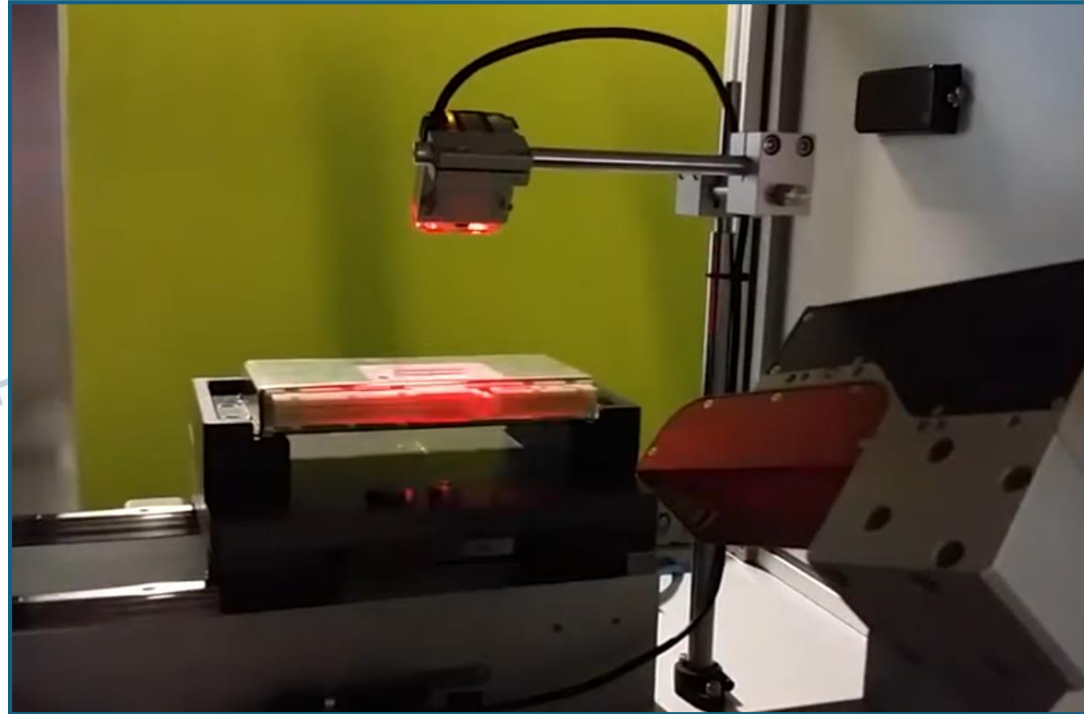
- Connector not having enough pins
- Pins length not consistent

### Solutions:

- Product moves on slider
- Camera scans to measure connector pin length to determine failed products

### Benefits:

- Reduce worker fee
- Increase product quality



## Station Specification

- Output: 3 products/min
- Illumination requirement: 300-1000 lux
- Connector pin size: 1-2 mm



## Machines

1. Sensor
2. Camera 3D
3. Slider
4. Cables, ethernet



## Product



## Industries

- Semi-conductors
- Electronics



## Specifications



### In-sight 3D L-4000:

- Resolution: 2K
- Illumination:
- Laser layers: 2M
- Output power: 45mW

*Thank  
you*

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