SMART FACTORY Solution

Automotive + Packaging Automation Technology

YUDO-SUNS

SMART FACTORY Solution

Automotive Automation Technology

1. OVERVIEW

“Consilience Technology for AutomotIve AutomatIon”

YUDO offers the **"Consilience Technology"** for the injection molding industry to fill up the needs in major components of automotive.

This presentation shows a summary of **YUDO FA Solutions** which matched with a market requirement about each automotive part.

1. OVERVIEW

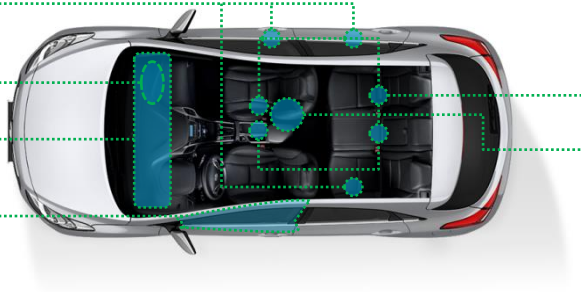
Exterior

- **Head Lamp** Gate Cutting System
- **Reflector** Bezel Production Cell
- **Carrier** Production Cell
- **Front Bumper** Production Cell

- **Quarter Glass** Insert System
- **Rear Bumper** Production Cell

Interior

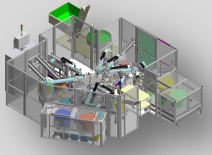
- **Grab Handle** Production Cell
- **In-Panel Airbag** Trimming System
- **Instrument Panel** Production Cell
- **Door Trim** Production Cell



- **Seat Belt** Insert System
- **Console Box** Production Cell

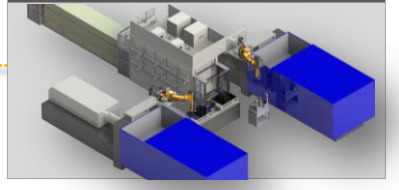
1. OVERVIEW

Grab handle system



Trimming system

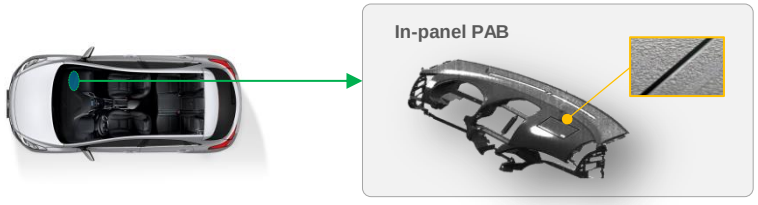
Head lamp gate-cutting
& Annealing system



Bumper Automation system

Carrier nut insert
& assembly system

1-1. SCORING SYSTEM for IN-PANEL PAB



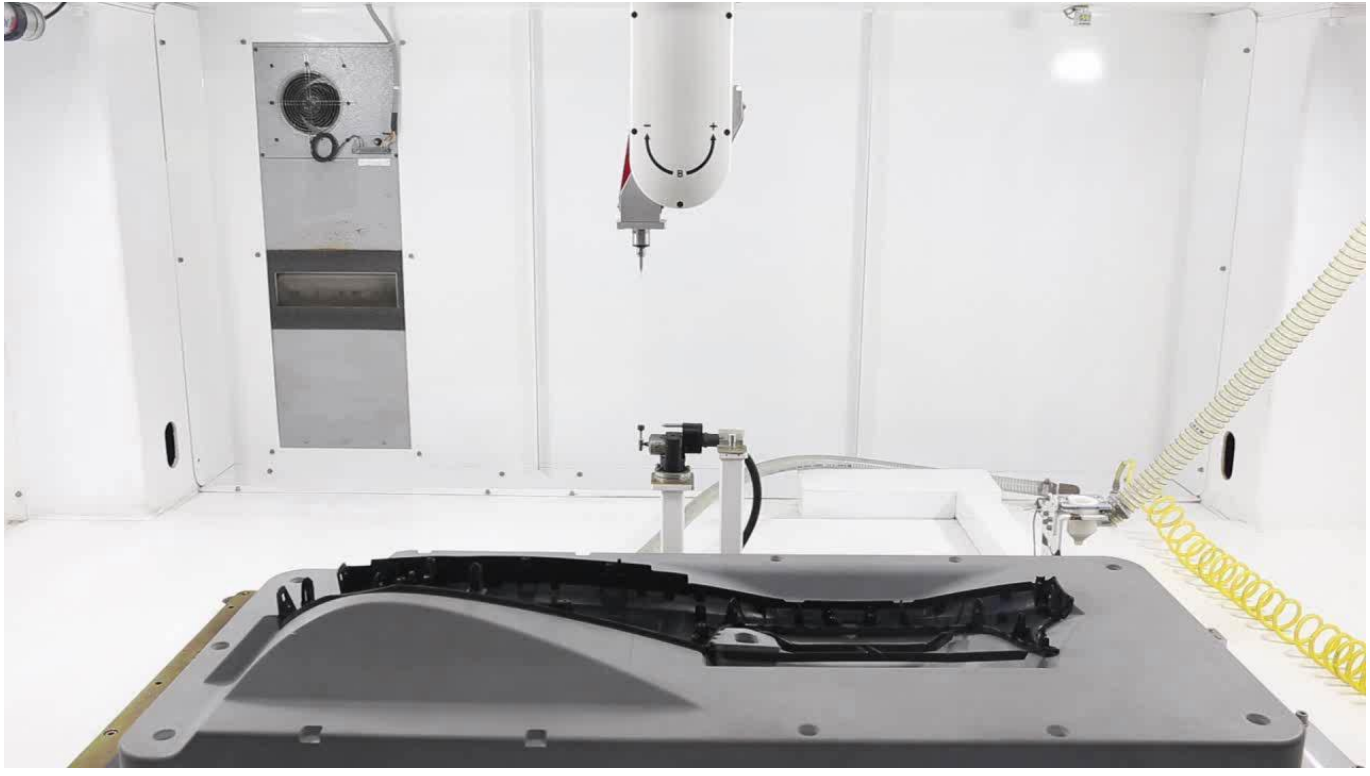
Scoring system

is the milling system for In-panel air bag line and enables to provide the reliable product by milling uniform thickness in accordance with the product shape.

Features

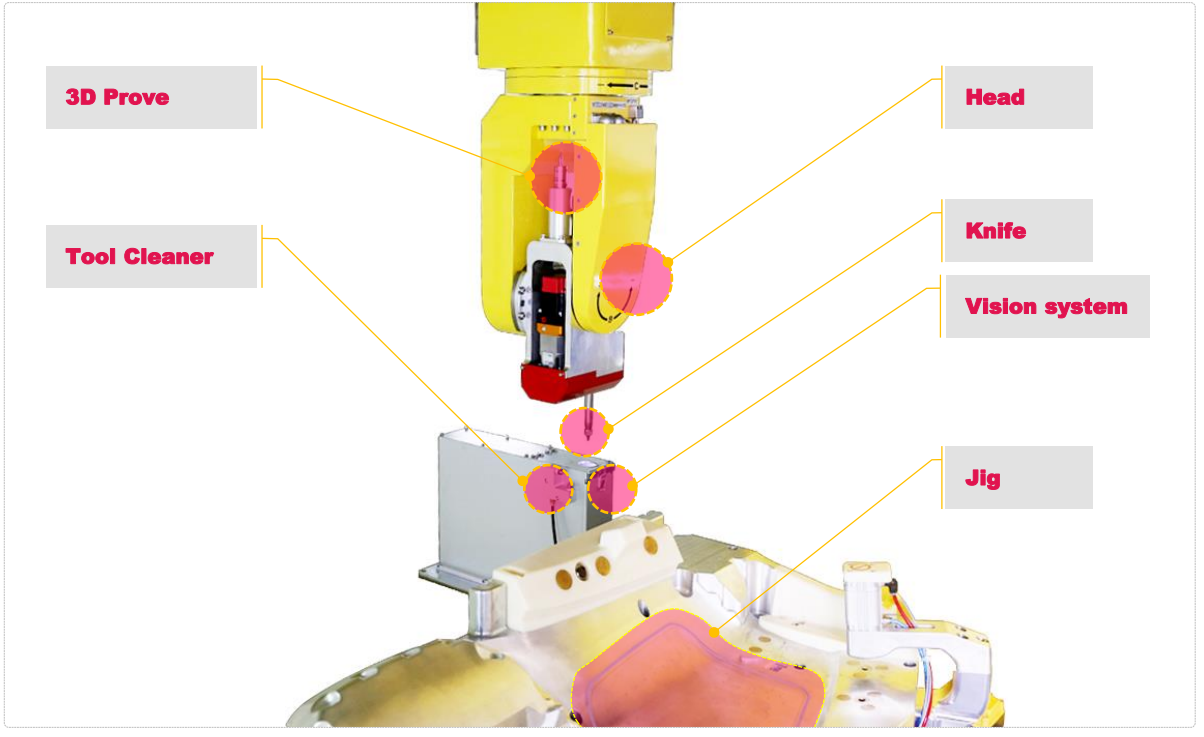
- Cycle Time: 45~60 sec
- Product change time: ~ 1 min (2 stage)
- Processing deviation: ±0.05 mm
- Quality improvement
- (applying process compensation program)
- Remote control via Ethernet

1-1. SCORING SYSTEM for IN-PANEL PAB



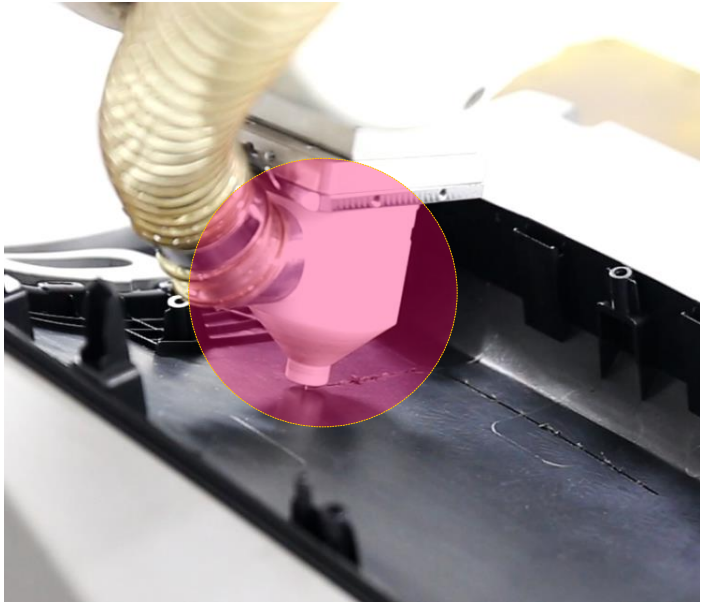
1-1. SCORING SYSTEM for IN-PANEL PAB

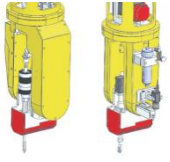
> Components of Scoring Machine



1-1. SCORING SYSTEM for IN-PANEL PAB

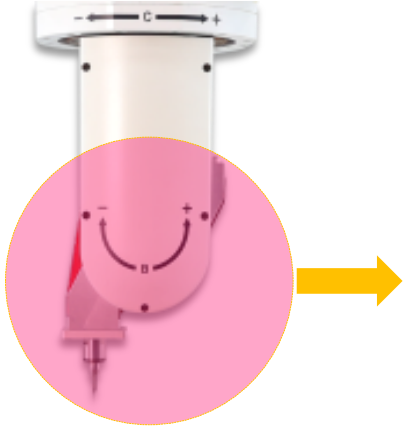
> Type of Scoring machine

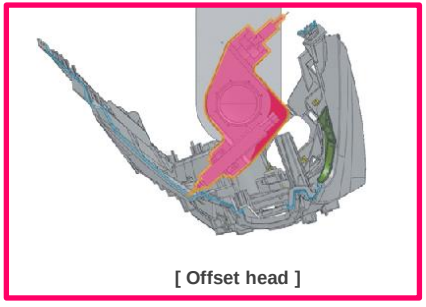


Type	In-panel Skin	Head shape
Milling Scoring	Hard skin	
Ultrasonic Scoring	Soft skin	
Hybrid Type (Milling + Ultrasonic)	Hard skin & Soft skin 동시 가공	

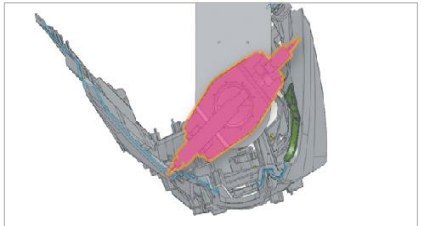
1-1. SCORING SYSTEM for IN-PANEL PAB

> Milling Type





[Offset head]



[Straight head]

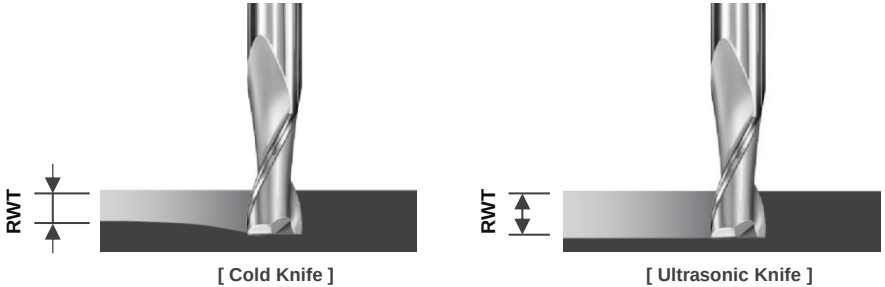
Features

- **Offset-type scoring head**

→ offset type head of CamoMill minimizes the collision between a head and a complicated shape of panel vs. straight head

1-1. SCORING SYSTEM for IN-PANEL PAB

> Ultrasonic Type



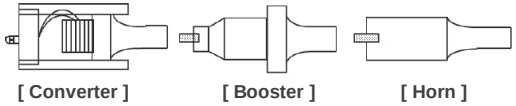
[Cold Knife] [Ultrasonic Knife]

*RWT : Residual Wall Thickness

Features

- **Ultrasonic knife** with frequency of 20kHz makes more smooth and soft scoring performance for **more accurate RWT** of the scoring lines.
- Cold knife scoring for skin may cause sponge effect which makes larger RWT than actual path of knife end point.
- Generator : 20 KHz High Freq
- Blade : 'I' or 'V' cut

> Optimized design



[Converter] [Booster] [Horn]

Features

- Optimum head design to perform precise ultrasonic vibration
→ Improve durability and performance
- Developed through experimental verifications based on FEM

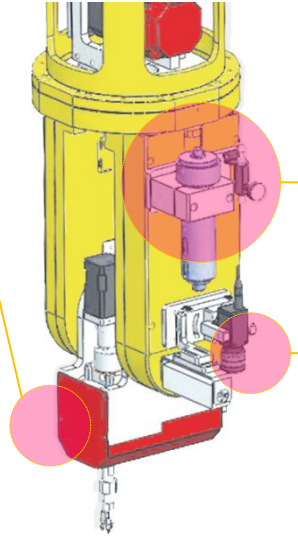
1-1. SCORING SYSTEM for IN-PANEL PAB

> Release agent dispenser system

Spread Unit
RAD*

*RAD : Release Agent Dispenser

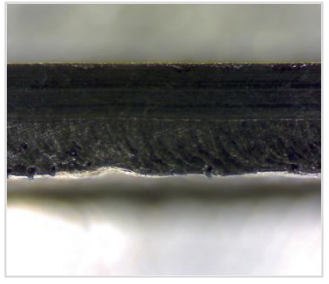
Cleaning



Supply Unit
RA cartridge

Vision Camera
RA inspection

[In-panel cutaway with RA]



[[In-panel cutaway without RA]

Features

- Release Agent can prevent the fusion due to high temperature generated n the process of forming

1-1. SCORING SYSTEM for IN-PANEL PAB

> Hybrid Type (Milling + Ultrasonic)

[Endmil RWT Laser sensor]

[Ultrasonic RWT sensor]

Features

- **Endmil and ultrasonic available in one machine**

→ hard core and skin processing sequentially

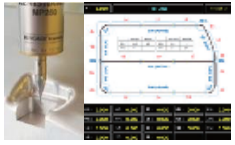
- **Measure RWT during Scoring process**

→ Endmil RWT sensor (Head)
→ Ultrasonic RWT sensor (base of Jig)

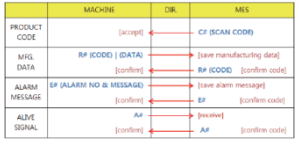
*__RWT__ : Residual Wall Thickness

> Accuracy Proof System

Double ball-bar measurement and correction



Auto compensation of environmental effects

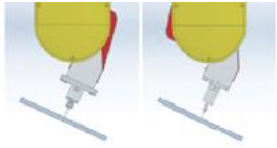


MES connectable

Pitch error compensation by laser sensor

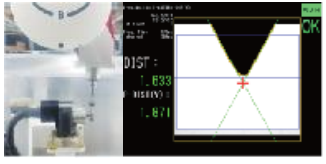
Manufacturing data traceability

Remote monitoring



Fixture points

Product Code



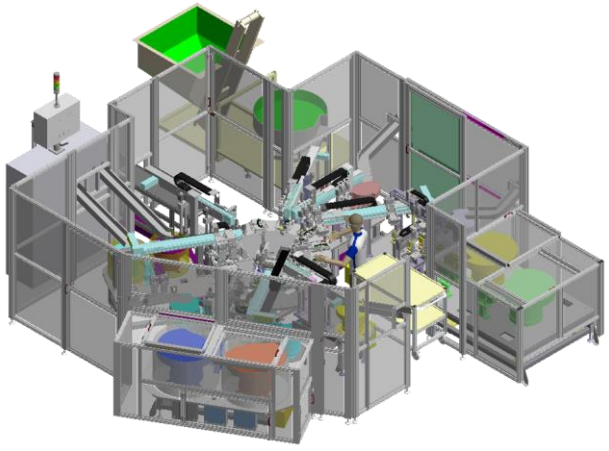
Tool length

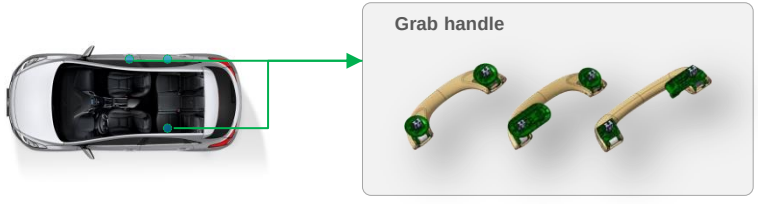
RWT Measurement

> Project Reference

Customer	Model	Q'TY	Country
HMC MOBIS Project	End-Mill Ultrasonic	7	Korea / China / Brazil
HMC Tier-1 Project		7	Korea / China
Honda Motors Project	Hybrid Type (End-Mill + Ultrasonic)	2	China
Other	End-Mill	1	Korea
Total		17	

1-2. GRAB HANDLE SYSTEM





Grab handle system

make it possible to assemble the grab handle in 6 sec and to assemble various models by flexible jig change solution.

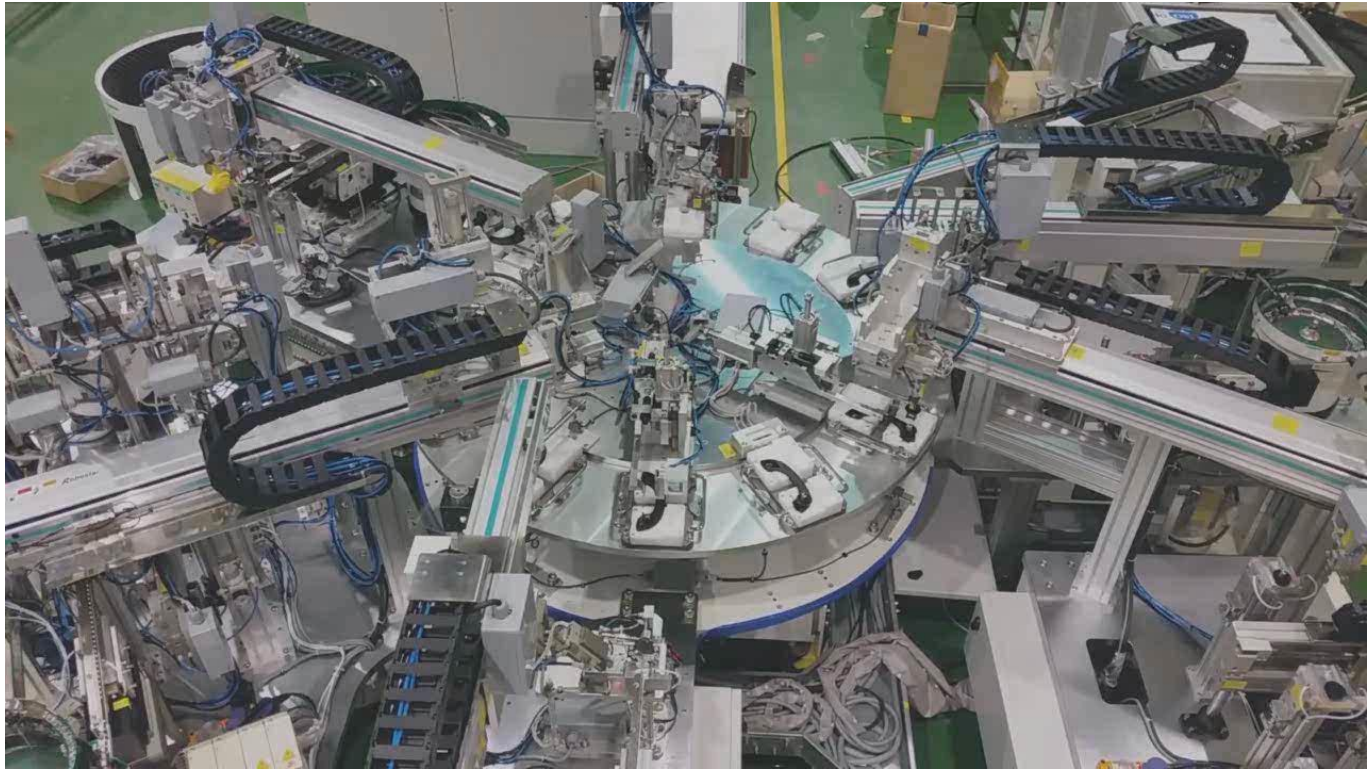
Ensuring product quality by checking the product in production and productivity improvement by High speed index table / High speed pick & place solution.

Features

- Full automation including the quality inspection
- Design for 5 model production
- C/O within 30 min per model
- Each handle consists of 11 single parts, 6 of them are always the same

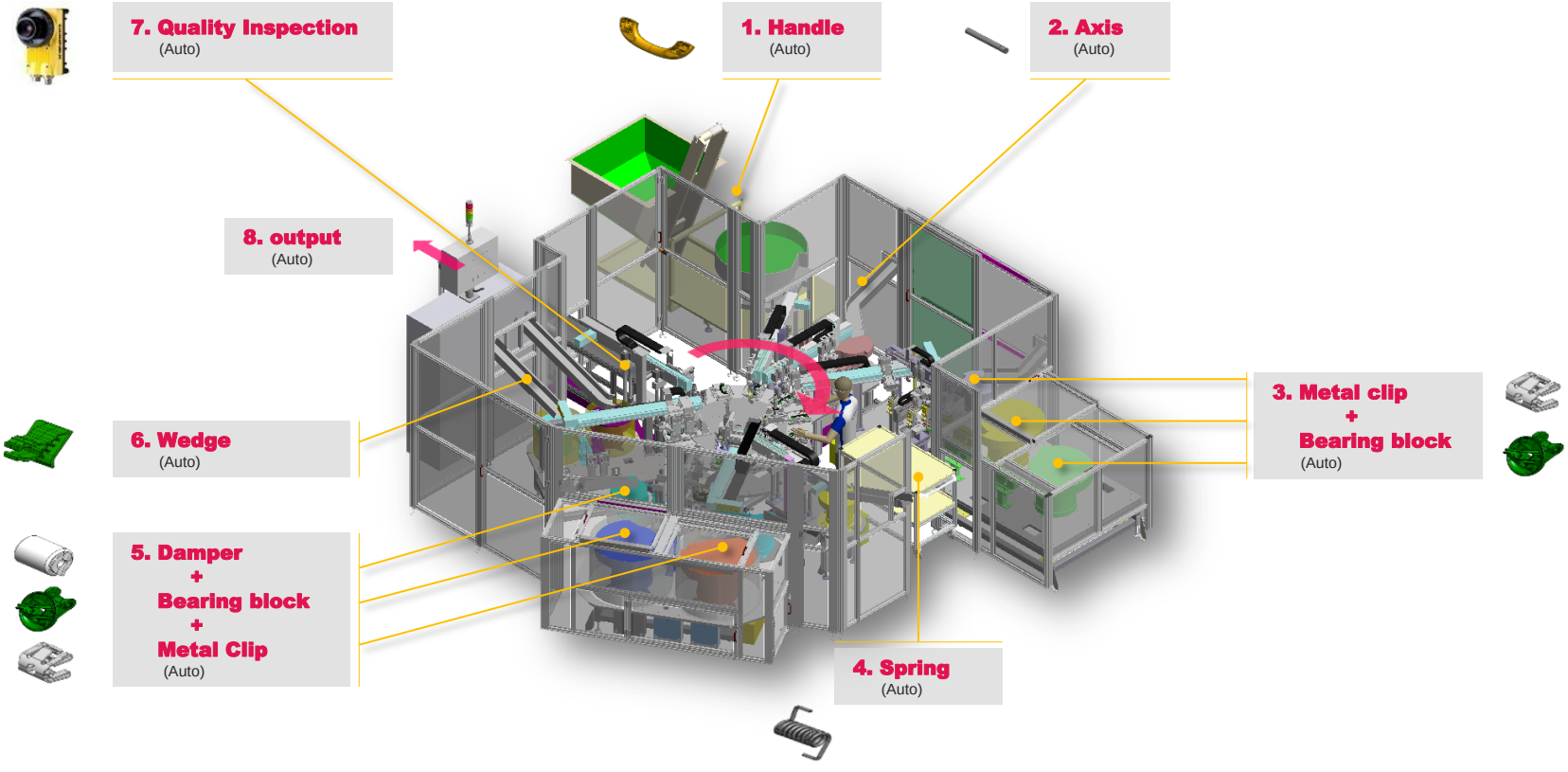
- Cycle Time: 6 sec
- 5 models available (C/O Time: 10~15 min)
- Automatic quality inspection (color, height, part missing)
- Space saving by optimized process

1-2. GRAB HANDLE SYSTEM



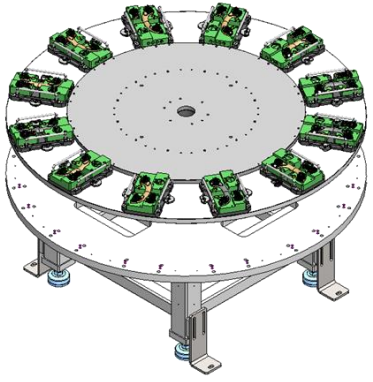
1-2. GRAB HANDLE SYSTEM

> Components of Gran Handle System



1-2. GRAB HANDLE SYSTEM

> TC rotary indexing table



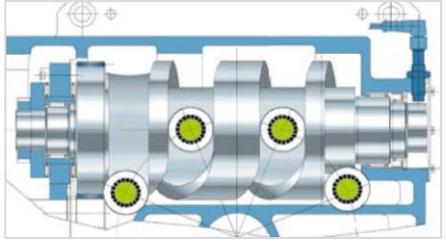
Features

• Reliability for a lifetime

Technical data TC 700T

• Tool plate diameter: Recommended up to 3000 mm
• Indexings: 2, 3, 4, 6, 8, 10, 12, 16, 20, 24, 30, 36, 48, 60, special increments upon request
• Cycle frequency: Up to 120 cpm, depending on inertia loading and number of stops
• Indexing precision: Indexing 2-12: ± 12“. Indexing 16-60: ± 16“ (in degree seconds)

> Roller Cam Drive

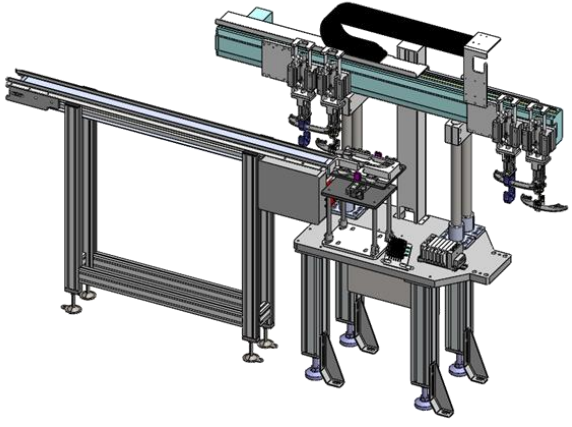


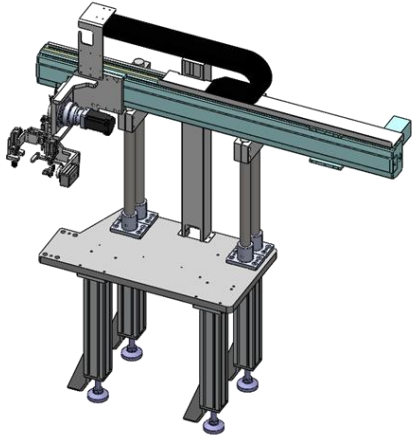
Features

• Our roller cam drives are dimensioned as large as possible.
And the full length of the cams is used here.

1-2. GRAB HANDLE SYSTEM

> Sub Unit Assembly



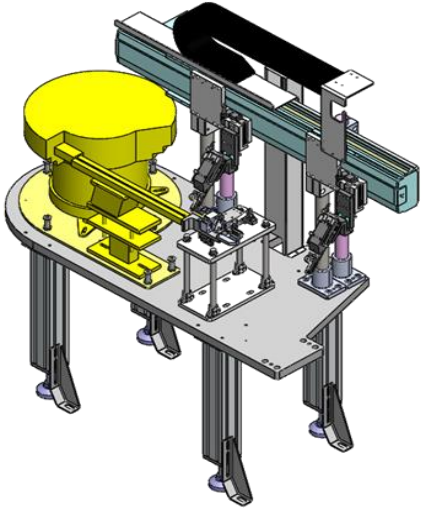


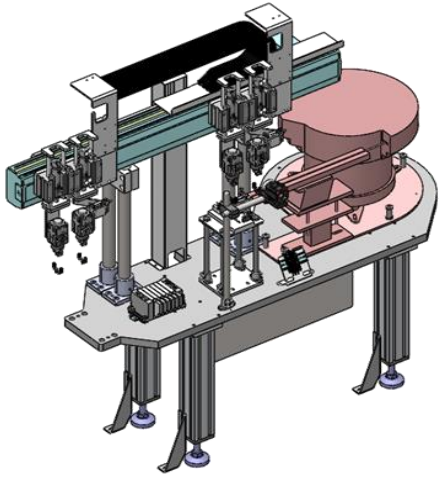
Features

- Loading unit for Grab Handle
- Un-loading unit for Grab Handle

1-2. GRAB HANDLE SYSTEM

> Sub Unit Assembly



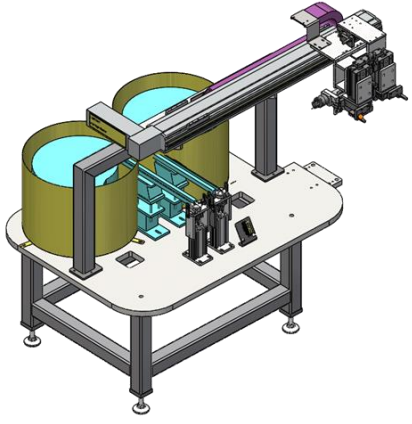


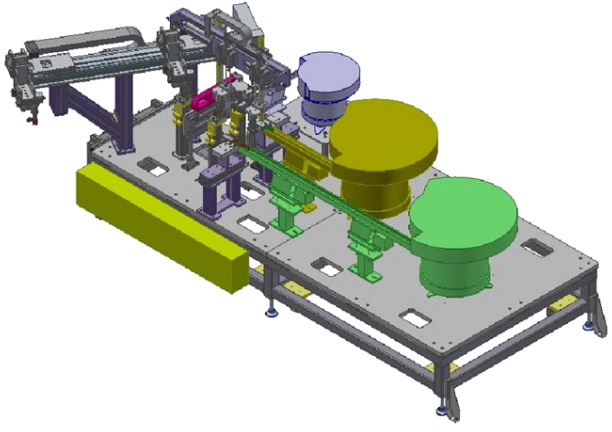
Features

- Loading unit for Axis Pins
- Loading unit for Spring

1-2. GRAB HANDLE SYSTEM

> Sub Unit Assembly

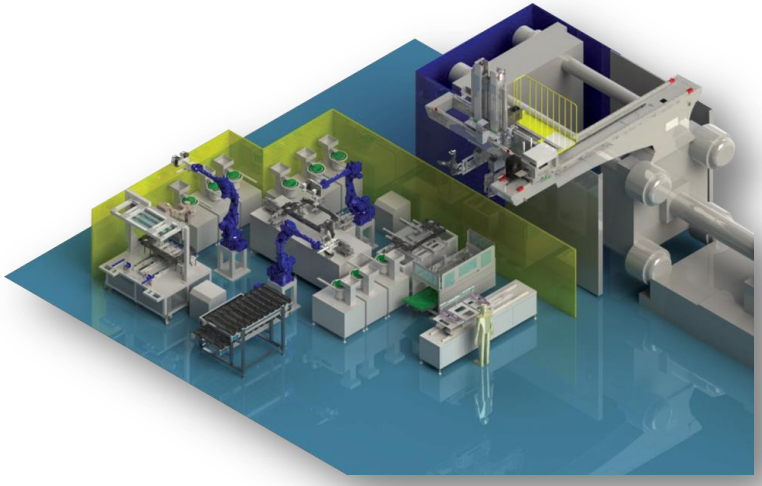


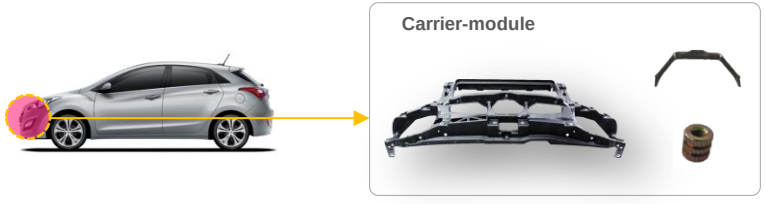


Features

- Loading unit for Clip
- Loading unit for Handle parts

1-3. CARRIER NUT INSERT SYSTEM





Carrier nut insert & Assembly system

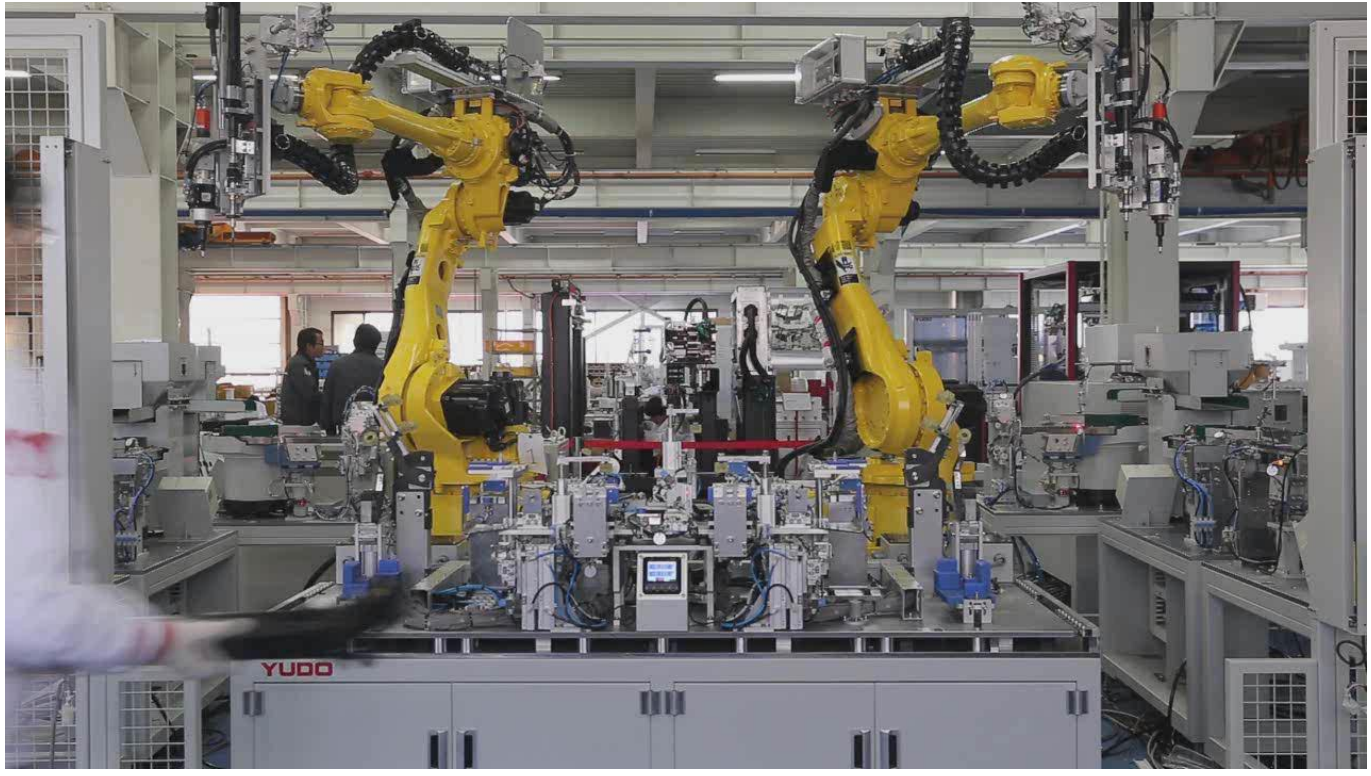
provide productivity improvement through optimized design of all the process (take-out, assembly, cutting, insert, quality inspection) and quality improvement through precise insert solution (repeatability: ±0.1mm)

Features

- Cycle Time: 140 sec 90 sec (35% up)
- Product Quality: 40ea/hour
- Quality improvement (accurate insert and assembly)
- Automatic quality inspection (weigh check, Vision Inspection)
- Space saving

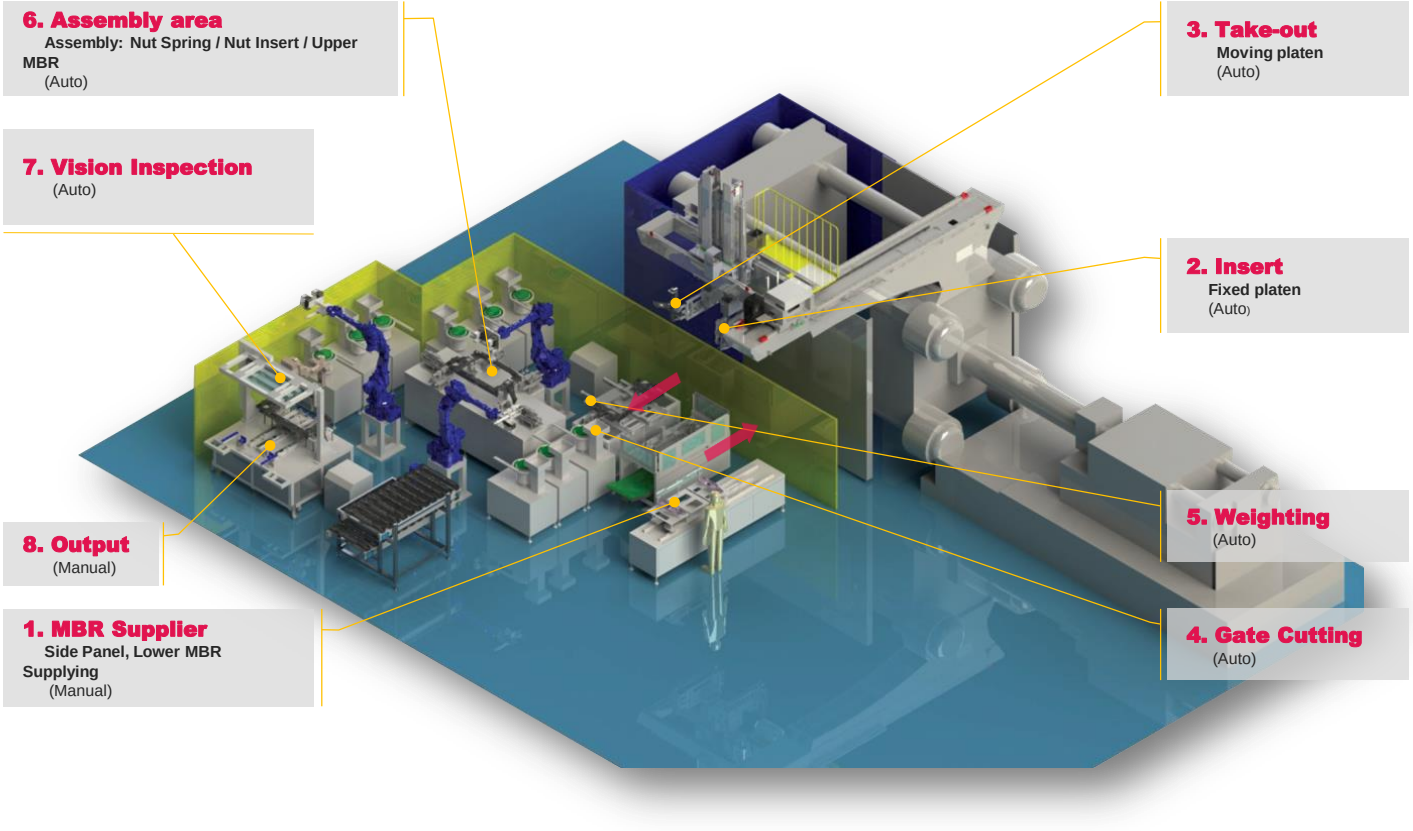
1-3. CARRIER NUT INSERT SYSTEM

1-3. CARRIER NUT INSERT SYSTEM



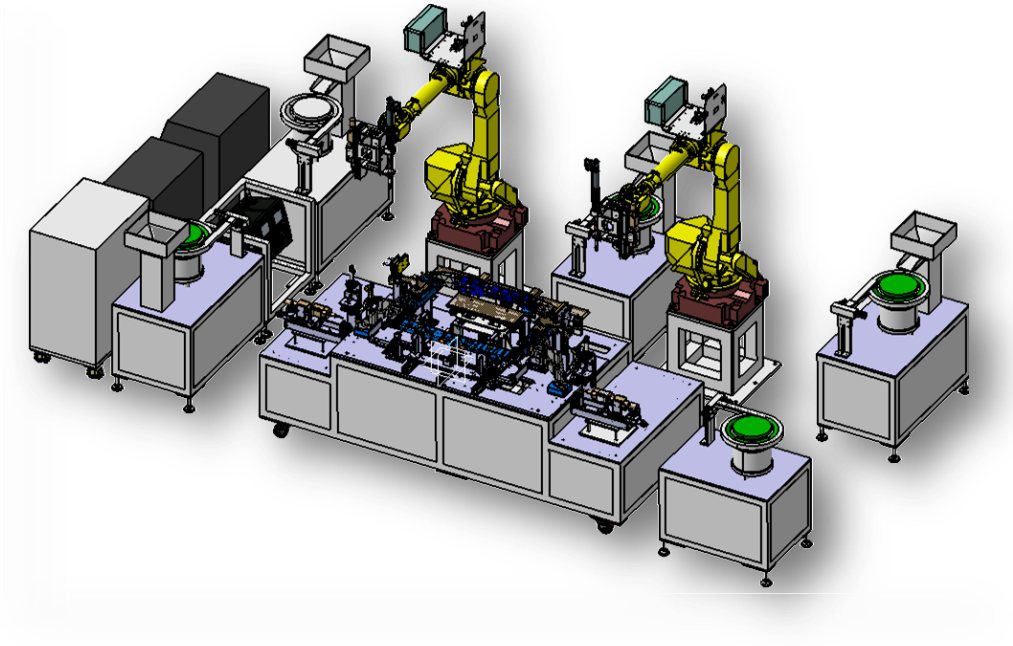
1-3. CARRIER NUT INSERT SYSTEM

> Components of Carrier Nut Insert system



1-3. CARRIER NUT INSERT SYSTEM

> Carrier Automation



Features

Semi automation system for Carrier assembly

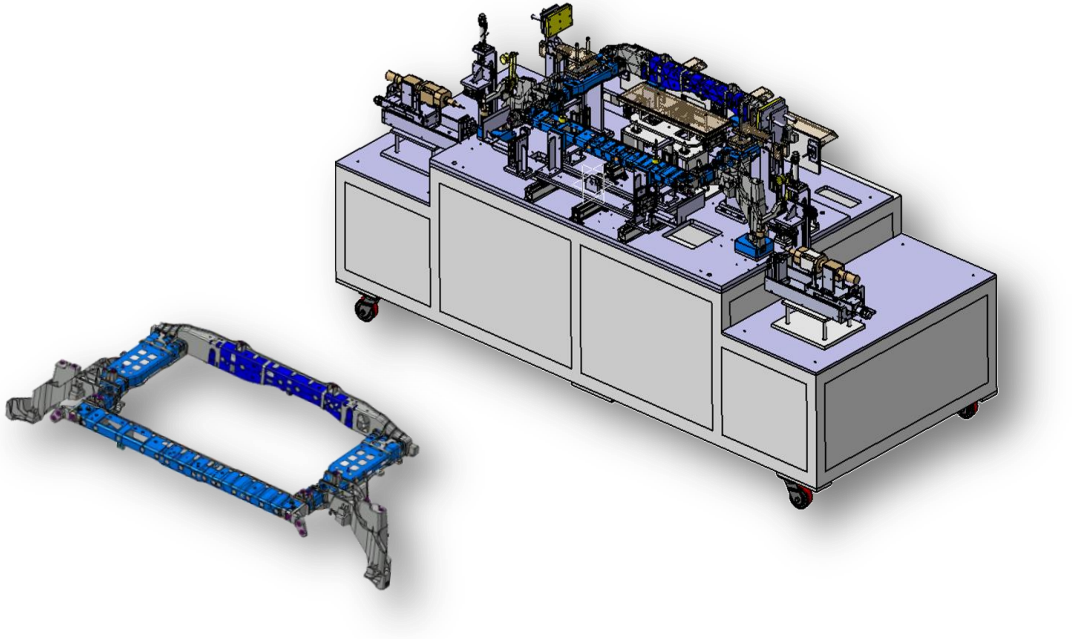
- Cycle Time : about 70~80sec
- Bolt, Nutsert, Nut Spring
- Part Inspection
- Measurement

Composition

- Take-out Robot
- Assembly Unit
- LVDT Measurement System
- Part Feeder
- Multi Axis Robot
- EOAT
- Nut Runner Tool
- Power Clamp

1-3. CARRIER NUT INSERT SYSTEM

> Assembly Unit



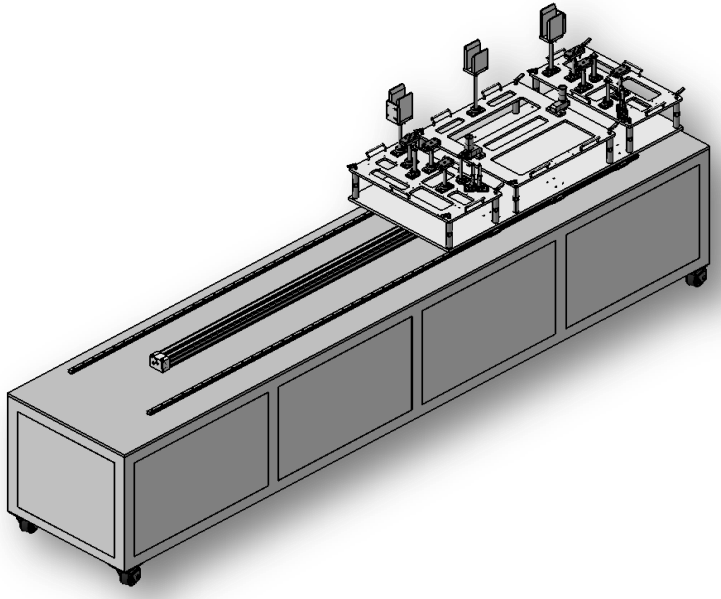
Features

Semi automation system for Carrier assembly

- Cycle Time : about 70~80sec
- Bolt, Nutsert, Nut Spring
- Part Inspection
- Measurement

1-3. CARRIER NUT INSERT SYSTEM

> Loading Unit



Features

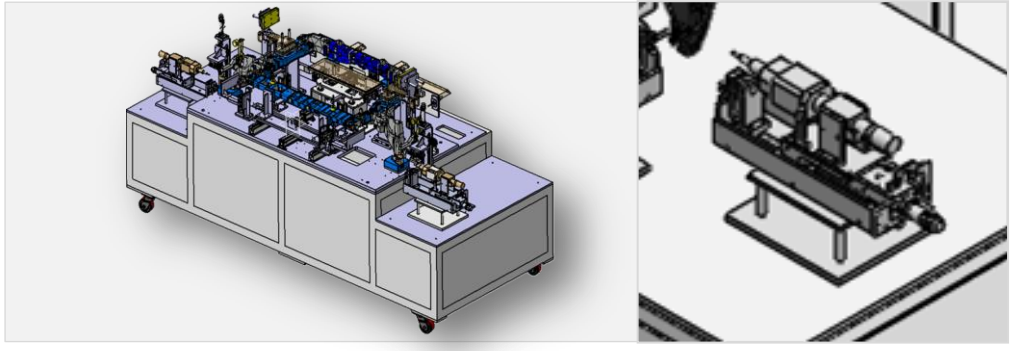
- Loading unit for Carrier Insert Part

Composition

- Panel, Nut Loading Unit
- Shuttle Moving Type
- Model Change Kit
- Part Inspection Sensor

1-3. CARRIER NUT INSERT SYSTEM

> Assembly Unit (Bolt Fastener)



Features

Bolt fastener with Nut Runner

- Upper MBR
- Nutsert
- Dimension control
- U/MBR Bolt fastener torque

* Air Motor

- Model: F-6SM-21R
- Maker: FUJI
- Torque: 4 Nm (0.4 kgf.m)
- Speed: 2000 rpm
- Air consumption: 0.34㎥/min

1-3. CARRIER NUT INSERT SYSTEM

> Multi-axis Robot


ABB


YASKAWA


FANUC


KUKA


NACHI


DENSO

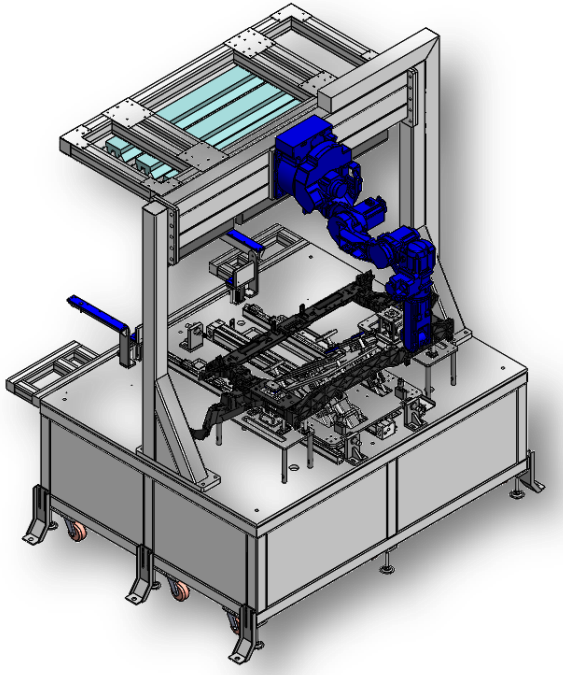

STAUBLI


MITSUBISHI


UNIVERSAL

1-3. CARRIER NUT INSERT SYSTEM

> Robot Vision Inspection System



Features

Carrier vision inspection with 6 Axis Robot

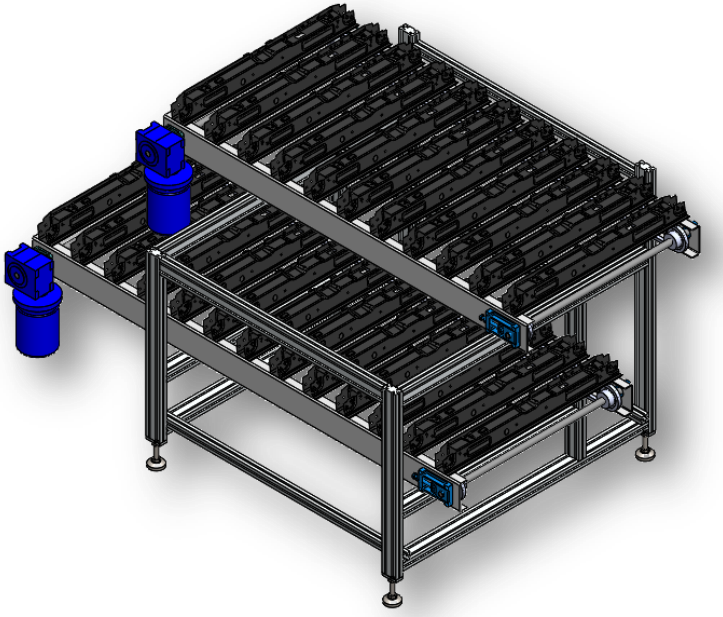
- Cycle Time : about 50~80sec (depending on # of Inspection Point)
- Inspection item : Bolt, Nutsert, Nut Spring
- Assembly and part miss
- Incomplete molding
- Vision Camera resolution : 1296x966
- Measurement

Composition

- Robot
- Sliding Unit
- Vision Camera
- Lamp Unit
- Power Clamp

1-3. CARRIER NUT INSERT SYSTEM

> Upper MBR Loading Conveyor



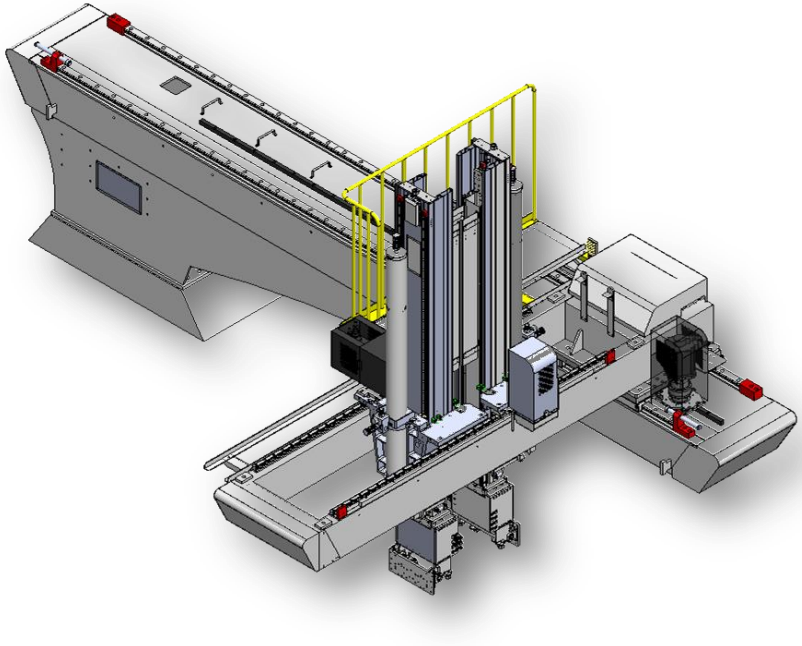
Features

Upper MBR provider

- 2 layer-Chain Conveyor
- Feeding Speed: 5~10m/min
- Loading quantity : depending on customer's requirement
- Speed Controller: Inverter

1-3. CARRIER NUT INSERT SYSTEM

> Take-out Robot : MEGA 3000MS-5



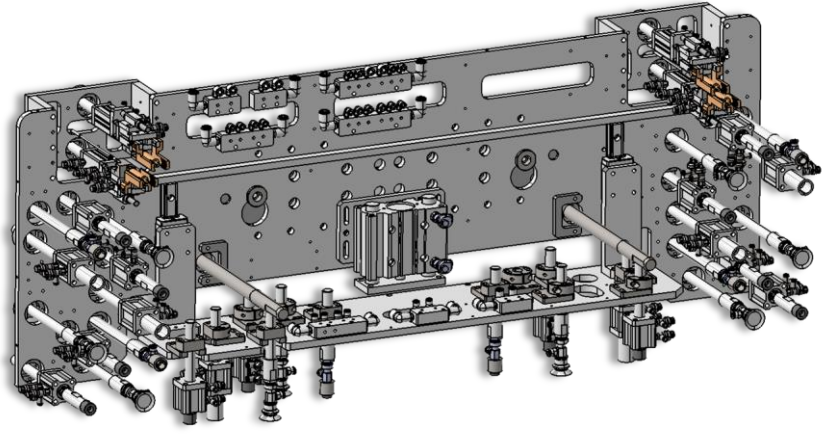
Features

- **Take out ROBOT for Carrier (5 axis)**
- Insert & Take-out

Process	Specification
Take-out Robot	MEGA-3000MS-5
Payload	80kg
Drive	AC Servo 5 axis
Application	Insert & Take-out
Traverse(mm)	4,500
Vertical(mm)	3,000
Repeat accuracy	±0.1mm
Controller	YUCON-500

1-3. CARRIER NUT INSERT SYSTEM

> Insert EOAT



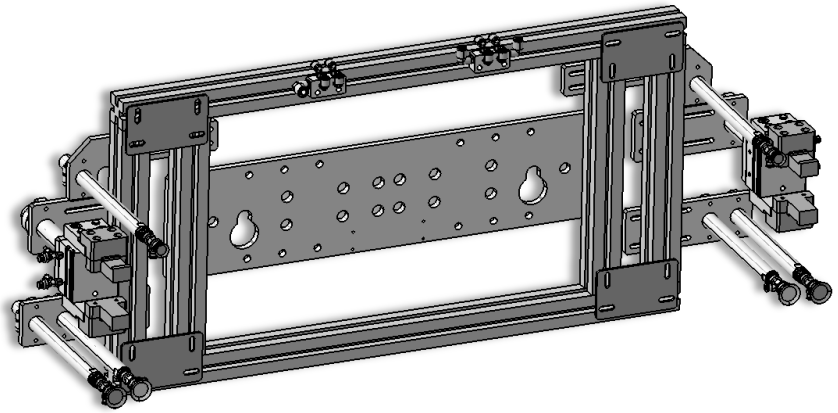
Features

- Insert Part to Mold
- Complex structure and precise part
- Short change time with ATC (Option)

Process	Specification
Insert EOAT	Stationary platen
Major component	Gripper /Vacuum Pad
Application	Mbr & Nut Insert
Insert type	Vacuum-pad/Grip
Insert part change	Available

1-3. CARRIER NUT INSERT SYSTEM

> EOAT for Take-out Part



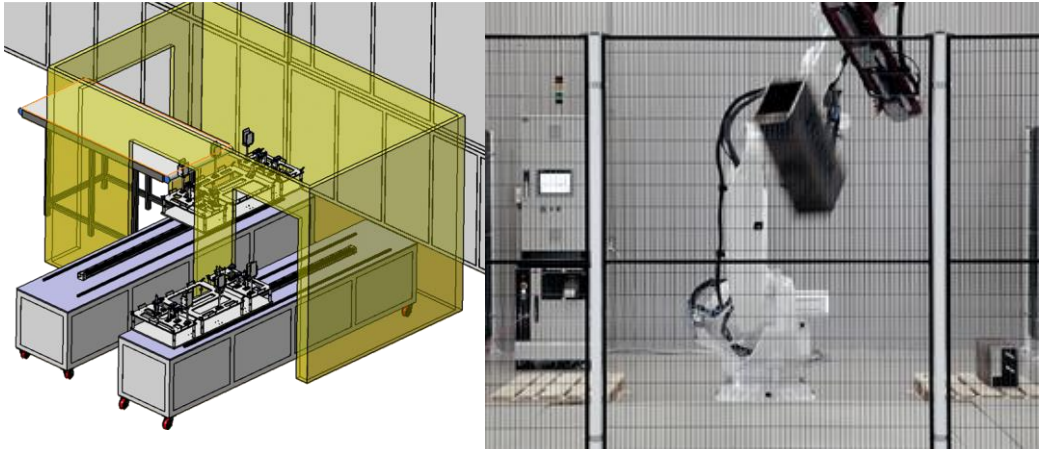
Features

- For Take-out
- Short change time with ATC (Option)

Process	Specification
Take EOAT	Moveable Platen
Major conponent	Gripper/Vacuum Pad
application	Take out
Take out type	Vacuum-pad/Grip
Take out part change	Available

1-3. CARRIER NUT INSERT SYSTEM

> Safety Fence



Features

- Machine guarding for production environment

Option

- Area Sensor
- Door Lock Switch
- Steel Mesh, PC, Al Profile

> Electric fixtured Nutrunner

Features

- Torque range : 10 ~ 50 Nm (1 kgf.m ~ 5kgf.m)
- Speed: 700 r/min
- Socket holder size : ½ inch

- High reliability
- Calibration value stored in spindle
- Robust connector
- 43 or 31 mm cc-distance
- 50 mm travel as standard
- Inline, offset and angle versions

> Hydraulic Cylinder

Features

- Max Pressure: 140kgf/㎠ (14.3Mpa)
- Stroke: 10mm
- Speed: 8~100 mm/s

1-3. CARRIER NUT INSERT SYSTEM

> Sensor

Vision Sensor

Digital Contact Sensor

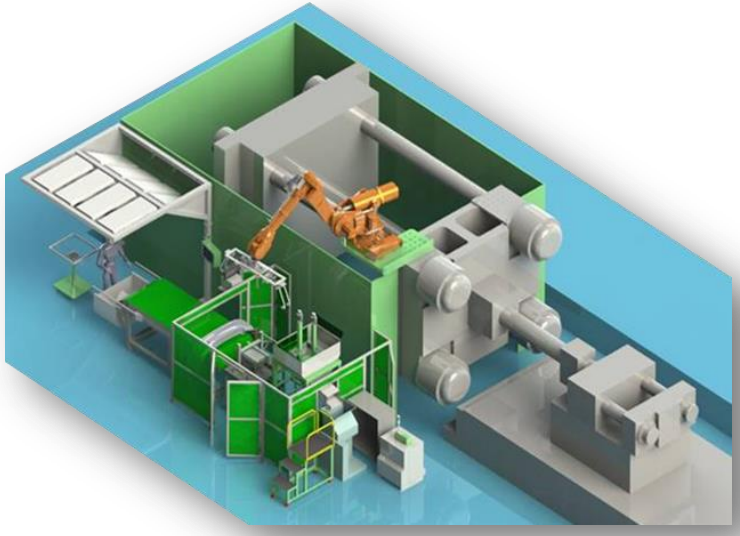
Inductive Sensor

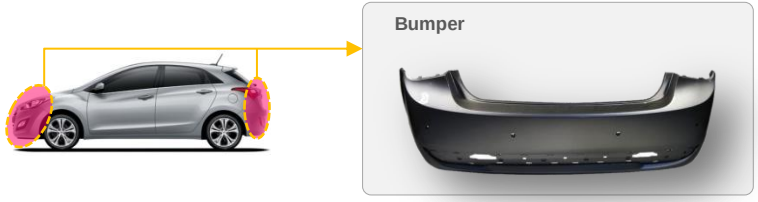
Laser Sensor

IR Temperature Sensor

Ultrasonic Sensor

1-4. BUMPER DE-BURRING SYSTEM





Bumper de-burring system

increase the value of product as cutting gate by ultrasonic blade and removing burr by plasma flame.

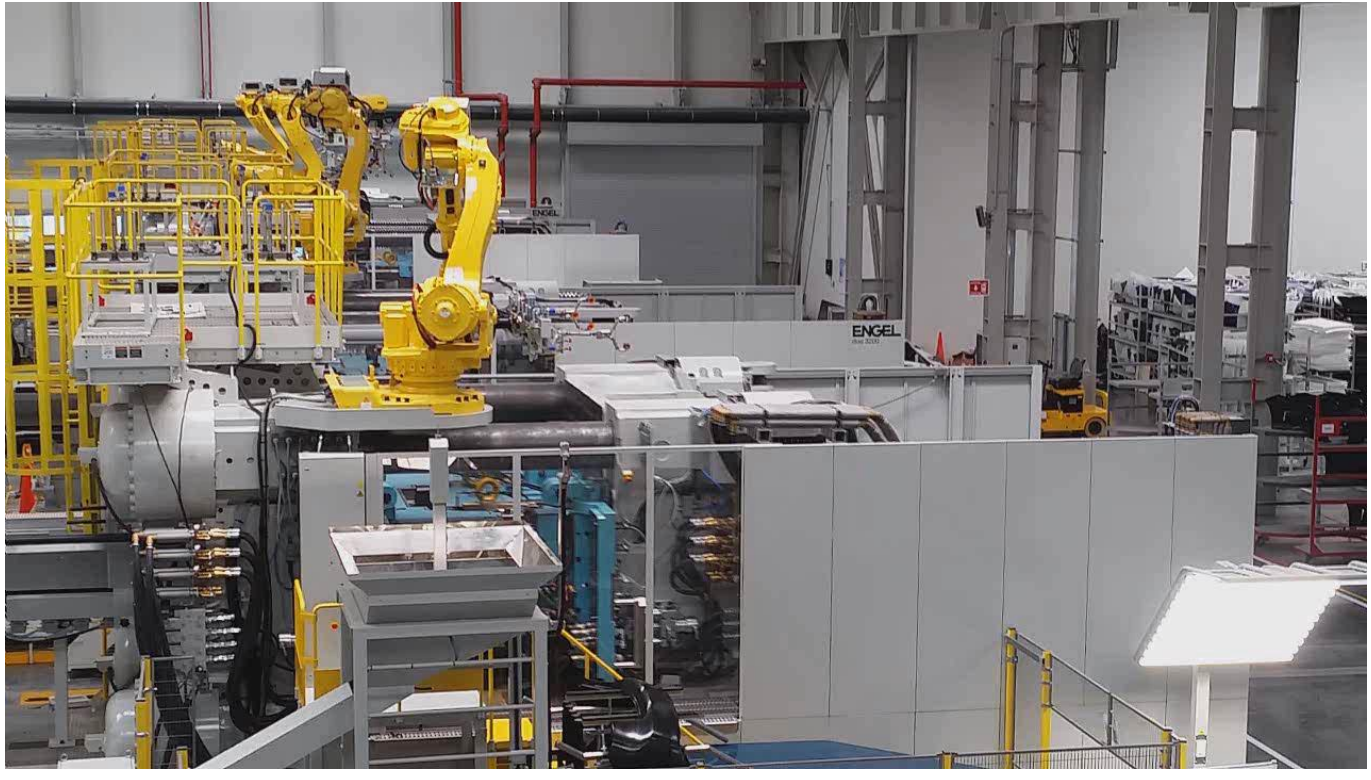
Productivity improvement by single system for multi-processing and model change time reduction by adjusting suction point by servo motor type chuck & jig.

Features

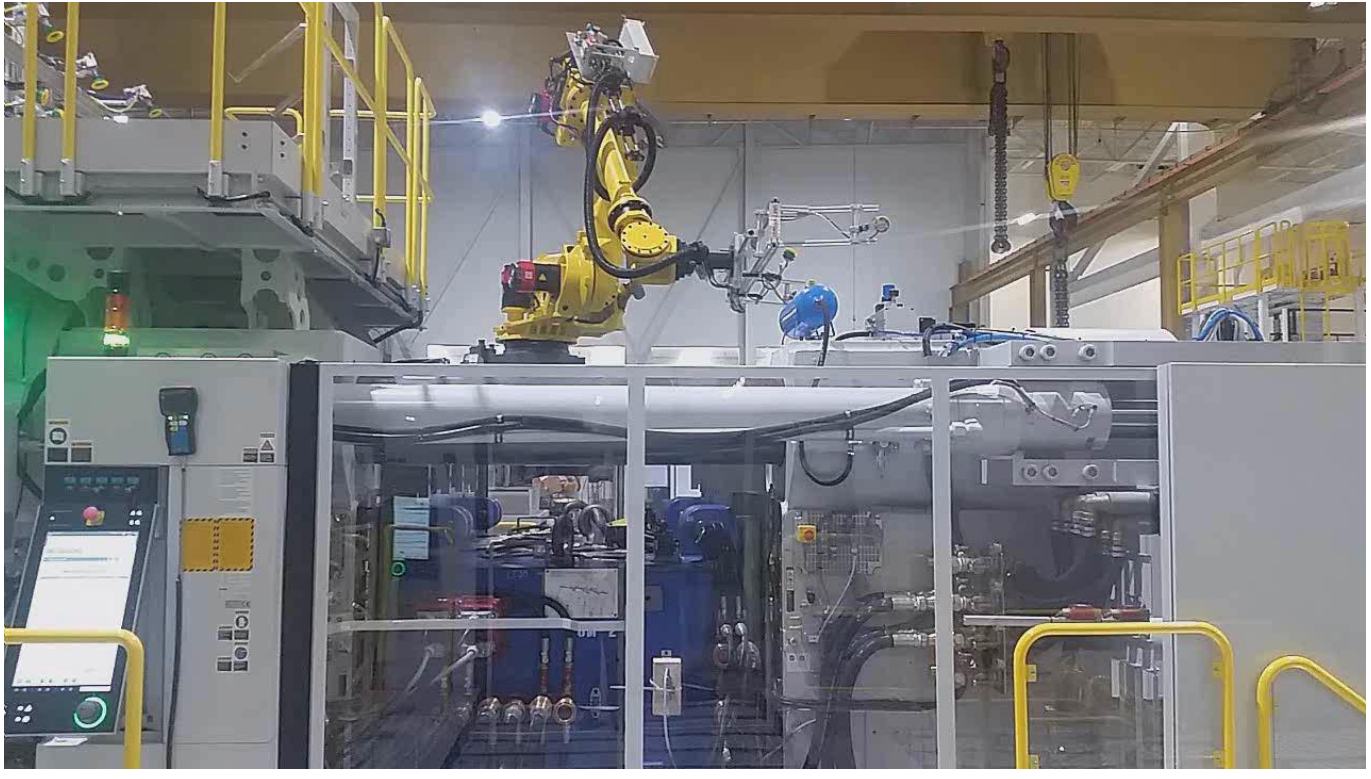
- Cycle time: 72 sec 59 sec (18% up)
- No chuck & jig change as model change (Universal EOAT)
- Quality improvement (Ultrasonic cutter system & Plasma flame)
- Automatic quality inspection in production (vision system)

1-4. BUMPER DE-BURRING SYSTEM

1-4. BUMPER DE-BURRING SYSTEM

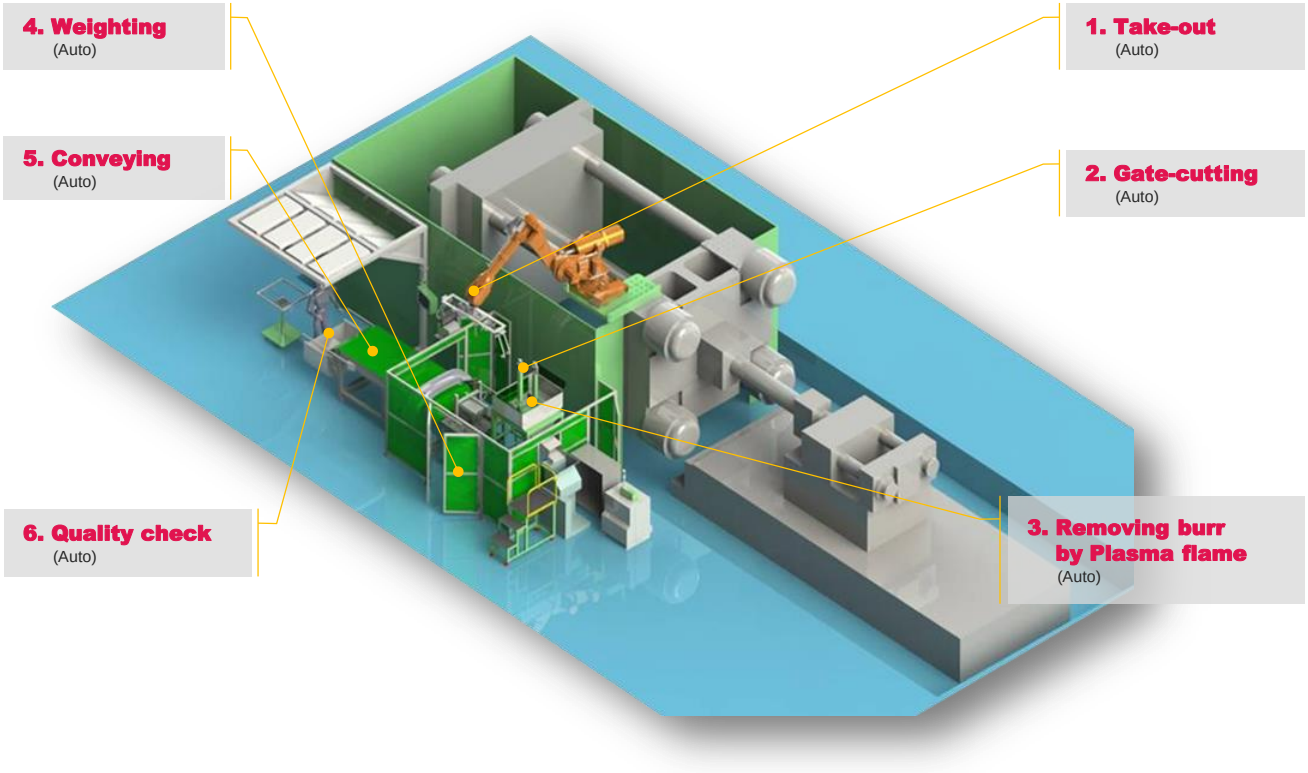


1-4. BUMPER DE-BURRING SYSTEM



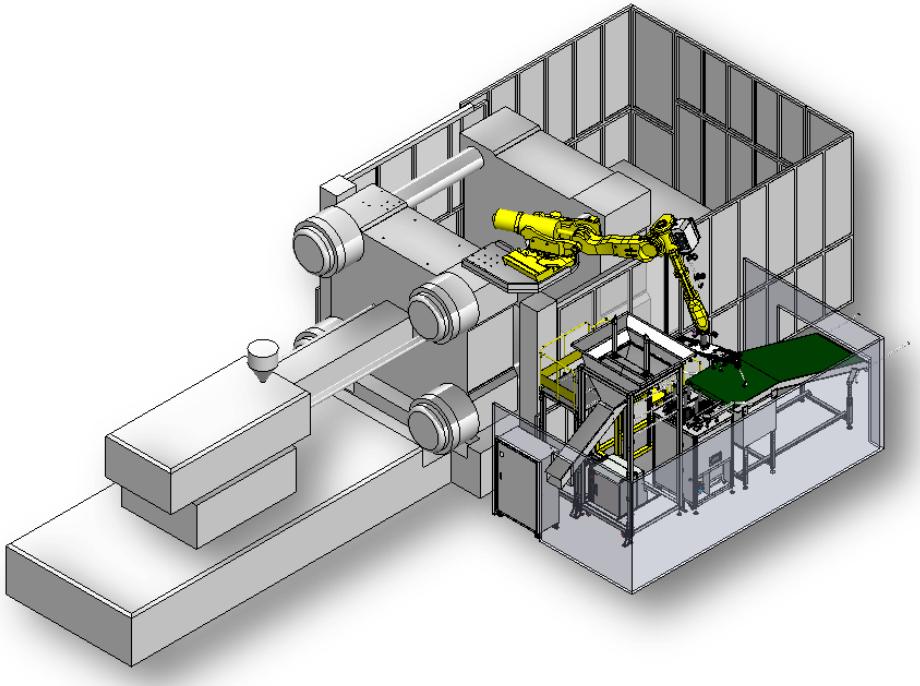
1-4. BUMPER DE-BURRING SYSTEM

> Components of Bumper De-burring system



1-4. BUMPER DE-BURRING SYSTEM

> **Bumper De-burring System** (Standard Type)



Features

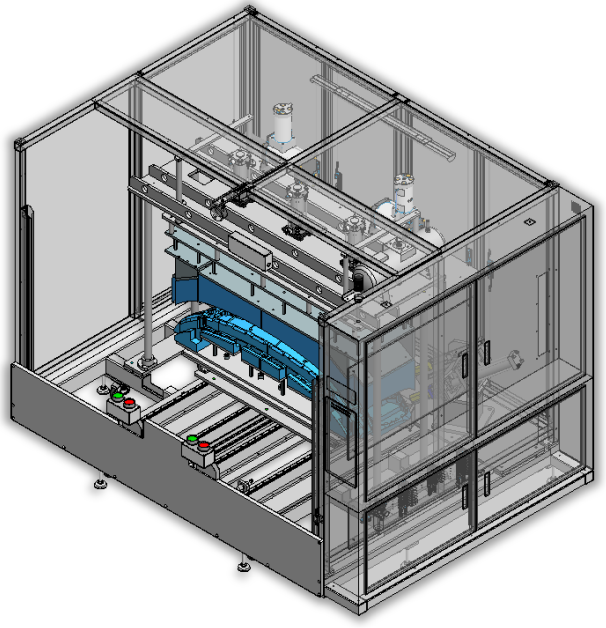
- Cycle Time : 70~80sec
- Gate Cutting
- Plasma
- Weight Check
- MES applicable

Composition

- Multi Axis Robot
- Bumper **EOAT**
- Weight Checker
- Safety Fence

1-4. BUMPER DE-BURRING SYSTEM

> **Bumper Punching System** (Standard Type)



Features

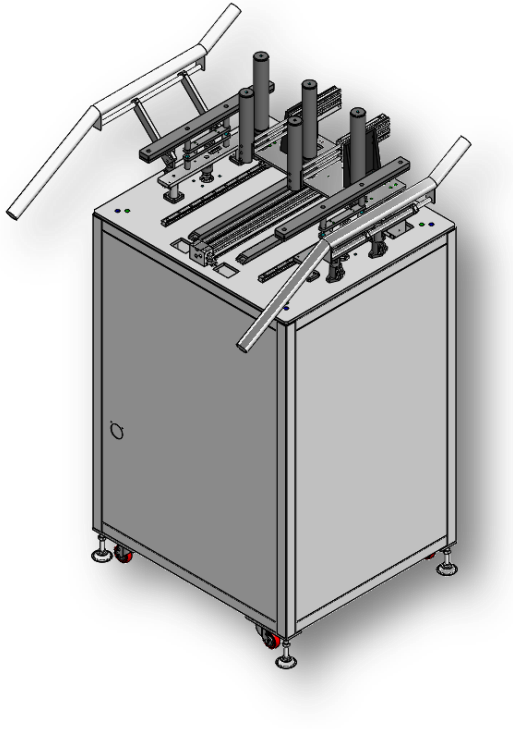
- Cycle Time : 70~80sec
- Bumper Press for Part Assembly
- Hole Punching
- Hydraulic Cylinder

Composition

- Linear Sliding Unit
- Press Unit
- 3D JIG
- Safety Fence

1-4. BUMPER DE-BURRING SYSTEM

> Weight Check System



Scale Terminals

Single Point Load Cell

Precision Junction Box

Features

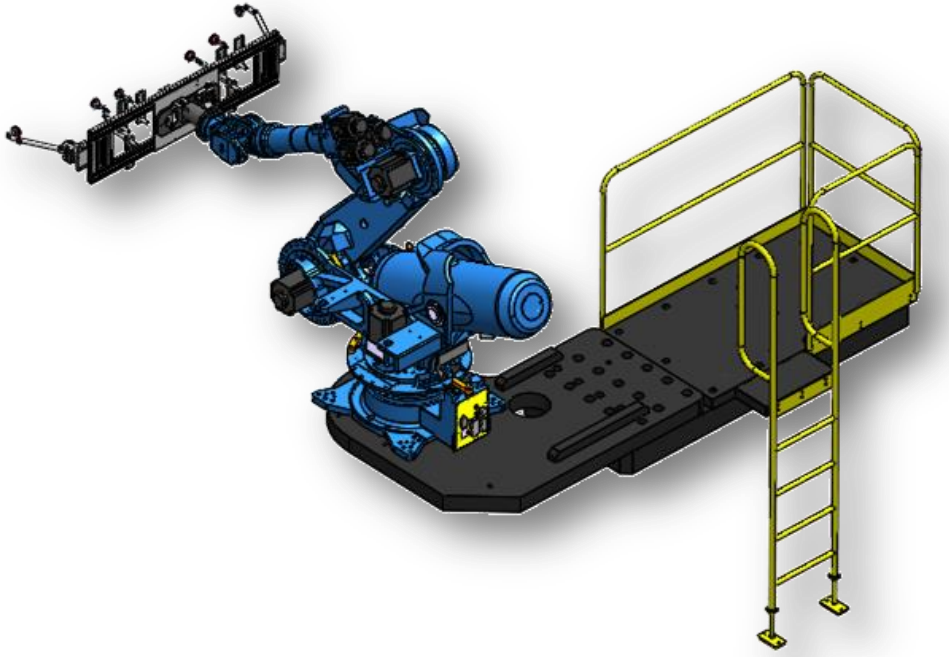
- Moment insensitive load cells for direct Platform mounting.
- Capacity: 3kg – 750kg
- Auto Weight Check
- MES applicable

Composition

- Scale Terminals
- Single Point Load Cell
- Junction Box

1-4. BUMPER DE-BURRING SYSTEM

> **Take-out System** using Multi–axis Robot



Features

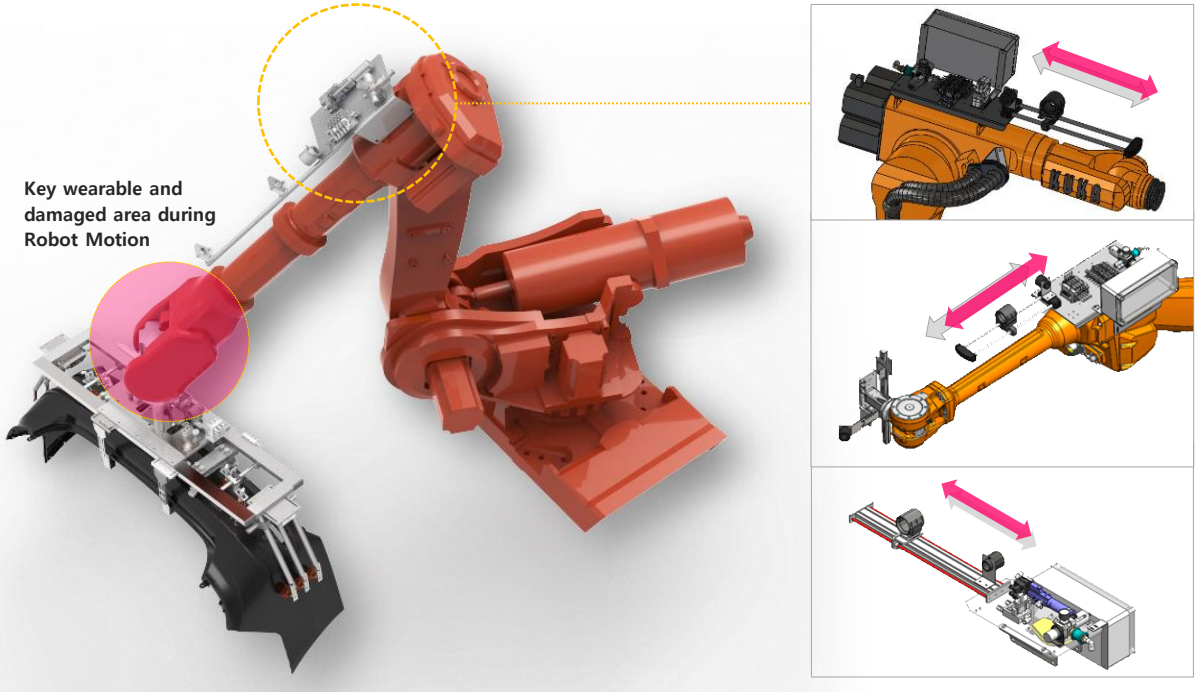
- Bumper Take-out, Cutting, Plasma, Weight Check.
- Capacity: 180kg
- MES applicable

Composition

- Multi Axis Robot
- Customized **EOAT**
- Robot Stage

1-4. BUMPER DE-BURRING SYSTEM

> **Dress Packs** for Multi–axis Robot



Features

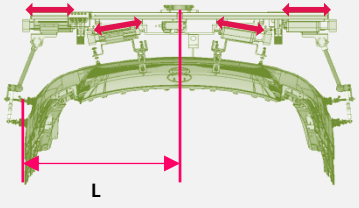
- Product Flexible Hose & Cable
  due to wide range of Multi-axis Robot Motion
- Economical cost
- Standard feature for Bumper Automation System

1-4. BUMPER DE-BURRING SYSTEM

> Multi EOAT for Bumper Automation

Features

- Adaptable for multiple applications
- Integrated design: Servo Motor and Controller
- Quick and easy tool change with Auto Tool Changer

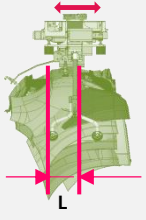


Bumper Size deviation

• Servo Actuator : 50mm

unit : mm

	FR(4D)	RR(4D)	FR(5D)	RR(5D)	Deviation
A	836	829	846	866	
B	816	853			50
C	833	821			



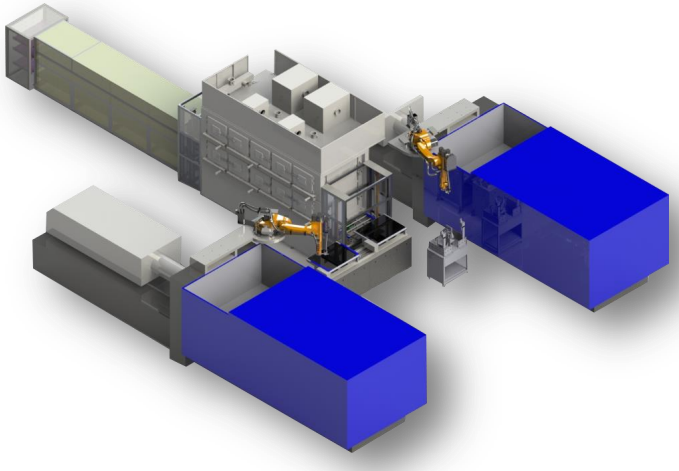
Position Deviation of Bumper

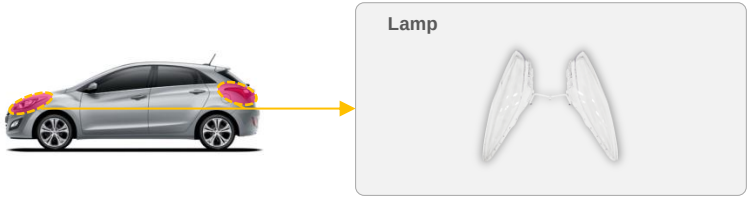
• Servo Actuator : 50mm

unit : mm

	FR(4D)	RR(4D)	FR(5D)	RR(5D)	Deviation
A	0	0	0	0	
B	100	0	0	0	100
C	0	0	0	0	

1-5. LAMP GATE-CUTTING & ANNEALING SYSTEM





Lamp gate-cutting & annealing system

make it possible to increase the quality of product by removing the internal stress through the balanced temperature control of in-door tunnel.

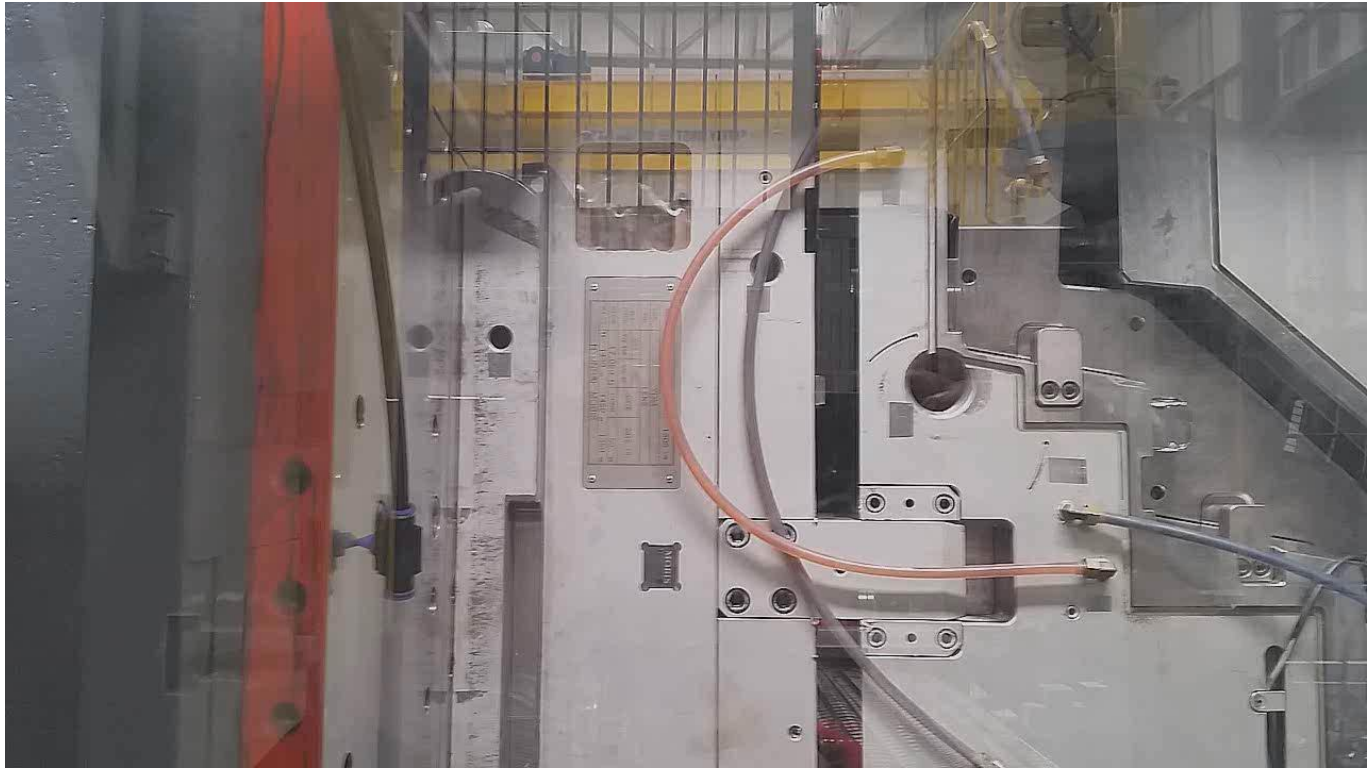
No dust and no pollution system for transparent product as head lamp (clean room specification: ISO 14944, 8 Level)

Features

Integrate Lamp take-out, Weight Check and Gate Cutting with Multi-axis Robot. Lamp Full Automation System with In-line of 2 units of IMM and Annealing MC

- Cycle Time : about 60~90sec
- Gate Cutting
- Weight Check
- MES applicable
- Quality improvement (No dust, No pollution)
- Ensuring quality consistency (uniform annealing temperature(130℃))
- Automatic quality inspection (weight check)
- Double capacity in single space

1-5. LAMP GATE-CUTTING SYSTEM



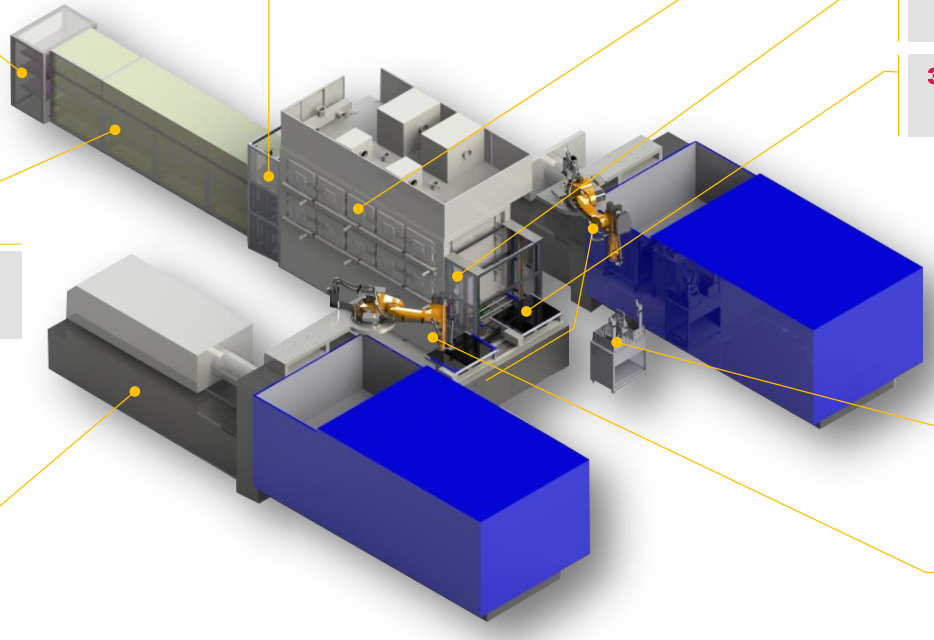
1-5. LAMP GATE-CUTTING & ANNEALING SYSTEM

1-5. LAMP REFLECTOR GATE-CUTTING SYSTEM

1-5. LAMP BEZEL GATE-CUTTING SYSTEM

1-5. LAMP GATE-CUTTING & ANNEALING SYSTEM

> Components of lamp Gate-cutting & Annealing System



8. Pallet Return Lift
Pallet Return Lift Conveying
(Auto)

6. Out Lift Conveyor
Out lift Conveying
(Auto)

5. Annealing
Annealing process
(Auto, IR heater and air circulation system)

4. In Lift Conveying
Shuttle Unit Conveying
(Auto)

3. Shuttle Unit
Shuttle Unit Conveying
(Auto)

9. Product Return Conveyor
Product Return Conveying
(Auto)

7. Out Conveyor
Out Lift Conveying
(Auto)

2. Gate Cutting
(Auto)

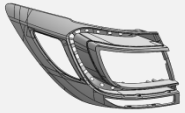
1. Take-out
(Auto)

1-5. LAMP GATE-CUTTING & ANNEALING SYSTEM

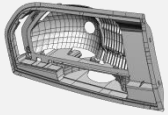
> Annealing

Lens

Annealing process to protect distortion by heat treatment that alter the physical and sometimes chemical properties of a metal to increase its ductility



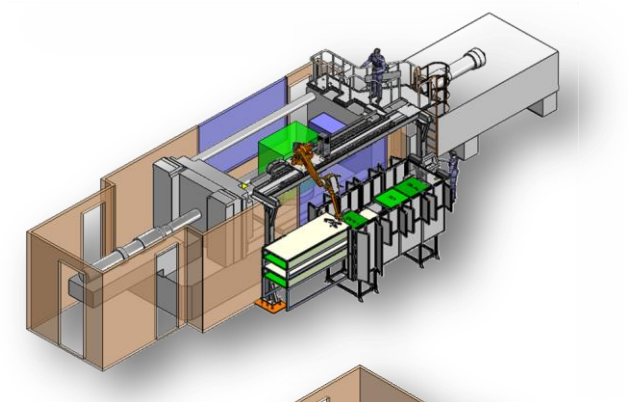
Reflector

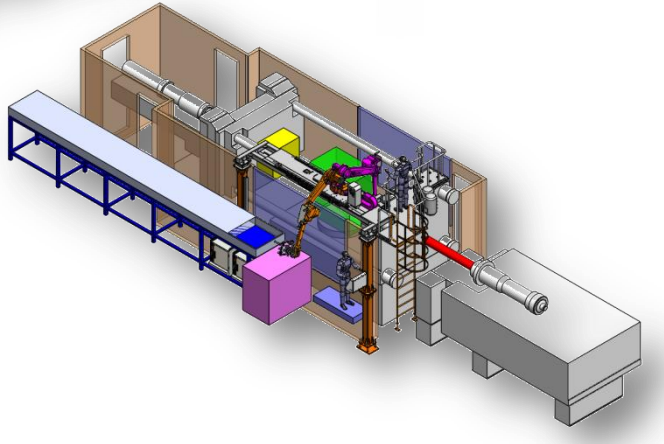


Bezel

1-5. LAMP GATE-CUTTING & ANNEALING SYSTEM

> **Lamp Gate-cutting System** (Linear Track Type for Tandem mold)





Features

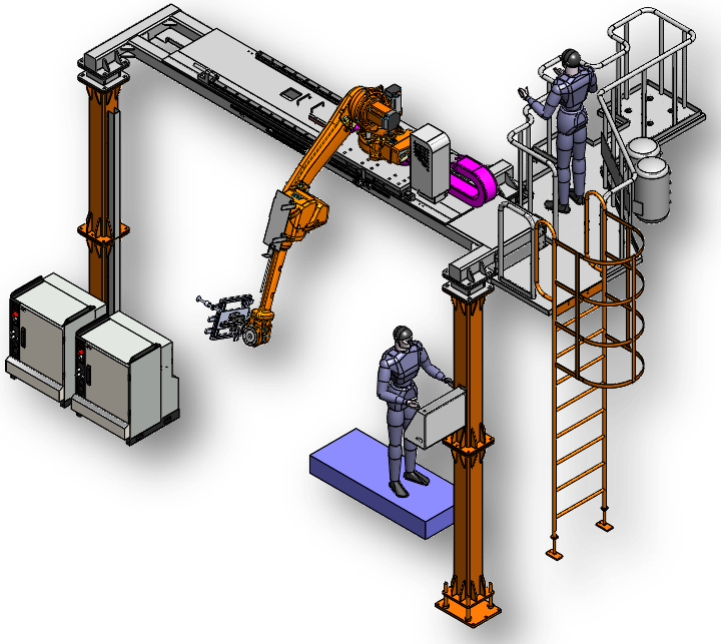
- Cycle Time : about 60~90sec
- Gate Cutting
- Weight Check
- MES Applicable

Composition

- Multi Axis Robot
- Linear Track Motion
- Lamp EOAT
- Cutting Unit
- Weight Checker
- Vision Inspection System
- Part Feeder
- Clean Conveyor

1-5. LAMP GATE-CUTTING & ANNEALING SYSTEM

> Linear Track Motion

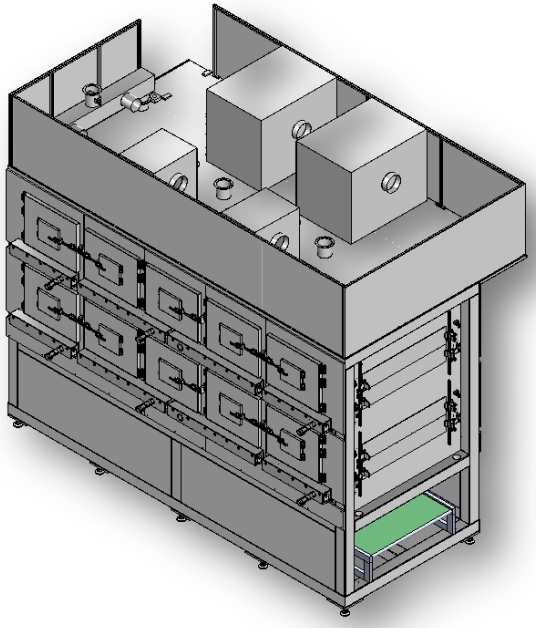


Features

- Tandem Mold ramp take out with multi axis robot
- Cycle Time : about 60~90sec
- Stroke: Optimum stroke tailored to customer requirement

1-5. LAMP GATE-CUTTING & ANNEALING SYSTEM

> **Annealing** Machine



Features

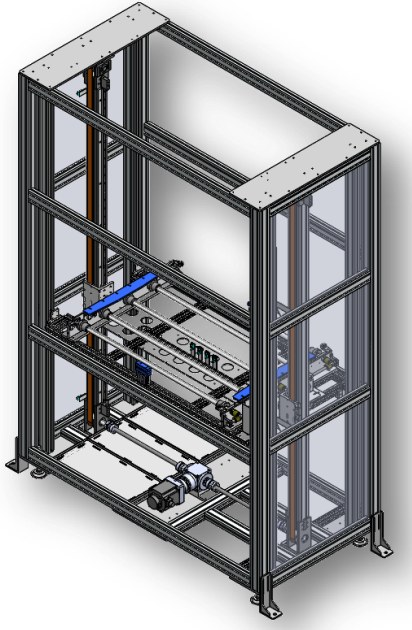
- Speed: 1000mm/min
- 1000 Class clean room
- Temperature: 150℃
- PID Controller
- MES Applicable

Composition

- IR Heater
- SUS Chamber
- Servo motor drive
- Sliding door
- Reflow
- Clean conveyor
- Weight Checker
- Vision Inspection System
- Part Feeder
- Clean Conveyor

1-5. LAMP GATE-CUTTING & ANNEALING SYSTEM

> High Speed **Elevator**



Features

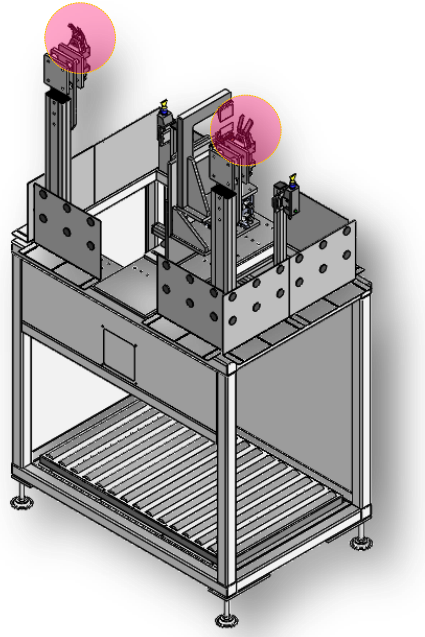
- Cycle Time : about 60~90sec
- Gate Cutting
- Weight Check
- MES Applicable

Composition

- Linear Belt Driver
- Servo Motor
- Clean Conveyor
- Linear Track Motion

1-5. LAMP GATE-CUTTING & ANNEALING SYSTEM

> Gate Cutting Unit



Round Body Nipper
Economic Price

Sliding Nippers
Normal Price

Fan Gate
High Price

Features

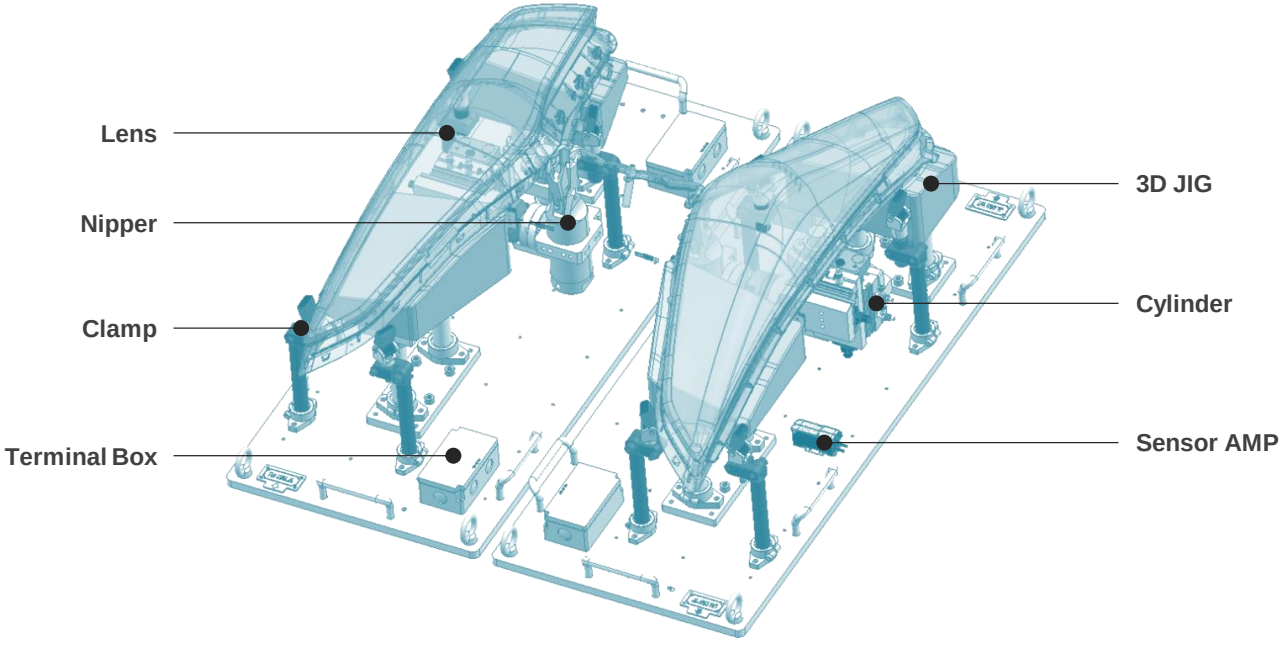
- Gate cutting by either Take-out Robot or Multi axis robot
- Select Cutting Nipper determined by Gate shape material and thickness

Composition

- Round Body Nippers
- Sliding Nippers
- Fan Gate Nippers

1-5. LAMP GATE-CUTTING & ANNEALING SYSTEM

> Jig Unit



SMART FACTORY Solution

Packaging Automation Technology

2. OVERVIEW

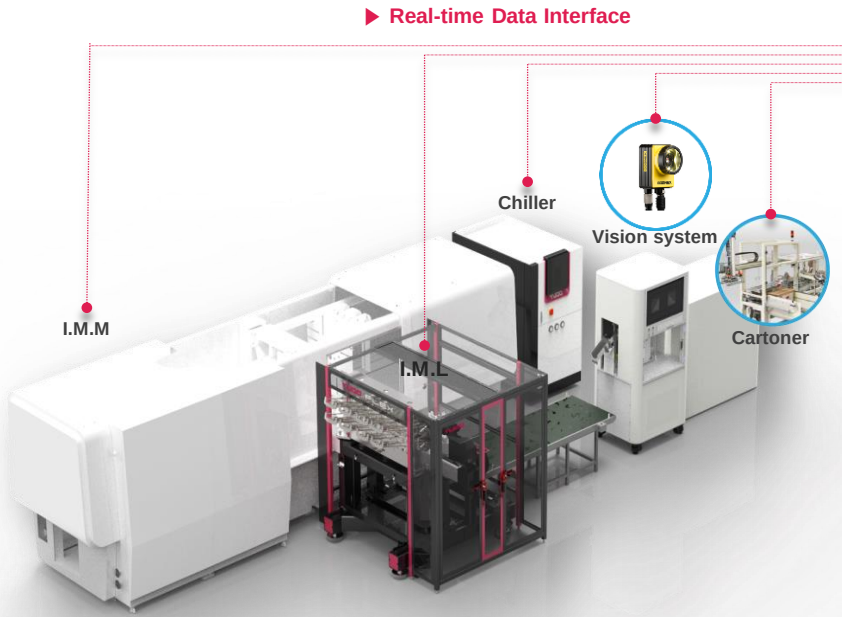
Cup IML

Lid IML

Container IML

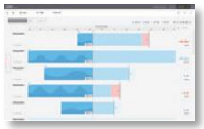
Blow-molding Bottle IML

2-1. IMC.M

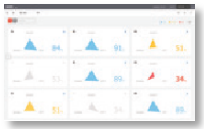


IMC.M

MES :
Manufacturing
Execution
System



MBO :
Management
By
Objectives



OEE :
Overall
Equipment
Effectiveness

- **Uniform Reproducibility**
- **Implementation of Planned Production**
- **Continuous Production with Maximum Efficiency**

Injection Automation

- **Take-out Robot**
- **MTC** Mold Temperature Control
- **MH** Material Handling
- **HRS** Hot Runner System
- **HRC** Hot Runner Controller

Factory Automation

- Mobile equipment
- Optical equipment
- Car manufacturing
- In-mold labeling
- Home electronics

Vision System

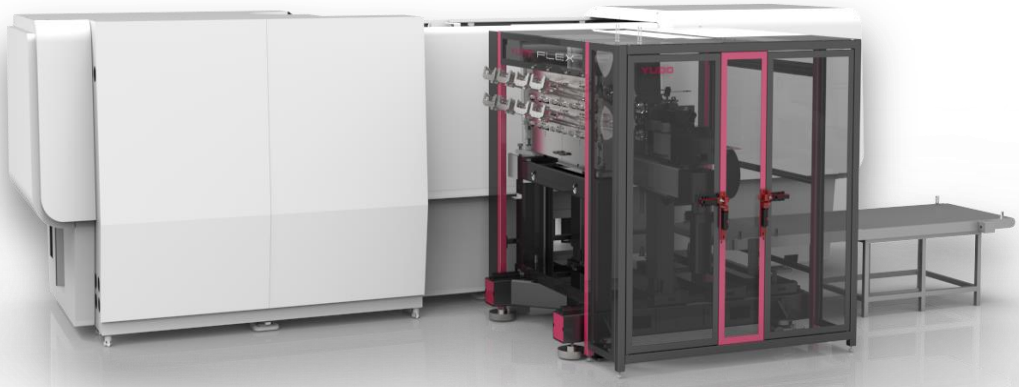
Integrated Logistic Automation

- **AGV** : TAGON

Warehouse Automation

- **TAGON Shuttle**

Customers using the **IMC** platform are able to monitor the complete Injection Molding process intuitively, enabling them to maximize resources and improve efficiencies and productivity using “fact-based” data resulting in a more automated and competitive work environment.
The **IMC** platform enables connection and integration of ALL **YUDO** Equipment for Real-Time Data Acquisition.



Functional Modularization with LM base

Fence / Main Platform / Label Supplier / Side entry robot / Stacking Unit / Conveying System

FLEX

IN MOLD LABELING SYSTEM

Per Product, IML Process Variable Composition

FLEX is possible to reconstruct major module equipment according to mold type. Also it is possible to equip additional module for assembly and inspection except the basic equipment composition. Customer can reduce capital expenditure cost and save setting time to remodel per part unit.

Features

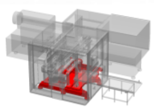
- **Improve Productivity**
  / FLEX Modular system
  / High cycle (1.3sec)
- **Easy Management / Supervise**
  / Excellent Expandability
  / Open and shut magazine Unit design
- **High quality**
  / Label placement calibration
  / YUMAN method : Accurate Label film absorption
  / Improvement of yield

2-2. IN MOLD LABELING_FLEX

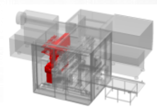
2-2. IN MOLD LABELING_FLEX

2-2. IN MOLD LABELING_FLEX

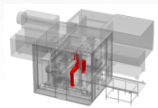
2-2. IN MOLD LABELING_FLEX



Module 1
: Main platform

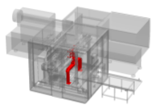


Module 2
: Label supplier

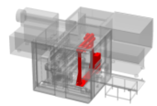


Module 3
: Side entry robot

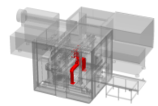
>> **Combination** of FLEX module



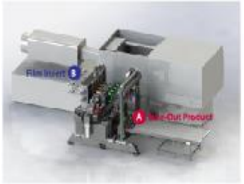
Module 4
: Receive unit



Module 5
: Staking Unit

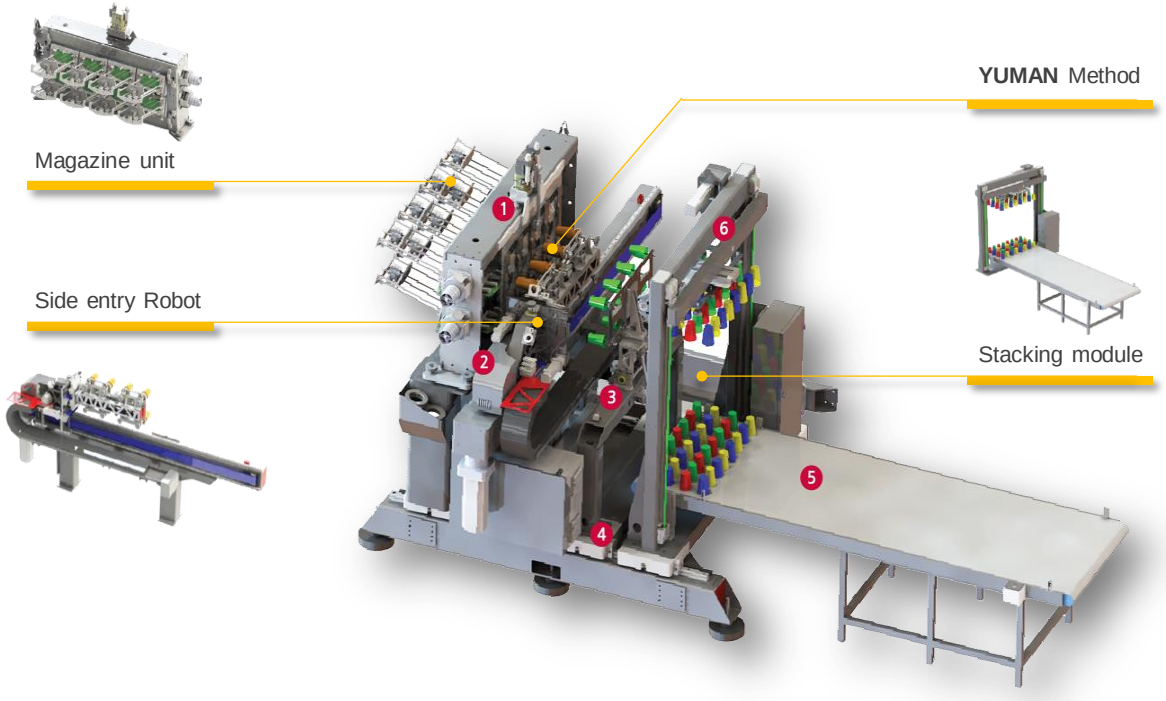


Module 7
: Conveying System



Process Shift
According to mold type

2-2. IN MOLD LABELING_FLEX



FLEX Modular system

① **Label Supply Module**
Stable Label Supply, Possible to supply label while driving the machine

② **Side Entry Robot**
Realize High Cycle, Minimize shaking with optimized structure

③ **Receive Module**
Transfer from Stacking Unit from Side entry Robot, Change Loading direction

④ **Modular Frame**
Safe arrival and adjustment of each module, Connection and Fix with IMM, Possible to adjust the standby position according to mold thickness

⑤ **Conveyor Module**
Possible to change take out direction

⑥ **Stacking Module**
Available to stable loading carrying and X,Y Packing

Economical IML System for high productivity

Y-PACK

IN MOLD LABELING SYSTEM

High technical **Y-PAC** provides more economical I**ML** system for increasing productivity.
YUDO is available to give substantial advice for making Label, Packaging design, IMM, Mold, Material and **IPO**(Injection Process Optimal)equipment.

Features

- **Productivity**
  / Reduced cycle time by simplified process without separate pre-process and post-process

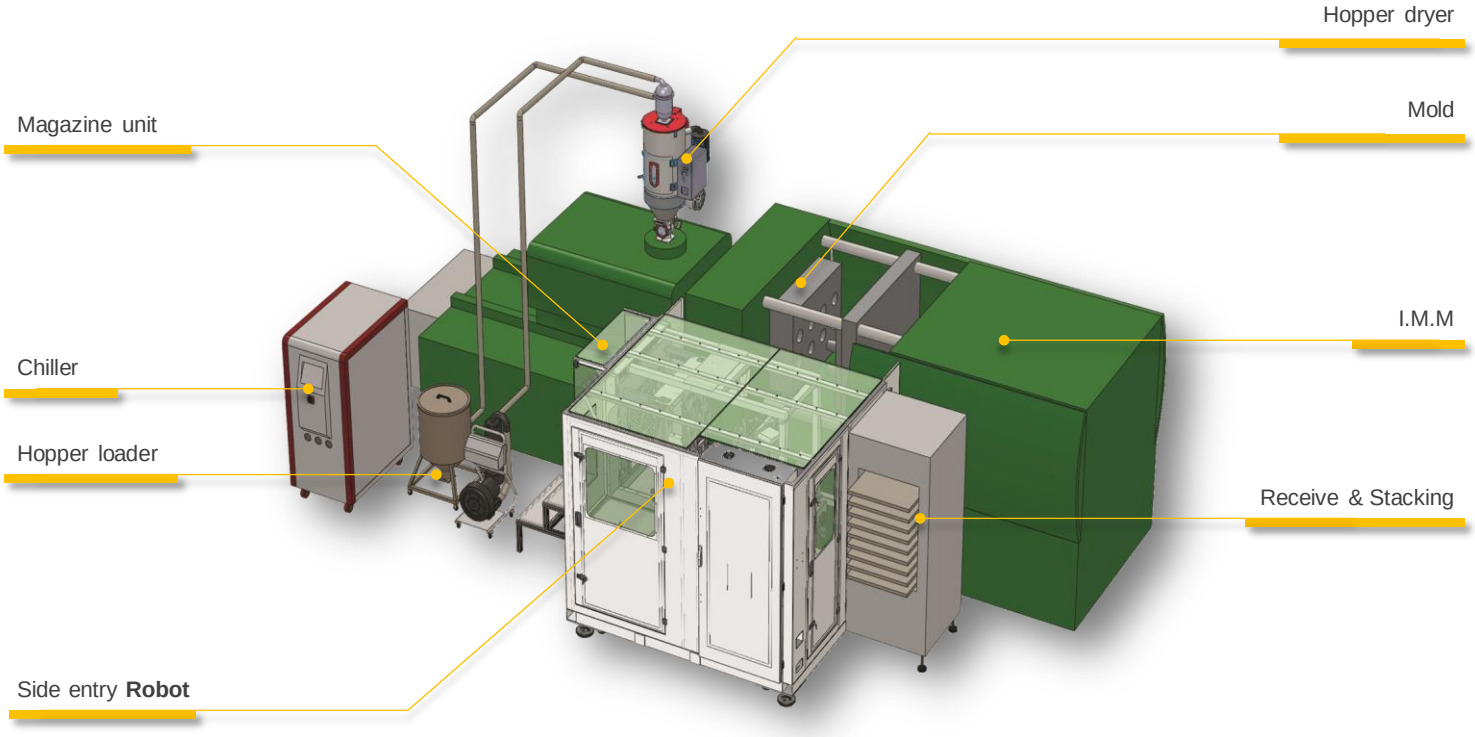
  * Insert & Take-out time within **1.52**sec. (i.e. 8-cavity cup)

- **Durability**
  / Improvement of container rigidity and shelf life extension: Daily products

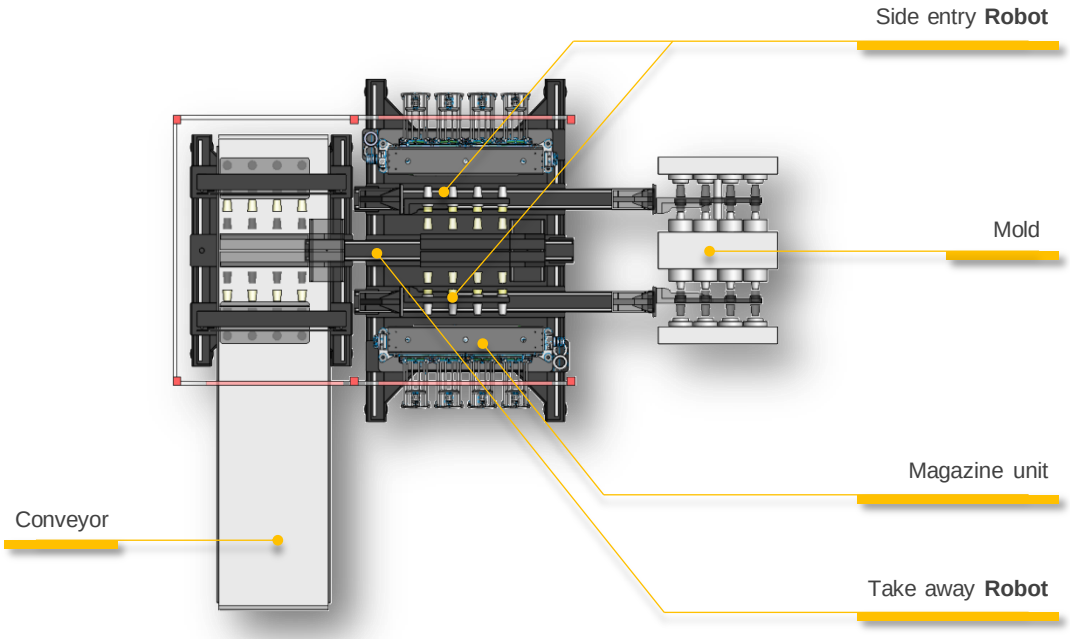
- **Sanitation level**
  / No need for separate glue process
  : Suitable for food container

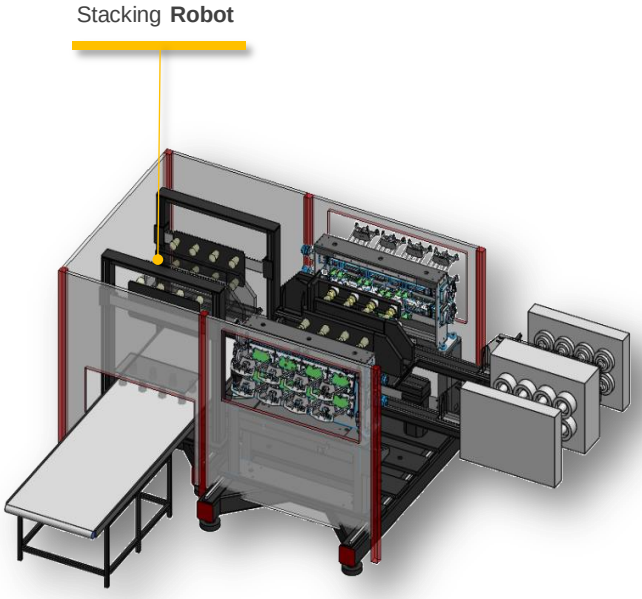
2-3. IN MOLD LABELING_Y-PACK

2-3. IN MOLD LABELING_Y-PACK



2-3. IN MOLD LABELING_Y-PACK



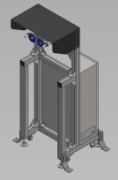
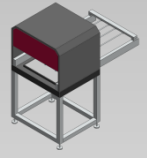


SMART FACTORY Solution

VIsIon InspectIon Technology

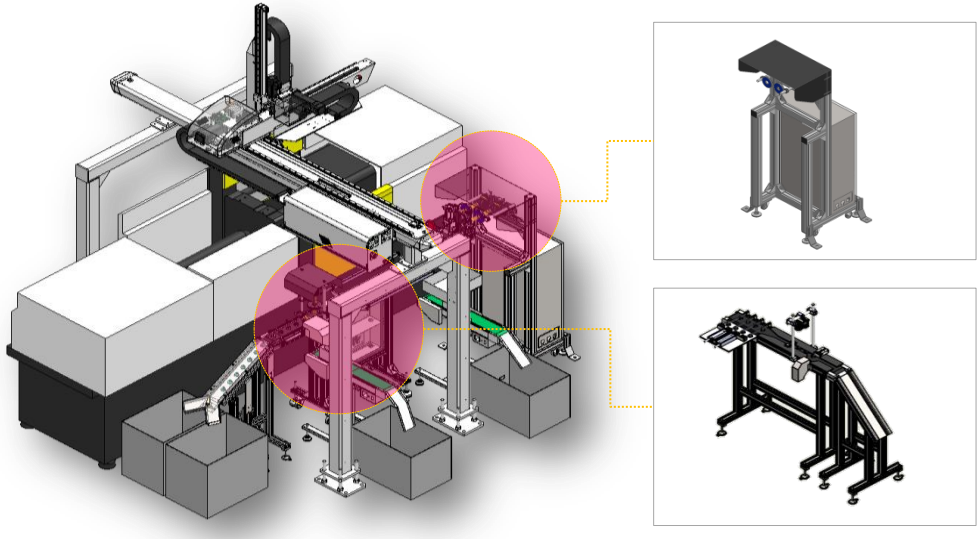
3. VISION INSPECTION SYSTEM

> Type of Vision System

Type	Strength	Weakness
 **A : Standard Type** : Vision + Take-out Robot	• Small injection part • Side light • Low cost	• Contamination from external variables • Flat surface only • Impinge on Cycle Time • Space and Fence required
 **B : Stand alone Type** : Vision Unit + Weight check	• Med-large injection part • Side light + Back Light • Easy and accurate result due to illumination overlap • No contamination • Large surface applicable	• Med-cost • Curved surface available • Space required
 **C : Multi-axis robot Type** : Vision + Multi-axis Robot	• Available from all angles • Side light • Curved surface at higher height • No limit of height and shape of objectives	• High cost • Contamination from external variables • Space and Fence required • Specialist for multi axis robot

3. VISION INSPECTION SYSTEM

> Standard Type



Features

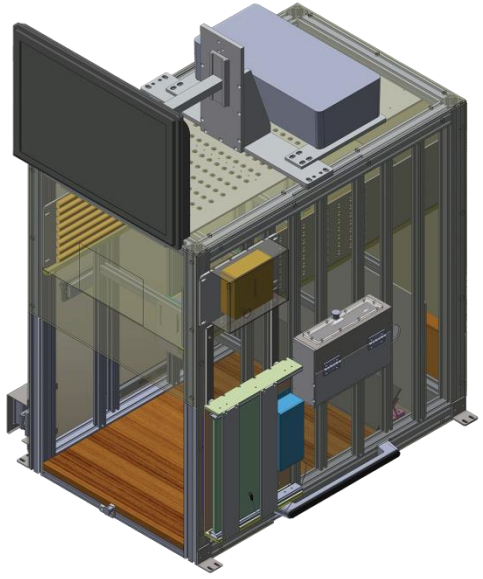
- Cycle Time : about 15~20sec
- Incomplete molding and appearance
- Measurement : dimension
- Vision Camera resolution : VGA, 1M, 2M, 5M
- Coaxial Light

Composition

- System Frame
- Cover
- Vision Camera
- LED Light Unit

3. VISION INSPECTION SYSTEM

> Stand alone Type



Features

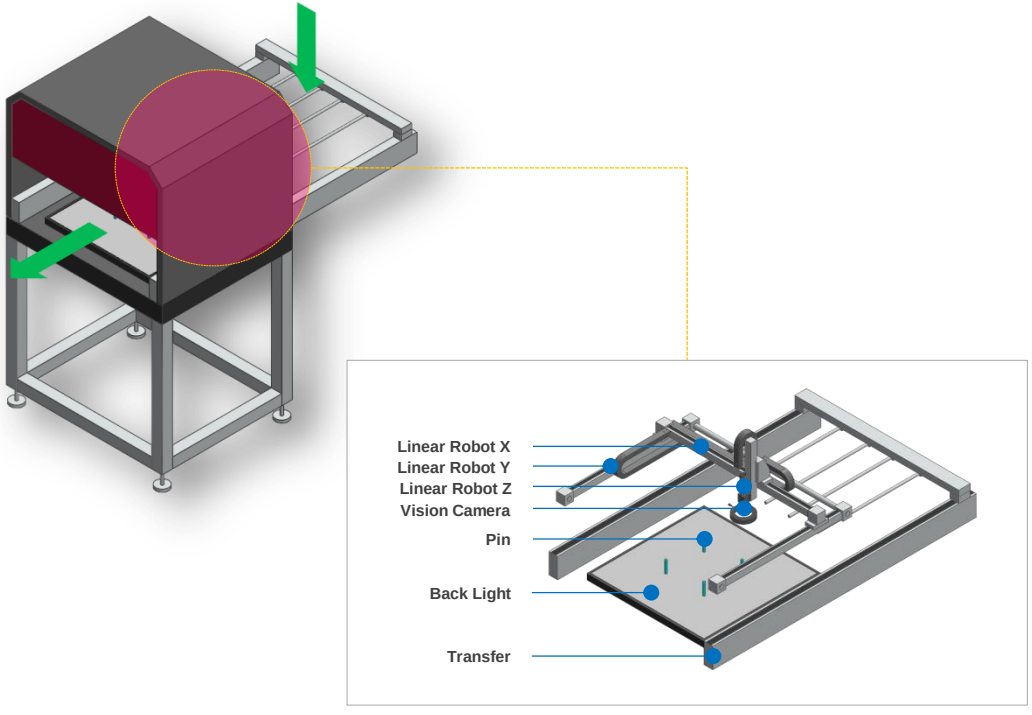
- Cycle Time : about 15~20sec
- Incomplete molding and appearance
- Measurement : dimension
- Vision Camera resolution : : VGA, 1M, 2M, 5M
- Coaxial Light

Composition

- System Frame
- Cover
- Vision Camera
- LED Light Unit

3. VISION INSPECTION SYSTEM

> Stand alone Type



Features

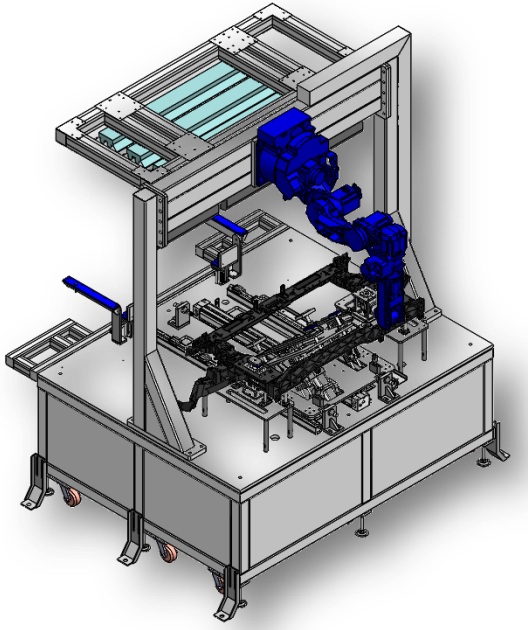
- 3D JIG design technology
- Best Cutting solution based on YUDO know-how
- Higher flexibility

Composition

- Coaxial Light
- Side Light
- Back Light
- Nipper cutters
- By-Pass Trim tools
- Pinch trim

3. VISION INSPECTION SYSTEM

> Multi-axis Robot Type



Features

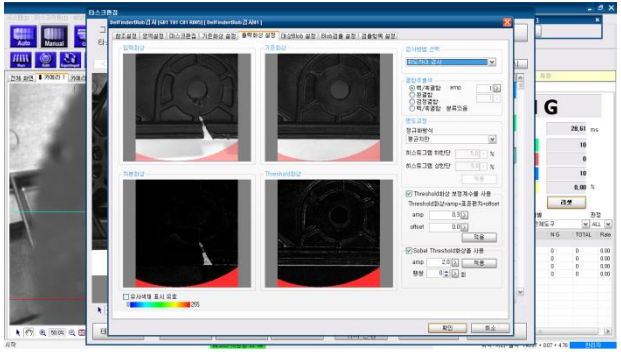
- Cycle Time : about 50~80sec (Inspection Point)
- Inspection item : / Bolt, Nutsert, Nut Spring
  / Assembly and part miss
  / incomplete molding
- Vision Camera resolution : VGA, 1M, 2M, 5M + Measurement

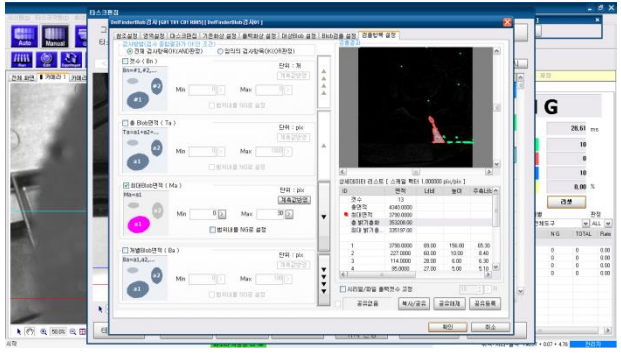
Composition

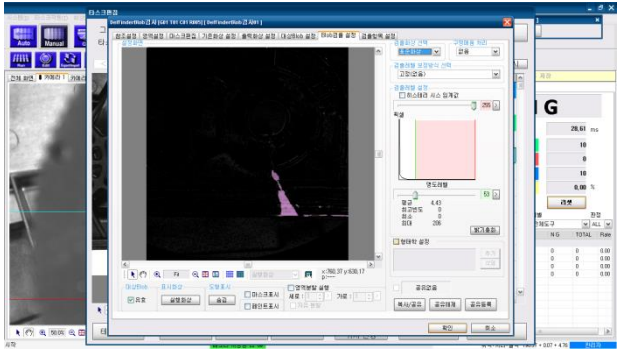
- Robot
- Sliding Unit
- Vision Camera
- Lamp Unit
- Power Clamp

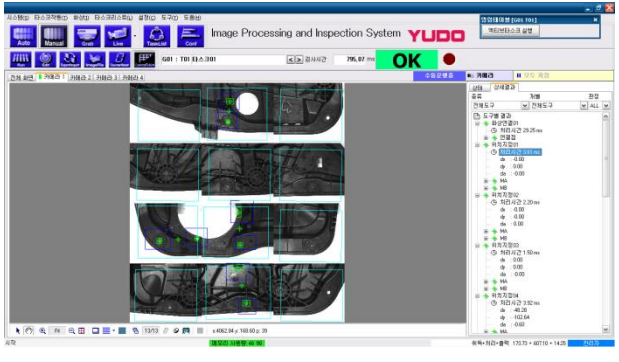
3. VISION INSPECTION SYSTEM

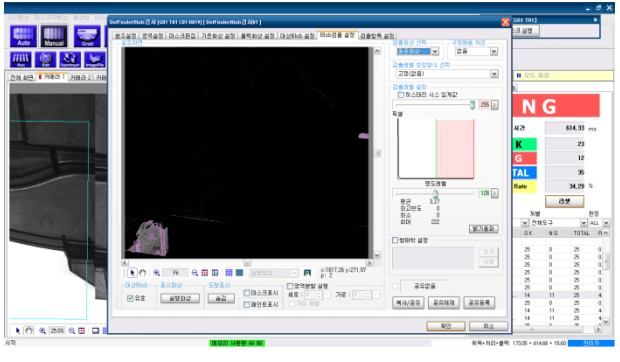
> User Interface





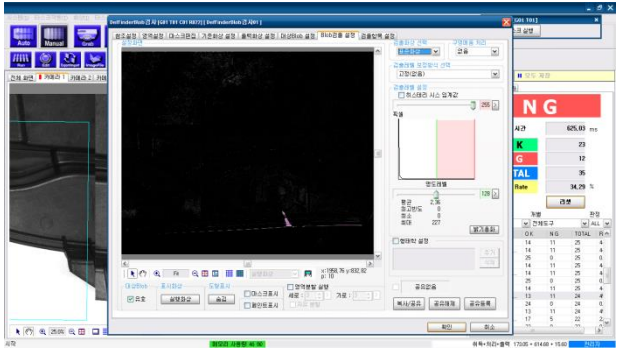


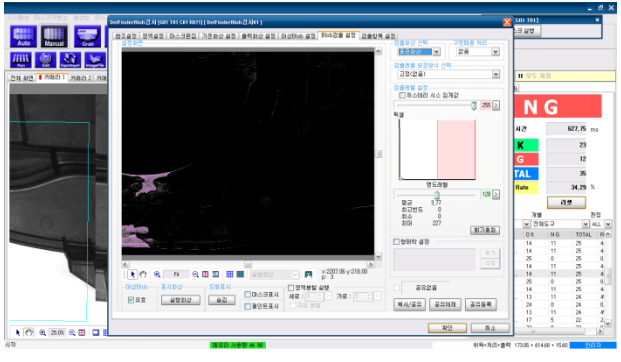
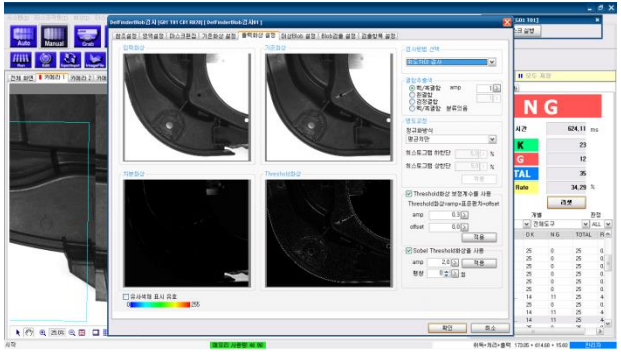
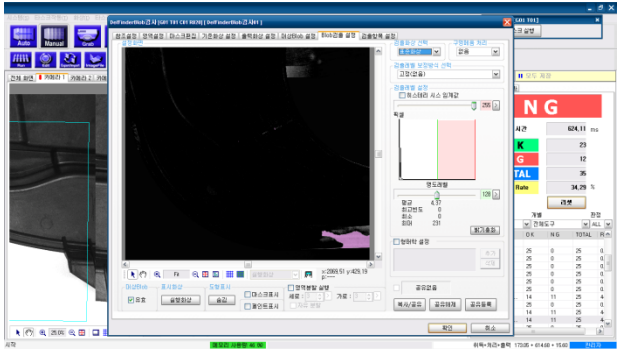




3. VISION INSPECTION SYSTEM

> User Interface

SMART FACTORY Solution

LogIstIc AutomatIon Technology

4. LOGISTIC AYTOMATION SYSTEM

> TAGON

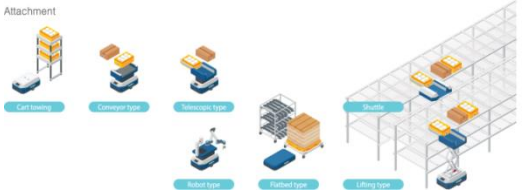
AGV: TAGON

SMART FACTORY Solution

Warehouse Automation Technology

5. WAREHOUSE AYTOMATION SYSTEM

> TAGON Shuttle



Thank you.