

Skill and Experience  
Create a new

**NO.1** Customized auto mecha-solution partner  
Technology that guarantees assurance  
Innovation that exceeds the basics

# SANGSIN ENG





## The History of SANGSIN ENG

- 1991.01 Cheongwoo Machine Established
- 1993.03 Sheet Lining Automated Line Developed
- 1994.05 Shoe Assembly Automated Line Developed
- 1995.03 Large Shoe Lining Automated Line Developed
- 1997.05 Company Name Changed to Cheongwoo ENG
- 2003.04 Large Shoe Auto Riveting Device Developed
- 2005.05 Auto Forming M/C Developed
- 2006.10 Modular Automated Line Developed
- 2007.01 Company Name Changed to Sangsin ENG Co.,Ltd
- 2007.02 Chinese Machinery Division Newly Established
- 2009.01 Pad Finished Accessory Assembly Line Developed
- 2010.08 Linear Pre-Forming M/C 4Cavity 6P Developed/  
Direct Input Semi-Auto Forming
- 2011.01 Rotary Type Weighing And  
Pre-Forming Equipment Developed
- 2011.12 5 Million Dollars Export Tower On Trade Day Awarded
- 2012.01 Multi Grinding M/C Developed
- 2012.12 Linear Pre-Forming M/C Exported to Japan Brake in Japan
- 2013.08 Mini 2-Stage 300 Tons Press Developed
- 2014.12 10 Million Dollars Export Tower On Trade Day Awarded
- 2015.02 SE-Model Tester (1/5 Scale) Developed
- 2015.04 SE-D20A Dynamometer Developed (Full Type)
- 2015.05 TBK Auto Weigher & Mixer Line Developed
- 2016.12 Linear Auto Forming  
M/C\_Large(4Cavity X 6P) Developed
- 2017.03 Servo Type Hydraulic Motor Developed
- 2017.12 SE-D25LNA Noise Dynamometer Developed
- 2018.01 Compressibility Tester Developed
- 2018.01 SE-Model Tester for Rail Brake Developed
- 2018.12 30 Million Dollars Export Tower Awarded on Trade Day
- 2020.12 Direct Charging Robot Press (4-Cavity X 6/8P) Developed
- 2021.01 Automatic Flow Line (Multiple Application) Developed
- 2022.02 Flow Curing Oven Developed
- 2023.02 Linear Pre-Forming Continuous Automatic Line
- 2024.02 Robot Grinding M/C Developed
- 2025.03 Automatic Accessory Line(Version 2) Developed



30 Million Dollar Export Tower Award  
on Trade Day



## The Product of SANGSIN ENG

### Pad-Part

Weighing and Mixing Facilities  
Raw Material Mixer (50D, 600D, 1200D)  
Shot Blaster & Cleaning M/C  
Back Plate Coating Pretreatment Line  
Direct Input Semi-Auto Forming M/C (4-Cavity X 6P)  
Linear Auto Forming M/C (4-Cavity X 6P)  
Rotary Pre-Forming M/C (Weighing + 300 Tons)  
Clamping Vise & Heat Treatment Tunnel Furnace  
Pad Finishing Line  
(Grinding-Scorching-Powder Coating-Accessory)  
Direct Input Semi-Auto Forming M/C\_Large Pad(2-Cavity X 6P)  
Linear Auto Forming M/C\_Large Size(4-Cavity X 6P)  
Back Plate Hole Punching M/C  
Direct Charging Robot Press(4-Cavity X 6/8P)  
Automatic Flow Line (Multiple Application)  
Flow Curing Oven

### Small Shoe-Part

Sheet Finishing Line  
(Cutting, In/Out Grinding M/C, Marking M/C, Chamfering M/C)  
Shoe Welding Line  
(Shoe Welding M/C, R-Correction M/C, Preprocessor)  
Spreader and Bonding Oven  
Shoe Auto Bonding M/C  
Shoe Outer Surface Grinder

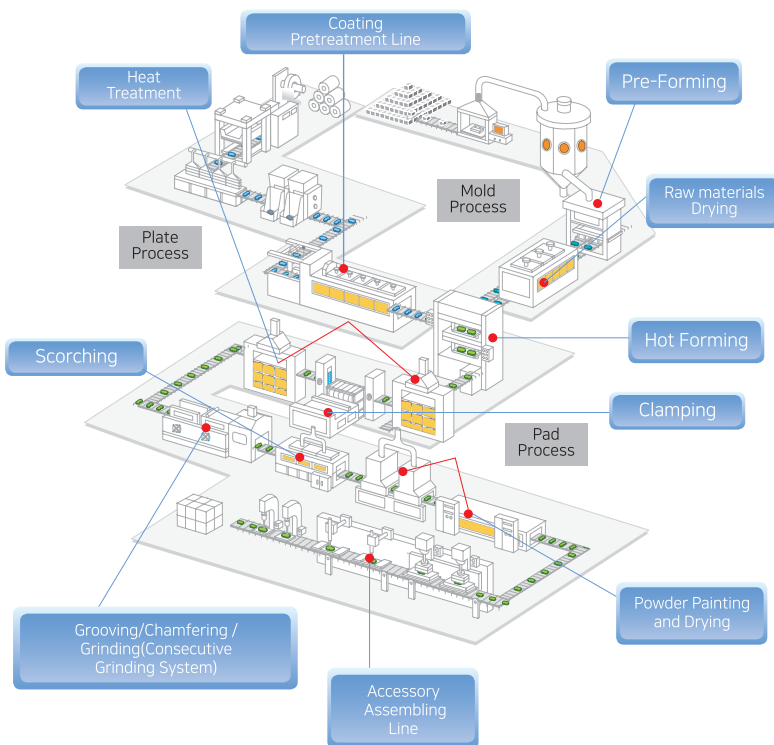
### Large Shoe-Part

2-Axis Drilling M/C  
Large Riveting Device  
Lining Grinding Line  
Shoe Coating M/C  
Large Assembly Line

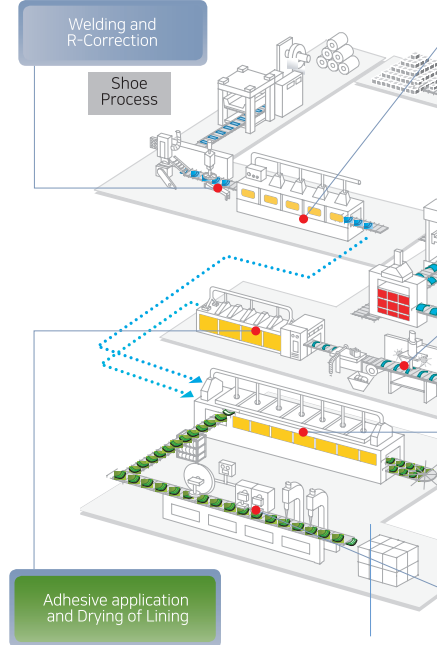
### Tester-Part

SE-Model Tester (1/5 Scale)  
SE-D20A Dynamometer  
SE-D25LNA Noise Dynamometer  
SE-D25LB Low Temperature Dynamometer  
SE-Model Tester for Rail Brake  
SE-Model Tester for Commercial Vehicle Brake

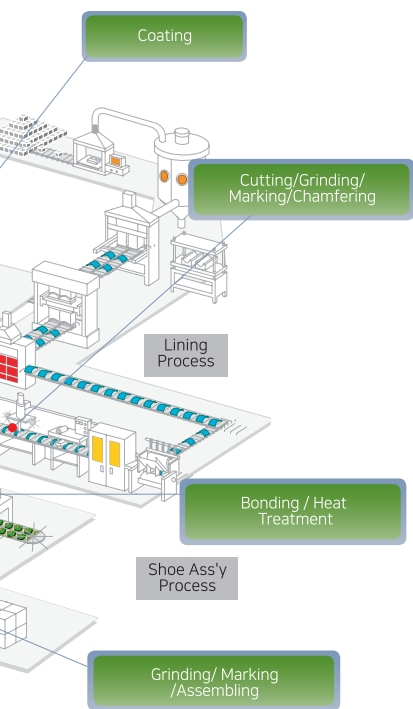
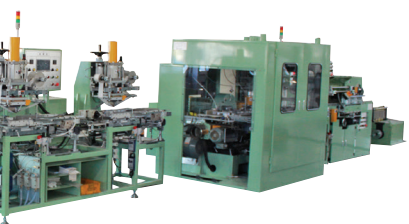
## Pad Process



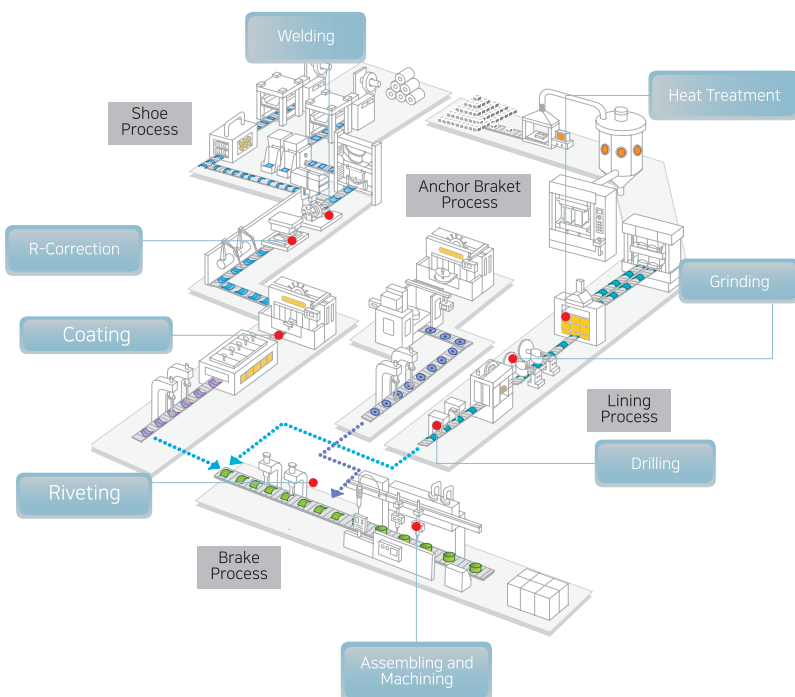
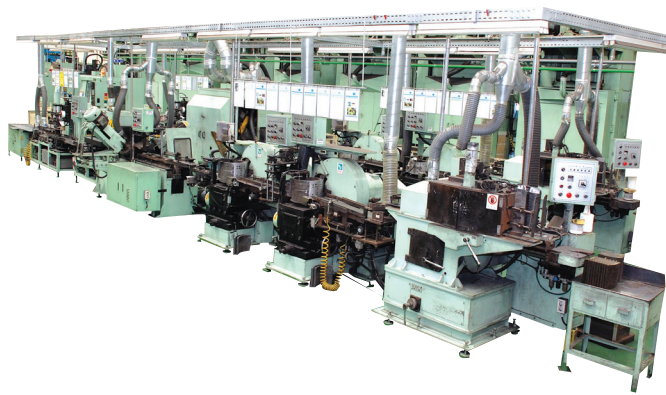
## Shoe Pr



# Process



# Brake Process



# Pad Process

**Clamping**

Process preventing deformation and keeping physical characteristics of properties

**Raw materials Drying**

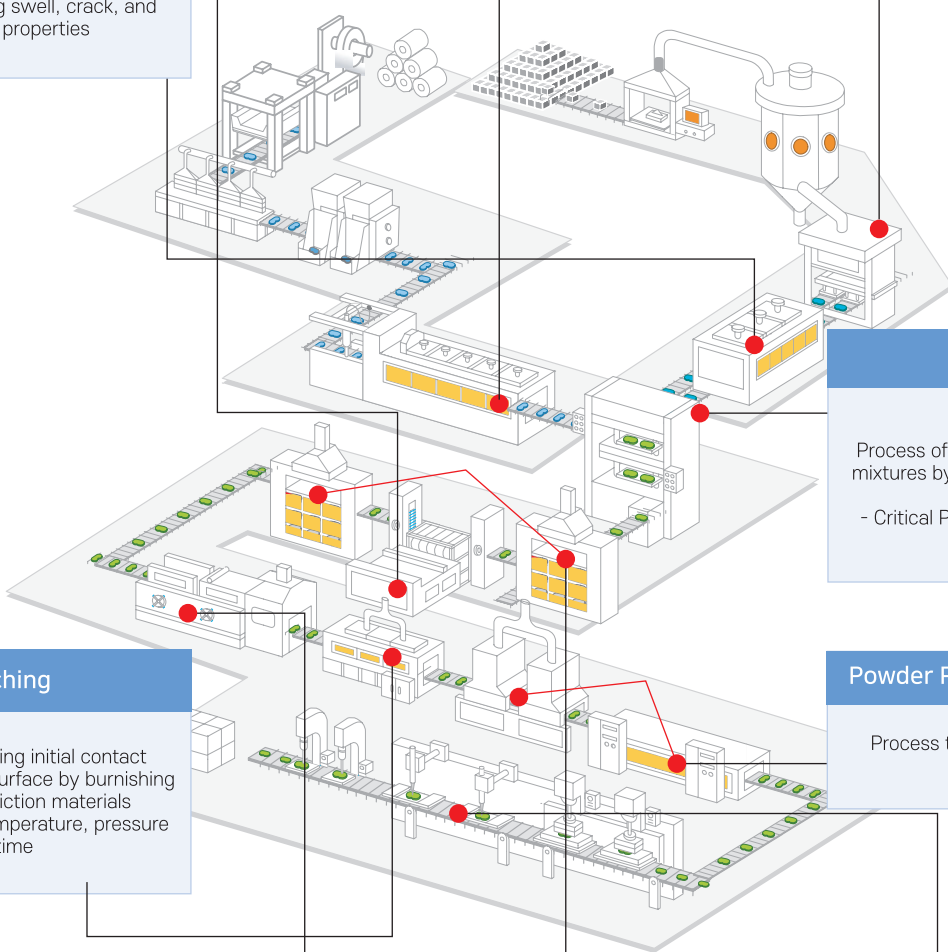
Process of reducing swell, crack, and variation of properties

**Spray Pretreatment Line**

Process of product formation with mixtures by temperature, pressure, and time  
- Critical Processes for properties

**Pre-Forming**

Process of making pre-shape of the product to be easy to make the next forming  
- Critical Processes for properties



**Forming**

Process of product formation with mixtures by temperature, pressure, and time  
- Critical Processes for properties

**Scorching**

Process of improving initial contact condition of friction surface by burnishing the surface of friction materials  
- Setup of proper temperature, pressure and time

**Powder Painting and Drying**

Process to paint the surface of back plate

**Grooving/Chamfering/Grinding (Consecutive Grinding System)**

Process of slotting center of mold for reducing noise and temperature  
- Maintaining parallelism of product

**Heat Treatment**

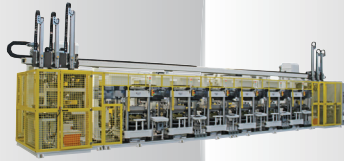
Process to acquire necessary properties doing hardening resin inside the mould by inputting specific heat

**Assembling Line(Accessories)**

Process of automatic assembling and inspecting part such as shim, wear indicator



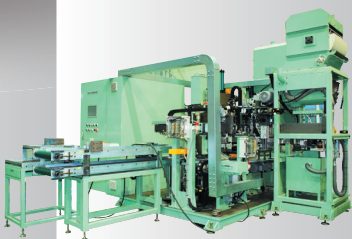
Direct Charging Robot Press  
(4Cavity X 8P)



Direct Input Semi-Auto Forming M/C



Linear Auto Forming M/C



Rotary Pre-forming M/C



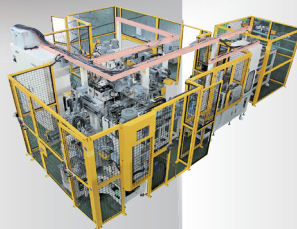
2-Stage Press for 300 & 400 Tons



Pad Finishing Line



Multi Grinding M/C



Pad Shim Auto Pressing Line



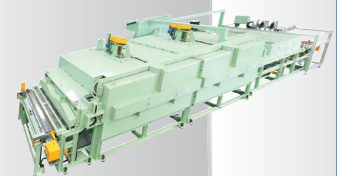
Robot Grinding M/C



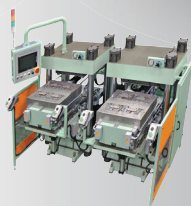
Back Plate Coating Pretreatment Line



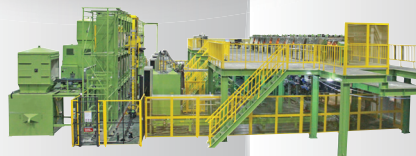
Pad Accessory Assembly Line



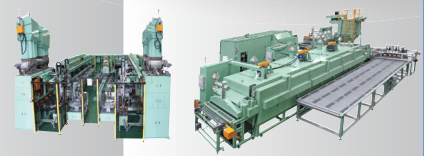
Flow Curing Oven



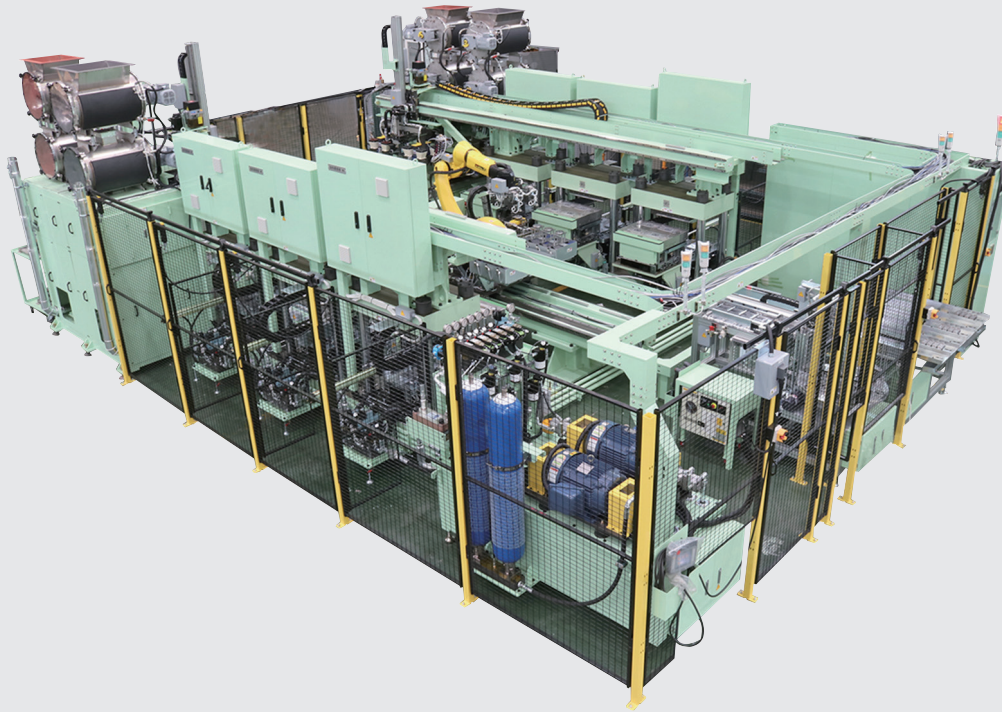
Multiple Press



Auto Weigher & Mixer Line



Automatic Flow Line  
(Multiple Application)



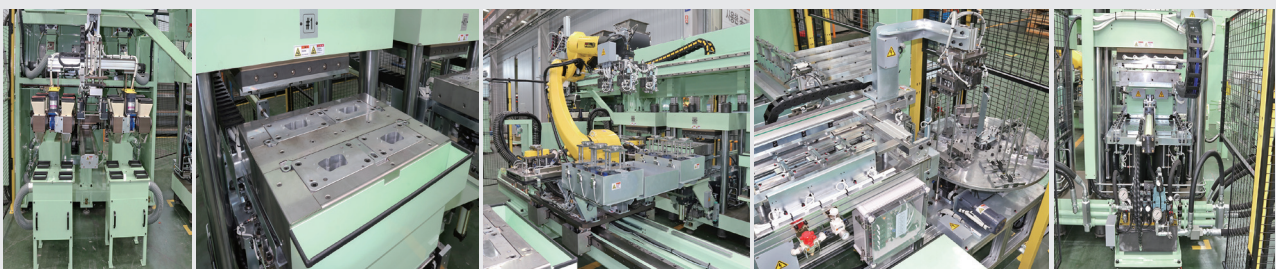
## Direct Charging Robot Press (4Cavity X 6P)

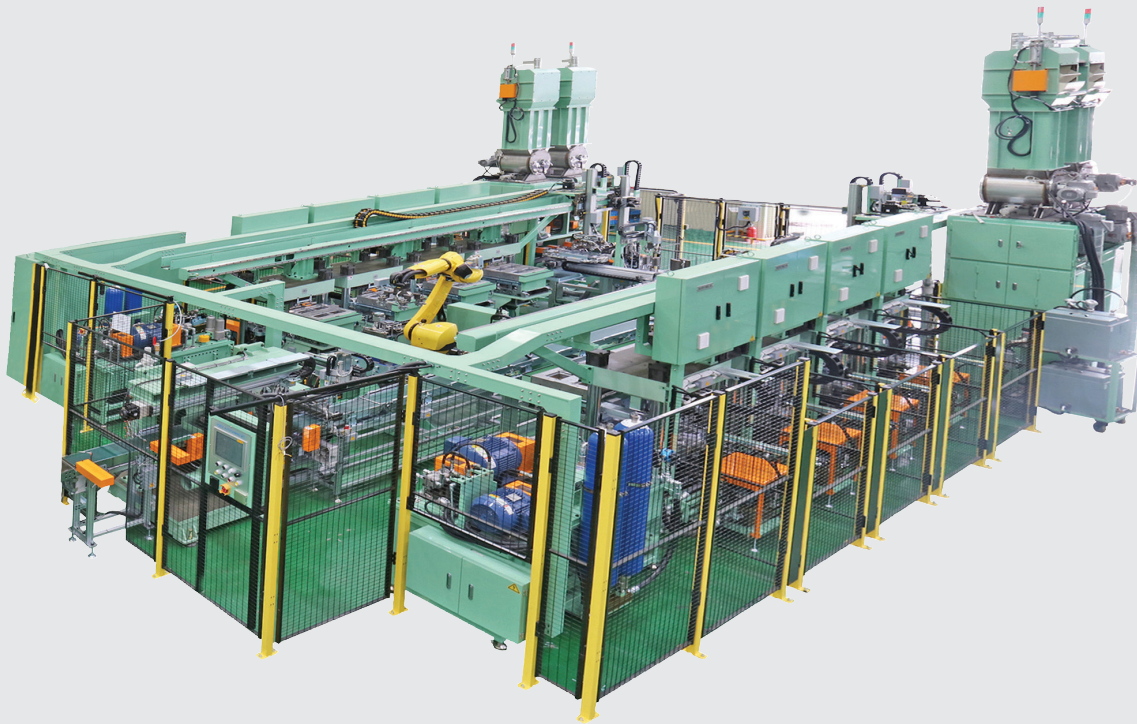
### Feature

- ▶ All of automatic process from supplying raw material to discharging product.
- ▶ 1 cell consists of 6 presses.
- ▶ 6 different models are possible to be produced
- ▶ When a mold is replaced in a press, other presses are able to be on manufacturing.

### Spec

- ▶ Capacity : MAX 205PCS/HR(Changeable according to working standards)
- ▶ Process : Dry&Weighing(2 Units) → GANTRY(Input friction material, Leveling) → ROBOT(Releasingagent, BRUSH, Tamping, Input B/PLATE) → Forming(6P) → ROBOT(Discharging forming product) → Automatic loading





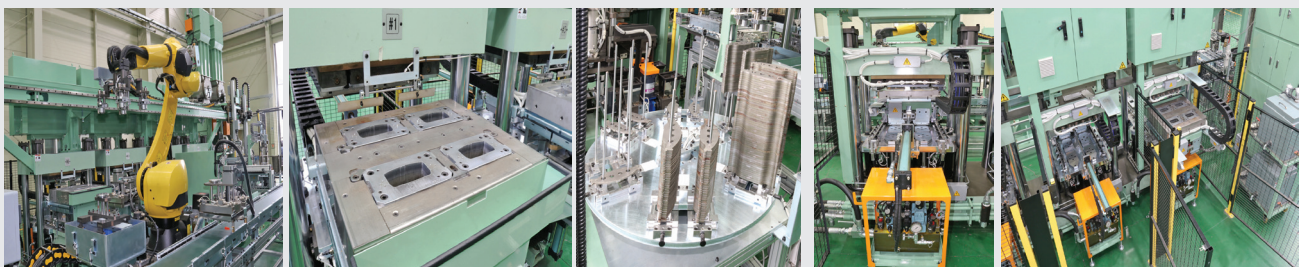
## Direct Charging Robot Press (4Cavity X 8P)

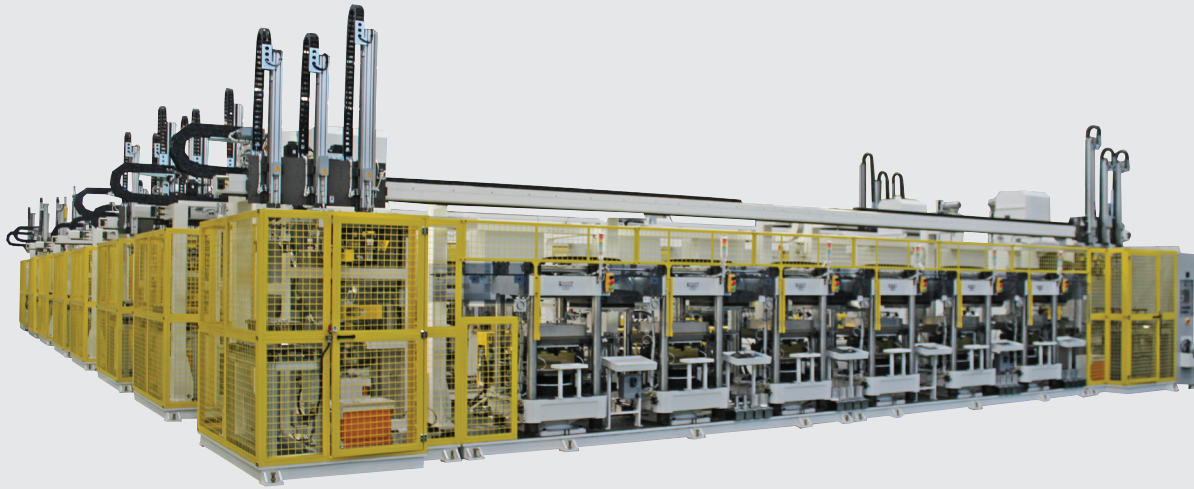
### Feature

- ▶ All of automatic process from supplying raw material to discharging product.
- ▶ 1 cell consists of 8 presses.
- ▶ 8 different models are possible to be produced
- ▶ When a mold is replaced in a press, other presses are able to be on manufacturing.

### Spec

- ▶ Capacity : 300PCS/HR(Changeable according to working standards)
- ▶ Process : Dry&Weighing(2 Units) → GANTRY(Input friction material, Leveling) → ROBOT(Releasingagent, BRUSH, Tamping) → Forming(8P) → ROBOT(Discharging forming product) → Automatic loading





## Direct Input Semi-Auto Forming M/C

### Feature

- ▶ Suitable for small quantity batch production
- ▶ 1 cell operable by 1 operator / 1 cell consisting of 6 forming presses
- ▶ Process-specific automatic and semi-automatic separate production
- ▶ Management a variety of conditions
- ▶ Same material available to up to six kinds of vehicles
- ▶ Easy replacement of molds
- ▶ Mold production costs reduction (Insert Type)

### Spec

- ▶ Capacity : 220 Pcs/HR (It varies depending on the forming time.)
- ▶ Process : Raw material input (Mixture / Under Layer) → Automatic Weighing → Gantry (Material supply, Homogenizing, Compaction) → Back Plate Input (manual) → Forming → Discharging Product





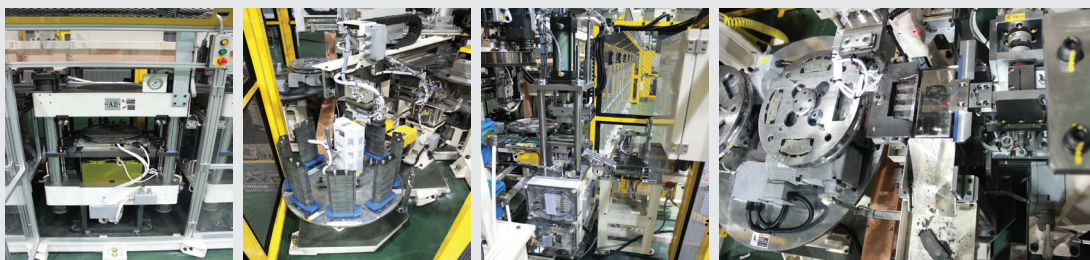
## Linear Auto Forming M/C

### Feature

- ▶ Suitable for small quantity batch production
- ▶ 4 cells (24 presses) operable by 1 operator / 1 cell consisting 6 forming presses
- ▶ Full automation of the entire process (Manual part : Back Plate Loading, Raw Material Supply)
- ▶ Only for OEM
- ▶ Management a variety of conditions

### Spec

- ▶ Capacity : 220 Pcs/HR (It varies depending on the forming time.)
- ▶ Process : Raw material input (Mixture / Under Layer) → Automatic Weighing → Pre-forming → Back Plate Input → Gantry (Product supply, Parting agent, Brush, Output) → Forming → Thickness inspection → Trimming → Automatic load





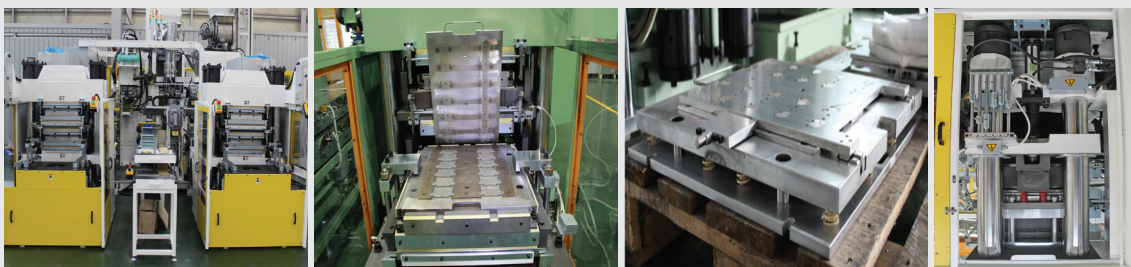
## 2-Stage Press of ▶ 300 & 400 Tons

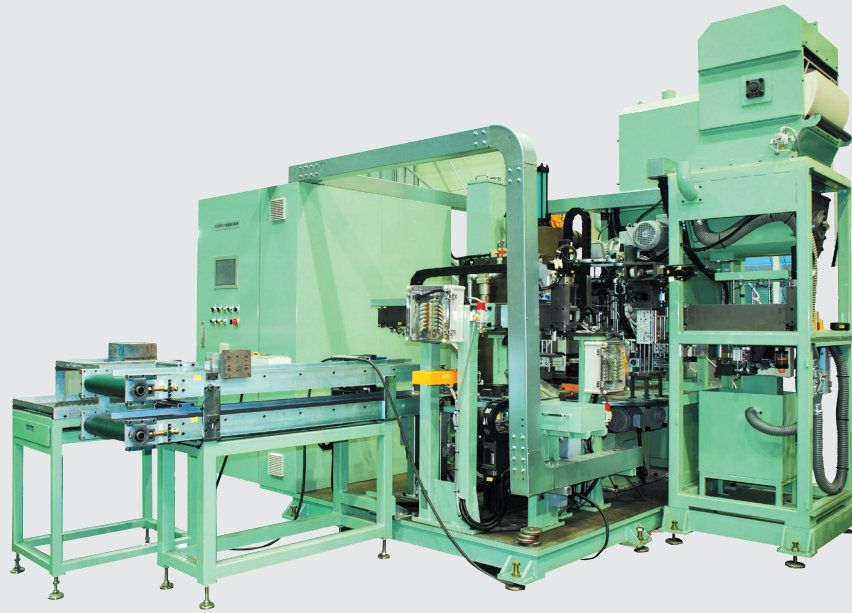
### Feature

- ▶ Consisting of up / down 2-stage mold
- ▶ Free combination and production of mold due to the configuration of 10-12 holes / 1 set
- ▶ Mold weight lightening and mold replacement time reduction
- ▶ Compact equipment configuration
- ▶ Suitable for small quantity batch production
- ▶ Work efficiency improvement with a simple operation

### Spec

- ▶ Capacity : 300 Pcs/HR
- ▶ Process : Pre-formed pad Input → Back Plate Input → Forming → Discharging Product





## Rotary Pre-Forming M/C

### Feature

- ▶ Compact equipment configuration
- ▶ Suitable for small quantity batch production
- ▶ Same material available to up to two kinds of vehicles
- ▶ Compact equipment configuration
- ▶ Easy management of data

### Spec

- ▶ Capacity : 300 Pcs/HR
- ▶ Process : Raw material input (Mixture / Under Layer) → Automatic Weighing → Homogenizing → Compaction → Pre-forming → Sorting → Discharging Product





## Automatic Flow Line (Linear Preforming)

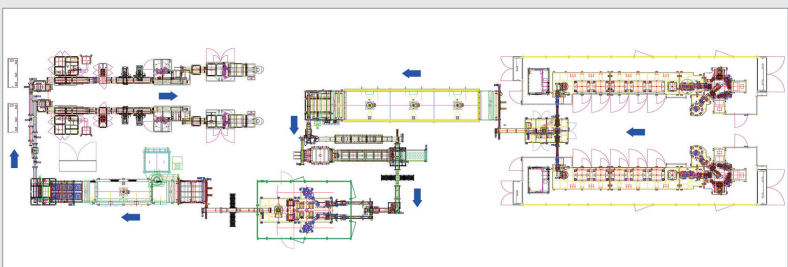
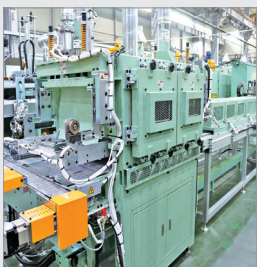
### Feature

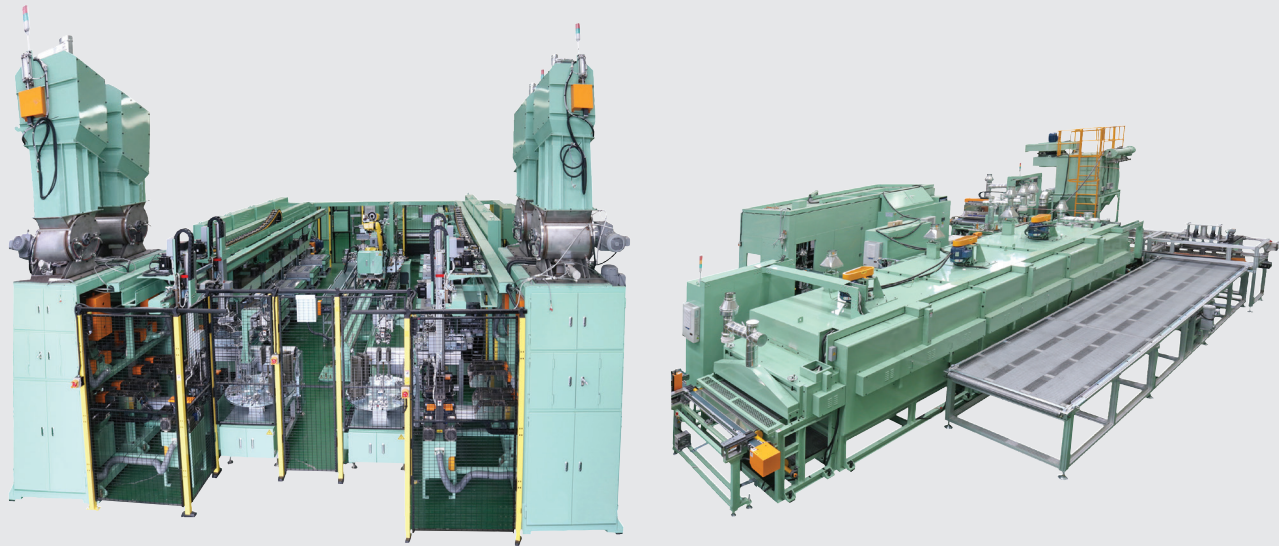
This line is a process from forming ~ 1st grinding ~ heat treatment ~ scorching ~ 2nd grinding ~ painting ~ heating ~ accessory assembly in the fully automatic brake pad production process.

- ▶ Forming machine with 2 CELLS that allow simultaneous production of 2 car types
- ▶ Excellent product quality through heat treatment and heating oven hot air type
- ▶ All shapes of chamfering, including j-cut, upper/lower straight chamfering, and reverse chamfering, are possible with robot grinding
- ▶ Automation of entire accessory process(shim assembly, silicon marking, sensor assembly, marking, vision, loading)
- ▶ The product quality is improved and power consumption is minimized, by combining the latest technologies in all processes such as forming, heat treatment and scorching etc.

### Spec

- ▶ Capacity : MAX 300PCS/HR
- ▶ Process : Preforming → Forming → Thickness Inspection → TRIMMING → 1st Grinding → Heat Treatment → Scorching or BY-PASS → 2nd Grinding(Chamfer, Grooving) → Powder Painting → Heating Oven → Shim Assembly/Pressing → Silicon Marking → Sensor Assembly → Marking → Vision Inspection → Loading





## Automatic Flow Line (Direct Charging)

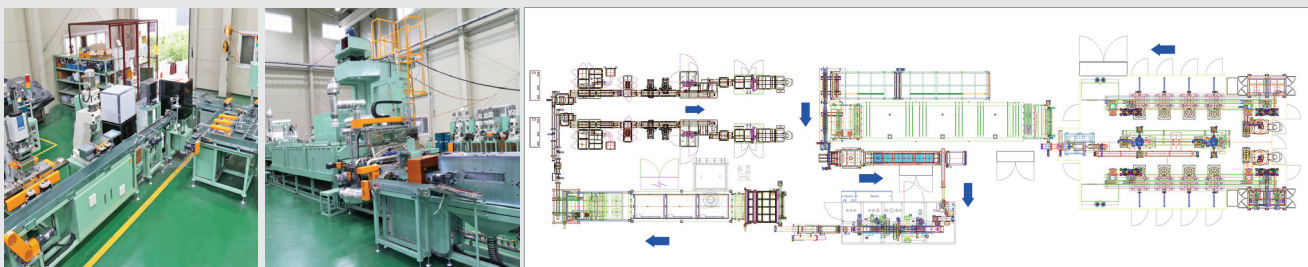
### Feature

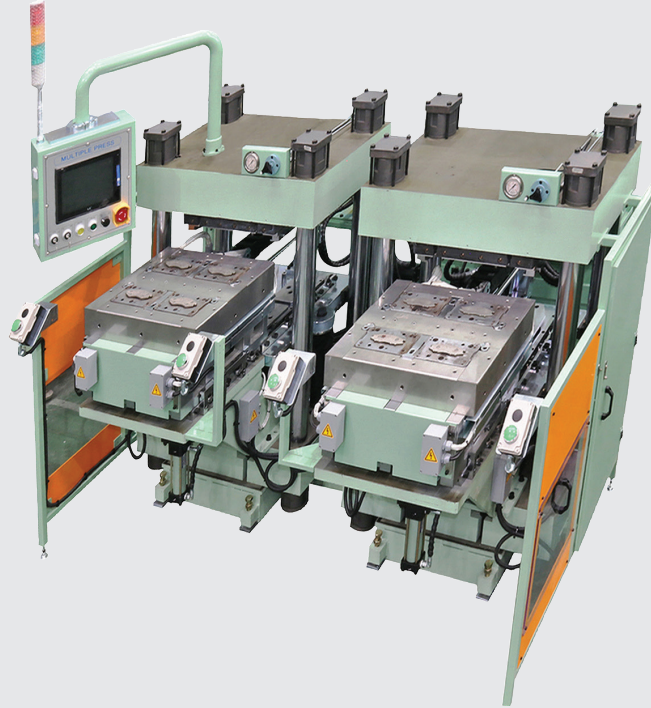
All of automatic process from forming to discharging product  
In forming process, possibility of automatic manufacturing and increasing the productivity by adding a robot

Developing quality by the hot air system in heating process  
Scoring reduces the heater capacity to 1/5 by shaking and swinging method (reducing power consumption) Real-time monitoring of the entire process is possible with IT and monitor

### Spec

- ▶ Capacity : 300 Pcs/HR (Changeable according to working operation standards)
- ▶ Process : Forming → 1st Grinding (Flat) → Heating → Scorching → Trimmings → 2nd Grinding (Flat, Grooving, Chamfering) → Painting Booth → Discharging Product





## Multiple Press

### Feature

- ▶ For use of Small quantity batch production, it is easy to replace models (Moulds)
- ▶ Each cavity has cylinder which supply same pressure during forming process.
- ▶ This type is useful for maintenance.
- ▶ Machine Type: shuttle type (Excellent workability and convenience of mold replacement)
- ▶ Forming pressure: 47.5ton x 4 cavities = 190ton

### Spec

- ▶ Capacity : 50 Pcs/HR (Changeable according to working operation standards)
- ▶ Process : Cleaning, Spraying release agent (Manual) → Supplying Mixture (Manual) → Leveling (Manual) → Supplying Back Plate (Manual) → Forming → Discharging Product





# Forming Press (Proto Shop)

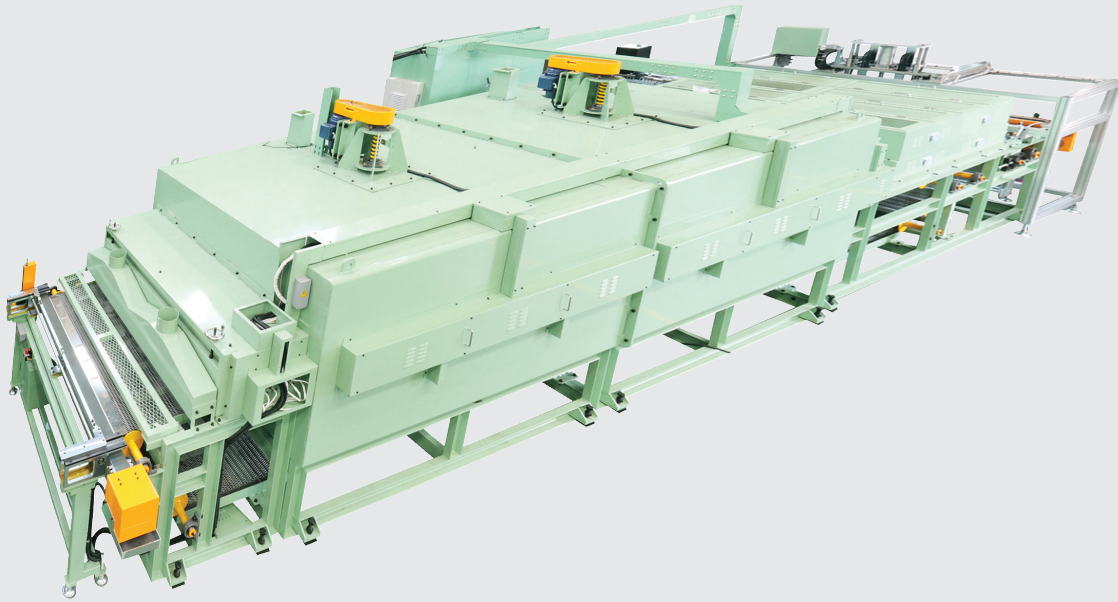
## Feature

- ▶ Small forming press for laboratory proto sample
- ▶ Applied the worker safety device
- ▶ It have same produce system and condition with actual manufacturing equipments

## Spec

- ▶ Process : Raw material Input (or Pre-formed Pad) → Heat forming → Discharging Product





## Flow Curing Oven

### Feature

- ▶ As heating process to manufacture brake pad, reducing energy consumption and developing quality by the hot air system in heating process
- ▶ Reduce number of operators by automatic continuous flow automation as conveyor type

### Spec

- ▶ Capacity : 400 Pcs/HR (Changeable according to Production quantity)
- ▶ Process : Supply formed product (Manual / Automatic) → Transferred by the conveyor → Heating → Discharging Product





## Pad Finishing Line

### Feature

- ▶ Quality stabilization implementation and process flow improvement
- ▶ Personnel and manufacturing cost reduction
- ▶ Configuration with highly efficient equipment

### Spec

- ▶ Capacity : 2,000 Pcs/HR
- ▶ Process : Integrated Grinder(Grinding, Grooving, Chamfering) → Scorching → Powder Painting → Baking furnace → Shim assembly → Marking → Sensor assembly → Inspection → Packing and loading





▶ Radial-Diagonal-Flat ◀



▶ Top-Straight-Flat ◀



▶ General-Two-line-Flat ◀



▶ Diamond-Straight-Flat ◀



▶ Radial-Straight-Flat ◀

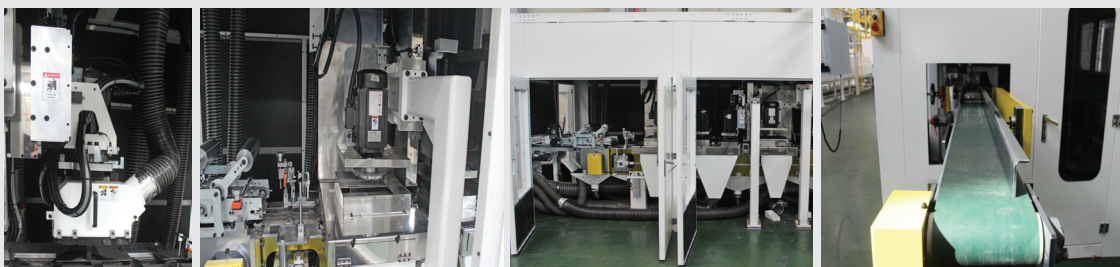
## Multi Grinding M/C

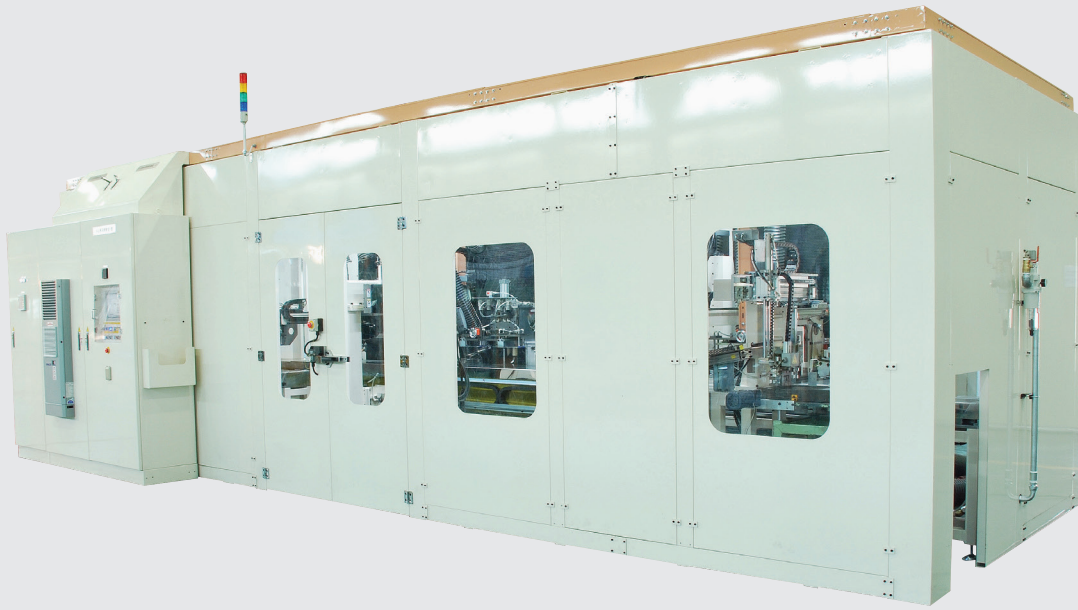
### Feature

- ▶ Maximization of production quantities
- ▶ Oblique grooving, radial chamfering, J-CUT Process available
- ▶ Reduction of vehicle replacement time

### Spec

- ▶ Capacity : 2,000 Pcs/HR (MAX: 2,400 Pcs/HR)
- ▶ Process : Product loading → Grooving → 1st Grinding → Chamfer → 2nd Grinding → Product demagnetizing → Product reversal → Brush → Discharging Product





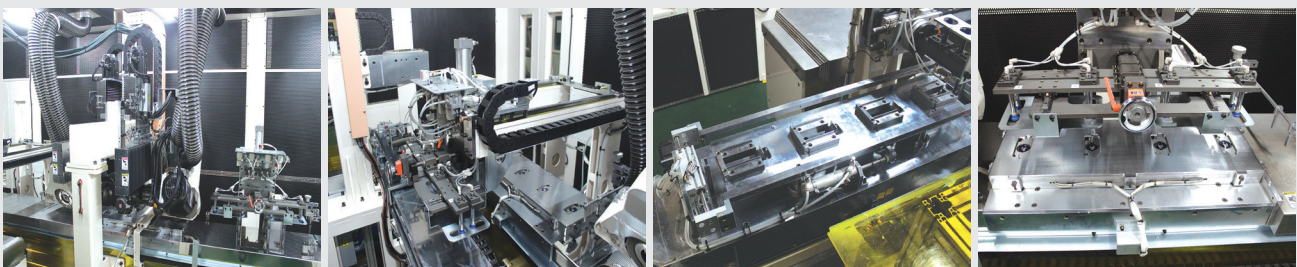
## Multi Grinding M/C (Shuttle Type)

### Feature

- ▶ Easy to Change Pad type
- ▶ Broad line production

### Spec

- ▶ Capacity : 300 Pcs/HR
- ▶ Process : Product Supply → Loading → Chamfering → Grooving → Unloading → Thickness Inspection → Discharging Product





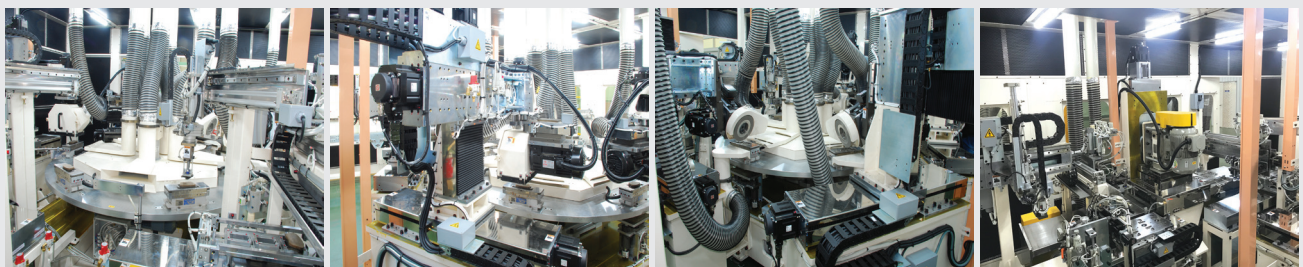
## Multi Grinding M/C (Index Type)

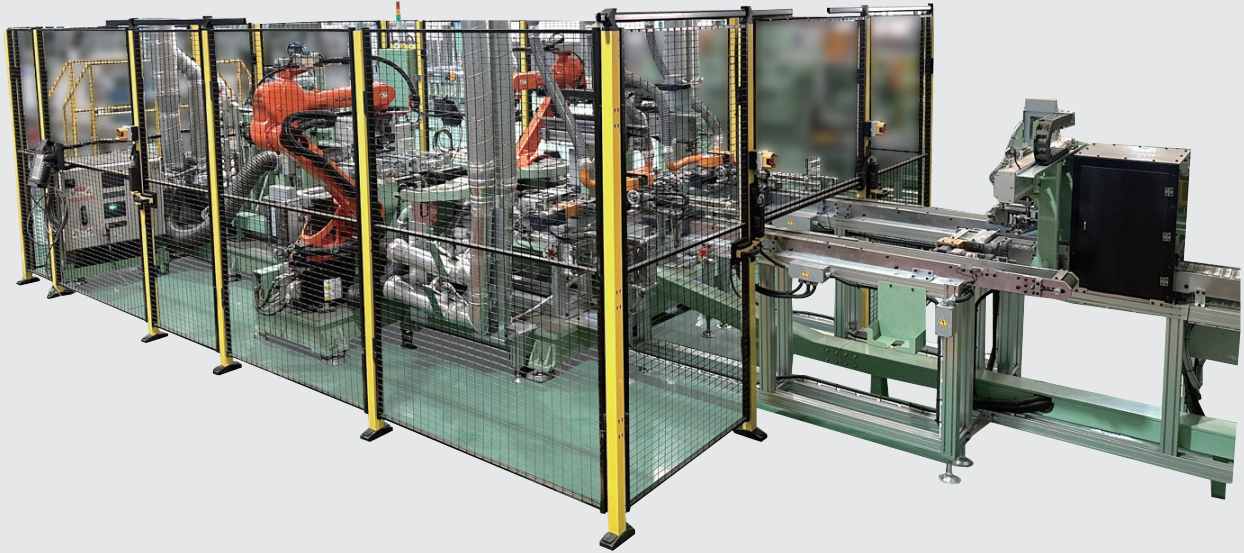
### Feature

- ▶ V-Grooving Radial Chamfer, J-Cut (J-Scoop)
- ▶ Can be grinding after painting

### Spec

- ▶ Capacity : 600 Pcs/HR
- ▶ Process : Product Supply → Grooving#1 → Grooving#2 → Grooving → Unloading → Thickness Inspection → Discharging Product





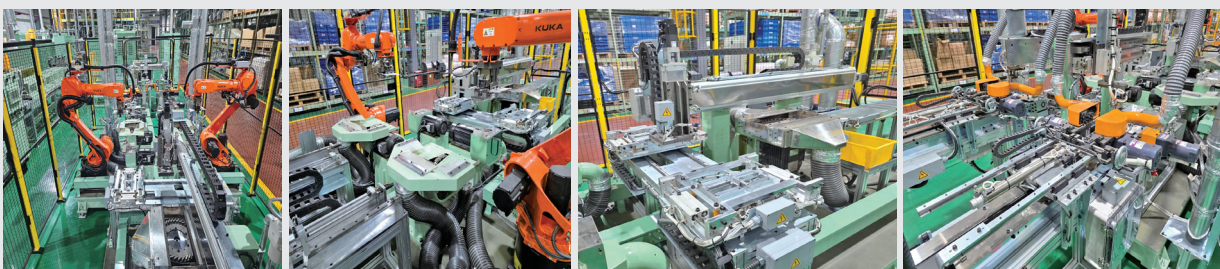
## Robot Grinding M/C

### Feature

This grinding machine is part of the grinding process in brake pad production. Using ROBOT, this machine is possible for all shapes of chamfering.

### Spec

- ▶ Capacity : MAX 600PCS/HR
- ▶ Process : Input product → Chamfer → Grooving → Grinding → Thickness inspection → Discharging
- ▶ All shapes of chamfering are possible, including J-cut, upper/lower straight chamfering, and reverse chamfering, diamond chamfering etc.





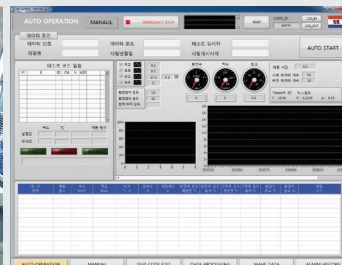
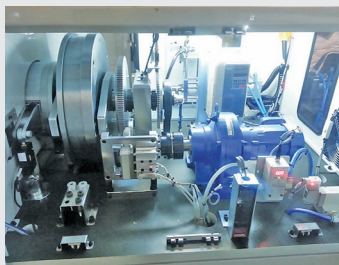
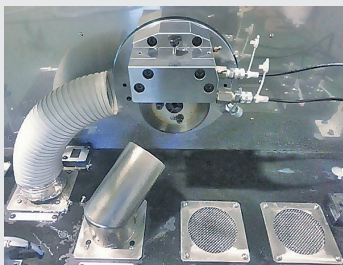
## SE-Model Tester

### Feature

- ▶ Reduced size to one-fifth of the full-size tester (Reduction of production costs)
  - ▶ Easy development of initial friction materials
- \* Test items: Performance, Abrasion, and Parking

### Spec

- ▶ Inertia : Overall Inertia 0.3kgfms<sup>2</sup> (Fixed Inertia 0.15kgfms<sup>2</sup> + Driving Inertia 0.05kgfms<sup>2</sup> + 0,1kgfms<sup>2</sup>)
- ▶ Maximum Revolutions : 3,500 (similar to DIR 180km/h)
- ▶ Electric Power : 7.5KW
- ▶ Torque : 25kgfm (1.14G)
- ▶ Environmental Equipment: Temperature : 10 - 40°C +-1°C, Humidity: 30 ~ 85 +-5 %

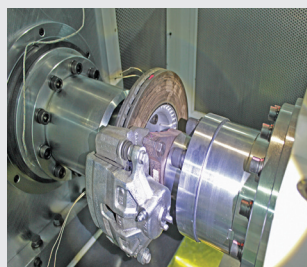
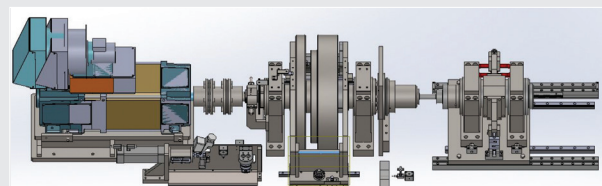




## Dynamometer (SE-D20A)

### Spec

- ▶ Test Items : Performance, Abrasion
- ▶ Inertia : Over Inertia 20kgfms<sup>2</sup> (Fixed Inertia: 1.5kgfms<sup>2</sup> + Driving Inertia (5kgfms<sup>2</sup> + 10kgfms<sup>2</sup>) + Electric Inertia 3.5kgfms<sup>2</sup>)
- ▶ Electric Power : DC440V 125kw
- ▶ Rated RPM : 1,150
- ▶ Maximum RPM : 2,300
- ▶ Isothermal-Isohumidity : Temp. Range : 15°C ~ 30°C  
Exhaust Fan : 300CMM x 160mm Aq x 20HP  
Wind Speed : 20m/sec



# Shoe Process

## Welding and R-Correction

Process of bonding web and rim's protrusion and doing correcting deformation during bonding process according to designated dimensions using correction tools Process

## Cutting/Grinding/Marking/Chamfering

Process to produce linings after making desiring width and necessary process

## Coating

Process of improving lining's adhesive strength and anti-corrosion

Shoe Process

Lining Process

Shoe Ass'y Process

## Grinding/Marking/Assembling

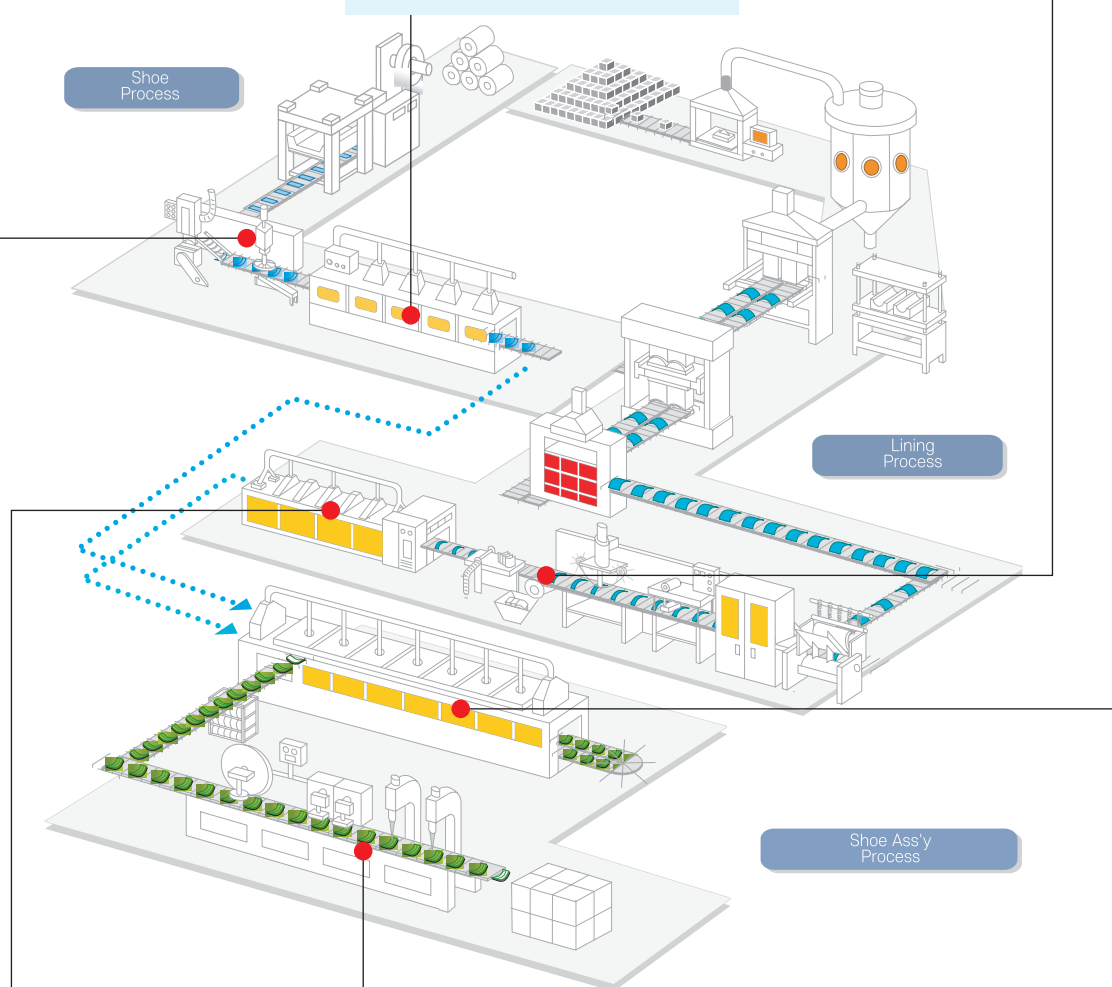
Process to machine surface of friction materials and mark such as lot no. for easy recognition Process  
- Assembling parking lever pine to brake shoe

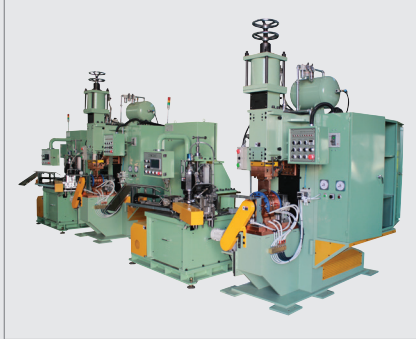
## Adhesive and drying process

Process to glue and dry the adhesives  
- Critical Process for Adhesive performance

## Bonding and Heat Treatment

Process to gratify adhesive strength and area with specific pressure  
- Process to improve adhesive strength and area by using bonding spring





### Welding M/C



### R-Correction M/C



### Coating Line M/C

#### Spec

#### 1. Welding M/C

- ▶ Capacity : 257 Pcs/HR
- ▶ Process : Manual Product Loading & Separated Supply → Product Clamping & Rotation  
→ R-Correction → Product Output & Loading

#### Spec

#### 2. R-Correction M/C

- ▶ Capacity : 257 Pcs/HR
- ▶ Process : Manual Product loading → R-Correction → Output

#### Spec

#### 3. Coating Line M/C

- ▶ Capacity : 450 Pcs/HR
- ▶ Process : Product Input → High-Frequency Cleaning → Vapor Degreasing Cleaning →  
Atmospheric Cooling → Coating → Release



## Sheet Finishing Line

### Spec

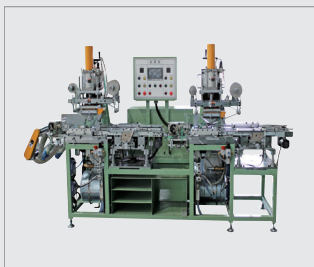
- ▶ Capacity :900 Pcs/HR
- ▶ Configuration : 1. Sheet Cutting Machine  
2. In / Out Grinding Machine  
3. Edge Marking Machine  
4. Chamfering Machine



Sheet Cutting Machine



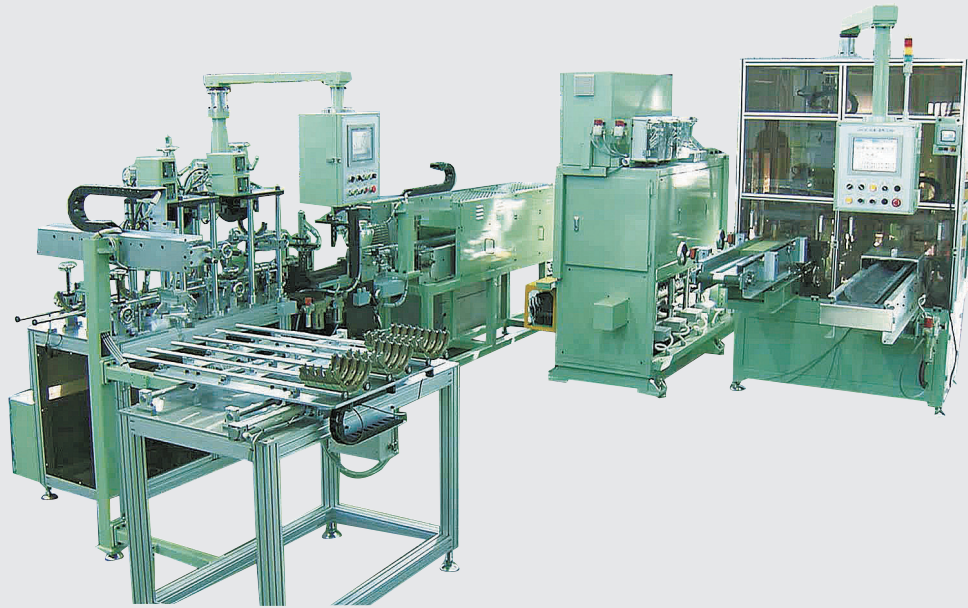
In / Out Grinding Machine



Edge Marking Machine



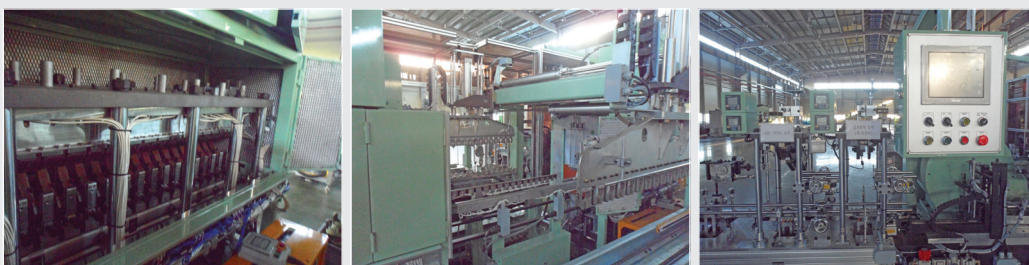
Chamfering Machine



## Auto Shoe & Lining Bonding M/C

### Spec

- ▶ Capacity : 360 Pcs/HR
- ▶ Process : Lining & Shoe Loading and Supply → Tack Bonding → Pitch Alignment → Thermal Bonding → Cooling → Location Inspection → External Grinding → R- Inspection



# Brake Process

**R Correction Process**  
 Process to correct deformation of shoe using correction tools after welding

**Welding**  
 Process of bonding web and rim's protrusion

**Heat Treatment**  
 Process to acquire necessary properties doing hardening resin inside the mould by inputting specific heat

**Shoe Process**

**Anchor Braket Process**

**Lining Process**

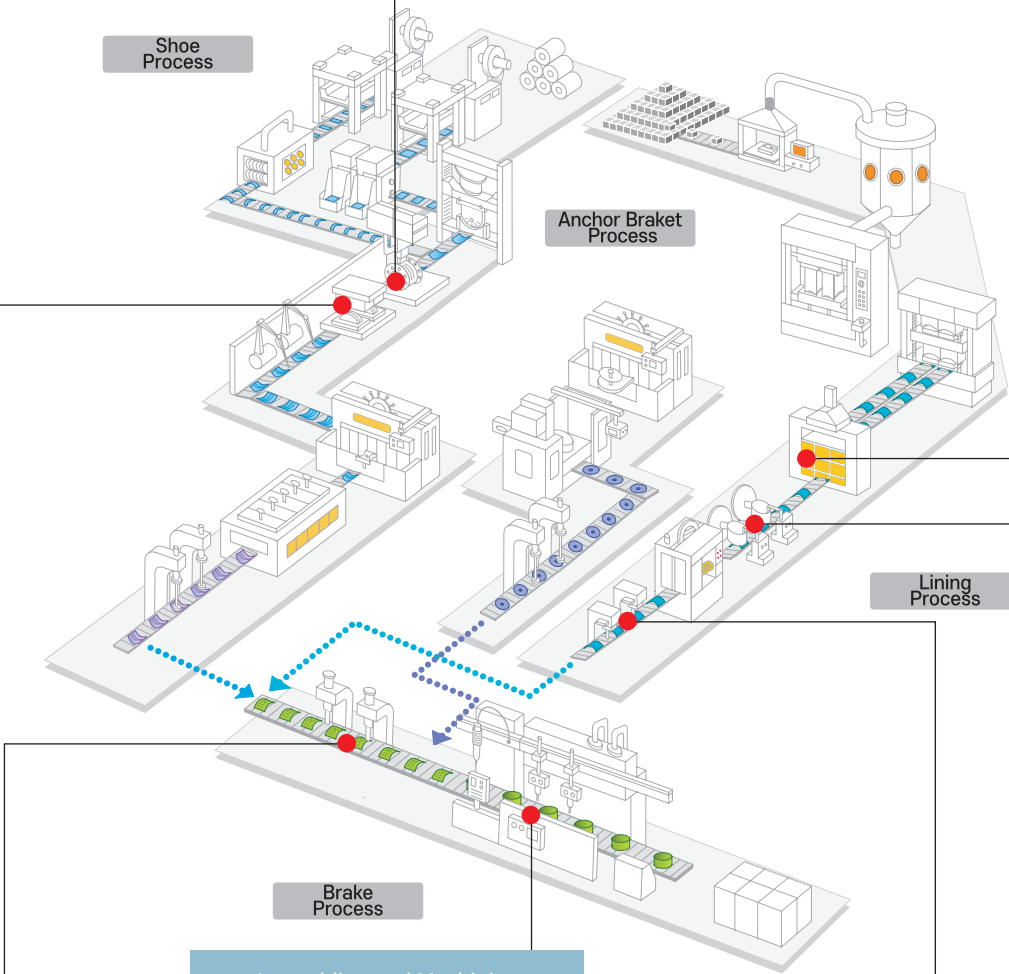
**Brake Process**

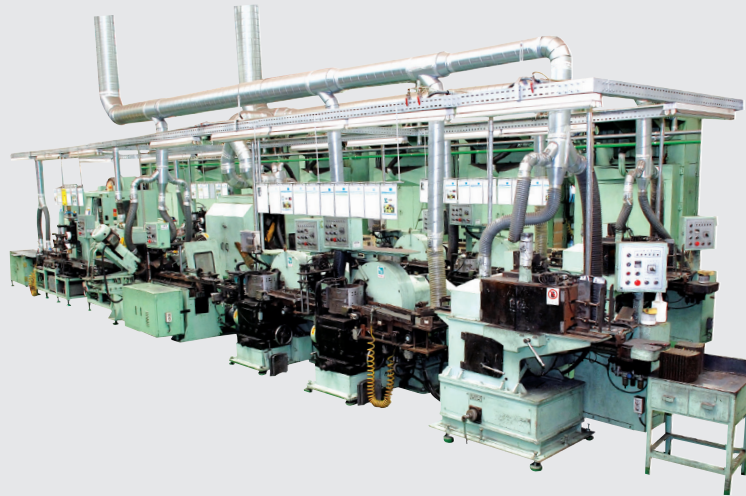
**Assembling and Machining**  
 Process to grind and machine the required external diameters

**Drilling**  
 Process to make holes to combining shoe and lining

**Riveting**  
 Process to combine lining and shoe using rivet into the holes

**Grinding**  
 Process to grind required shape and dimension  
 - Using diamond wheel





## Large Lining Finishing Line

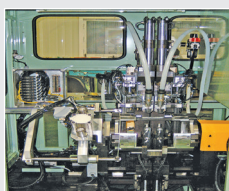


### Spec

- ▶ Capacity : 400 Pcs/HR
- ▶ Process : Input → External Grinding → Magazine Unit Input → Internal Grinding → 2nd External Loading Conveyor → External Grinding → Product Ejection

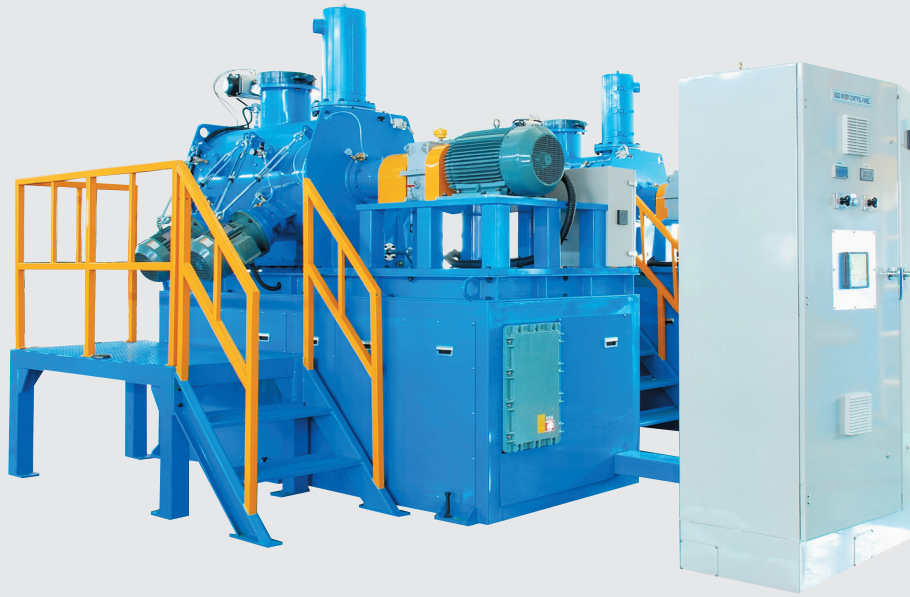


## Shoe Auto Riveting M/C



### Spec

- ▶ Capacity : 400 Pcs/HR
- ▶ Process : Input → External Grinding → Magazine Unit Input → Internal Grinding → 2nd External Loading Conveyor → External Grinding → Product Ejection



## Raw Material Mixer

### Feature

- ▶ Mixing of a variety of raw materials
- ▶ Easy management of conditions

### Spec

- ▶ Capacity : 25, 50, 600, 1200 Liter
- ▶ Process : Raw Material Input → Mixer (mixing) → Raw Material Output → Weighing (Electronic Scale) → Loading (Standby)





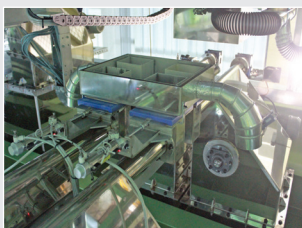
## Auto Weigher & Mixer Line

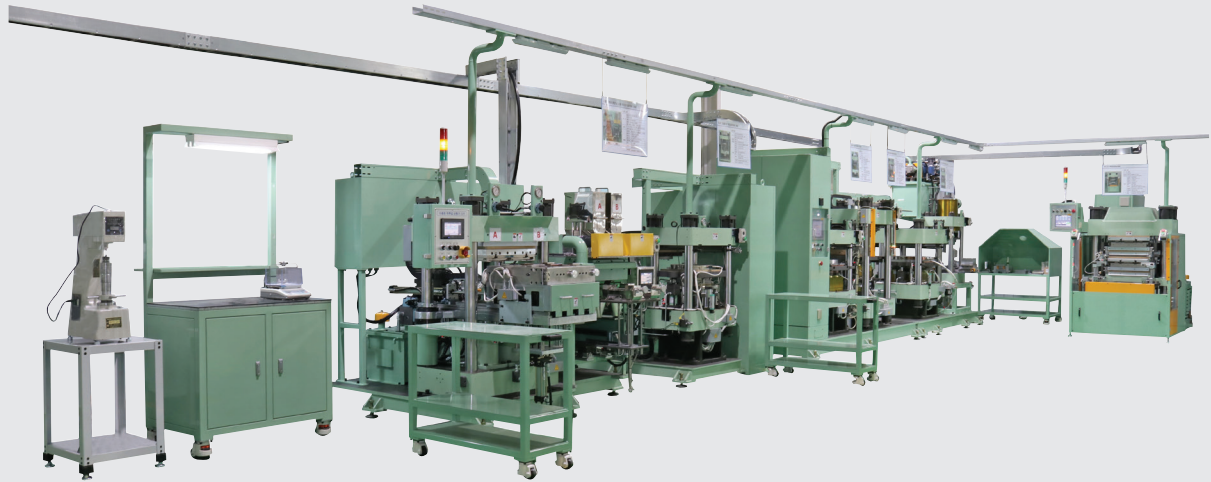
### Feature

- ▶ Reversal mixer
- ▶ QR-Code & PC System
- ▶ Full automatic

### Spec

- ▶ Capacity : 8 Batch(Bucket) / HR
- ▶ Process : Auto Weighing(ST.#1~#10) → Small Weighing(Manual) → Second Time Auto Weighing → Mixer(#1~#3) → Stacker Crane → Rack → Auto Supply To Press → Auto Cleaning → Auto Return





## Proto Shop

### Feature

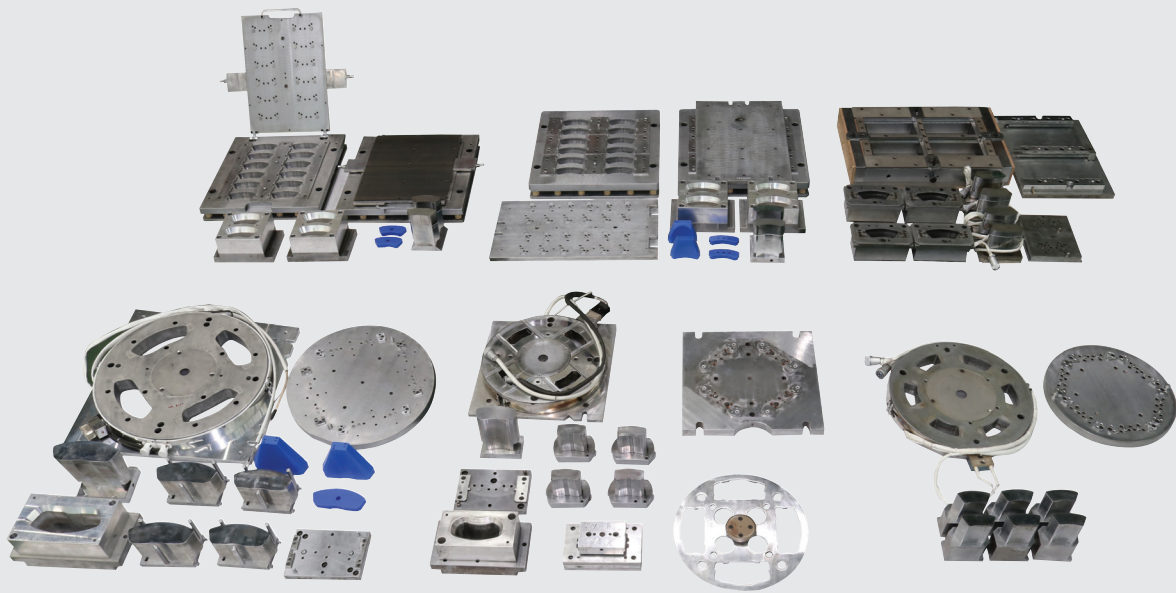
#### ► Introduction of Proto shop

When Sangsin ENG is manufacturing moulds, Sangsin ENG connect moulds with the same machine as customer and proceed test to figure out any problem may occur later. When Sangsin ENG proceed trail run with satisfied manufacturing condition from customer, we check size of cavities and product hardness, specific gravity and Material properties.

### Spec

#### Forming Machine

- 1) 2-Stage Press (300T)
- 2) Preforming machine (70T)
- 3) Linear 120Ton
- 4) Linear 200Ton



## Mould

### Feature

#### ► Introduction of Mould

Customized service for customer's need (Considering proper material, component and post treatment) Proper thickness of hard chromium plating is used for the pressuring point between mould and product. (In other case, plating will be used to prevent rust.)

### Spec

- 1) Linear type (Standard /Large size) : forming/preforming mould, trimming mould, Jigs installed in equipment
- 2) Hydraulic press (Hot, preforming) type (Hinge Type/ Adhesion Type): forming/preforming mould, compact punch
- 3) Direct charging Type (Standard /Large size) : Forming frame, insert moulds for each model



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