



*R&D Grant Projects and  
Intellectual Property Rights  
Sultaniye DEMİRKAN  
AK-PRES INC. CO.*



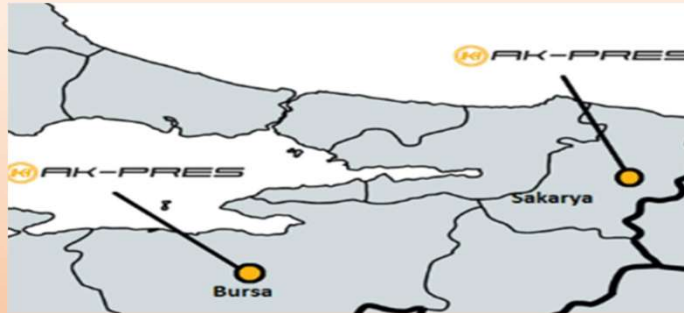
Ak-Pres Automotiv Inc. Co. an automotive supplier corporation within the Küçükoğlu Holding



Ak-Pres Inc. Co. which serves the world's biggest automobile brands by shaping sheet metal parts in Turkey.

Ak-Pres operates totally in 35,000 m<sup>2</sup> of covered area factories in Sakarya and Bursa.

There is R&D Department in Sakarya.



## Our Expertises:

R&D activities like processes engineering

Part and process design (NX 12, Enovia DV1, Catia v5, Creo, Robot Studio, TiaPortal)

Metal joining methods: Thermal joining, Robotic gas metal arc welding, Projection welding, TOX Clinching & particularly Cold Metal Transfer Welding and Aluminum Spot Weld with structural sealed parts.

Cold Metal Transfer Weld, Clinching and Spot Weld expertise performed for many manufacturers like DAIMLER, TESLA, WV, TOYOTA.



## Our Activities:

- Design and development of welding processes
- Successful CMT & Spot weld of challenging parts in BIW processes
- Cold forming of Aluminum parts (5xxx & 6xxx series) and joining with structural seals
- Spot welding of Structural Sealed Aluminum panels
- Clinching of Sealed Aluminum parts
- Forming aluminum body parts and AHSS especially that are difficult to shape is available in 1600 tons capacity Servodrive Transfer Schuler Press machine



## R&D Development

### 1. Sheet Metal Forming Technologies

- Stamping Technologies
- Servo Press Technology

### 2. Joining Technologies (Welding, Assy etc.)

- Robotic Arc Welding
- Robotic Spot Welding
- Fully Automated Projection Welding
- Assembly by Clinching Technology
- Assembly by Structural Bonding in Combination with Spot Welding (Weldbonding)
- Assembly of Bolts/Nuts by Clinching-Riveting Technologies
- Automated Assembly Lines

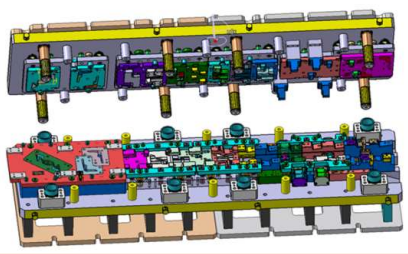
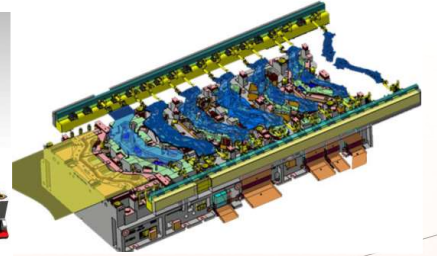
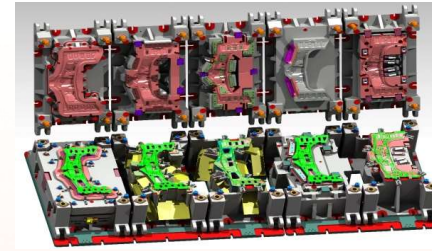




# 1. Sheet Metal Forming Technologies

## Stamping Technologies

Processing of HSS, UHSS, Aluminium body parts by Link Motion and Servodrive transfer press machines is one of our key technologies.



Processing of steel and aluminium parts using progressive dies in press machines with coil feeders is another one of our key technologies.

## Servo Press Technology

Servo press combines advantages of mechanical and hydraulic press.

- Programmable stroke,
- Programmable slide position & velocity
- Availability of work energy through out the cycle
- High process speed and accuracy



## 2. Joining Technologies (Welding, Assy etc.)

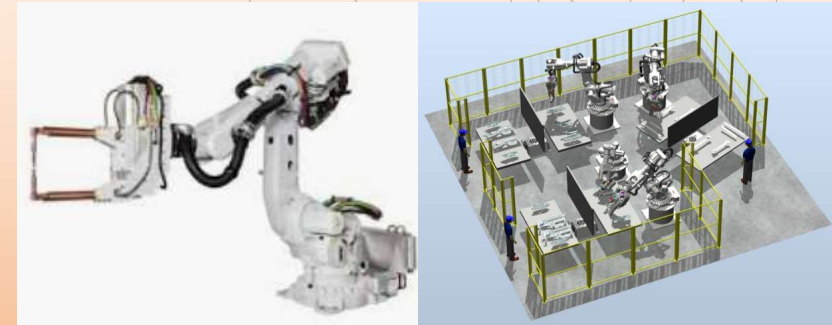
### Robotic Arc Welding



- Extensive «steel and aluminium» arc welding experience.
- «Critical parts-processes control» in our welding lines and report to our customer.
- «Robustness study» to make sure quality is not sensitive to part&process variations.
- «3D Tool center point calibration» to make sure our quality is guaranteed.
- «Cold metal transfer» technology to reduce weld distortions and weld spatter.

### Robotic Spot Welding

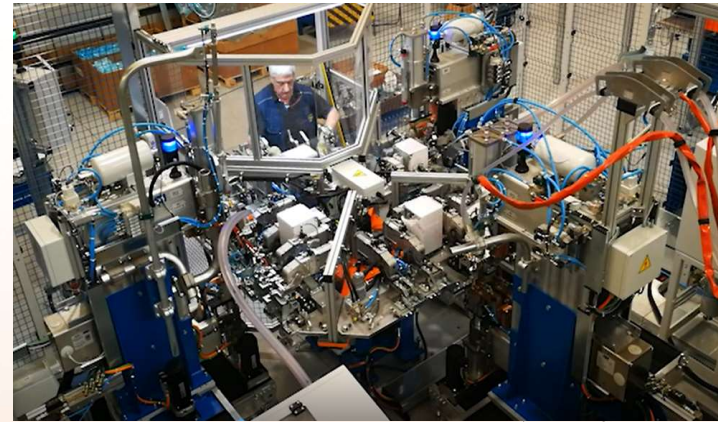
- Extensive experience in spot welding of «HSS/UHSS steel and also aluminium» materials.
- Both «MFDC and AC» welding technologies.
- «Special equipment (gun, electrode, controller) for welding of aluminium panels».
- «Single robot cells or a line of robots» with complex process flow.
- Parts with «components as much as 25 and weld points as much as 250».



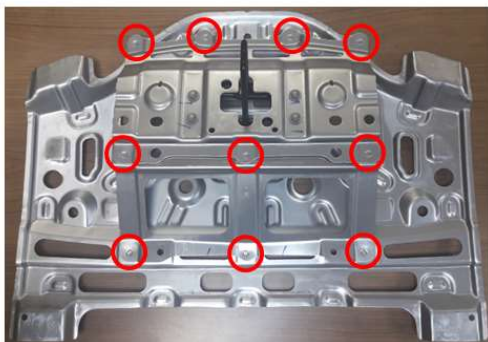
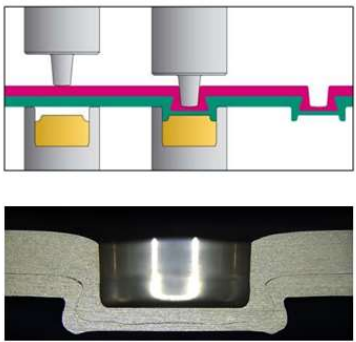
## 2. Joining Technologies (Welding, Assy etc.)

### Fully Automated Projection Welding

Efficient cell with maximum automation and minimum manpower utilization => Reduced cost and improved quality performance due to reduction of human interference



### Assembly by Clinching Technology

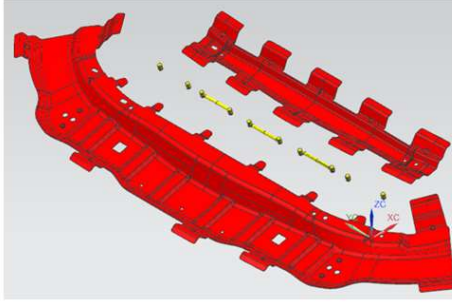


Clinching is used for joining of aluminium sheet metal, but it can be used also for joining of aluminium-to-steel and steel-to-steel.  
It's cheaper than spot welding.



## 2. Joining Technologies (Welding, Assy etc.)

### Assembly by Structural Bonding in Combination with Spot Welding (Weldbonding)

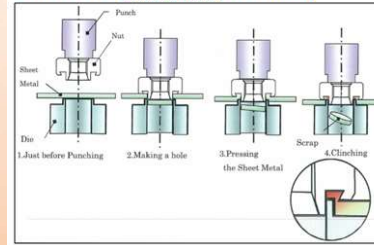


Structural bonding is used in combination with spot welding or clinching for joining of body parts, especially aluminium body panels.

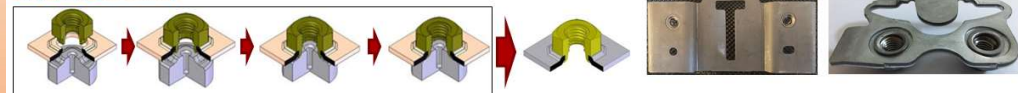
### Assembly of Bolts/Nuts by Clinching-Riveting Technologies

These are alternative Technologies to welding for assembling of steel nut/bolts to aluminium panel. We have experience for application of these technologies and we can offer to our customers in China as well.

Self-Pierce Clinch Nut Assembly



Rivet Nut Assembly

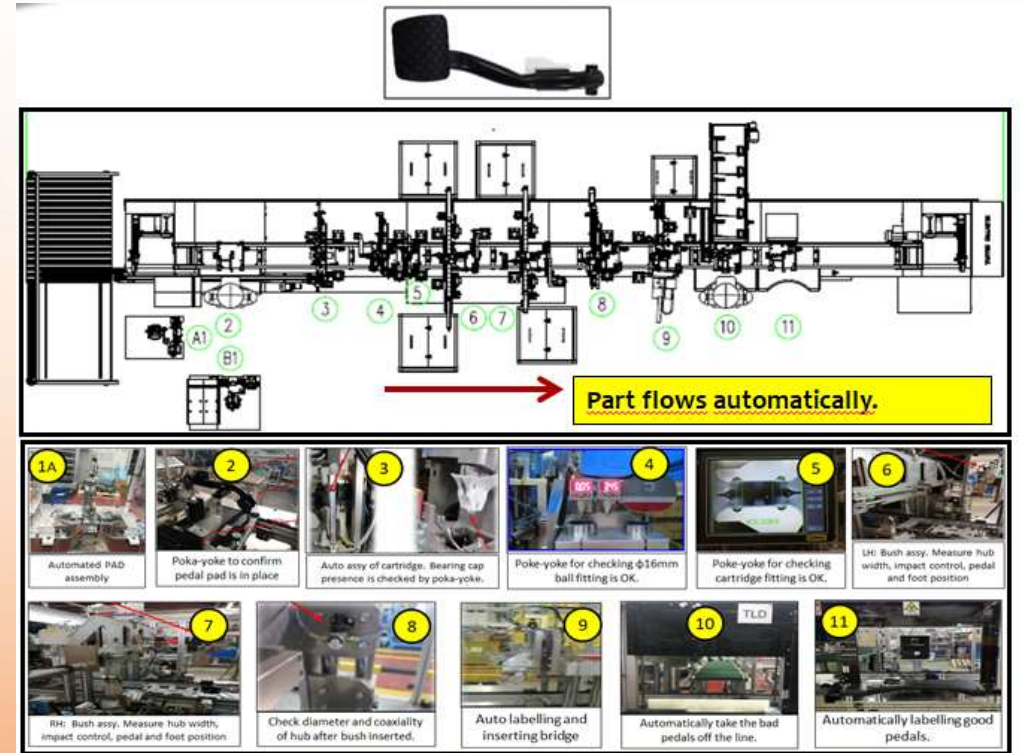


## 2. Joining Technologies (Welding, Assy etc.)

### Automated Assembly Lines

We have extensive technology experience for assembly of parts such as pedals, PKB levers, hood hinges, luggage hinges etc.

- Automatic feeding of parts
- Automatic assembly operations
- In-line and end-of-line inspection
  - Dimensional & functional confirmation
  - Missing component confirmation
  - Assy completion confirmation (Kanketsu)
  - Auto blockage of NOK parts
  - Auto labelling of NOK & OK Parts



## Calls to join as partners:

HORIZON-CL4-2021-TWIN-TRANSITION-01-01: AI enhanced robotics systems for smart manufacturing (IA)

HORIZON-CL4-2021-TWIN-TRANSITION-01-02: Zero-defect manufacturing towards zero-waste (IA)

HORIZON-CL4-2021-TWIN-TRANSITION-01-07: Artificial Intelligence for sustainable, agile manufacturing (IA)



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