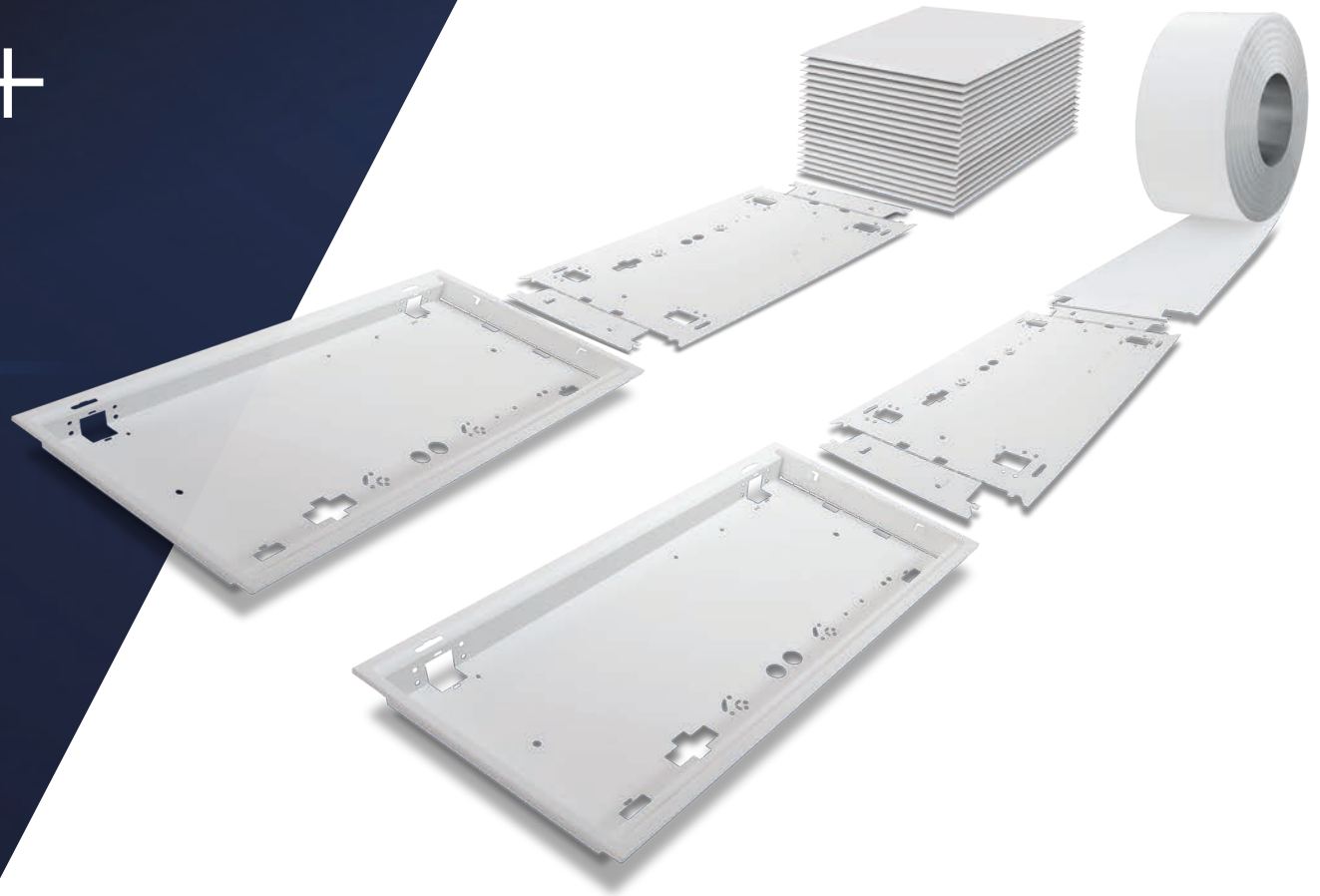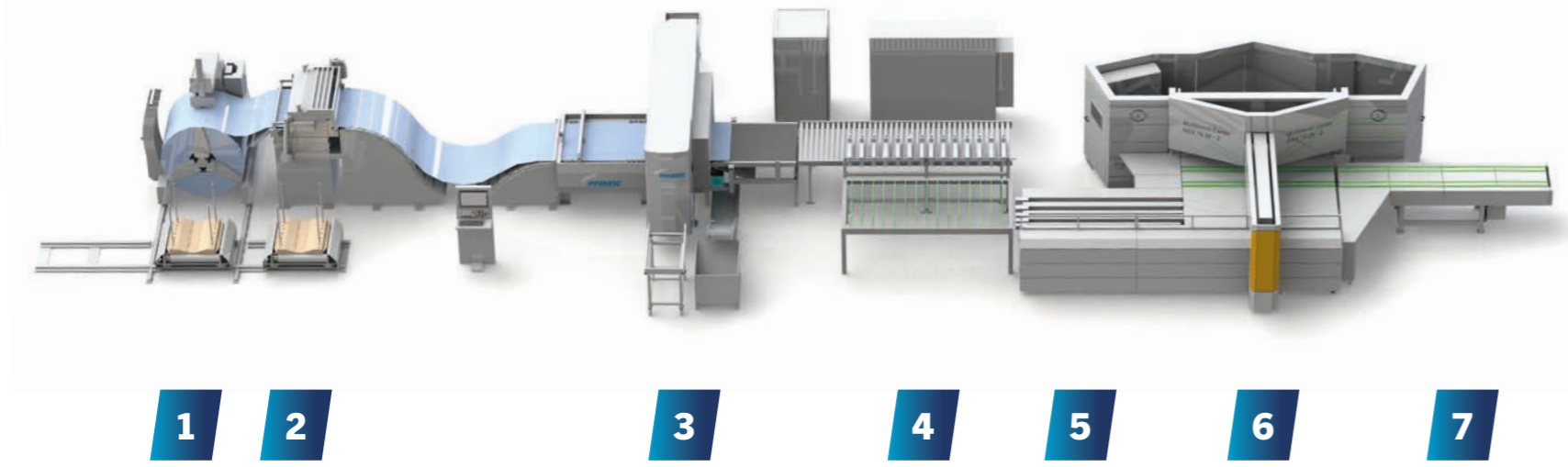# Punching + Bending

The unique Pivatic-RAS solution consists of two sheet metal technologies integrated in a single production line:

PUNCHING BY PIVATIC - BENDING BY RAS.

PIVATIC

RAS

1 **2** **3** **4** **5** **6** **7**

MAIN BENEFITS

- Reduced work-in-process inventory for punching material. Parts of different lengths can be punched and bent from one coil.
- For quality, blanks are flipped before bending (paint outside, burr inside) or fed to the panel bender without flipping (embosses)
- Lower material costs, as coils are cheaper than pre-cut blanks
- Requires less total floor space than separate lines
- Fast cycle time due to better synchronization of punching and bending
- Fully automated solution with high throughput and low costs per part
- Flexible and customized production scheduling
- Highest level of punching and bending precision and repeatability
- Automatic bending tool setup
- Very fast up/down folding sequences without flipping the part

- Typically, one set of bending tools for the entire product range
- Scratch free bending, no wear of tools
- Communication with line controller

OPTIONS

- Coil storage/coil change system for additional material flexibility
- Intermediate punched blank storage system
- Multitools for more economical punching tooling solutions
- Automatic programming of bending sequence from STEP files
- Bending tool options for additional flexibility
- Stacking system for finished parts

CONCEPT

The same coil material can serve different parts in typically medium to large batch sizes. The line can run for hours without a coil change.

PROCESS

1 Coil handling and decoiler
2 Straightening and feeding
3 Punching and cut-to-length
4 Conveyor and blank rotation
5 Grippers for blank loading
6 Panel bender incl.
   Handling manipulators
   Tools
   Tool changer
7 Runout conveyor

APPLICATION IDEAS

Cabinets   Wall panels   Ceiling panels   Doors   Shelves   Lighting   HVAC

| 1 | 2 | 3 | 4 | 5 | 6 |

MAIN BENEFITS

- Requires less total floor space than separate lines
- For quality blanks are flipped before bending (paint outside, burr inside) or fed to the panel bender without flipping (embosses)
- Fully automatic material flow
- Quick change of material types, sizes and thicknesses
- Ideal for medium and small quantities
- Ideal for large and heavy blanks
- Suitable for thin and sensitive materials
- Flexible and customized production scheduling

OPTIONS

- Vertical blank storage system for more flexible material use
- Cut-to-length shear
- Cut-to-width shear
- Intermediate punched blank storage
- Multitools for economical tooling solutions
- Automatic programming of bending sequence from STEP files
- Bending tool options for additional flexibility
- Stacking system for finished parts

CONCEPT

Uninterrupted material feeding from 2 pallets of pre-cut blanks to punched and bent parts. Automated solution for production without set-ups and down time between ordered batches. Configuration for unique type parts, small and medium batch sizes when thickness, surface and color can vary. Flexible and customized production scheduling.

PROCESS

1 De-stacking from two pallets
2 Punching
3 Conveyor and blank rotation
4 Grippers for blank loading
5 Panel bender incl.
   Handling manipulators
   Tools
   Tool changer
6 Runout conveyor

APPLICATION IDEAS

Cabinets (small batches)   Doors (kit production)   Shelves   HVAC

1   2   3   4   5   6

MAIN BENEFITS

- Vertical blank storage system for more flexible material use
- For quality blanks are flipped before bending (paint outside, burr inside) or fed to the panel bender without flipping (embosses)
- Requires less total floor space than separate lines
- Fully automatic material flow
- Quick change of material types, sizes and thicknesses
- Ideal for medium and small quantities
- Ideal for large and heavy blanks
- Suitable for thin and sensitive materials
- Flexible and customized production scheduling

OPTIONS

- Cut-to-length shear
- Cut-to-width shear
- Intermediate punched blank storage
- Multitools for economical tooling solutions
- Automatic programming of bending sequence from STEP files
- Bending tool options for additional flexibility
- Stacking system for finished parts

CONCEPT

Highly automated solution for unmanned production feeding pre-cut material from chosen pallets to punched and bent parts. Fully automatic material flow from storage system to ready part without set-ups and down time between ordered batches. Configuration for batch- or unique type parts, small and medium batch sizes when thickness, surface and color can vary. Flexible and customized production scheduling.

PROCESS

1   Storage system and de-stacking
2   Punching
3   Conveyor and blank rotation
4   Grippers for blank loading
5   Panel bender incl.
       Handling manipulators
       Tools
       Tool changer
6   Runout conveyor

APPLICATION IDEAS

Cabinets (small batches)   Doors (kit production)   Shelves   HVAC

1 **2** **3** **4** **5** **6** **7** **8**

CONCEPT

For a process where same coil material can be used for many different parts. Produced part dimensions can vary due to Cut-to-Size. Ideal for low, medium and large batch sizes. Automated palletizing of bent parts. The most flexible and automated line configuration with lowest material cost.

PROCESS

1 Coil handling and decoiler
2 Straightening and feeding
3 Punching and cut-to-length
4 Cut-to-width
5 Conveyor and blank rotation
6 MiniFeeder blank loader

7 Panel bender incl.
   Handling manipulators
   Tools
   Tool changer
8 Palletizing of bent parts

MAIN BENEFITS

• Reduced work-in-process inventory for punching material. Parts of different lengths can be punched, sheared and bent from one coil
• For quality blanks are flipped before bending (paint outside, burr inside) or fed to the panel bender without flipping (embosses)
• Several parts can be nested side by side
• Lower material costs, as coils are cheaper than pre-cut blanks
• Requires less total floor space than separate lines
• Low total cycle time from raw material to finished product
• Fully automated solution
• Flexible and customized production scheduling

OPTIONS

• Coil storage/coil change system for additional material flexibility
• Intermediate punched blanks storage system if punching should be done in batches (based on coil material) but bending should be done in kits
• Multitools for economical tooling solutions
• Automatic programming of bending sequence from STEP files
• Bending tool options for additional flexibility
• Palletizer with max 15 stacking positions

APPLICATION IDEAS
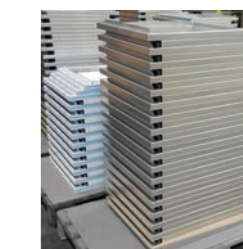
Panels   HVAC

Cabinets   Custom doors   Coolers   Furniture   Kitchen   Clean rooms   Heating

THE CONCEPT

The unique Pivatic-RAS solution consists of two sheet metal technologies integrated in a single production line: punching by Pivatic - bending by RAS. Compared to other systems, the material moves only one time through the Pivatic punching machine. The result is a punched part created faster than on any other flexible punching solution.

This punching speed combined with the bending speed and flexibility of the RAS panel bender leads to an automated fabrication solution characterized by low cycle times, high productivity, less logistic and handling effort, flexible part design capabilities and low costs per part.

The integrated line is very compact and requires minimum floor space. Due to the flexibility of both technologies, this awesome and modular line is suitable for long run batches as well as for short runs or even batch size one.

THE SOFTWARE

A line controller software manages data communication to the integrated line components, sends information for an ERP system and creates statistic data. State-of-the art technology meets Industry 4.0 standards.

THE PROCESS

The punching process can start from the blank or coil. The RAS bending module can be any of three panel bender models (RAS 79.22-2, 79.26-2, 79.31-2). Additional cut-to-length and cut-to-width shears provide highly accurate blank dimensions for the bending process. After bending the Palletizer stacks finished parts.

The safety system which conform to the CE-directive regulations are separate for Pivatic and RAS. The line can be used as a seamless, integrated production system but punching and bending operations can be also used separated from each other. As an example, Pivatic can punch blanks that will not be bent or will be bent on a different machine. RAS can bend parts being punched or laser cut on different upstream sources. This adds even more flexibility to the integrated system.

Automatic programming of punching and bending starting from 3D and 2D CAD drawings and connection to ERP through line controller enables automated production orders.
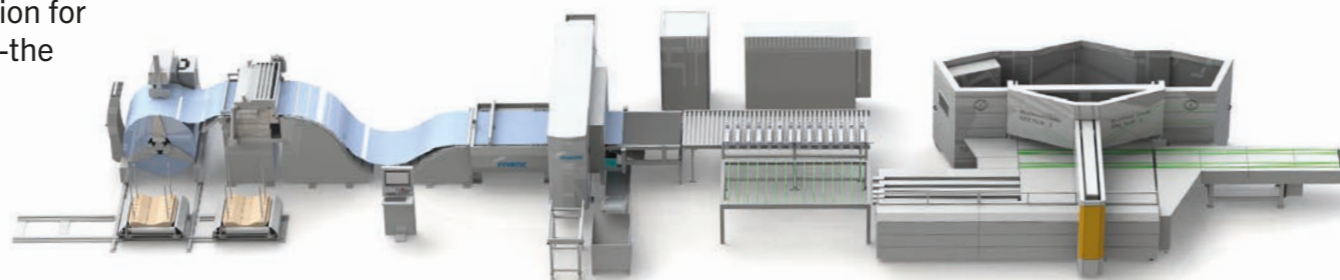
THE LINE BENEFITS

- Integrated line reduces logistics and improves the material flow
- Reduced work-in-process inventory
- Automated processes reduce human errors
- Synchronized processes increase throughput and minimize ineffectiveness
- Lower cycle time result in lower costs

PIVATIC PUNCHING BENEFITS

- 100% actual punching time as there is zero tool change time
- Double Tool Punch punches two holes or corners at a time
- No loading time with continuous coil feeding
- No skeleton required
- Standard Thick Turret Tooling set in quick-change tool cassettes
- Minimum tool wear as tools are in fixed location in cassettes
- Includes up to 120 stations for thick turret tools

RAS BENDING BENEFITS

- Automatic blank loading, squaring, positioning, bending and unloading
- Alignment of the following part parallel to the main time
- Very fast up/down folding sequences without flipping the part
- Highest level of bending precision and repeatability

- Automatic tool setup
- Automatic programming of bending sequence from STEP files
- Typically, one set of tools for the entire product range
- Scratch free bending, no wear of tools
- Optional stacking system for finished parts

PUNCHING

- Coil widths: 600, 1250 and 1500 mm
- Minimum loading blank size: 200 mm x 850 mm
- Maximum loading blank size: 1250 x 2250 mm or 1500 x 3000 mm

BENDING

- 3 panel bender sizes: 2160 mm, 2560 mm and 3060 mm bending length
- Max blank width 1500 mm
- Max mild steel thickness 2 mm (2.5 mm with reinforced tools)
- Min bent part length 430 mm (with corner tools)
- Min bent part width 150 mm
- Max four-sided box height 203 mm
- Palletizer for 3 or 5 max part size stacks (max 11 or 15 stacking positions for smaller bent parts)

The unique Pivatic-RAS solution consists of two sheet metal technologies integrated in a single production line:

PUNCHING BY PIVATIC - BENDING BY RAS.

PIVATIC

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