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Multibend-Center
RAS 79.22 - 2

R A S

- Cutting
- **Bending**
- Forming

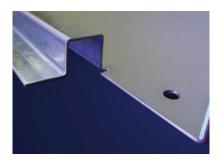RAS Reinhardt Maschinenbau GmbH

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High-tech perfection!

If you want to produce complex sheet metal parts regardless of batch size, with incredible throughput, total flexibility, amazing accuracy, and total repeatability, the Multibend-Center will meet all of these demands.
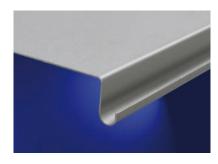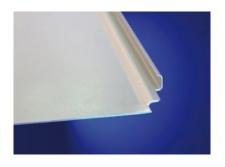
The RAS Multibend-Center continues to be the trend-setter within automated folding technology, using highly dynamic servo-motors, an ultra fast tool changer, scratch-free folding, innovative material flow components and flexible folding tools. Flexibility, speed and perfection have been the terms sheet metal specialists use to describe the remarkable Multibend-Center.

The Multibend-Center offers limitless design flexibility and will produce unheard of part repeatability. Batch or Kit production, simple or complex parts - the Multibend-Center covers all the specifications!
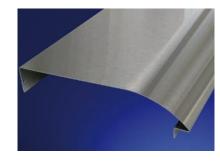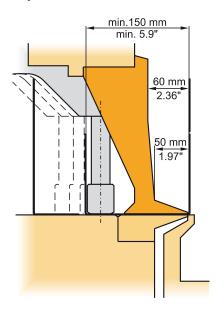
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Design flexibility without limits!

A single set of tools is all that is needed to create the parts shown on this page. With the patented 3D-motion control of the folding beam, the tool rolls away with the part. This results in scratch-free folding without any wear and tear on the tools.
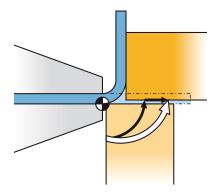
min.150 mm
min. 5.9"

60 mm
2.36"

50 mm
1.97"

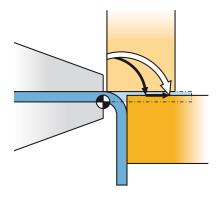Free space of the standard upper beam tool geometry

Generous free space around the tools and a 203 mm (8") tool height are a quantum leap in your ability to create complex, highly profitable "designer" parts.

• Sensitive material surfaces
• Closed profiles
• Stand-offs
• Internal bend in cut-outs
• Radii of any size
• Hems
• Weld tabs
• Small off-sets
• Very small flanges
• Hat profiles
• Bends close to the part center
• Last negative bends
• Tapered parts

Versatile features for distinctive products!

Folding up

Folding down

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Material handling: accurate, fast, flexible!

Precise scanning

Once a blank is loaded into the Multibend-Center the „Magic-Eye" Scanner optically measures the blank. This precision measuring technology is able to scan the most complicated notches, tapered blanks and even very thin parts without touching the part itself. All of this happens simultaneously to the production time of the previous part and therefore without any delay from part to part. After the actual blank position has been determined, the load and main manipulator automatically compensate any off-set that may be needed.

The "Magic-Eye" system scans the position of the blank.

Highly dynamic folding beam

The main manipulator positions and rotates the blank with an accuracy of 0.001 degree.

Quick supply
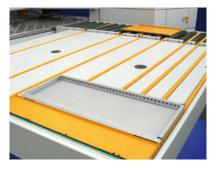
After scanning, the blank arrives at the main manipulator. It clamps and positions the part during the entire folding sequence. With the blank being scanned outside of the folding area, the typical part-to-part time is just approximately 4 seconds. The main manipulator rotates the blank to any angle with an accuracy of 0.001 degree. No operator can be this accurate, no matter how experienced! This results in precision parts … extremely accurate and infinitely repeatable.

Flexible unloading

Finished workpieces can be unloaded by many different options. The Multibend-Center can deliver the part back to the operator or pass them through to the other side of the machine. At the end of the runout system, the operator can pick the parts from a buffer table, or an intelligent unload robot can pick and stack the workpiece.

The runout extension moves the finished part to the multiple finished part buffer.

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Information technology: powerful and easy-to-maintain!

The PC-based RAS CellControl software controls the entire folding cell including the load and unload systems. The folding cell controller therefore becomes a sub-system of the master system: RAS CellControl.

Integrated into the customer's network, the RAS CellControl allows convenient and cost-effective online service. A wireless camera transmits online video streams and even sounds for remote service, the control also provides data for internal process analysis.

The offline-software creates programs on a PC while the machine produces parts.

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Tooling technology at its best!

All of the RAS superiority comes into play at the bend line. The servo-mechanical driven upper beam clamps the blank to the lower beam. Then the folding beam moves to the programmed angle or automatically folds radii, tabs, hems, off-sets, closed profiles – without any special tools, scratch-free and to perfection.

Automatic tool changer

The servo-mechanical drives are characterized by high dynamics, constant operating conditions and very low energy requirements.
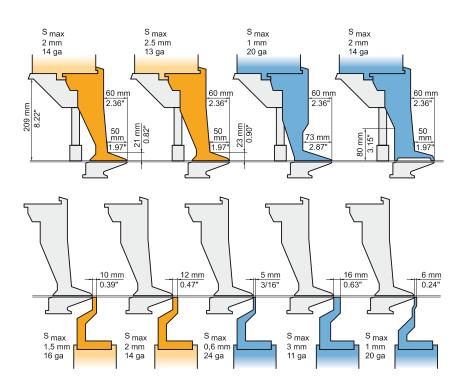
Short tool change times by independent tool change gripper arms.

At the beginning of a folding sequence, the tool changer gripper arms setup the machine with lightning speed and unmatched accuracy. By separate servo drives the tool changer can set-up different tool lengths right and left of the machine center line, as they are needed for tapered parts. For most parts the tool change sequence is completed, before the next blank arrives at the bend line.

The controller automatically calculates the required tool segments and the fastest tool change strategy. If a specific tool with a cutout in the foot should be placed exactly above an emboss: No problem! A tool change within a folding sequence – also a standard RAS tool change feature! Tools currently not used: The changer stores them in the tool magazine.

Tool geometries

For heavier applications upper beam tools for 2.5 mm (13 ga) mild steel are available. Matching folding beam tools are also available. RAS offers customized upper and folding beam tools for specific applications.

Upper and folding beam tools: Standard geometries (yellow) and customized shapes (blue).

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Corner tool inside the part

Corner tool inactive position

UpDown-tools

The system is complete with the unique UpDown-tools for the folding beam. They are a premiere class high-tech state-of-the-art tooling innovation. A clever mechanism automatically allows the UpDown-tools to change position within the folding cycle. In normal position these tools have the same height as all the other folding beam tools and are used for normal bends. In a second, the same tool collapses for parts with off-set bends to the inside or for tapered shapes. They can also come above the other tools for welding tabs which should be bent with a one times material thickness off-set. If a flange should be bent on the left hand side of the part, but not on the right hand side, asymmetrical UpDown-tool positions can be programmed.
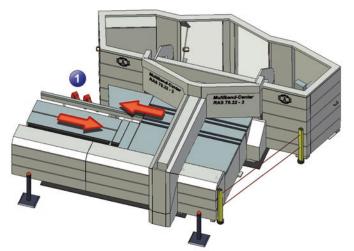
Segmented folding beam tools

Segmented folding beam tools offer even more design flexibility for window bends, tapered parts or off-set bends. A combination of basic segments and adapter tools allows set-up of virtually any tool length.

Automatic tool clamping

Before a folding sequence starts, the automatic tool clamping systems for the upper beam and the folding beam lock the tools in position.

Roto-foot corner tools

Programmable roto-foot corner tools automatically rotate in and out. This allows them to pass pre-bent side flanges. They precisely dive into the part. After the precise corner has been created, they automatically rotate into their inactive position and move out of the part. Fast and simple.

Tools for weld tabs at flexible positions

Tab tools

Tabs that are used for spot welding or clinching, are easily done with specialized tab tools. The tool changer places them at any position along the working length of the part being folded.

UpDown-tool inactive position (collapsed)

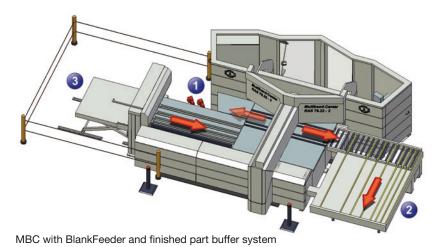UpDown-tool raised position

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Load systems: versatile and upgradeable modules!

With the modular RAS loading systems, you can start with manual blank loading and upgrade to full automation whenever you wish. Using the latest CAN-Bus technology, each configuration can be added by plug-and-play, thus offering high production flexibility - today and in the future.
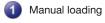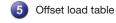

BlankFeeder

BlankFeeder

The BlankFeeder is an economic masterpiece for medium size batches loaded from a single stack. A pallet with punched or laser-cut blanks sits on a scissor table. After suction cups have lifted the leading edge of the blank, the blank loading grippers grasp the blank and pull it into the folding center.

Manual loading

Manual loading is your best bet, if a single operator should run the Multibend-Center, or if you have limited floor space or a limited budget. The finished part is either returned to the operator or is unloaded to the opposite machine side.
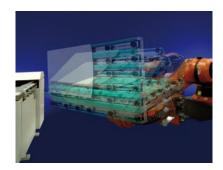

Multibend-Center (MBC) with manual blank loading system

MBC with BlankFeeder and finished part buffer system

1 Manual loading	3 BlankFeeder	5 Offset load table	➡ Material flow
2 Buffer table	4 Load robot		

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Load robot flips blanks

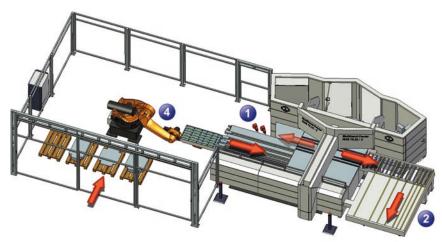## Robotic blank loading

The unique RAS robotic load-ing system uses an intelligent six axes robot? What does this mean? If you intend to process small batches or kits, program-ming or teaching a robot would be too time consuming. The intelligent load robot calculates its movement paths automati-cally - whether a small or large blank has to be loaded.
Material supply can come from wooden pallets or from an auto-mated high rack warehouse. A pallet can be loaded with stacks of different blank sizes and with different stack heights.
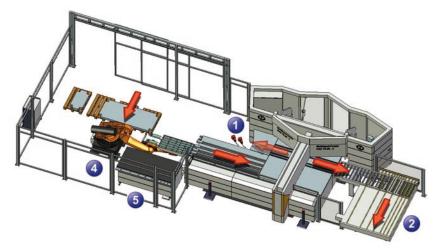The robot is able to flip the blank during the load sequence, thus the punched burrs are on the inside of the finished box or the color of coated material is on the outside of the folded part.

Offset load table

If blanks should be loaded to the Multibend-Center without flipping, an additional off-set load table is required. The robot places the blank onto the off-set load table. The off-set loading table squares the blanks that were not stacked properly. If the robot should flip some blanks, but not others, an off-set load table with shuttle function is also available.

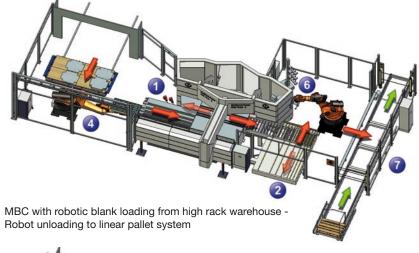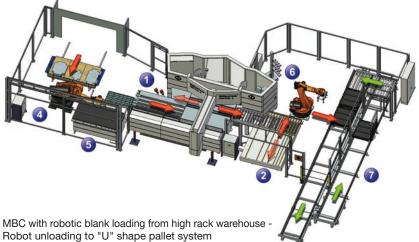MBC with robotic blank loading from wooden pallets (right)

MBC with robotic blank loading from wooden pallets (left) and off-set load table (Shuttle table)

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Unload robot: maximum efficiency!

MBC with robotic blank loading from high rack warehouse - Robot unloading to linear pallet system

MBC with robotic blank loading from high rack warehouse - Robot unloading to "U" shape pallet system

Unload robot

As with the loading robot, RAS uses the intelligent robot also for unloading the finished work-pieces. The robot receives all relevant part geometry data from the RAS CellControl system. The user just needs to specify how the parts will be stacked: horizontally, vertically, beside each other, with an off-set or rotated. The magic is done by the intelligent unload robot. Teaching or programming are things of the past.

Finished part rotator

If folded parts should be nested within each other, the finished part rotator comes into play. The suction cups of the finished part rotator holds the part from one side. The robot moves around the workpiece and regrips it from the other side. Of course, without programming! Fast and simple.

Pallet system

The robot stacks the finished parts on pallets, which are sup-plied and discharged by a pallet system. The design of the pallet system will be customized to the local floor space availability at the customer's facility.

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Basic pallet and „push-in" back panel

The basic pallet for horizontal stacking measures 1000 x 1200 mm (39" x 47"). If the robot should stack longer parts vertically, a steel frame back panel is simply pushed into the basic pallet. For Kanban production concepts a matrix code label can be added to the pallet. There is nothing simpler than this!
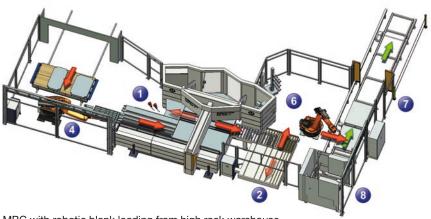
Pallet magazine

A magazine for empty basic pallets minimizes the length of the supply chain within the pallet system. Safe and space saving!

Magazine for back panels

Steel frame back panel can be stacked in a compact magazine. The robot is able to automatically convert a basic pallet into a pallet with a back panel. Or vice versa: to rebuild a pallet with back panel into a basic pallet. It is not possible to get more efficiency.

MBC with robotic blank loading from high rack warehouse - Robot unloading with pallet magazine

1. Manual loading
2. Buffer table
4. Load robot
5. Offset load table
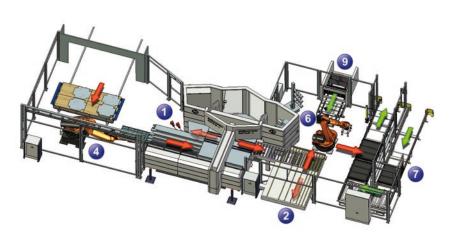6. Unload robot
7. Pallet system
8. Pallet magazine
9. Magazine for back panels

➡ Material flow

➡ Pallet flow

MBC with robotic blank loading from high rack warehouse - Robot unloading with magazine for back panels

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Multibend-Center

Technical Data	RAS 79.26-2		RAS 79.22-2	
Working length max.	2560 mm	100"	2160 mm	85"
Sheet thickness max. (mild steel)	2.0 (2.5) mm	14 (13) Ga.	2.0 (2.5) mm	14 (13) Ga.
Sheet thickness max. (stainless steel)	1.5 mm	16 Ga.	1.5 mm	16 Ga.
Sheet thickness max. (aluminum)	3.0 mm	0.125"	3.0 mm	0.125"
Finished part length min. (w/o corner tools)	200 / 250 mm	7.87" / 9.85"	200 / 250 mm	7.87" / 9.85"
Finished part length min. (w/ small corners)	380 / 430 mm	15" / 16.93"	380 / 430 mm	15" / 16.93"
Finished part length min. (w/ large corners)	430 / 480 mm	16.93" / 18.9"	430 / 480 mm	16.93" / 18.9"
Finished part width min. (inside)	150 (140) mm	5.91" (5.52")	150 (140) mm	5.91" (5.52")
Finished four sided part height max. *	203 mm	8"	203 mm	8"
Side free space corner tools (small / large)	30 / 50 mm	1.18/1.97"	30 / 50 mm	1.18/1.97"
Folding beam travel range	180 Grad	180 deg.	180 Grad	180 deg.
Working height	1000 mm	39.4"	1000 mm	39.4"
Machine width	7700 mm	303"	6900 mm	272"
Machine length	5800 mm	229"	5400 mm	213"
Machine height max.	2400 mm	95"	2300 mm	91"
Weight approx.	17000 kg	37.480 lbs.	14000 kg	30.865 lbs.
Drive Power max.	25 kW	33.5 hp	25 kW	33.5 hp
Average Power Consumption	16 kW/h	22 hp/hour	16 kW/h	22 hp/hour

* For parts wider than 233 mm /9.18"