ROBOSOFT

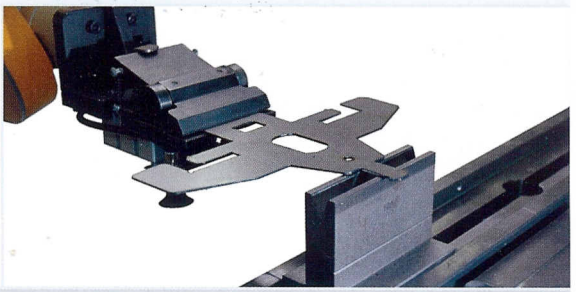
HACO

for impressive performances

HACO - ROBOSOFT

ROBOT BENDING SYSTEM

THE NEXT STEP IN AUTOMATED BENDING



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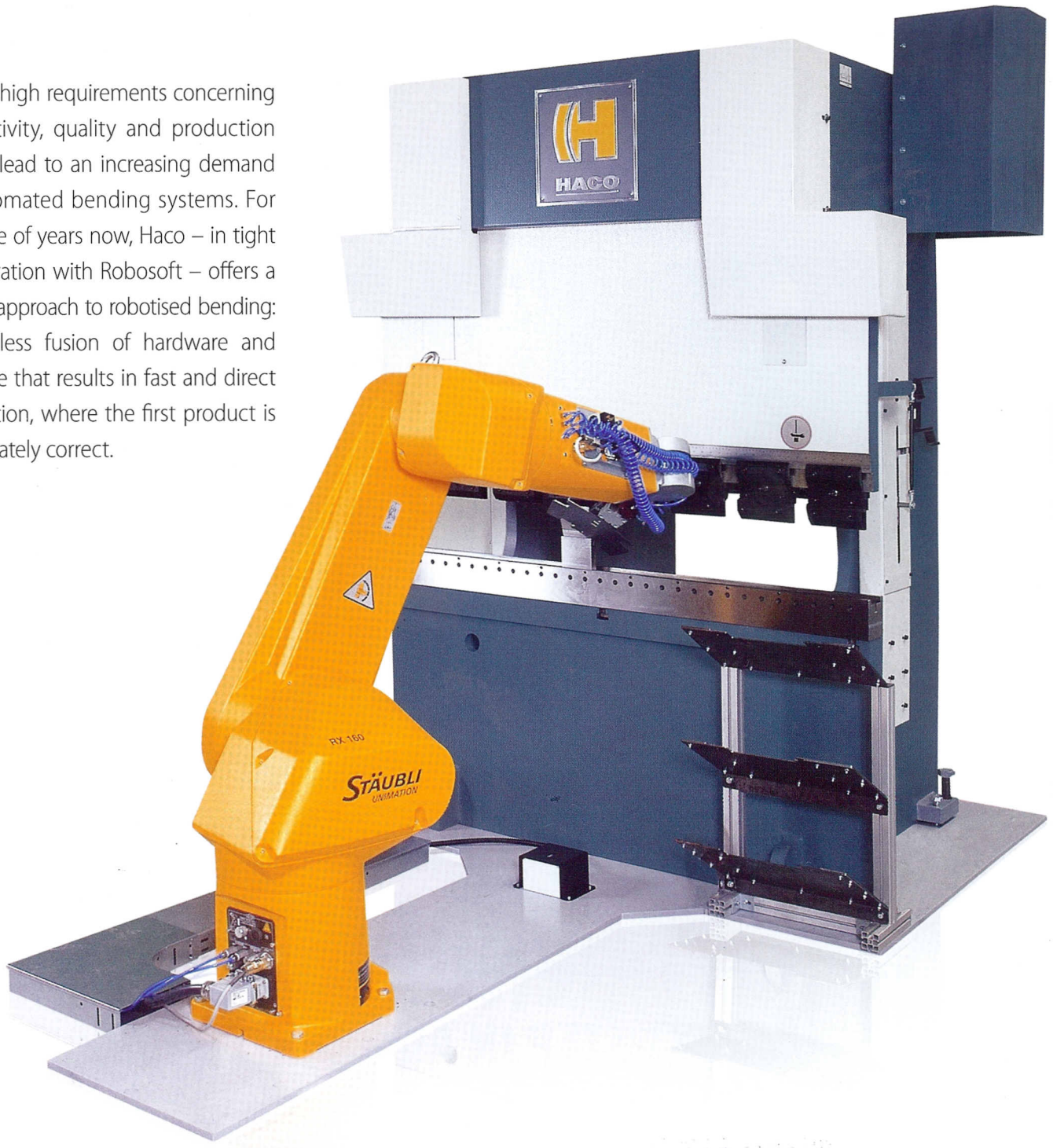
PRODUCTIVITY THROUGH TECHNOLOGY...

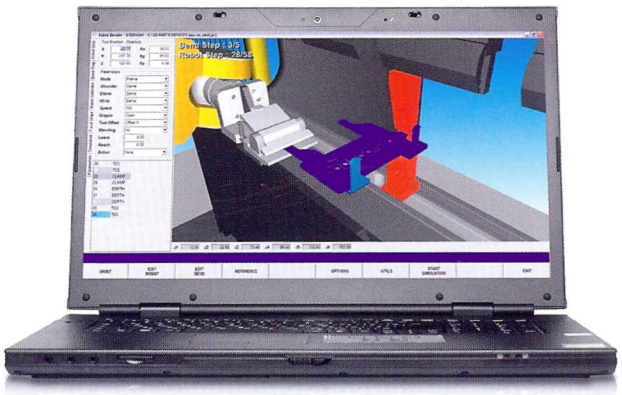
Today's high requirements concerning productivity, quality and production speeds lead to an increasing demand for automated bending systems. For a couple of years now, Haco – in tight collaboration with Robosoft – offers a unique approach to robotised bending: a seamless fusion of hardware and software that results in fast and direct production, where the first product is immediately correct.



For demo videos of the robot bending system, please visit www.youtube.com "Robosoft cnc controls".

SOFTWARE

The product is processed in a specific software suite, developed by Robosoft. First the product drawing is imported and the material properties are defined. Then the software is able to propose the most ideal tool setup, still leaving the opportunity to make manual adjustments. Then there's a fully automatic bending sequence search. Unlike similar systems, this software is capable of finding all possible bending sequences in a very short amount of time. After finding the optimal bending sequence, the robot program is ready to be simulated and approved for immediate production. In other words, the robot program is created entirely in function of the product to be produced. No additional teaching or calibration is required!



SIMULATION

By simulating the robot program, it's possible to test the production process in a virtual representation of the actual bending cell, where the user even has the option to add, displace or remove objects. The integrated collision detection is able to find occurring collisions with all possible obstructions in the virtual cell and adjusts the program where necessary in order to avoid them.

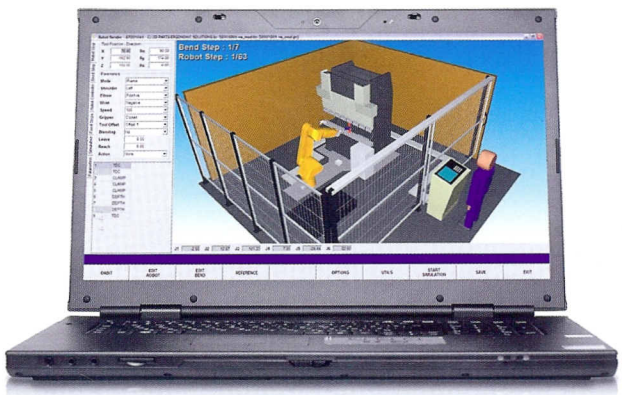


PLATE HANDLING

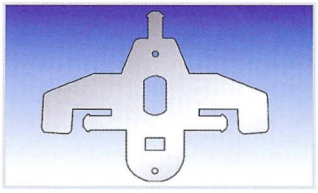
Depending the specifications of the product, the robot can be equipped with standard or custom manipulators, whether they be mechanical, pneumatic or magnetic. This makes that almost any kind of product can be handled by the robot. The base plate is placed on the V-die and once the bend is finished, the robot moves to the most ideal grip position and takes the product to the appropriate position for the next bending step. This results in fast and precise production from the taking of the base material to the stacking of the finished product. The high positioning precision even eliminates the need for a classic back gauge, in this way avoiding possible conflicts between two positioning systems.

FIRST PRODUCT = CORRECT

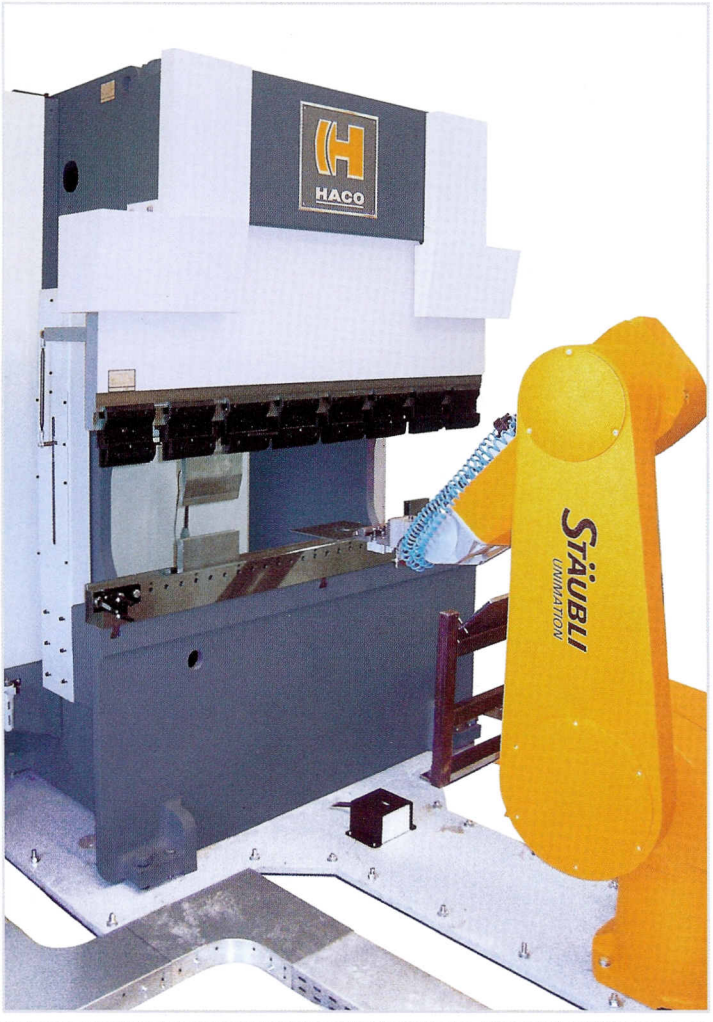
Thanks to the innovative programming method and the fact that the robot program is based on the bending program, all possible factors (e.g. angle calculation, material properties, etc.) are taken into account during the preparation of the program. This results in a product that is produced correctly from the first time, ensuring a continuous production with no down-time in case of a production changeover.

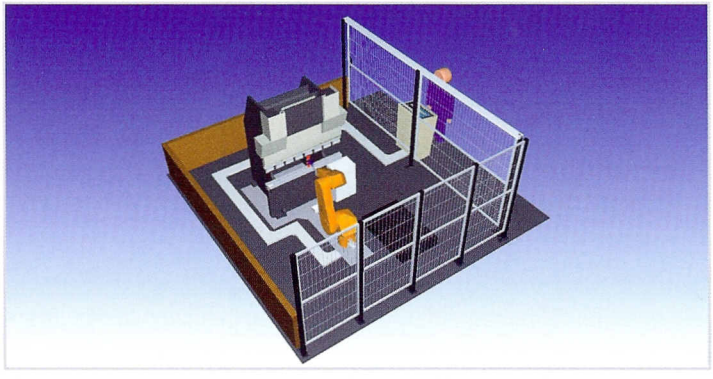
CASE EXAMPLE: COMPACT BENDING CELL

Product group	3D products (supports payment terminals)
Material	ST37...42
Weight	1...5 kg
Dimensions	Max. 300 x 300 x 2.5 mm
Series	200-600 products per run ±15000 pcs./product/year



Robot cell





PRESS BRAKE ERM 16040

Graphic control	MC9510 T
Table length	1600 mm
Daylight opening	425 mm
Stroke	200 mm
Gap	300 mm
Toptool system quick clamping	100 mm
Standard Haco colors	
No back gauge	
Table with groove for single V-die (13 mm)	
No anti-deflection table	
Measuring scale on upper beam	

ROBOT STAUBLI RX160

Robot arm length	1710 mm
Nominal load	20 kg
CSC8 control	

ROBOT GRIPPER

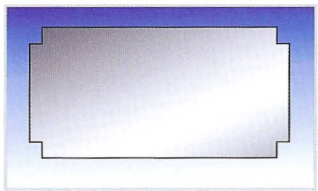
Standard mechanical gripper
Adapter for mounting 2 vacuum suction cups on standard gripper
Adapter for mounting magnet on standard gripper

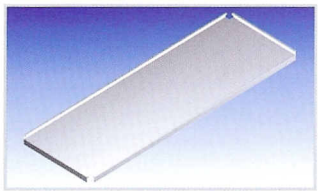
PERIPHERAL EQUIPMENT

Fence side length 4.9 m with two sliding doors
T-shaped floor plate non-chamfered, thickness 20 mm, RAL 7035
Sensor for thickness measurement
Sensor for position measurement

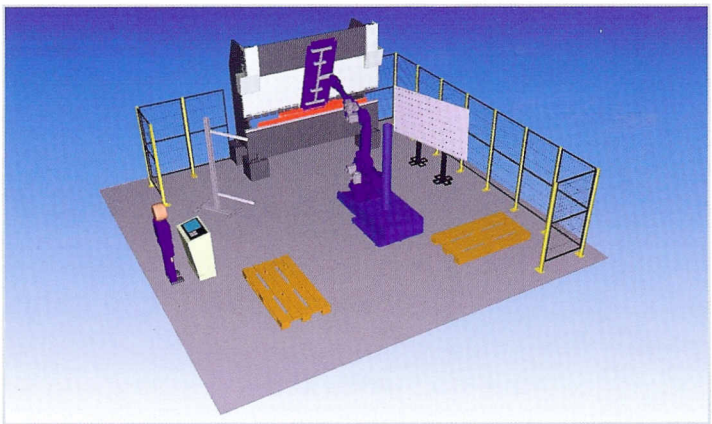
CASE EXAMPLE: COMPACT BENDING CELL

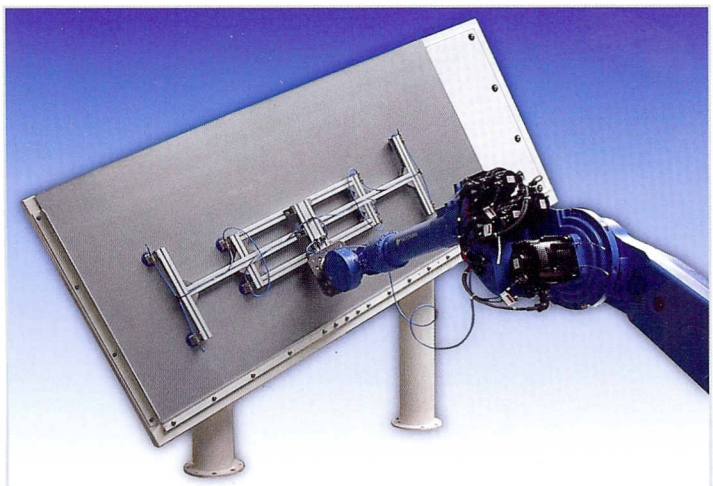
Product group	Panels & profiles
Material	Stainless steel
Weight	5…24 kg
Dimensions	Max. 3000 x 800 x 1 mm
Series	±200 products per run ±16000 pcs./product/year





Robot cell





PRESS BRAKE ERM 36100

Graphic control	MC9510 T
Table length	3600 mm
Daylight opening	640 mm
Stroke	300 mm
Gap	250 mm
Toptool system quick clamping	100 mm
Standard Haco colors	
No back gauge	
Back gauge 4 axes X-R-Z1-Z2	
Sheet support	
Anti-deflection table integrated in Wila hemming tool	

ROBOT MOTOMAN ES165RD

Robot arm length	3140 mm
Nominal load	165 kg
DX100 control	
Additional rotating axis VST-1500	

ROBOT GRIPPER

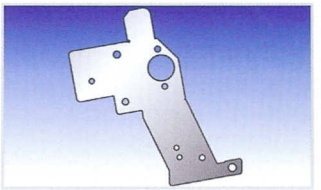
Vacuum gripper for panels 3000 mm x 700 mm
Vacuum gripper for panels 2000 mm x 800 mm
Vacuum gripper for profiles

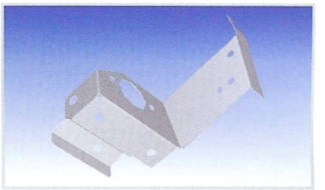
PERIPHERAL EQUIPMENT

Safety perimeter 6 m x 6 m with access door
Retaking station with adjustable arms
Pallet with sheet separation by compressed air
Reference table for zeroing of manipulation position
Sensor for thickness measurement
Sensor for position measurement

CASE EXAMPLE: MULTIPLE BENDING CELLS

Product group	3D products
Material	ST37...42
Weight	2...5 kg
Dimensions	Max. 400 x 400 x 6 mm
Series	300-1000 products/run ±12000 pcs./product/year





4 Robot cells

4 PRESS BRAKES CE

3 x ERM with table length	1275 mm
1 x ERM with table length	2200 mm
4 x Graphic control	MC9510 T
Daylight opening	425 mm
Stroke	200 mm
Gap	300 mm
Custom clamping	
Custom colors	
No back gauge	
Anti-deflection table	

4 ROBOTS: STÄUBLI RX160

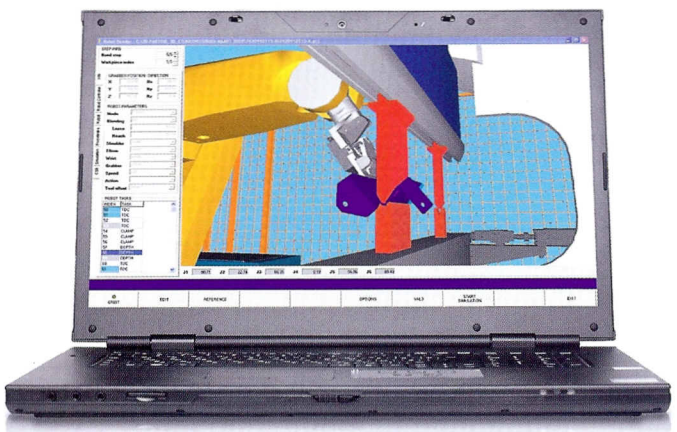
Robot arm length	1710 mm
Nominal load	20 kg
CSC8 control	

ROBOT GRIPPER

4 x standard mechanical gripper

PERIPHERAL EQUIPMENT

3 x safety perimeter 3.5 m x 4.5 m with access door
1 x safety perimeter 4.5 m x 5.2 m with access door
4 x square floor plate chamfered, thickness 20 mm, RAL 7035
4 x base plate supply with Vision system
4 x product evacuation chute + container



HIGHLIGHTS

ROBOSOFT

QUICK AND EASY INSTALLATION

The plug-and-play concept of the Haco-Robosoft robot bending system ensures an installation of most bending cells within a single day. This includes on-site installation and start-up of the bending cell. Operator training of the bending cell usually takes no longer than two days.

FIRST PRODUCED PART IS IMMEDIATELY CORRECT

Haco's and Robosoft's high level of technology know-how results in a system where robot and press brake are able to work together seamlessly. This results in the first produced part being correct from the start, thus significantly increasing production rates and machine availability.

TOTAL CONTROL FROM A SINGLE UNIT

The Robosoft high-performance bending control is a centralised unit that is able to control the entire production process, i.e. the press brake, the robot, access control, etc. from a central spot in the bending cell.

START PRODUCING RIGHT AWAY

Robosoft's powerful software guarantees a superfast pre-production process, where the time between product drawing import and robot program generation is reduced to mere minutes, or even seconds for simple products.

LOW LEARNING CURVE

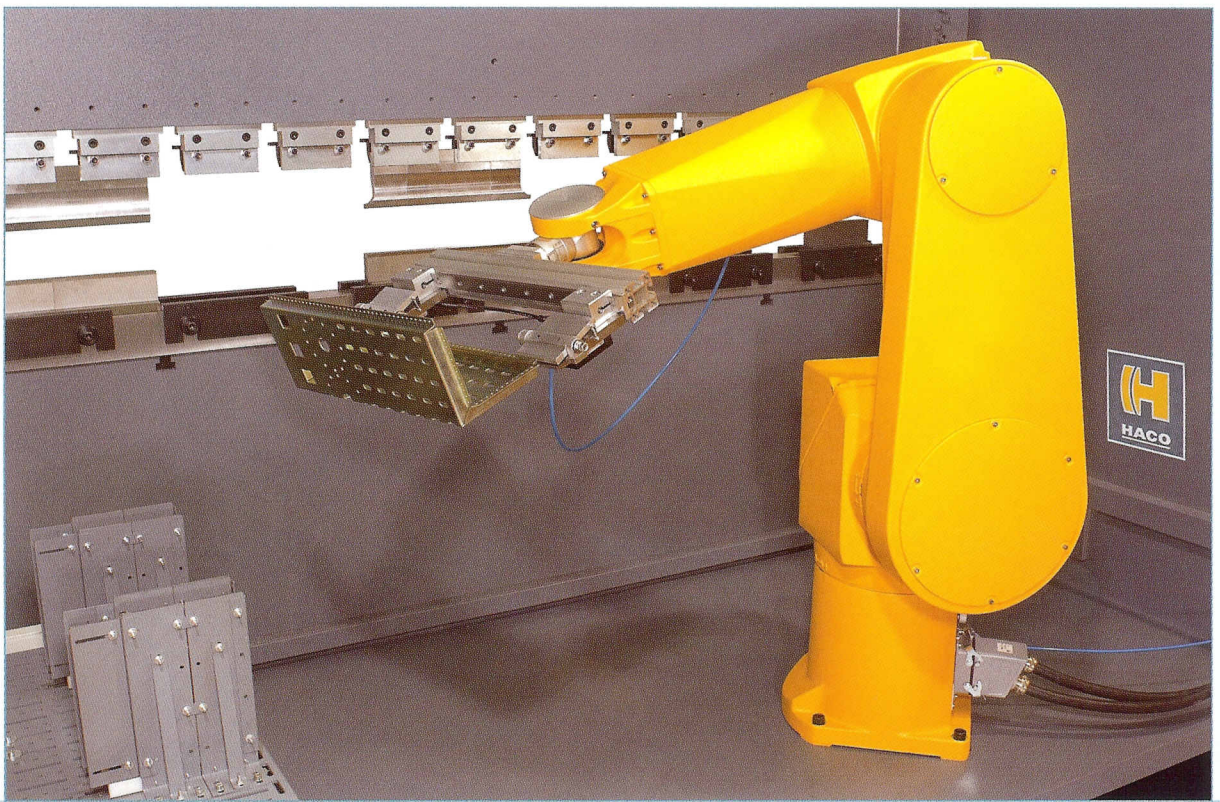
The programming software for the bending cell and the control's firmware aren't only easy to learn, they're also easy to master and any experienced press brake operator can work with them in no time. Moreover, thanks to the programming software, no robot knowledge is required to operate the system.

CONTINUOUS HIGH-PRECISION PRODUCTION

The robot performs all bending operations at a constant speed and at the highest precision, which results in identical high-quality and high-quantity productions, time after time.

A fully automatic Robotic solution for HACO Press Brakes

Type HRB (HACO Robot Back Gauge)



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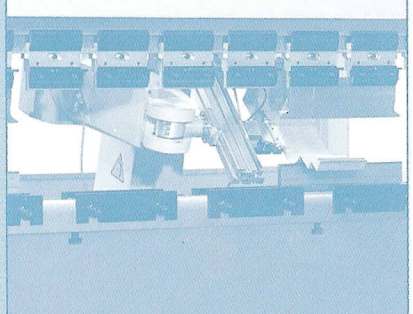
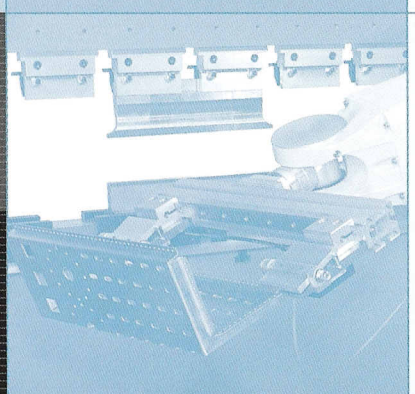


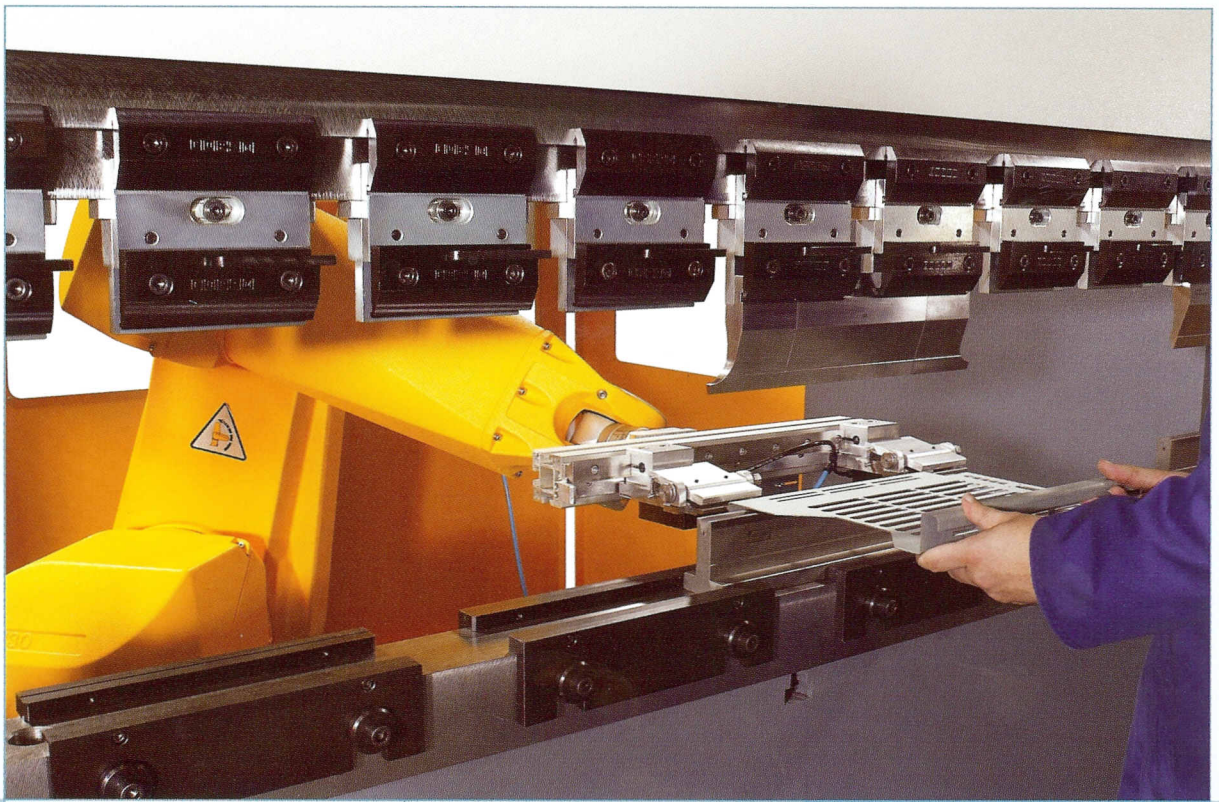


Advantages in comparison with the usual systems on the market:

- Capital costs are reduced as both the Press Brake & Robot System are manufactured by one OEM.
- The calibration between the Robot System and Press Brake is constant with no additional synchronisation required.
- Immediate start-up of the machines with no time loss for calibration.
- Our user friendly Press Brake Controller automatically generates the robot program.
- The corresponding positions of the material (turn, rotate, shift, clamp…) are generated through the robot system without the need for an additional back gauge system.
- The material grabs or vacuum pads manoeuvre the most complex of work-pieces.
- Fast user friendly programming of multi or single runs.
- Safety & Operator security is assured through mechanical restraints and light guards.
- The integrated software allows full optimisation for the feeding and stacking of materials.
- Auto CE for the whole system.

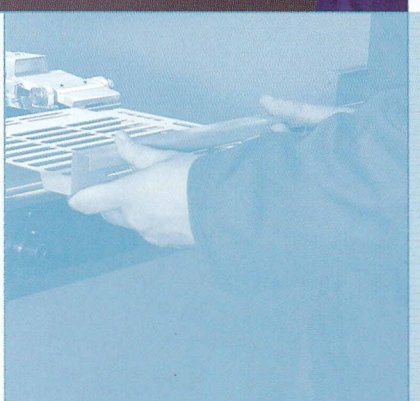
Easy changeover from fully automatic (cycles without operat

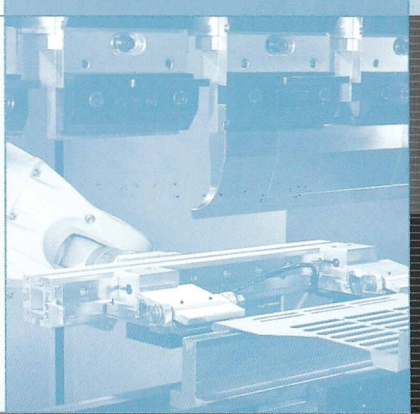
Robot system also acts as a high precision multi-axis backgauge system when in conventional use with an operator:



Advantages in comparison with the usual systems on the market:

- No additional costs to switch between robotic and manual mode.
- The front of the machine is free of obstructions.
- Standard ergonomic machine working heights.
- The operator or manual mode is as normal Press Brakes.
- Integrated automatic collision detection for the complete bend cycle.
- Graphical representation of the complete bending cycle.
- Real time program status.
- Automatic change clamp positions to ensure material stability.
- Precise fast positioning for complex 3D-workpieces on different working stations.
- Protection of the operator optional by light guard systems at the machine (front)side(s).

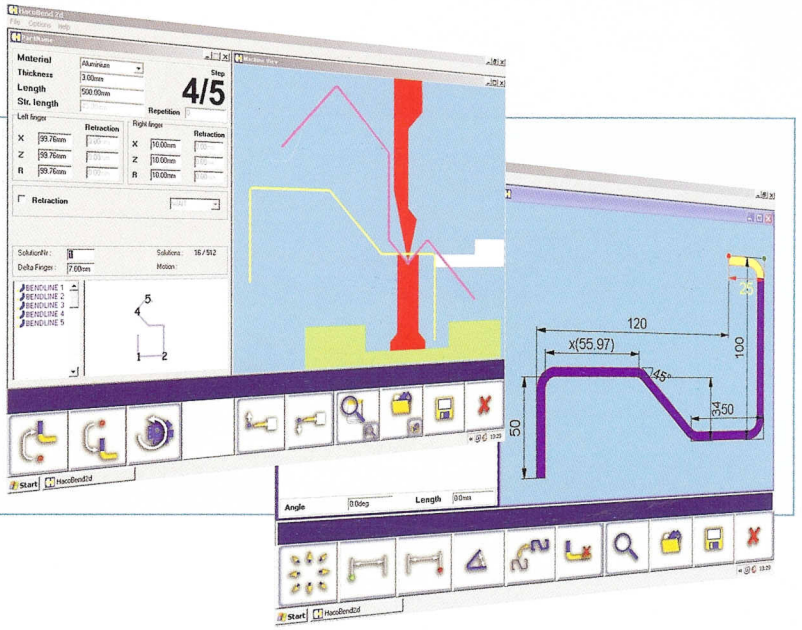




or) to manual or semi-automatic mode (cycles with operator).

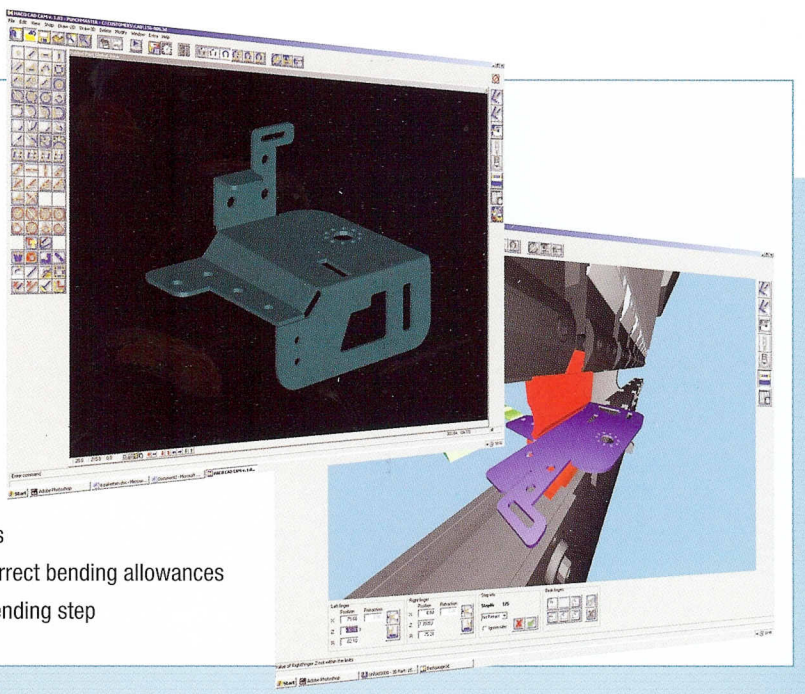
HacoBend 2D

- Windows based software
- User-friendly parametric design of 2D profiles
- Customizable macro parts
- On-line automatic calculation of best bending sequence
- Radius bumping and hemming
- Scaling of thickness and large parts
- NC file is created while drawing the part



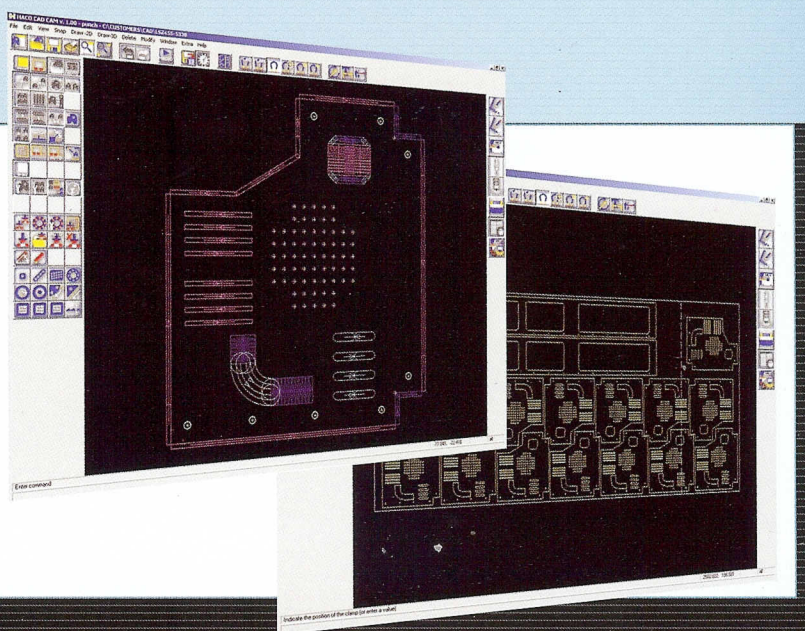
HacoBend 3D

- Windows based software
- User-friendly 2D CAD functions
- 3D CAD for sheet metal
- Importing of 2D files: DXF, ME10, HPGL
- Importing of 3D files: IGES, STEP, DXF
- Automatic and manual sequence calculation with collision detection
- Dynamic collision control with real machine
- 3D shaped tools, e.g. with horns, are possible
- Possibility to mix tools in one setup
- Completely integrated in HacoSoft CAD/CAM
- Automatic and manual calculation of backgauge positions
- Automatic calculation of flat layout of the part with correct bending allowances
- Creation of NC file with 3D rotatable view for every bending step



HacoPunch Pro

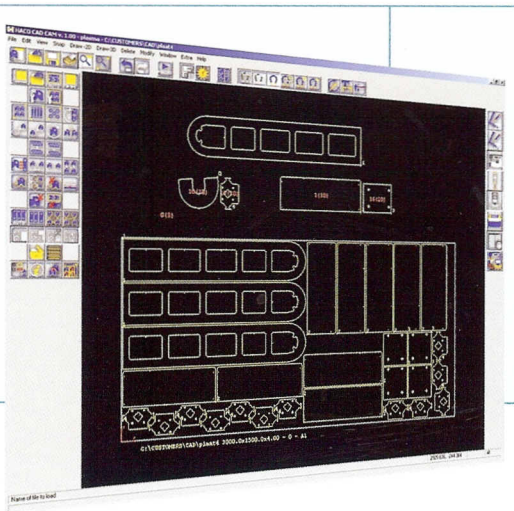
- Windows based software
- User-friendly 2D CAD functions
- Importing of 2D files: DXF, ME10, HPGL
- Tool library
- Manual and automatic tool assigning
- Manual, automatic and combined nesting
- Common cuts, micro joints…
- Manual and automatic repositioning
- Punch path simulation and run time calculation
- Completely integrated in HacoSoft CAD/CAM



HacoPlasma Pro & Lite

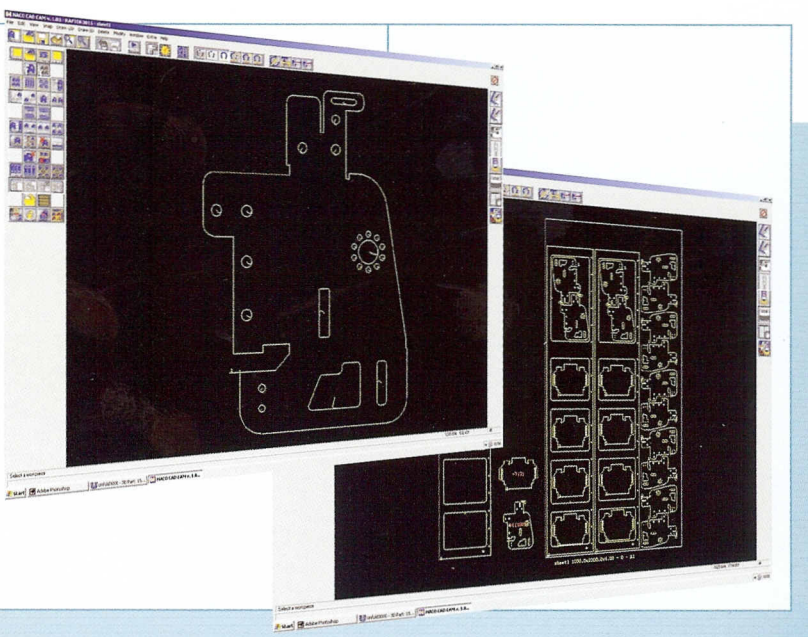
- Windows based software
- User-friendly 2D CAD functions
- Importing of 2D files: DXF, ME10, HPGL
- Assigning of technology to sheet and/or part
- Rectangular and True Shape nesting
- Manual, automatic* and combined* nesting
- Common cuts*, bridging, micro joints…
- Cutting path simulation
- Completely integrated in HacoSoft CAD/CAM

(*) only for HacoPlasma Pro



HacoLaser

- Windows based software
- User-friendly 2D cad functionality
- Importing of 2D files: DXF, ME10, HPGL
- Assigning of technology to sheet and/or part
- Rectangular and True Shape nesting
- Manual, automatic and combined nesting
- Common cuts, bridging, micro joints…
- Path simulation and run time calculation
- Completely integrated in HacoSoft CAD/CAM



HacoSoft Setup Packages

HACO OFFERS ALSO:

HYDRAULIC PRESS BRAKES

Hydraulic conventional press brakes, type PPM.
Up to 10 axis CNC-controlled hydraulic press brakes, type Synchromaster, Euromaster and HDSY.

Capacity of 40 up to 3000 tons.
Single or tandem configuration.

CNC PLASMA CUTTING MACHINES

CNC plasma and oxy-fuel cutting machines type Kompakt and Proxima.
From 2 x 1 meter (6' x 3')
up to 30 x 6 meter (98' x 20').

CNC PUNCHING MACHINES

High speed servo hydraulic punching head. All tools 360° indexable.
From 18 to 30 tons punching force.
12 to 20 turret stations. Type Q2-Q3-Q5.

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