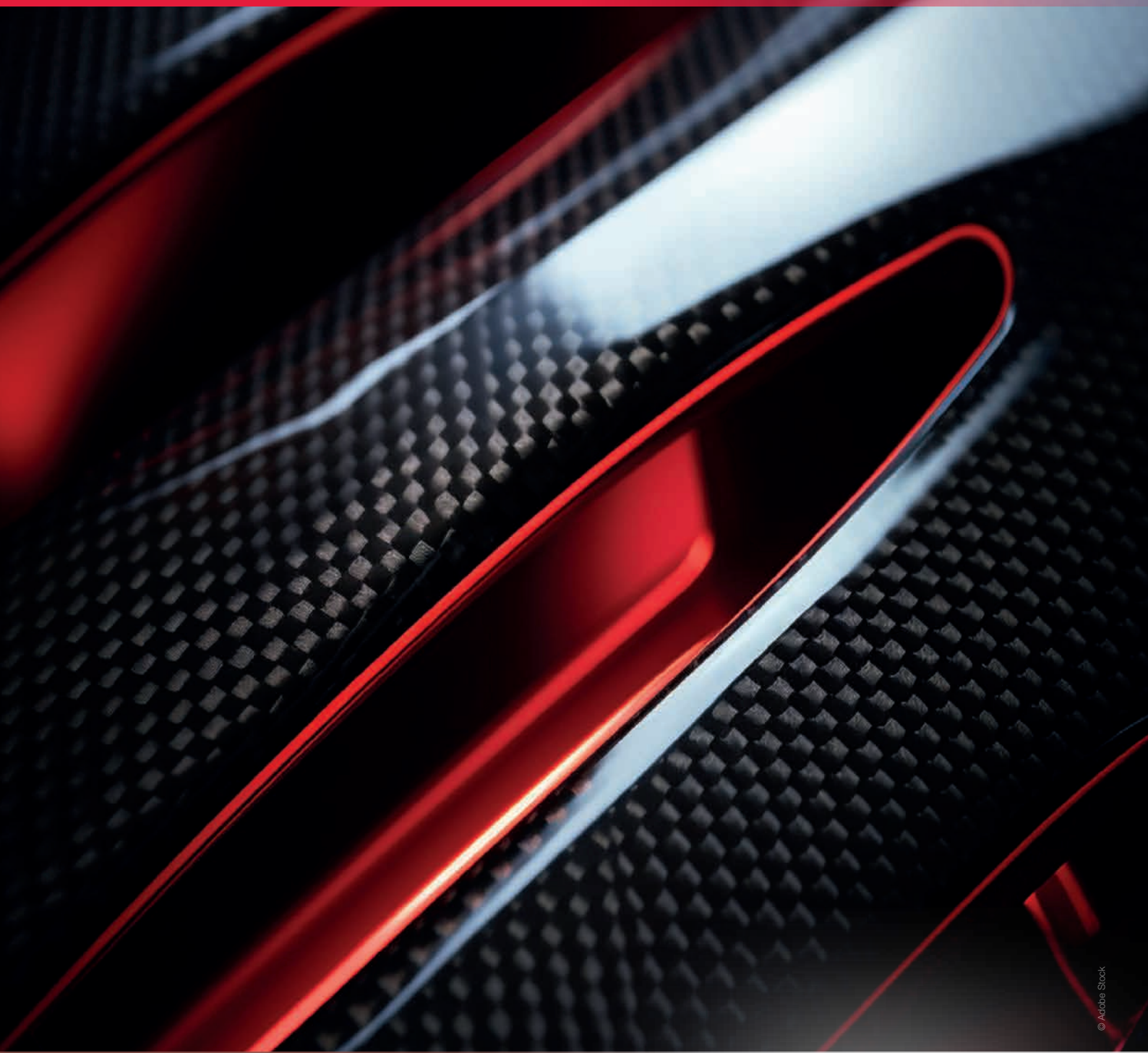
Top Technology for ***Machining Plastics and Composites***



CNC-machining centres that meet highest demands

HAMUEL REICHENBACHER

Members of the SCHERDEL*Group*

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REICHENBACHER machining of plastics and composites

Plastic machining is a broad field:
It starts at the trimming of vacuum deep-drawn components, covers free-formed CFRP- and GFRP-components, as well as the machining of technical plastic components with filter mats as an example.

Here, CNC-machining centres unite a world of extremes:
On the one hand, there is a demand for great milling feeds with little chip removal at a high speed of the milling spindle, which can only be obtained by a CNC-control system of highest performance. On the other hand, the manufacturing cell is to allow for the maximum chip removal rate at minimum spindle speed, for example when machining thermoplastics.

Machining of plastics and composites

Promising manufacturing solutions

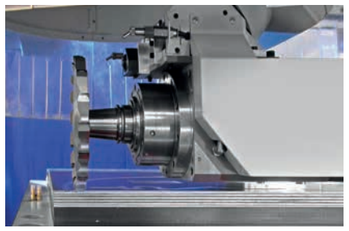
A new definition of machine technology

The “Champions League” is reached when machining composites – for example in caravan manufacture – where the lateral wall consists of layers of aluminium, polyurethane foam and wood. Here, the manufacturing tool is subject to highest demands and an optimum power spectrum of the milling spindle over the entire speed range must be assured.
Specialists for vehicle interiors, producers of technical plastic components, screw conveyors, display packages or plexiglass components for medical technology, as well as companies processing technical foams or manufacturers of light-weight components for aircraft construction, trust in the competence, reliability and technological top performance of Reichenbacher Hamuel.

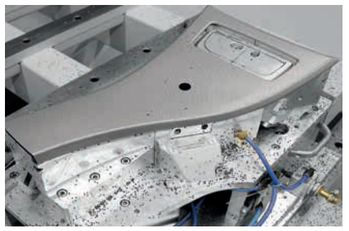
Versatile and modern
The use of 5-axis technology permits challenging work at three-dimensional bodies with convincing results for aircraft interior fittings, as well as in the construction of automobiles, yachts, rail vehicles and in model making. All these sectors place special emphasis on precision, process reliability and specific solutions.

Customised machinery and equipment
Our excellent reputation in these markets is based on our innovative engineering and pronounced quality awareness. The use of future-oriented technology, comprehensive application experience, and the continuous education and training of our staff, form the basis of such convincing results. Make consistent use of the procedural and technical progress of Reichenbacher Hamuel to increase your production efficiency.

Machining of a honeycomb core, e.g. for reinforcing aircraft wings.



Disc miller for the linear and circular milling of decorative grooves in aluminium and plastic plates.

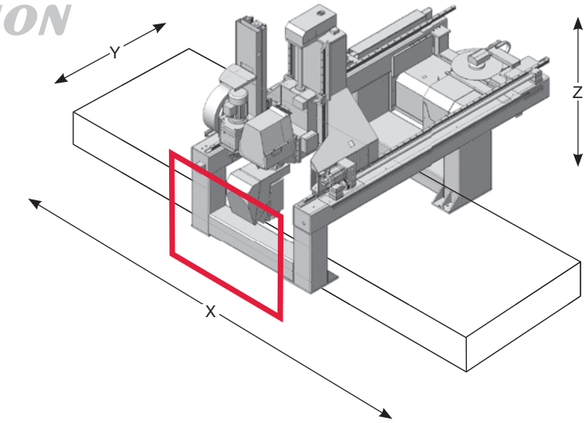


Clamping device with interior component on an ECO-NT.

CNC-machining centre VISION

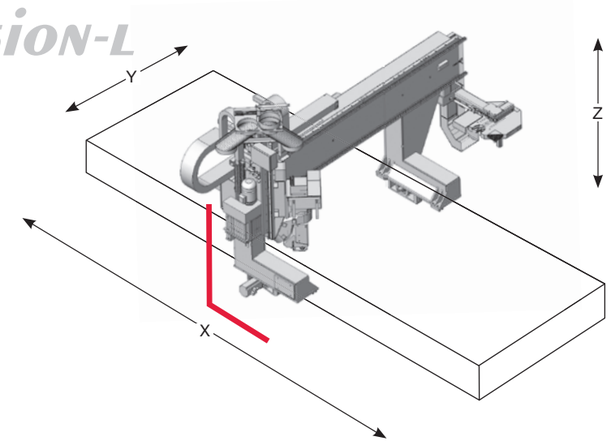
Portal configuration

vision



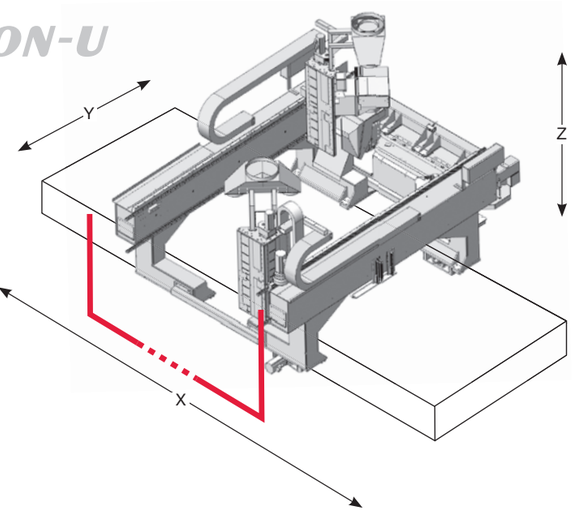
Characteristic for the **VISION** series is its machine substructure with a fixed table. The portal is mounted on this machine substructure and carries out the longitudinal movement (X-movement). All unit movements are performed within the enclosed portal equipped with safety bumpers.
The main machine components are in ripped welded design to ensure an optimum rigidity or weight ratio, respectively. Thus, very good acceleration values can be obtained.

vision-L



The **VISION-L** allows for the mounting of up to two independent Y-slides one behind the other. Thus, the tools for a tool change can be taken from either of the two tool magazines while machining takes place in parallel, and the synchronous machining of two workpieces placed one behind the other can be effected – for example when 5-axis fork heads are used. The independent units are mounted on an L-shaped support and guarantee high up-time.

vision-U



Thanks to its U-shaped portal, the **VISION-U** offers a lot of varieties for parallel and single machining. This permits, for example, a tool change for both units from the same chain tool magazine while machining takes place at the respective other unit and omits the need to keep the same tool available twice. The use of up to two big cardanic 5-axis heads and of other comprehensive equipment guarantees maximum flexibility, such as the synchronous machining of two workpieces clamped one next to the other and/or one behind the other in an offset position.

The components show what the machine can do

In many demanding applications, the basic version of the VISION series has already proven its capabilities at our customers. Its stability and precision correspond to the standards set by all Reichenbacher Hamuel machines. The machines excel by their good dynamics and are therefore predestined for reducing manufacturing costs while keeping productivity high. This is why these machining centres are an excellent choice for the order-related manufacturing even of the smallest batch sizes. Moreover, they offer an outstanding cost-/performance ratio.

The VISION-L and -U types supplement the reliable VISION series. What is so special about these machines is their variability in size and their multitude of different machining units to choose from. Up to four independent Y-slides are available to be combined in these units for single and parallel machining purposes. Thanks to their extremely rigid machine construction, a diversity of machining units can be used next to each other or one behind the other.

Equipped with a cardanic working head, the VISION Sprint permits the three-dimensional machining of freeform surfaces and contours. Given this multi-side machining in freely definable planes, there are almost no limits to flexibility.

The VISION system:

- **Even after around 30 years we are still market leader with our safety concept for machines with mobile portals**
- **Enclosed portal made of sheet steel with safety bumpers**
- **No safety shut-off mats**
- **No safety barriers**
- **Safe view of the working process through generously dimensioned windows**

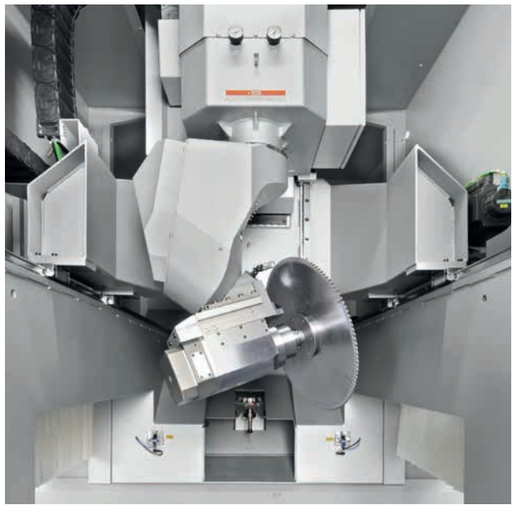
The high-performance units in the portal are supplied with tools either by plate magazines with 24 places or by a joint chain magazine with up to 80 places. In this case maximum time savings are possible by performing tool change in parallel. Owing to their high transmissible torque, the hollow cone shanks used are particularly suitable for high-speed machining. To perfect flexibility, a multi-spindle drilling unit with individually controllable spindles can be added.

VISION	Basic concept of the machine		
Unit configuration	3-axis milling units with vertical spindle 4-axis milling units with vertical spindle 5-axis milling units with cardanic spindle		
Additional units	Multi-spindle drilling units with 5 to 60 spindles Sawing units Printing and labelling system, laser labelling		
Types of spindles	Manufactured by Reckerth, HSD, Omlat, IBAG Power 3.5 kW – 55 kW Speed 0 – 60,000 rpm Tool holder HSK F25 – B80, ER 25, SK 40		
Tool changers	Tool changers with 24 to 80 places Pick-up for saw blades Pick-up for special units		
Extraction and chip removal	Extraction hood (rigid or adjustable in height) Chip conveyor Cleaning stations, table and component cleaning		
Machine table design	HPL table plate (smooth or grooved) Aluminium table plate (smooth or grooved) Manual beam table (system RH or Schmalz) Automatic beam table Steel bars with fitted and threaded bushes, zero point clamping systems		
Working area (strokes of the axes)	X-direction: VISION-I = 3,740 mm VISION-II = 6,140 mm VISION-III = starting at 6,940 mm (extension in steps of 800 mm)	Y-direction: VISION = 1,600 mm VISION-T = 2,200 mm VISION-TT = starting at 2,800 mm (extension in steps of 300 mm)	Z-direction: VISION = 480 mm VISION-H = 780 mm
Workpiece clamping	Vacuum clamping devices Pneumatic clamping devices Special clamping devices		
Control systems	Siemens Sinumerik ONE (operator surface HMI Operate, WIN 10)		
Control options	Mobile operator desk Suspended operator desk HT2 hand-held unit (as an option) HT10 hand-held unit (as an option)	Control extension (Siemens machining package milling) Control option remote diagnostics (SINEMA Remote Connect) Control option machine data recording Control option OEM runtime licence	
Safety equipment	Enclosure of the mobile portal including safety bumpers Light barrier (as an option) Safety fence (as an option) Laser scanners (as an option)		
Additional equipment	Loading and unloading systems Torque support for supplementary units Blasting nozzles Blast air ionisation Minimum quantity lubrication	Rotary feed-through for coolant Broken tool detection Tool recognition system Camera system Laser projector	

Subject to changes inspired by technical progress.

By our highly dynamic 5-axes CNC-machine VISON-FLEX we have created a perfect platform to make the processing of plastic profiles even more efficient, as this machine revolutionises the cutting and machining even of large profile cross-sections up to 7,300 mm in length and permits three-sided and end-of-profile machining.

When you use this series, you will succeed in saving precious working time and thus in achieving cost reductions. How has this been realised for this machine concept? The absolute position measuring system for the CNC-axes, for example, renders referencing unnecessary. Clamping blocks with individual drives, which can also be displaced in groups, result in a significant reduction in set-up and manufacturing times. Positioning of the clamps for profile processing is carried out automatically by the control system. Even during processing, the motor-driven clamping blocks can be moved and displaced in groups.



Cardan 5-axes working head with attached milling spindle (undercut 20°) for milling, drilling, sawing and grinding work.

The VISION-FLEX system:

- **CNC-centre for the 6-sided machining of aluminium and plastic profiles**
- **Very large machining area (7,300 x 500 x 350 mm) at a small footprint (12,800 x 3,000 x 3,000 mm)**
- **Efficient 5-axis machining with 15 kW spindle (35 kW spindle as an option)**
- **Sawing up to a saw blade diameter of 500 mm**
- **Measuring stop for measuring the profiles (as an option)**
- **No interruption of the machining operation for setting / loading: while machining takes place in station 1, loading can simultaneously be effected in station 2**
- **8 - 10 clamping blocks: massive, inclined design for a better chip removal**
- **Machine bed with chip conveyor; a sheet-metal labyrinth protects all guide and drive elements against chip penetration**
- **No pressure mats, no protective grating: safety system in bumper design**
- **Control system Siemens Sinumerik ONE with mobile operator desk**

Without any problems it will also be possible to open the clamps as a function of the profile and to fix the profile with only one clamp. Moreover, the component can additionally be fixed in the Z-direction by a vertical clamp at the beam. And last but not least: if machining is to take place in the range of the clamp, the latter can be withdrawn.

The challenges within the industry are manifold, and we meet them with an innovative milling head technology, the cardan spindle mounting of which permits a pivot range with an undercut of up to 20°. This is rendered possible by the connection of the pivot block to the B-axis arm at an angle of 50°. In the case of the VISION-FLEX we have thought of everything and implemented the technology required for machining processes needed by all manufacturers of aluminium profiles: freeing of the saw blade, quick notching from below, bevel notching, notching step-by-step, embedded notching, undercut machining, cycled processing, friction drilling, thread forming and powerful 5-axis milling.

The automatic tool changer comprises 20 tools and is freely configurable by the operator. Also bigger tools and additional heads can be used. The magazine moves along with the portal, thus permitting a tool change during the portal movement, which in turn considerably reduces non-productive times. The locating edge at the front of the table provides an ergonomic advantage even for the loading of long profiles. Moreover, the typical Reichenbacher safety concept with bumpers, and therefore without protective grating, turns this line into a real space saver. This line takes any profile manufacturer a big step closer to the manufacturing of the future.

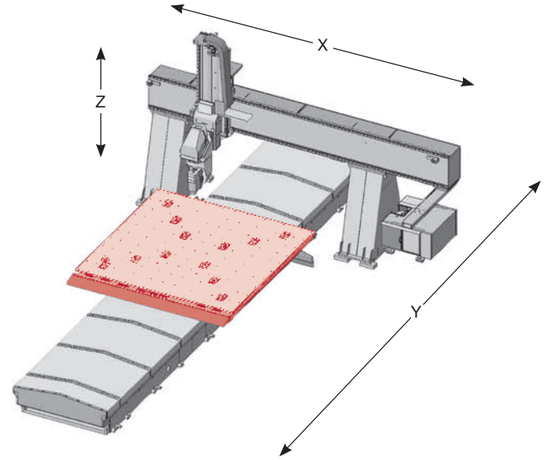
VISION-FLEX	Basic concept of the machine
Unit configuration	5-axis milling unit with cardanic spindle (20° undercut)
Additional equipment	Minimum quantity lubrication Blasting nozzles Torque support Spotlight at the working head Vibration monitoring Measuring probe
Spindles	Reckerth make – 15 kW; 24,000 rpm; HSK-F63 Reckerth make – 35 kW; 24,000 rpm; HSK-F63
Tool changers	Plate changer with 20 places with space for saw blade Ø 500 mm
Extraction and chip removal	Oil mist extraction Chip conveyor
Machine table equipment	Automatic beam table with pneumatic clamping units Stop faces left / right
Working area layout (strokes of axes)	Single loading 7,300 x 500 x 350 mm Alternate loading 3,100 x 500 x 350 mm
Workpiece clamping technology	Pneumatic clamping devices
Control systems	Siemens Sinumerik ONE (user interface HMI Operate, WIN 10)
Control options	Mobile operator desk HT2 hand-held unit (as an option) Control option remote diagnostics (SINEMA Remote Connect) Control option machine date recording Control option OEM run time licence

Subject to changes inspired by technical progress.

CNC-machining centre ECO

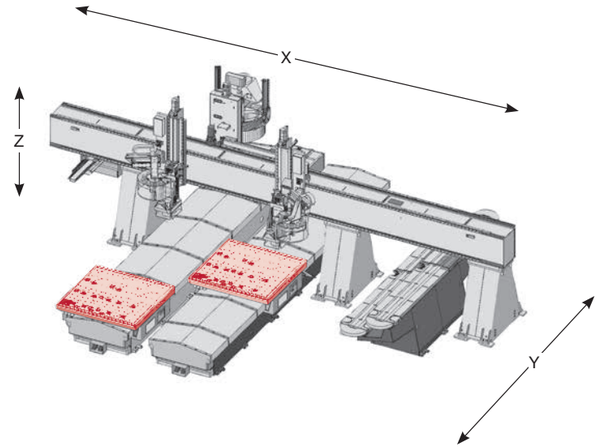
Portal configuration

ECO-A



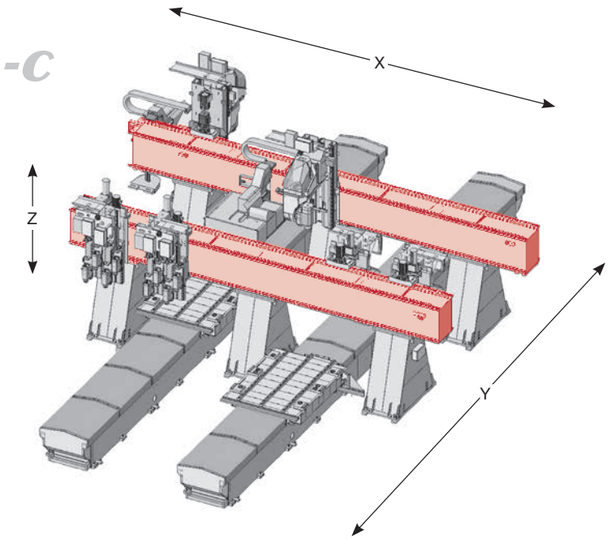
A fixed, low-vibration 2-column portal with one mobile machining table is the characteristic feature of the **ECO-A**. The machining dimensions, the configuration of its units, the tool changer, the clamping system for the workpieces, etc. can individually be adapted to customer specifications. The same applies to all machines of the ECO series.

ECO-B



A fixed, low-vibration 2-column portal with two mobile machining tables is the characteristic feature of the **ECO-B**. The tables are arranged directly next to each other and can be coupled to allow for the machining of large components.

ECO-C



A fixed, low-vibration 3-column portal with two mobile machining tables is the characteristic feature of the **ECO-C**. The tables are arranged between the left and centre portal column or between the centre portal column and the right one, respectively. Given the large distance between the tables and the existence of two machining units, this permits the completely independent processing of components on the two halves of the machine.

A synonym for flexibility

The ECO machining centres, a series of utmost flexibility and efficiency, are proof of the experience Reichenbacher Hamuel has acquired in the field of special engineering. The ECO series combines all qualities of Reichenbacher Hamuel, such as reliability, swiftness and precision, to apply them to all types of machining. The low-vibration portal, which rests on two or three columns depending on the size and execution of the tables, carries one or several slides (as an option also at the rear side of the portal) that perform the transverse and vertical movements of the working units.

Depending on the manufacturing tasks at hand, the ECO can be equipped with one or two machining units controllable via separate NC-channels. The basic machine possesses one or two mobile machining tables. Moreover, there is the option of installing supplementary machine tables, for example to carry out set-up work while the machine is in alternate operation and to avoid production interruptions for loading purposes. Loading of the machining tables can be effected from three sides. The great variety of configurations always warrants for utmost production efficiency and up-time.

The ECO system:

- **The great variety of configurations always warrants for utmost production efficiency and up-time**
- **Operation in parallel on two independent machining tables, which can also be coupled**
- **5-axis fork-shaped or cardanic head for high-precision machining**
- **Upon request, customised solutions for machine table configuration or CNC-control system design will be projected and offered**

A coordinate table, a programmable beam table with quick-clamping devices, and an automatic pin table permit the order-specific production of components of batch size 1 to the same quality standards as applied to serial production. The ECO is definitely no off-the-shelf machine. Your suggestions and requests will become the basis of our planning and elaborate offer.

Of course, our projecting and offer submission will take into account your wishes as to special machine dimensions and customised solutions regarding the configuration of the machine table or the design of the CNC-control system. At Reichenbacher Hamuel the ECO is not merely a machine, but part of a system.

ECO	Basic concept of the machine		
Unit configuration	3-axis milling units with vertical spindle 4-axis milling units with vertical spindle 5-axis milling units with cardanic or fork-shaped spindle		
Additional units	Multi-spindle drilling units with 5 to 60 spindles Sawing units Printing and labelling system		
Types of spindles	Manufactured by Reckerth, HSD, Omlat, IBAG Power 3.5 kW – 55 kW Speed 0 – 60,000 rpm Tool holder HSK F25 – B80, ER 25, SK 40		
Tool changers	Tool changers with 12 to 120 places Pick-up for saw blades Pick-up for special units		
Extraction and chip removal	Extraction hood (rigid or adjustable in height) Chip conveyor Cleaning stations		
Machine table design	HPL table plate (smooth or grooved) Aluminium table plate (smooth or grooved) Manual beam table (system RH or Schmalz) Automatic beam table Steel bars with fitted and threaded bushes		
Working area (strokes of the axes)	X-direction: Customer-specific	Y-direction: Customer-specific	Z-direction: Customer-specific
Workpiece clamping	Vacuum clamping devices Pneumatic clamping devices Special clamping devices		
Control systems	Siemens Sinumerik ONE (operator surface HMI Operate, Win 10)		
Control options	Mobile operator desk Suspended operator desk HT2 hand-held unit (as an option) HT10 hand-held unit (as an option) Control extension (Siemens machining package milling) Control option remote diagnostics (SINEMA Remote Connect) Control option machine data recording Control option OEM runtime licence		
Safety equipment	Mobile tables with safety bumpers Light barrier (as an option) Safety fence (as an option) Laser scanners (as an option)		
Additional equipment	Loading and unloading systems Torque support for supplementary units Blasting nozzles Blast air ionisation Minimum quantity lubrication	Rotary feed-through for coolant Broken tool detection Tool recognition system Camera system Laser projector	

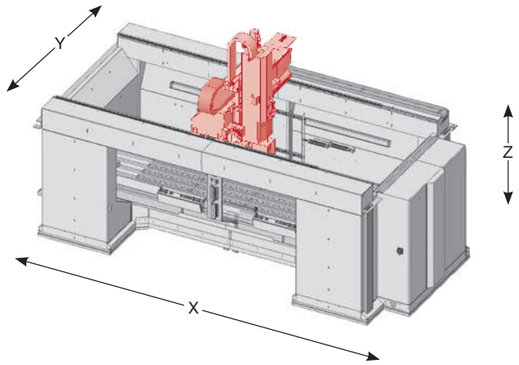
Subject to changes inspired by technical progress.

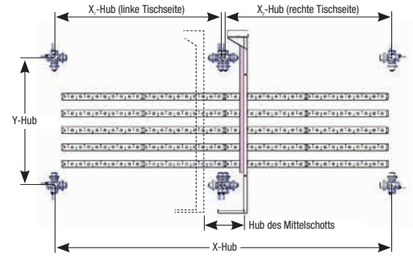
CNC-machining centre ECO-NT

Portal configuration

ECO-NT-1K

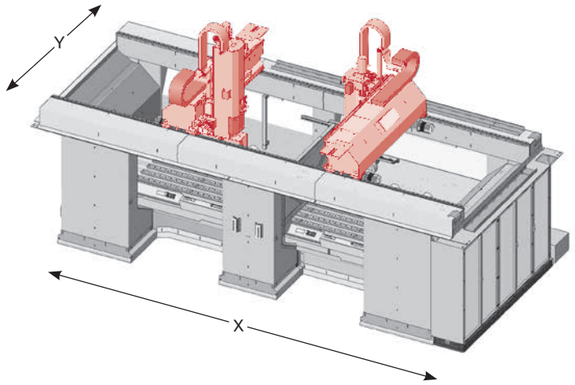
ECO-NT-1K
A centre partition has been installed to permit completely independent (alternate) working on both sides of the table. This centre partition can pneumatically be displaced by 500 mm in the X-direction. This increases the working area in the X-direction by 250 mm. In the opposite station, the net space available for loading will in turn be reduced by 250 mm.

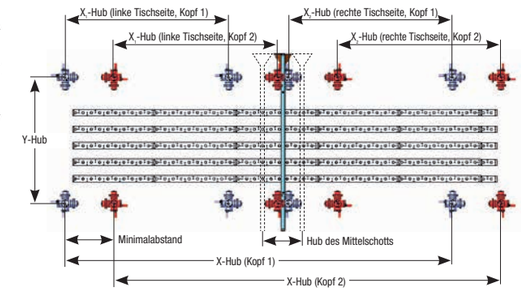




ECO-NT-2K

ECO-NT-2K
Identical to the ECO-NT-1K, also the working area of the ECO-NT-2K is separated by a displaceable centre partition. This likewise assures the optimum utilisation of the working table.





A lot of know-how in the smallest space

The Reichenbacher Hamuel ECO-NT series sets new standards for the machining of plastics, aluminium and composite materials: perfect 5-axis machining and universal applicability have been combined with maximum ease of operation and particularly compact design. The Reichenbacher Hamuel concept of a fixed portal ensures machining operations with very little machine vibration.

The fixed machining table on a stable substructure and the very high Z-axis permit the implementation of machining tasks at absolute contour accuracy, best surface quality and highest precision. In a single pass any spot where the component needs machining can be reached and machined in an optimum way. The Reichenbacher Hamuel coordinate table concept with its integrated fitted bushes and fixing holes provides perfect conditions for a quick and safe component change. The 3D-measuring probe, which precisely scans a component in place and transfers its reference points into the control system for further use, assures utmost workpiece precision in practical operation.

The ECO-NT system:

- **Configuration with one or two high-frequency spindles for efficient complete machining from 6 sides**
- **Universal use – for example for special profiles, formed parts and plates**
- **Machining of components from plastics, aluminium, GFRP and of hybrid parts from plastics and metal**
- **Partition of the working area for alternate operation**

Efficient versatility: with double working area or in alternate operation

The working areas of the ECO-NT machining centres can flexibly be adapted to any machining task at hand and at the same time provide for optimum machining conditions for the respective task. The working area is shut off by two separate sliding doors and safeguarding of the unit is by total enclosure, while even in the case of demanding freeform 5-axis machining the chips can always drop onto the conveyor belt unhampered. In alternate operation each door can be opened individually for loading. If a larger working area is required, for example for the machining of long components, the centre partition can simply be removed and thus the working area be doubled.

Tool changing systems can be integrated into the ECO-NT machining centres. They are mounted on the X-slide and travel along with it. Thus, a choice of 8, 12 or 24 tool places is available. Efficient complete machining is performed by the high-frequency spindles at up to 60,000 rotations per minute. The blasting nozzle (with air ionisation to avoid electrostatic charging of the chips), which can be activated by the NC-control system, and the likewise programme-controlled minimum quantity lubrication system complete the overall package.

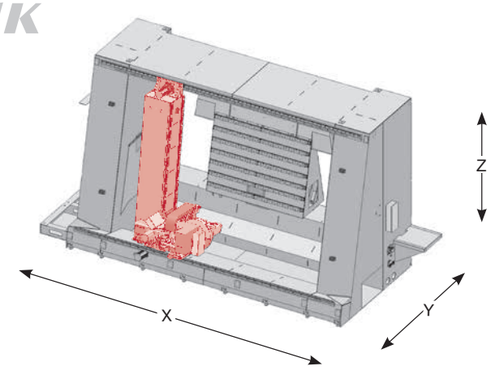
ECO-NT	Basic concept of the machine		
Unit configuration	5-axis milling units with cardanic or fork-shaped spindle		
Additional units	–		
Types of spindles	Manufactured by Reckerth, HSD, Omlat, IBAG Power 3.5 kW – 15 kW Speed 0 – 60,000 rpm Tool holder HSK F25 – F63		
Tool changers	Tool changers with 4 to 24 places		
Extraction and chip removal	Exhaust connector in the room for the extraction of lubrication mists and dusts Extraction at the clamping devices		
Machine table design	HPL table plate (smooth or grooved) Aluminium table plate (smooth or grooved) Steel bars with fitted and threaded bushes		
Working area (strokes of the axes)	X-direction: ECO-NT-3610 = 4,140 mm ECO-NT- 5411 = 5,440 mm ECO-NT-5411-2K = 2x 4,845 mm	Y-direction: ECO-NT-3610 = 1,440 mm ECO-NT-5411 = 1,630 mm	Z-direction: ECO-NT-3610 = 1,000 mm ECO-NT-5411 = 1,000 mm
Workpiece clamping	Vacuum clamping devices Pneumatic clamping devices Special clamping devices		
Control systems	Siemens Sinumerik ONE (operator surface HMI Operate, Win 10)		
Control options	Mobile operator desk HT2 hand-held unit (as an option) HT10 hand-held unit (as an option) Control extension (Siemens machining package milling) Control option remote diagnostics (SINEMA Remote Connect) Control option machine data recording Control option OEM runtime licence		
Safety equipment	Machine enclosure with automatic doors		
Additional equipment	Loading and unloading systems Torque support for supplementary units Blasting nozzles Blast air ionisation Minimum quantity lubrication	Broken tool detection Tool recognition system Camera system Laser projector	

Subject to changes inspired by technical progress.

CNC-machining centre ECO-RS

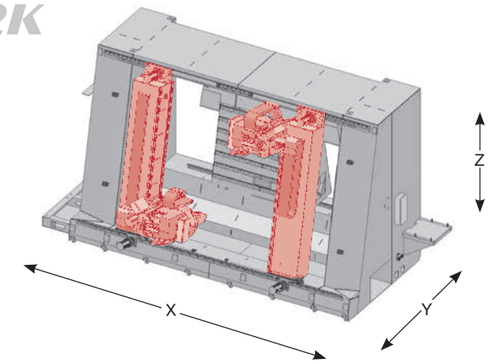
Portal configuration

ECO-RS-1K

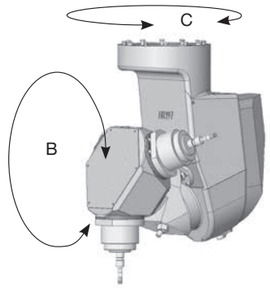


Machining centres type **ECO-RS-1K** feature a fixed, low-vibration portal frame into which the machine table has been integrated. They are equipped with one working unit. The machine table is in an almost vertical position (with an inclination of 12°) and can be rotated by 180° for loading to be effected from the machine front side. The operator is protected from dust and noise. All movements of the unit take place inside the protective cabin.

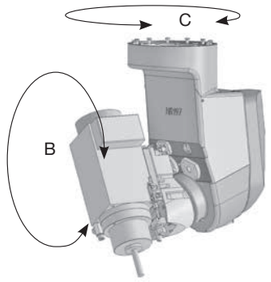
ECO-RS-2K



The machining centres type **ECO-RS-2K** are equipped with two working units. This permits the machining of either two small components or the joint machining of one bigger component. Working unit 1 and working unit 2 are mounted on two independent carriers. While milling takes place, in parallel a tool change will already be possible at the respective other unit.



5-axis star-shaped milling head with a cardanic 3-spindle turret. The spindles are arranged in a star-shaped layout at angles of 120° to each other. The spindle or tool change, respectively, is performed by indexing the spindle turret to the next position. Locking is by a mechanical interlock.



5-axis milling head with cardanic milling spindle. The pivot block with the spindle is attached to the C-axis at an angle of 68°, thus permitting an undercut of up to 46°. As an option, a tool changer can be installed above the milling head to move along with it.

A completely new sensation

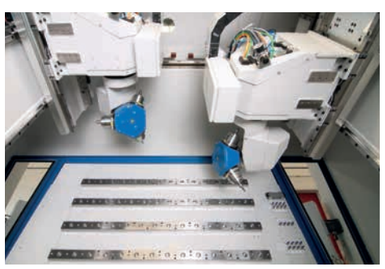
The ECO-RS is one of the latest machines developed by Reichenbacher Hamuel and available in three different sizes. Installation and commissioning of a machining centre has never been so simple, as all parts are firmly attached to the machine and no parts will have to be removed for transport or relocation.

What makes the new series unique is the way the components are loaded into the machine. The ECO-RS is a machine with an inclined machine bed, meaning that the table is mounted in the machine in an almost vertical position and can be rotated. Loading of the machine is effected from its front side, while the components already in its interior are being machined.

As the table is inclined by 12°, the components are no longer placed and clamped horizontally, but almost vertically. Once the components are in place, the table will be rotated by 180°, the entire process being safeguarded by laser scanners. Thus, the operator will no longer have to wait for the doors to open or for similar processes.

The ECO-RS system:

- **Configuration possible with one or two 5-axis working units, undercut of up to 44°**
- **Tool changer with 12 places that moves along in X, Y and Z**
- **Fully enclosed milling machine with rotary table and inclined machine bed**
- **Machining of components from plastics, aluminium, GFRP and of hybrid parts from plastics and metal**



The main machine assemblies are in ripped welded design and assure an optimum rigidity/weight ratio. This allows for very high acceleration values. Prominent features of the ECO-RS are the space savings achieved by its comparatively small footprint and the maximum production output due to its vertical rotary tandem table. The ergonomic loading and unloading of the components outside the machining area, as well as the time savings when cleaning the machine (grating, chip trays in the machine interior), are additional advantages of the ECO-RS concept.

ECO-RS	Basic concept of the machine		
Unit configuration	5-axis milling units with cardanic spindle		
Additional units	–		
Types of spindles	Manufactured by Reckerth, HSD, Omlat, IBAG Power 3.5 kW – 14 kW Speed 0 – 60,000 rpm Tool holder HSK F25 – F63		
Tool changers	Tool changers with 4 to 12 places		
Extraction and chip removal	Exhaust connector in the room for the extraction of lubrication mists and dusts Extraction at the clamping devices		
Machine table design	Steel bars with fitted and threaded bushes		
Working area (strokes of the axes)	X-direction: ECO-RS-I = 2,150 mm ECO-RS-I Duo = 2x 1,480 mm ECO-RS-II = 2,680 mm ECO-RS-II Duo = 2x 1,970 mm ECO-RS-III = 3,080 mm ECO-RS-III Duo = 2x 2,320 mm	Y-direction: ECO-RS-I = 1,390 mm ECO-RS-II = 1,980 mm ECO-RS-III = 1,980 mm	Z-direction: ECO-RS-I = 660 mm ECO-RS-II = 860 mm ECO-RS-III = 860 mm
Workpiece clamping	Vacuum clamping devices Pneumatic clamping devices Special clamping devices		
Control systems	Siemens Sinumerik ONE (operator surface HMI Operate, Win 10)		
Control options	Mobile operator desk Suspended operator desk HT2 hand-held unit (as an option) HT10 hand-held unit (as an option) Control extension (Siemens machining package milling) Control option remote diagnostics (SINEMA Remote Connect) Control option machine data recording Control option OEM runtime licence		
Safety equipment	Machine enclosure Loading area with laser scanners or cabin		
Additional equipment	Loading and unloading systems Blasting nozzles Blast air ionisation Minimum quantity lubrication	Broken tool detection Tool recognition system Camera system	

Subject to changes inspired by technical progress.

Up-to-date value for your money

The machining centre ECO-LT is to expand the proven ECO-NT series of Reichenbacher Hamuel by a version available at a very favourable price. It has specifically been developed for the machining of plastics, aluminium and composites (CFRP, GFRP) and permits the fully automated milling of cut-outs, circumferences and profiles.

The low-vibration portal frame with its fixed machining table on a stable sub-structure convinces by utmost processing quality at maximum feed rates. The machine is completely encased in a protective cabin including ceiling element while allowing also for an optimum chip removal. The two versions available meet most different customer requirements.

The ECO-LT convinces with its durable mechanical and electronic components. Its technically optimised assembly groups warrant for process reliability and operating efficiency.

The ECO-LT system:

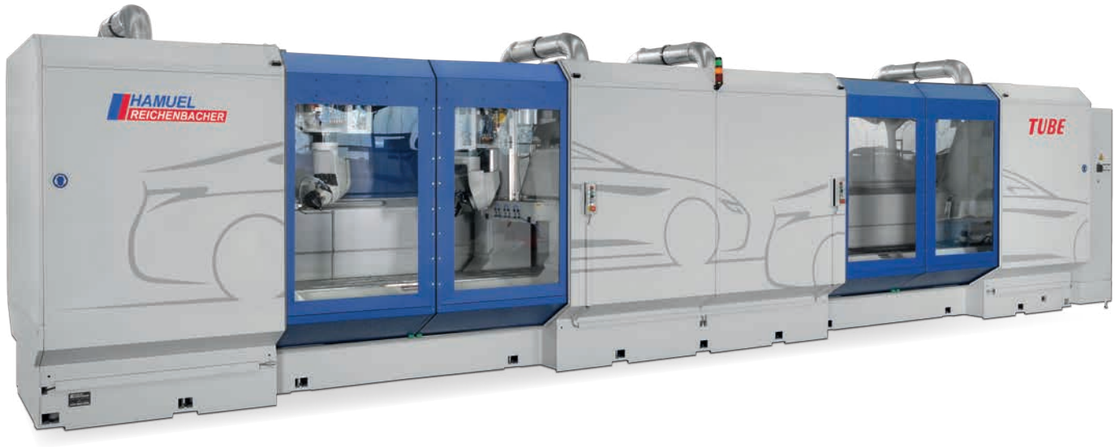
- **One cardanic 5-axes working unit with an undercut of up to 46° that can be equipped with various head versions**
- **Spindle power 14 kW, 1,000 – 24,000 rpm, HSK F63**
- **Tool changer with 7 places**
- **Fixed machining table (steel bars, grooved table with HPL or aluminium plate)**

The two front doors of the **ECO-LT-1010** can be opened and closed pneumatically. Safeguarding of the machine is by Safety Integrated. The machine is completely encased in a protective cabin including ceiling element. The handheld terminal SINUMERIK HT10 combines the functions of an operator terminal with those of a machine control panel in a single device. Thus, it provides for the possibility of operating and supervising the entire machine, as well as of creating user programmes via teaching and programming.

Even the basic type of the **ECO-LT** as the starter model offers a high degree of production efficiency. This machine with its somewhat more dynamic lightweight design is ideally suited for the processing of many types of components and materials. Two sliding doors shut off the loading area of the **ECO-LT-2012**. These front doors can be opened and closed manually. Thanks to their geometry, the 5-axes milling heads in special design are also apt for machining sections of the component that are hard to access.

ECO-LT	Basic concept of the machine		
Unit configuration	5-axis milling unit with cardanic spindle		
Additional units	–		
Types of spindles	Manufactured by Reckerth, HSD, Omlat, IBAG Power 4.6 kW – 14 kW Speed 0 – 60,000 rpm Tool holder HSK F25 – F63		
Tool changer	Tool changer with 7 places		
Extraction and chip removal	Exhaust connector in the room for the extraction of lubrication mists and dusts Extraction at the clamping devices		
Machine table design	HPL table plate (smooth or grooved) Aluminium table plate (smooth or grooved) Steel bars with fitted and threaded bushes		
Working area (strokes of the axes)	X-direction: ECO-LT-1010 = 1,280 mm ECO-LT-2012 = 2,400 mm	Y-direction: ECO-LT-1010 = 1,160 mm ECO-LT-2012 = 1,360 mm	Z-direction: ECO-LT-1010 = 800 mm ECO-LT-2012 = 800 mm
Workpiece clamping	Vacuum clamping devices Pneumatic clamping devices Special clamping devices		
Control systems	Siemens Sinumerik ONE (operator surface HMI Operate, WIN 10)		
Control options	Mobile operator desk HT2 hand-held unit (as an option) HT10 hand-held unit (as an option) Control extension (Siemens machining package milling) Control option remote diagnostics (SINEMA Remote Connect) Control option machine data recording Control option OEM runtime licence		
Safety equipment	Machine enclosure with manual or automatic door		
Additional equipment	Loading and unloading systems Blasting nozzles Blast air ionisation Minimum quantity lubrication	Broken tool detection Tool recognition system Camera system Laser projector	

Subject to changes inspired by technical progress.



Our business philosophy consists in developing lines that appeal to our target groups. Normally, to achieve this goal we base the concept for each line on our modular system. In other words, we select the optimum series and modify its technical equipment to customise the machine in such a way that it perfectly meets the requirements of the respective client. For the TUBE we have chosen a different approach, as we want to accommodate the peculiarities of the automotive industry.

Global players in this industry must be extremely flexible, not only in terms of their range of products, but also where the production sites are concerned. A relocation can imply transporting many machines and lines. In doing so, international standards will have to be observed, meaning that, apart from safety, the focus will also have to be on the ease of transportation.

The major challenge for our engineering department was to build the TUBE in such a way that it could be loaded into a container and shipped to places all over the world without the need to remove many of its components. This has successfully been accomplished with this fully enclosed machine, where the control cabinet and the cabin are firmly connected with the machine base. Using a 20 ton crane, the line can be loaded in one piece into a 40“ open top high cube container. A considerable cost reduction is achieved by this design, both, for transportation and for commissioning.

This series has been dubbed TUBE, as it very much resembles an underground. The “automotive industry” is our explicit target group, which is an absolute novelty, as all preceding series had never been designed for a specific industry. However, it is to be expected that its utilisation won’t be restricted to this industry. Taking into account the fact that the TUBE is ideally suited for the machining of plastics, aluminium and composites (CFRP, GFRP), it is also attracting attention from other industries.

The TUBE system:

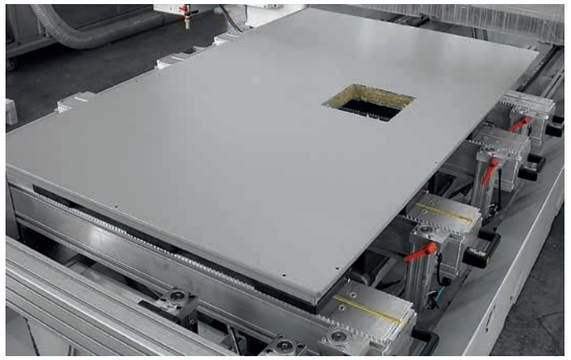
- **CNC-centre for the machining of plastics, aluminium and composites (CFRP, GFRP).**
- **Very spacious machining area (2x 3,200 mm in X-direction) at a very small machine footprint (12,000 x 2,500 x 2,500 mm).**
- **Automatic loading doors offer excellent accessibility for the operator and at the same time a good view of the machining processes.**
- **Setting/loading in parallel to machining time: while machining is in progress in station 1, loading can take place in station 2.**
- **Machine fully enclosed with two cardanic 5-axes units and separate tool changers.**
- **Control cabinet and cabin firmly connected with the machine base.**
- **Cost reductions for commissioning, as well as for transportation (container).**
- **Container loading of the crane hook machine: transportation in 40“ open top high cube container.**

TUBE	Basic concept of the machine
Unit configuration	5-axis milling unit with cardanic spindle (46° undercut)
Additional equipment	Minimum quantity lubrication Blasting nozzles Spotlight at the working head Vibration monitoring Measuring probe
Spindles	IBAG make – 4.5 kW; 58,000 rpm; HSK-F40 Omlat make – 7 kW; 40,000 rpm; HSK-E40
Tool changers	Pick-up with 4 places (in combination with spindle IBAG make) Pick-up with 8 places (in combination with spindle Omlat make)
Extraction and chip removal	Oil mist extraction Chip conveyor
Machine table equipment	Table with steel bars provided with fitted bushes and threads
Working area layout (strokes of axes)	Each table side 3,200 x 800 x 600 mm (in combination with spindle IBAG make) Each table side 3,200 x 800 x 450 mm (in combination with spindle Omlat make)
Workpiece clamping technology	Vacuum clamping devices Pneumatic clamping devices Special clamping devices
Control systems	Siemens Sinumerik ONE (user interface HMI Operate, WIN 10)
Control options	Mobile operator desk Suspended operator panel HT2 hand-held unit (as an option) HT10 hand-held unit (as an option) Control option remote diagnostics (SINEMA Remote Connect) Control option machine data recording Control option OEM run time licence

Subject to changes inspired by technical progress.

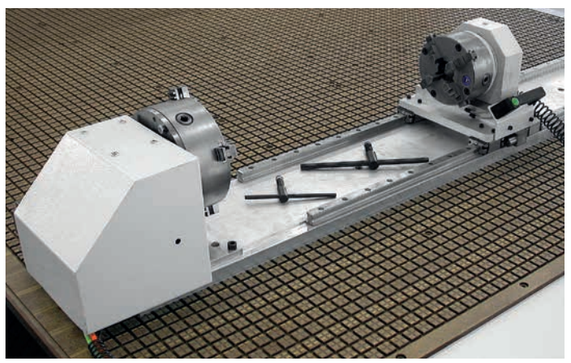
Machining centre UNIVERS with an H-profile carrier for aircraft floor construction clamped in the machine.

Pipeline machining on an additional NC-lathe (up to ø 600 mm).

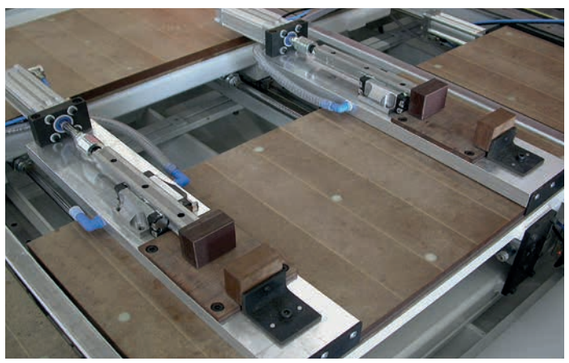


Machined composite interior component for motorhomes and commercial vehicles on a manual console table.

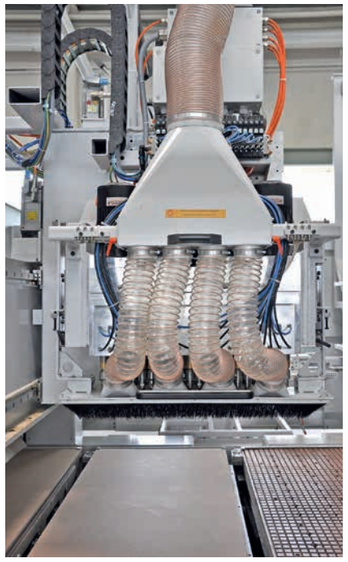
Machine tables of an ECO with 147 pins, each, for caravan walls.



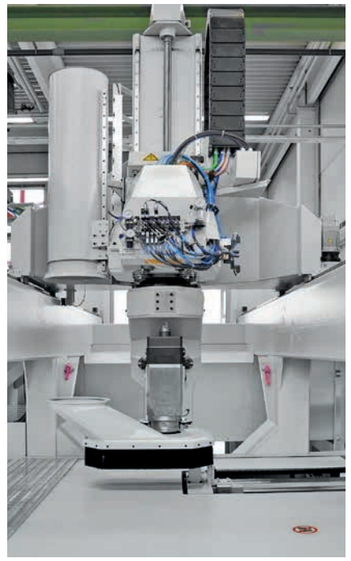
Small NC-lathe (up to ø 310 mm) on a grooved vacuum table.



Pneumatic clamping device for the machining of profiles.



40-spindle multi-drilling unit for manufacturing acoustic panels.



Extraction hood to be positioned for 3-axis machining with a 5-axis working head.

Machining of an impeller from ureol (Cibatool) by the cardanic 5-axis working head of an ECO-NT.

Machining of PU-foam in the ECO-2616 A, 5-axis fork-shaped working head, Z-stroke 1,300 mm.

Chip removal at a finished plastic component (wedge) for beverage bottling in the VISION-I-H, cardanic 5-axis working head, Z-stroke 780 mm.

Milling of a preformed plastic component in the ECO-NT, 5-axis fork-shaped working head, Z-stroke 1,000 mm.

Qualified service for your CNC-applications

Our machining centres are renowned for their high capacity and up-time, their long service life and their particular ease of operation, assembly and service. A service unit responsible for the after-sales service for Reichenbacher Hamuel machines worldwide will be at your side so that you can make optimum use of these advantages.

Service department

Our service department can be reached under the following telephone numbers:

Monday – Thursday from 7 a.m. to 5.30 p.m.
Friday from 7 a.m. to 3.30 p.m.
Customer hotline +49 9561-599-300
Spare part service +49 9561-599-400

Premium service

Availability of our hotline:
Monday – Thursday from 5.30 p.m. to 10 p.m.
Friday from 3.30 p.m. to 10 p.m.
And on Saturday, Sunday and public holidays from 8 a.m. to 4 p.m.

- Guaranteed reaction within 24 hours
- Quick and uncomplicated remote servicing free of charge
- Fitters on-call duty also over the weekend
- Spare part availability and immediate delivery

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