TAURUS CRACO

BACCI 1918 AMERICA

BACCI
BMT 4 - AXES CNC

MACHINING CENTRE for Mitre, Mortise, and Tenon of Stile and Rail Component

MADE IN ITALY

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MACHINE DESCRIPTION

The **BMT 4-Axis** is Baccis' new solution for producing mitred kitchen cabinet door components, and is specifically configured for flexible, high volume production requirements. The **Bacci BMT 4-Axis** produces high quality 45° mitred, mortised and tenoned components for use in cabinet door construction.

Bacci BMT 4-Axis Features

- Two (2) direct drive spindles, one for the mortise and one for the mitre/tenon.
- Two (2) zone work table for pendulum processing capability.
  - Opposing left and right reference fences for perfectly mitred corners.
  - Side and top clamps for maximum clamping ability.
- Four (4) interpolated axes fully managed by the NC control.
- Longer (800mm) X-Axis stoke for machining even the widest parts.
- Automatic lubrication system for the 4-Axis NC controlled motion systems.
- Quick and flexible programming software for processing various profiles shapes and sizes.
  - Easily recall previous programs manually or via bar code.

Note: The pictures and/or illustrations included in this proposal are for descriptive purposes and intended to aid in understanding certain features of the machine. Some depictions may not reflect the exact construction and may include options that are not part of this offer. In all cases, the written text supersedes any graphic representation.

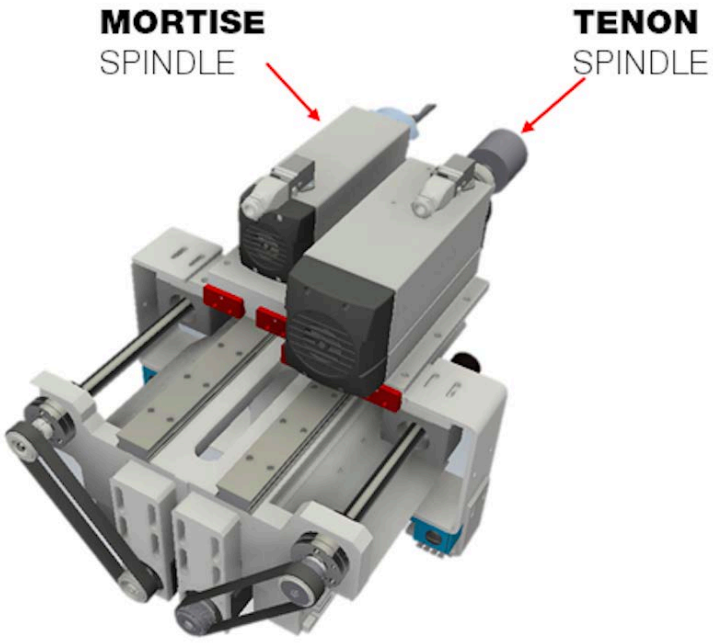
TECHNICAL DATA

- Minimum material length:	115 mm (4½”)
- Maximum material length:	Not Applicable(N/A)
- Minimum profile width:	38 mm (1½”)
- Maximum profile width:	127 mm (5”)
- Minimum profile thickness:	16 mm (5/8”)
- Maximum profile thickness:	40 mm (1.57”)
- Maximum Tenon Depth:	31,75 mm(1.25”) (50 mm Optional)
- Work table Size:	1,840 mm(72”) x 380(15”) mm 1” thick steel
- **Axes Stroke**	
- X-Axis (Rotary Ball Screw) :	800 mm (31.5”)
- Z-Axis(Rotary Ball Screw):	120 mm (4.72”)
- Y-Axis for tenon(Rotary Ball Screw):	150 mm (5.91”)
- Y-Axis for mortise(Rotary Ball Screw):	175 mm (6.89”)
- **Electrospindles**	10 kW(13.41hp)
- Tenon Spindle:	6kW (8.15hp), ER-32 at 18,000 RPM 3 kW
- Mortise Spindle:	(4hp), ER-25 at 24,000 RPM
- Control voltage:	24 V
- Air pressure:	6 bar
- Compressed Air Consumption:	30 NL
- Dust collection:	4,800 m³/hr (2,800 cfm) (1) connection @ 160mm (6.40”)
- Voltage 3Phase:	480 V 60Hz
- Machine Weight:	1,000 kg (2,200 lbs)
- Footprint:	1,900 mm(75”) x 1,100 mm(43”)
- Production Estimate(8 hour shift):	300 to 400 doors(900 to 1,200 components)

***** Estimated cycle time for mortise and tenon is ~20 seconds depending on size and tool path selection.**

4th NC CONTROLLED AXIS

The **Bacci BMT 4-Axis CNC** is the **only** machine to be equipped with a 4th NC controlled axis.

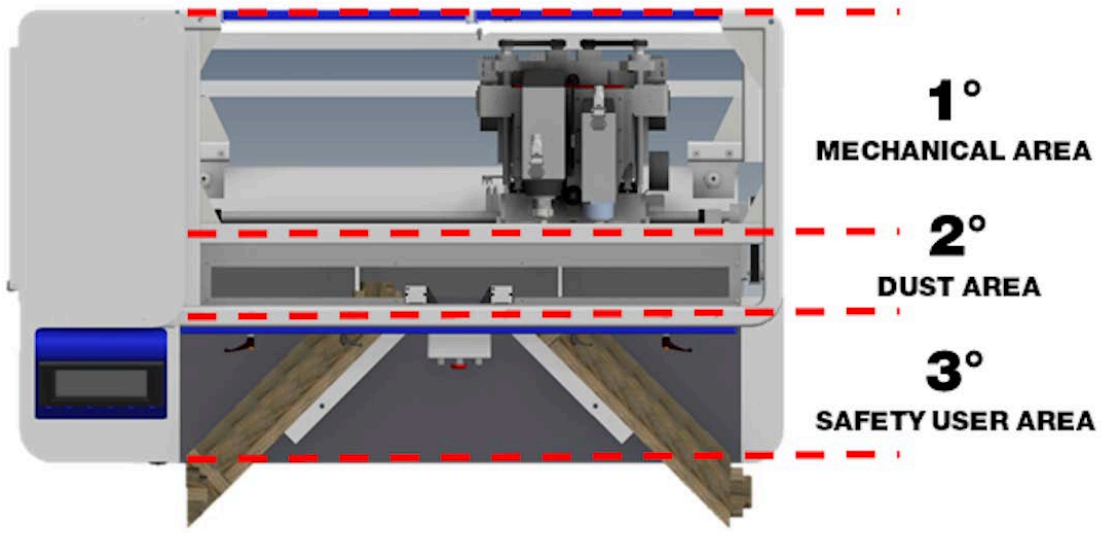


This 4th NC controlled axis allows

- Complete elimination of any possible manual settings, other than for a tool change.
- More accurate positioning and faster cycle times. The common 3-Axes machine controls the Y-axis movement of the mortise and tenon spindles with pneumatic cylinders. Bacci, instead, uses independent NC controlled drive motors for the mortise and tenon spindles. Thus the Y-Axis movement is faster and more accurate.
- A more reliable drive system over that of a pneumatic cylinder.

3 ZONES MACHINE CONSTRUCTION

The **Bacci BMT 4-Axis CNC machine** is designed, constructed and physically divided into three (3) separate zones:



Zone 1: Mechanical Area

- The Mechanical area is where where all the mechanical components reside (servomotors, motion systems, spindles, etc.)

Zone 2: Dust Area

- The Dust area is the machining area where the cutters work and the dust is made and accumulated. The Dust area is fully sealed with plexi-glass from the user area and with a folding bellows from the mechanical area Both the safety user and mechanical areas stay clean from produced dust and chips.

Zone 3: Safety User Area:

- The Safety User Area is where where the operator works and interfaces with the **Bacci BMT**. Thanks to the clear separation and distinction of the three (3) above mentioned areas, the **Bacci BMT** offers the following advantages:

- Maximum operator safety and protection whose hands have no way to reach the cutters. The plexi-glass cover is easily adjustable according to different part widths.
- Less daily stops for machine cleaning.
- Increased life span of mechanical components.

HEAVY DUTY MACHINE FRAME

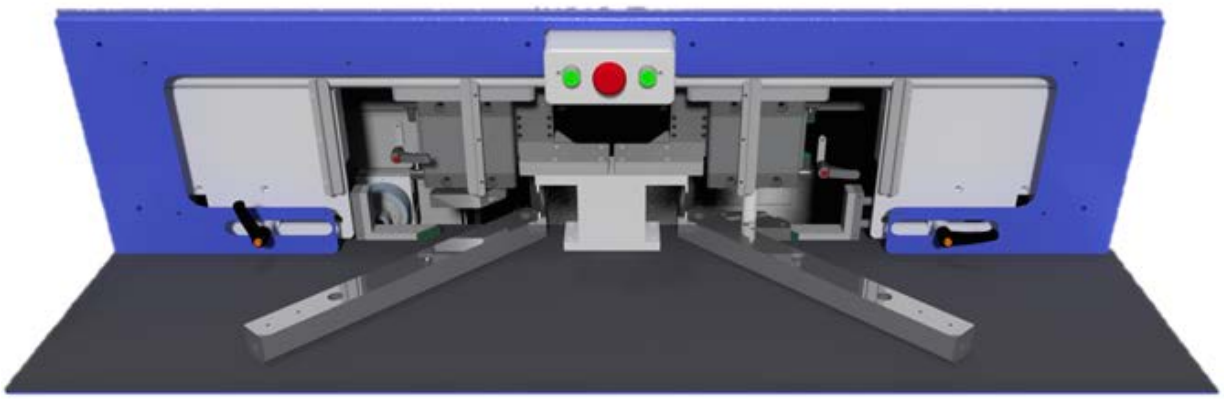
The **Bacci 4-Axis CNC machine** frame is constructed of heavy duty steel, welded and stabilized.

The wide working table (380mm deep by 1840mm wide) is machined from 1" thick steel. The work table is prepared with threaded holes for set-up of counter profile fixtures when needed.

DUAL ZONE WORK TABLE

A top the heavy duty welded steel frame (per Bacci standard) resides a wide working table machined from one (1) inch thick steel. Mounted to this table is a V-shaped fixture containing two 45 degree mitre reference fences. This configuration provides dual work zones to allow pendulum processing capability and thus maximize the machines productivity.

- All referencing is done off one edge.
- To compensate for any component thickness variation, parts are laid face-down on the work table surface. Any variation is then visible on the backside(unseen) surface of the stile or rail.
- The table is prepared with threaded holes so that counter profile fixtures can be easily mounted to allow machining of irregular shaped profiles.

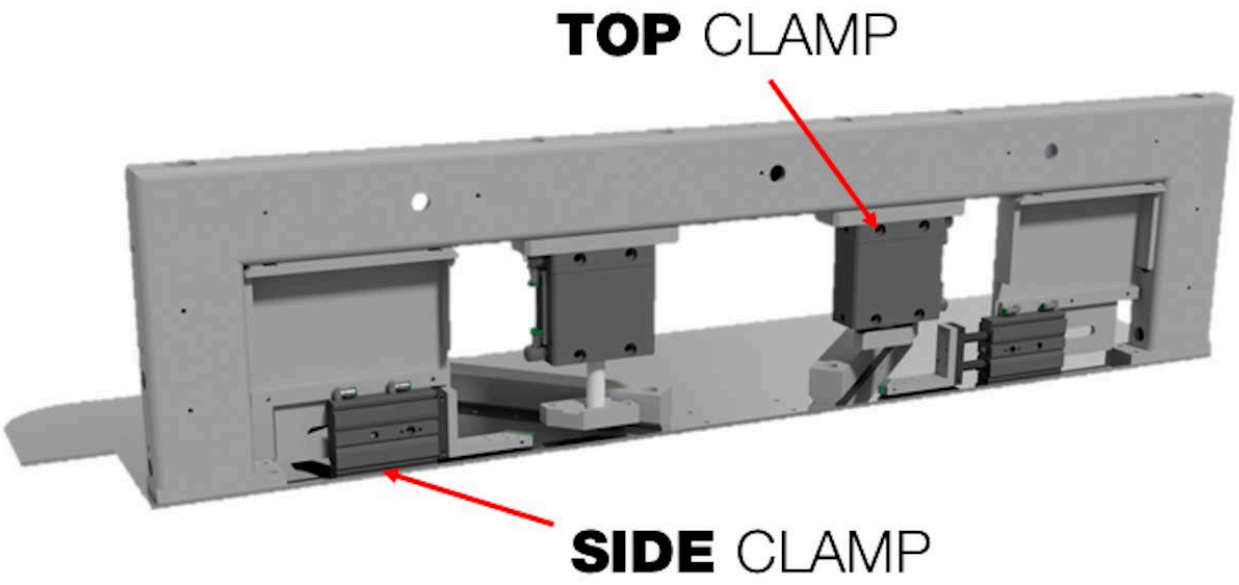


PARTS POSITIONING & CLAMPING :

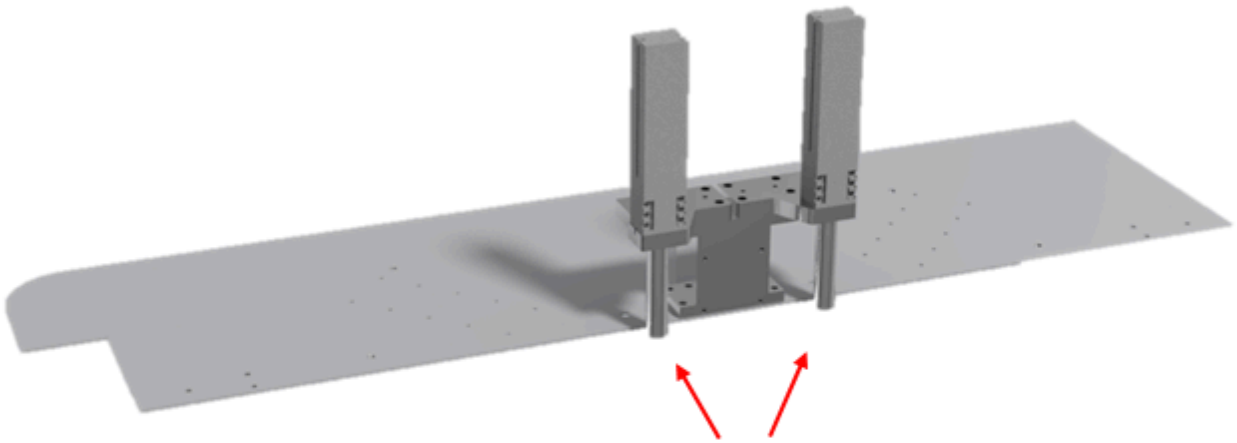
Proper positioning and control of the stile or rail during machining is necessary to provide a clean and accurate cut. Each mitre reference fence has:

- Pneumatically retracted 25mm (1”) non-deflecting stainless steel positioning pins for accurate referencing of the stile or rail from the front. Front Stops cylinders are equipped with sensor so
- A top clamp to firmly hold (180Kg pressure force each clamp) stile or rail once part is referenced front positioning pin.
- A side clamp to ensure maximum positioning control, even for small cross sections and short length pieces(4 ½”). The side clamp guarantees that the stile or rail is firmly held against the 45 degree miter fence. For even wider parts, the side clamp assures a quality cut by resisting the lateral force applied by the cutter head and keeping the part firmly against the reference fence.

Hold down clamps are acting their pressure on the table’s frame in correspondence of its welded ribs to minimize the table’s flection during the machining. This grants a better dimensionsal precision of the cut parts



The pneumatic Front loading stops are attached to a sturdy tower structure which is indipendent from the support structure of the front & side clamps cylinders. In this way the front stops are not affected by the torsion that is caused by the hard clamps on their support structure during the machining.
Front Stops cylinders as well as the top clamps are equipped with sensors so the machine can start cutting only when the top clamp is down and the front stop up.



DUST COLLECTION

Effective dust collection is very important for several reasons. Poor dust collection can impact quality by affecting the accuracy and cleanliness of the cut. Poor dust collection can also affect the overall life span of the machines mechanical components. Poor Dust collection implies more frequent stops for cleaning and at the end of year a much lower output. The Bacci BMT 4-Axis has the following:

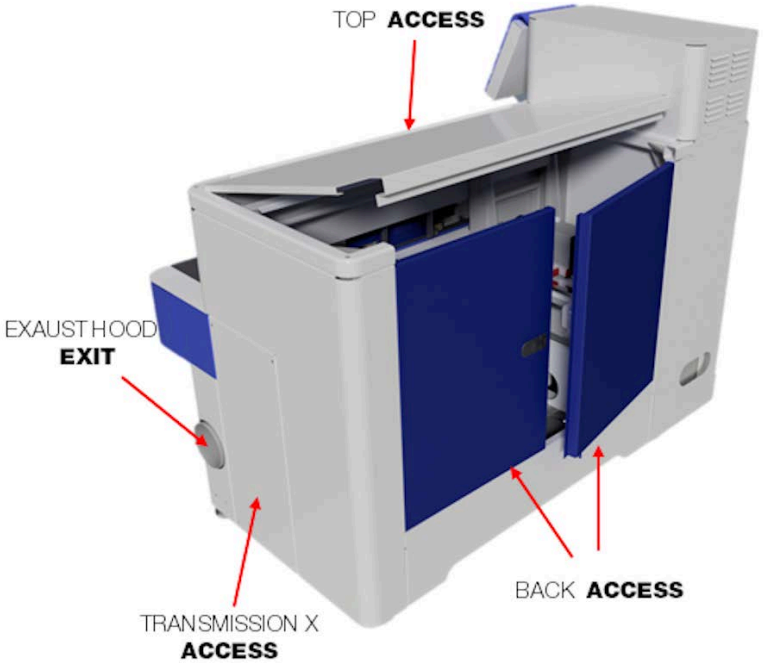
- A plexi-glass shield separating the work table from the cutting spindles. This shield prevents dust from accumulating against the reference fences and the front positioning pins. This reduces the likelihood of reference errors.
- A folding bellows to contain and channel dust and chips away from the work table and mechanical components. For the operator, this also means less production loss due to stops for cleaning and dust/chips removal.

AUTOMATIC NC LUBRICATION

The **Bacci BMT 4-Axis CNC** has a fully automatic lubrication for the 4 axes motion systems to provide a life time of proper operation.

SAFETY & ACCESSIBILITY

The gentle and modern design of the access covers prevent the operator from accessing the machine while in operation. All access doors have safety inter-locks for cleaning operations, inspections and maintenance.



SOFTWARE & USER INTERFACE

The user friendly Windows PC software and graphical user interface make the **Bacci BMT 4-Axis CNC** extremely versatile. Programming is easy, with a typical programming time of one minute or less. Recall of previous programming is also quick, either manually or via barcode.

The tool path is completely operator controlled, providing the ability to create a tool path for any type of wood or material. Parameters include, score depth, radius control, exit point, entry point, and number of passes to cut the tenon.

The **Bacci BMT 4-Axis CNC** is programmable in the X, Y, and Z axes, which is critical for producing a clean, high quality mitre joint. Each of which is equipped with a brush less motor and alpha gear reducer for precise and quick positioning.

In particular, the ability to NC control the Y Axis provides the ability to essentially infinitely alter the tenon depth and vastly improves the cut quality by providing the ability to make multiple hogging passes rather than removing all required material in one pass. Any possible decline in cut quality due to tool deflection is eliminated.

With this three axis capability, the Bacci BMT 4-Axis CNC can cleanly machine even difficult material such as vinyl wrapped MDF.

PC Numerical Control

Bacci BMT 4-Axis provided with PC equipped as follows:

- 10” Color Touch Screen Video Monitor
- 4 GB ram
- Operating System, Windows 7
- 40 Gig hard drive
- Complete keyboard + mouse
- Ethernet network card 10/100
- Multitasking CNC
- Connection to CNC with USB port

TOOLING:

Every **Bacci BMT 4-Axis CNC machine** is provided with a complete set of tools for producing high quality stile and rail mitred components. The provided tooling includes:

- One (1) 2" diameter Tenon Cutter head with replaceable carbide inserts.
- One (1) 3/8" diameter High Speed Steel Mortise bit
- One (1) 3/8" ER-25 Collet and cover nut
- One (1) ER-32 3/4" Collet and cover nut
- Four (4) Spindle Wrenches

The tenon tool has spurs that cut a groove at the base of the tenon for excess glue and spurs that bevel the end of the tenon for easy assembly. The spurs that produce the bevel at the base of the tenon also serve to score the exposed edges of the part for clean, precise cut, free of any chipping.

The mortising tool is a typical three-flute spiral roughing tool.

Both tools are programmed with CNC tool compensation for quick and precise manipulation of the tool paths for perfect-fitting joints resulting in a high quality, durable door.

A pre-set amount of stock is removed from each end of the part during the machining process, meaning stock should be pre-cut to a precise length prior to machining. The Bacci BMT 4-Axis cannot compensate for poorly cut to length parts.

OPTIONAL EQUIPMENTS:

Manually Positioned Back Fence

Manual back fence with dual digital read out (precision to 0.1mm) for precise sizing of rough - cut stiles and rails

Maximum length 1250mm

Note: manually positioned back fence is not needed when stiles and rails are previously cut to a precisely-oversized dimension. The amount of oversize to be removed can be configured at the machine. 0.125” total oversize is typical.

Automatic Positioned Back Fence

CNC back fence with digital read out (precision 0.1mm) for sizing Stile or Rail

Maximum length 1250mm

HSK C40 Spindles (both for tenoning & mortising spindles)