

A UNIQUE LOOK

UNIQUE MACHINE & TOOL CO.

4500 Series Shape & Sand Machines

Rev. E



'93 Model 330 pictured

1993



2015

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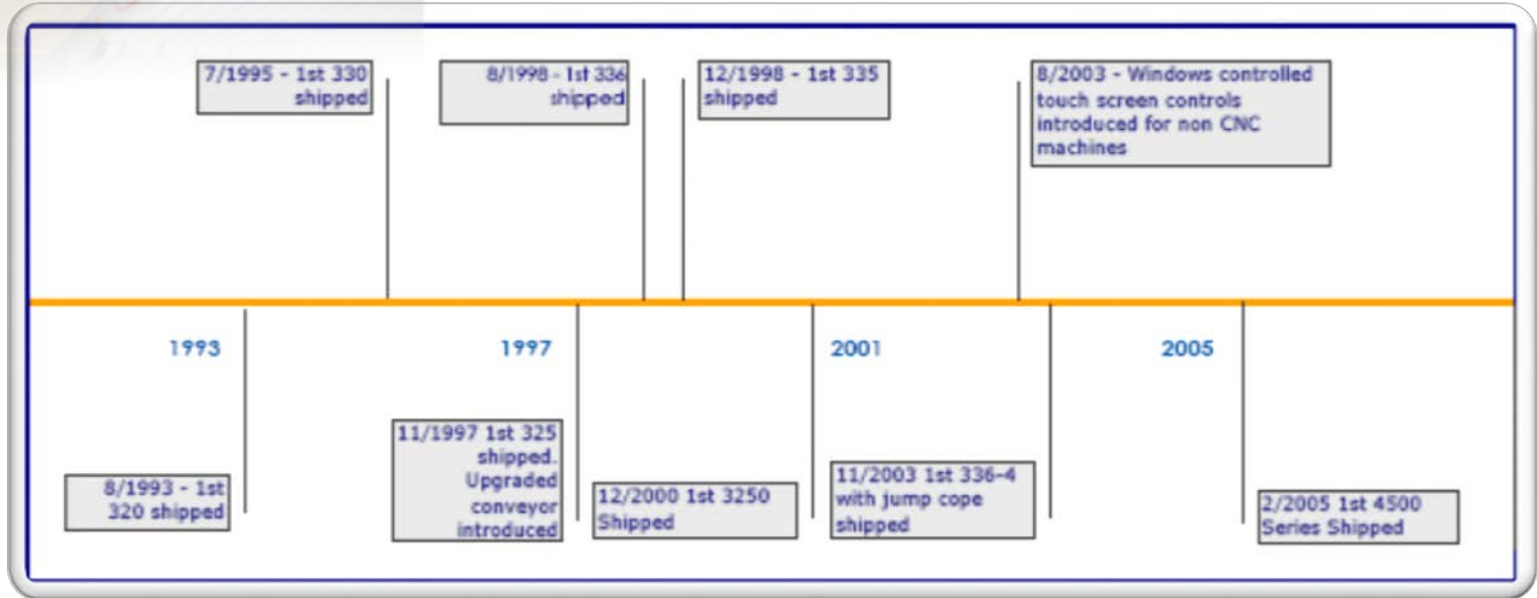


UNIQUE Shape & Sand Machine History



Unique has been producing Shape and Sand Machines for over 20 years and confidently produce quality industrial machinery at an affordable and fair price. Our technology is industry leading & more user friendly than traditional single-end-tenoners.

45 Years of American Made Quality that is hard to beat!



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4500 Series Shape & Sand Machines - Basics

One Series Many Configurations

4 5 X X

of shapers

of sanders

POPULAR MODELS

4522

4523

4533

4524

In 2005 Unique introduced the 4500 Series Shape and Sand. This series took our previous years experience in building shape sands and combined that with the latest in technology.

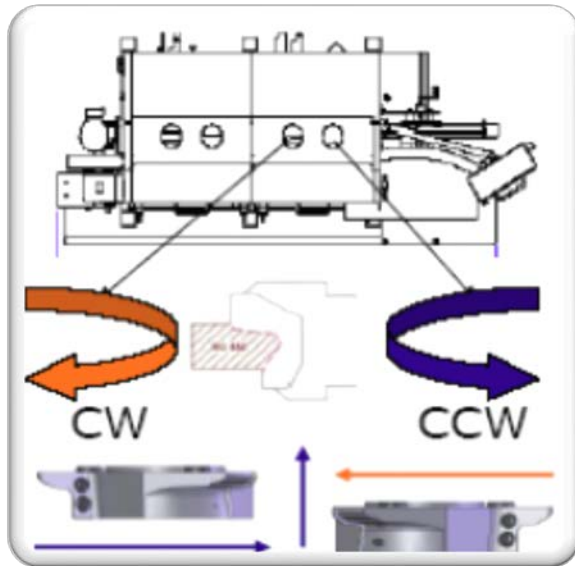
The modular frames can be built with anywhere from one to eight stations. The stations themselves are also modular and can be configured with any option at any phase of production.

An Industrial PC comes standard with all models. The control comes standard with "TrueSet" check off software, this software is modular and is used on the "DRO" encoder feedback option as well as the CNC Arching & CNC positioning versions.

All of this flexibility saves costly manufacturing time. These savings allow focus to be placed in other areas, improving both efficiencies in a shop and overall Quality!

4500 Series Shape & Sand Machines - Basics

← *Feed Rate 0-35 Ft/m*



All Unique 4500 Series Shape and Sand machines with two shaper motors, come with **Jump Cope Standard**. This term is used quite often but not always completely understood. Jump Cope is used when cutting across the wood grain to eliminate tear out on either the front or trailing edge of the material.

For example on a assembled cabinet door. If only one cutter is used cutting CCW (counter clockwise) there would be tear out on the right side of the door.

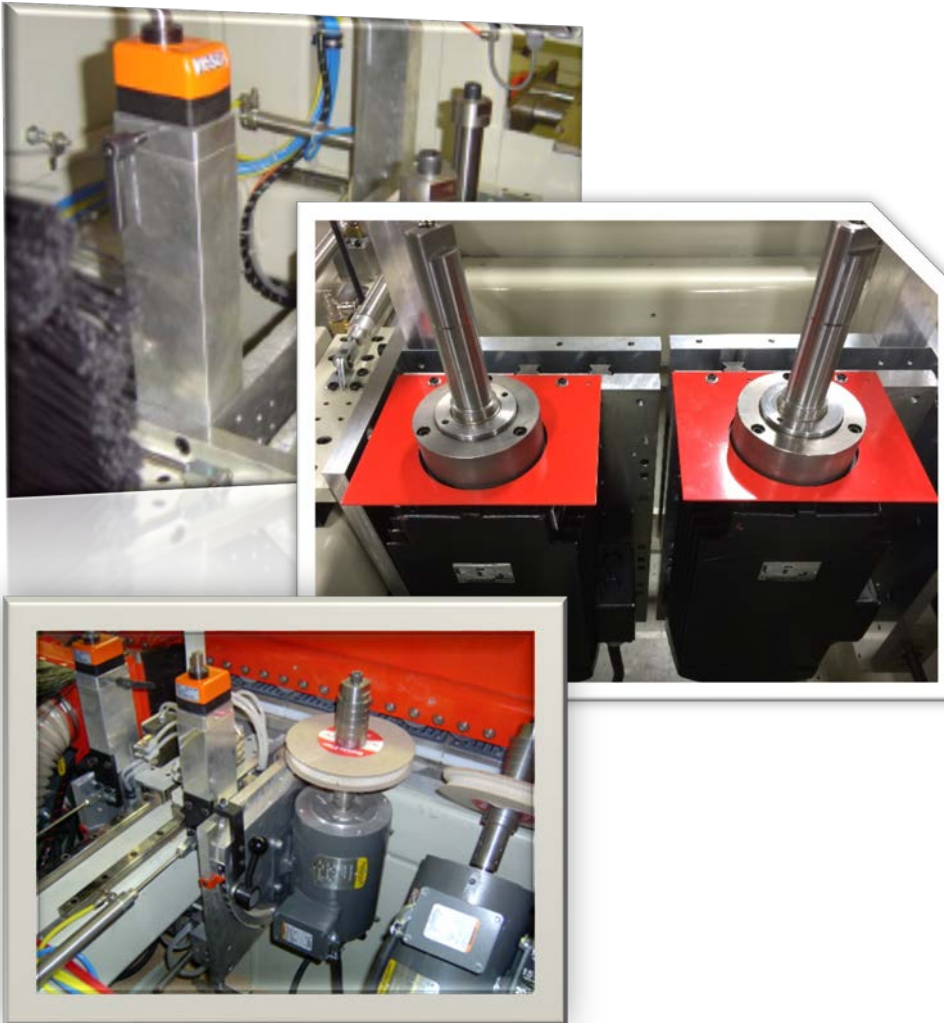
On Unique Machines with jump cope, the following sequence of events will happen:

- 1 - Part is loaded onto the conveyor
- 2 - A proximity switch will detect the part as it is passing through the first cutter.
- 3 - When the part is no longer read by the sensor, a PLC actuates an air cylinder in front of the first station and pushes it out of the way.
- 4 - The second station will then be cutting in the opposite rotation.
- 5 - Simultaneously, the first head returns to position, a green light turns on and the operator can then load the next part to be machined.

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4500 Series Shape & Sand Machines - Basics



- ✓ 5" of stack height is standard
- ✓ All stations are reversible
- ✓ All have variable speed

Shaper Stations

10 HP Direct Drive Shapers - STD
6000-9000 variable speed RPM

8 to 18 HP HSK-63F Quick-Change Available
6000-18,000 variable speed RPM

Sander Stations

2 HP Direct Drive Sanders - STD
0-2500 variable speed RPM

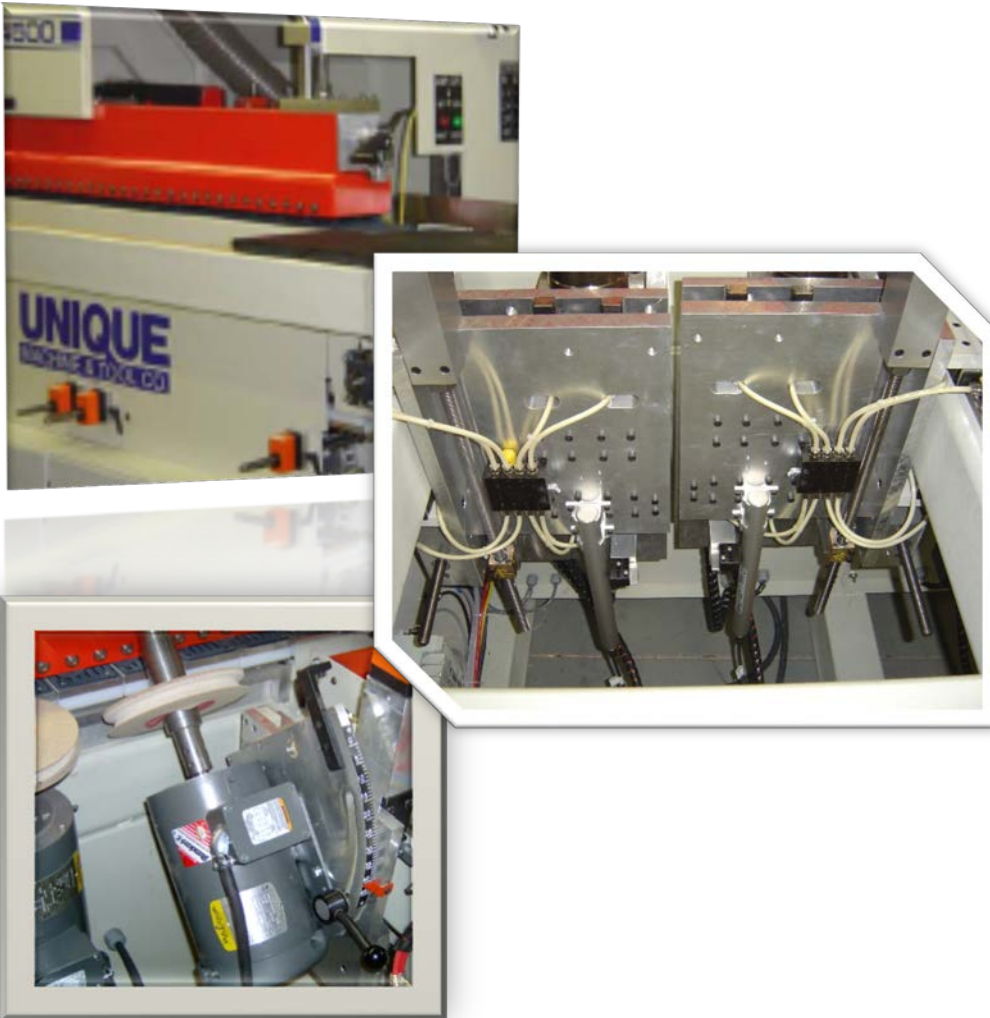
8 to 18 HP HSK-63F Quick-Change Available
0-18,000 variable speed RPM

** Guarding & Dust Hoods only removed for better component viewing in a "locked out" state*

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4500 Series Shape & Sand Machines - Basics



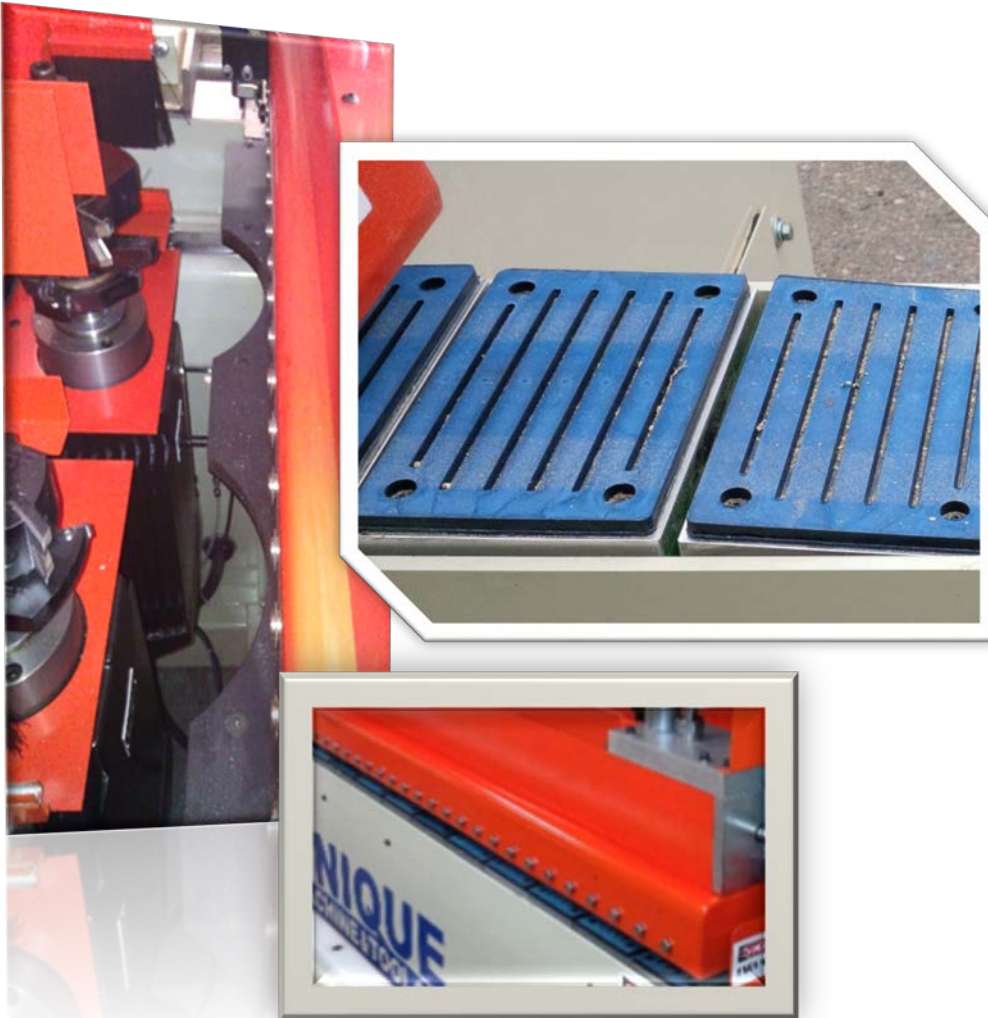
- All adjustment are made from the front of the machine allowing for faster and more user-friendly changeover.
- The 4500's Frame core structure is Precision Machined by a very large CNC Mill after the Frame is welded, ensuring accurate placement & alignment linear motion rails and components.
- Stations are guided on THK square rails mounted to the precisely machined steel frames core cross members.
- Centralized grease ports make access to bearings quick and easy which helps promote thorough maintenance habits.
- All stations float to follow pre-profiled patterns or pre-arched panels.
- Sanding Stations Tilt to 45 degrees

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4500 Series Shape & Sand Machines - Basics



- 6" Wide HD Conveyor Pad - STD
- ***"Size & Square" Special "Wide-Track"*** Design has increased surface contact area to further promote accurate material transfer and holds a tight grip during the machining process
- Each replaceable pad is a 1/4" thick vulcanized urethane bonded on 1/8" steel plates.
- Each Pad is mounted to a #80 Roller High-Quality HD Chain
- UHMW Guides ride on two precision ground shafts creating a "virtual table" for parts to be machined on.
- 2HP variable speed conveyor runs from Zero – 35 Ft/Min.
- 5 staggered rows of hold down rollers for increased grip on both small and large components.

* Guarding only removed for better component viewing in a "locked out" state

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4500 Series Shape & Sand Machines - Basics



- Dust-Collection exits top of machine for easy drop-down connections.
- Sound Enclosure to reduce shop noise also has Open-Hood detection will stop the machine in "Run" mode
- Additional E-Stop on the out-feed side for quick access
- **Highly visible Guarding** Increased awareness promotes operator safety.



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4500 Series Shape & Sand Machines – Controls



- All 4500 Series Shape and Sand Machines come equipped with our Unique software designed to computerize assist in set up of the machine. This will speed up change over time while helping to reduce operator error. All level of Set family of software store the following data:

1. Cut/Sand Direction
2. RPM for each spindle
3. Feed rate of the conveyor
4. How each tool stack should be configured
5. Specific Location of each spindle

Unique's Control & Software Options

- BASIC – “No Computer” + PLC Jump-Cope
- Industrial PLC “True-Set” software std. on all machines
- “DRO” Digital Reas-Out feed-back encoders all stations
- “CNC Setup” – 7 Axis of Servo control for Quick-Setups
- “FULL CNC” Coordinated Motion to create arches & more



(BASIC “No Computer” Controls pictured above)

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4500 Series Shape & Sand Machines – “True-Set” STD Control



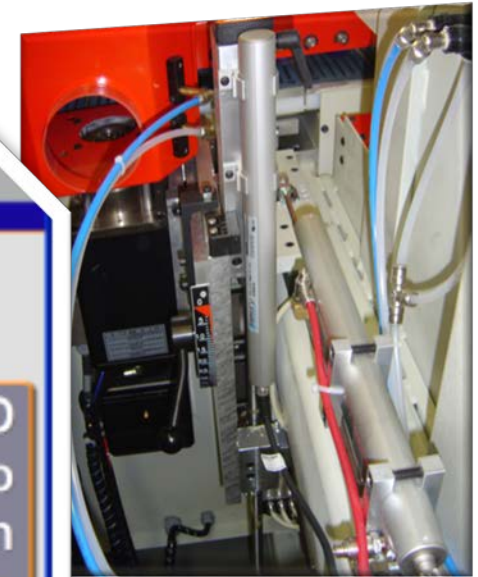
“TrueSet” the control that comes standard with the 4500 series will require a operator to position the spindles to the correct location manually. It also relies on the operator to be “truthful” to machine interface in order for the machine to start up and produce a product.

Before the machine will start, the software will remember the stored setting and ask the operator to verify (by checking off) that the station is located correctly. Machine will not run until this task is completed.

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4500 Series Shape & Sand Machines – “DRO” Optional Control



“DRO” control is an upgrade over the standard software, it has encoders that will send real-time feedback to the computer so the software can track where the spindle is and also tell you where it needs to be positioned for the desired profile to be machined and sanded properly. The machine WILL NOT run until the machine is located correctly and all numbers are green. Although this still requires manual adjustment this option provides the accuracy of a CNC machine at a fraction of the cost.

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4500 Series Shape & Sand Machines – “DRO” Optional Control



“CNC” control is an upgrade over the standard software, With “CNC Setup” there is no manual positioning. Simply select the product on the main screen and wait for the spindles to get to the correct location. This process often takes less than 15 seconds!

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4500 Series Shape & Sand Machines – “Size & Square” Feature



The “**Size & Square**” option that came along shortly after the introduction of the 4500 series incorporates a number of Upgrade features.

- Upgraded Conveyor Rails
- Upgraded Conveyor Guides
- Auto-Oiler for Conveyor
- SZ/SQ Support Table
- Automated SZSQ Fence

The “SZSQ” fence gives the 4500 the ability to **Size**, **Square** and **Sand** doors (or raised panels) at the same time.

Traditionally this was done on much more expensive single end & double end tenoners.

The nickel plated sizing fence is ambidextrous (inboard and outboard), once the panel or door is sized or squared an out board fence is no longer needed. This allows for a constant feed of parts of different sizes and allowing for more production, like a typical shape and sand machine.

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4500 Series Shape & Sand Machines – “Size & Square” Explained



Step one when **sizing panels** with the “**SZSQ**” option is to line up a rough size to size panel on the table. Using the manually fed squaring bar line the panel up to trim, and square the first cross grain end using the Optional laser light feature.

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4500 Series Shape & Sand Machines – “Size & Square” Explained

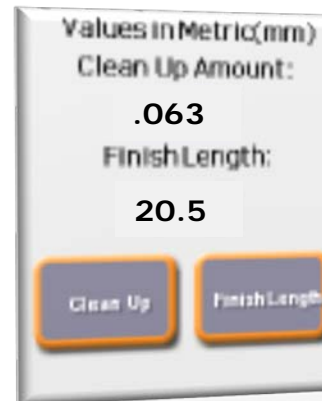


Now that the first cross grain end is trimmed, enter in the **Panels Final Length** dimension and press the Finished Length button. The Fence will then move to the correct position based on the numbers input. Rotate the panel 180 degrees so the “Cleaned up” Edge is facing the fence, now feed your part against the fence and through the machine **Shaped, Sanded and Sized!**

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4500 Series Shape & Sand Machines – “Size & Square” Explained



Often panels are square with the grain as panel stock is often coming from a rip saw. Therefore a set removal amount is all that is needed, In this case the shape and sand can be run like a standard shape and sand (or shaper).

The **Fence & Squaring Paddles** are ambidextrous, all that's needed is for the operator to switch from sizing mode to cleanup by entering the amount of material to be removed and pressing **Cleanup** to confirm. This will initiate the fence movement, it will travel to the desired position and be ready to feed.

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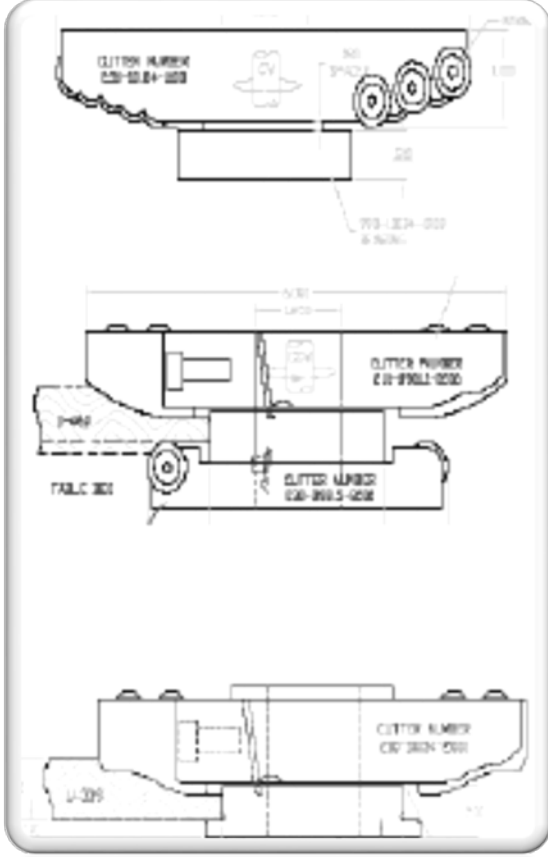
4500 Series Shape & Sand Machines – “Arch Following”



All 4500 Series Machine comes standard with floating heads for arch following.

In order to follow a arch effectively tooling is a key. To the right are a few common examples.

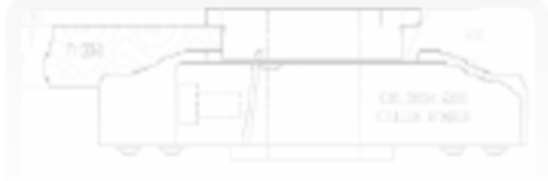
See Unique Tooling or your regional manager for more information.



Roughing Cutter with rub collar

Profile Head with back cutter and rub bearing for 3/4" Panels

Profile Head with support bearing for 5/8" Panels



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4500 Series Shape & Sand Machines – “Arch Following”



Step 1:

Before going to the 4500
“**Pre-hog**” arch pattern from
square panels.

A Unique 250 is pictured (*left*) with a
straight knife hogging cutter to
achieve a smooth cut.



Step 2:

Adjust fence back to the
desired finish arch-height.

*This allows the arch to hang over the conveyor
farther and be cut completely*

NOTE: slow down Arch-Feed
rate to approximately 20 FPM.



4500 Series Shape & Sand Machines – Q&A

•**What does it do?** The 4500 series machine is design to shape and sand raised panels and edge details for furniture components, doors and drawers.

•**What kind of finish can be achieved?** This is a difficult question that needs to be discussed in detail when choosing what machine to quote. All customers have different quality levels, as a general rule we use the following based off feed rates of 25-35 feet per minute when compared to finish quality that is produced on a shaper.

- A two sanding machine will eliminate 70-80% of all hand sanding.
- A three sanding machine will eliminate 80-90% of all hand sanding.
- A four sanding machine will eliminate 90-95% of all hand sanding.

In most instances the use of a random orbital should be eliminated and a cross grain should only have to be wiped with a sanding block / Sponge to blend remaining cross-Grain Scratch & achieve a finish quality.

Please note that these statements are based on consulting with both the preferred tooling and sanding manufacturers when ordering tooling as a single "package". Final sanding results vary based on customer preference.

Often Species such as maple and Cherry are at the lower end of the percentile and can even dip lower as they are typically more difficult to machine and sand.

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4500 Series Shape & Sand Machines – Q&A

- How many parts can it do?** The standard machine can run up to 35 feet per minute. The amount of parts that it can produce is based off average part size and the operators' ability to get parts to the machine.
- Can it square parts?** The 4500 series machines have the option of adding the "Size & Square" feature which allows shops to not only square-up, but also size parts as they are being profile shaped and sanded.
- Where can I see the machine?** Unique has distribution covering the entire USA with dealers world-wide as well, you may contact us and we will put you in touch with a person who can help setup an appointment to see the machinery in operation at a facility near you or you are also welcome to Visit the factory in Phoenix, Arizona *(located right next to Sky Harbor Intl Airport)*

Video Link: <http://uniquemachine.com/4500.html>

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