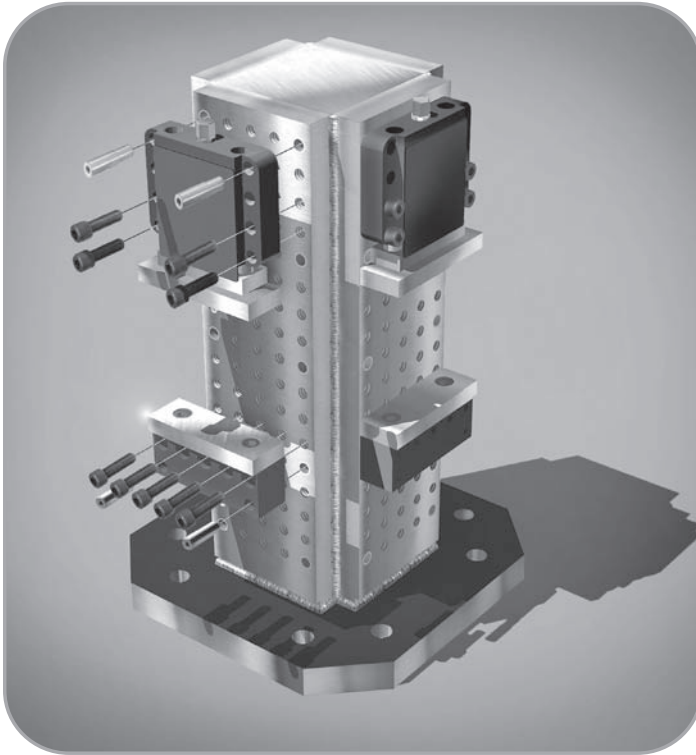


STEVENS

Modular Fixturing System
for horizontal machining centers

Stevens Engineering Inc.
www.stevenseng.com

BUILDING SETUPS ON STEVENS COLUMNS



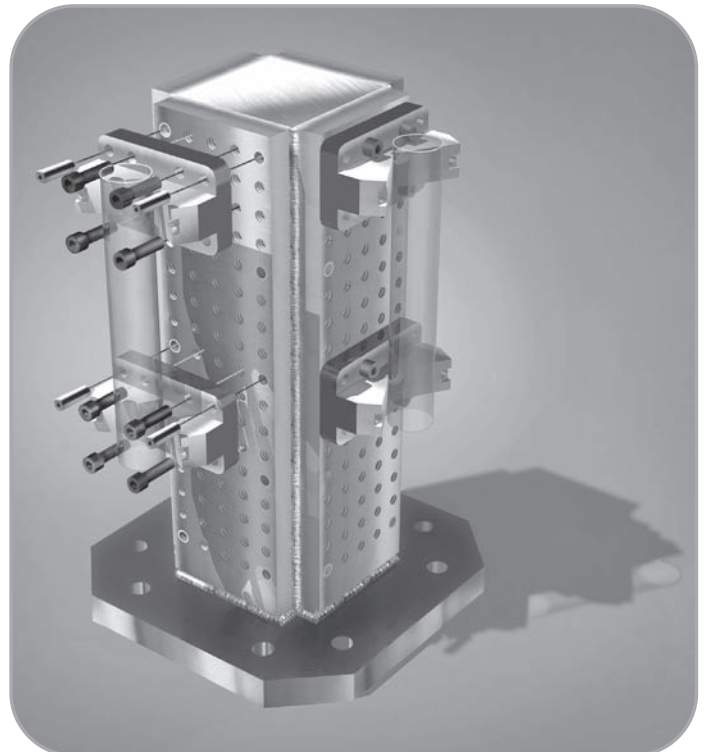
DRAMATICALLY REDUCES SETUP COST AND FIXTURE EXPENSE

- Standard grid pattern ideal for either dedicated fixtures or all-modular setups.
- Spacing of hole patterns on Stevens accessories matches the pattern on Stevens Columns.
- Insertion of pull dowels thru bushed holes in the accessory into corresponding bushed holes in the Column assures accurate location, alignment and repeatability.
- Fastening the accessory to the Column is done with cap screws which pass thru clearance holes in the accessory into corresponding threaded holes in the Column.

- Design and validate workpiece fixturing using your CAD or CAD/CAM system and the Stevens CAD Library.
- Simple building block approach eliminates setup error and makes mill setups quick, precise, and repeatable.
- System accuracy reduces probing requirement and reduces the need for multiple fixture offset changes.

All STEVENS MODULAR FIXTURING is manufactured in the U.S.A. with American labor and American materials.

STEVENS MODULAR FIXTURING IS PROTECTED BY U.S. PATENTS.



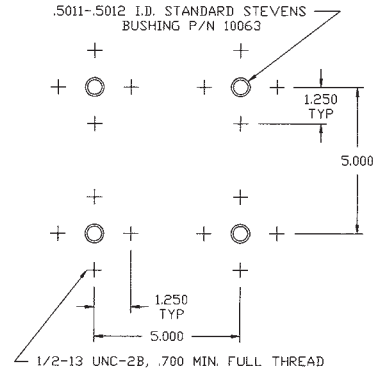
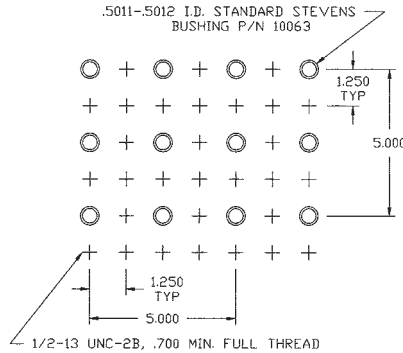
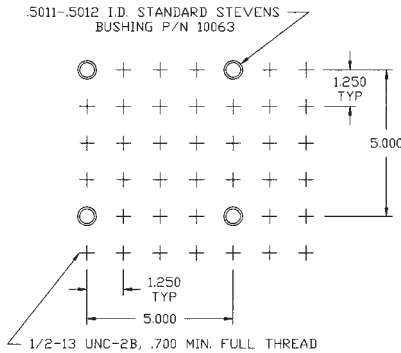
STEVENS PATTERN OPTIONS

Stevens Columns are available with several variations of the same basic hole pattern. All Stevens Columns include mounting holes and locating features to match machine pallet or table.

STANDARD PATTERN consists of 1/2-13 tapped holes on 1.250 centers and .5011-.5012 I.D. bushings on 5.000 centers. It is the most widely used pattern and may be used for mounting any Stevens accessory.

HIGH DENSITY PATTERN is basically the same as the Standard Pattern except that bushings are on 2.500 centers providing more locating positions.

CLUSTER PATTERN has an abbreviated hole pattern which is used with most Stevens accessories. It offers the same level of accuracy at a lower cost.



OTHER PATTERNS such as combination holes (bushings positioned over threaded holes) and ball-lock installations can be quoted upon request.

SYSTEM ACCURACY

Stevens Modular Fixturing is built to the highest standards of accuracy. Mitsui Seiki, SIP, and DIXI jig-boring machines, operating in a temperature controlled area, are used to produce exceedingly accurate hole patterns. Frequent calibration of these machines and other inspection equipment assures consistent accuracy.

Prior to finish boring and final inspection, modular components are placed in the environmentally controlled area for temperature stabilization. This assures exact correspondence between measurement standards and the finished product.

ACCURACY OF GRID

Bushings (All locating holes are bushed)

Inside Diameter +/- .000050"

Concentricity .0001" TIR

Dowel Pin Diameter +/- .000050"

Span	30" span	45" span	60" span
Jig-Bored Hole Position	.00015	.00025	.00035
Bushing Concentricity (1/2 TIR)	.00005	.00005	.00005
Bushed Hole Centerline Accuracy=	+/- .0002	+/- .0003	+/- .0004

Clearance Between Dowels and Bushings

minimum .0004" • maximum .0006"

Accommodates span, concentricity, and diameter tolerances to assure 100% interchangeable assembly.

ACCURACY OF SURFACES

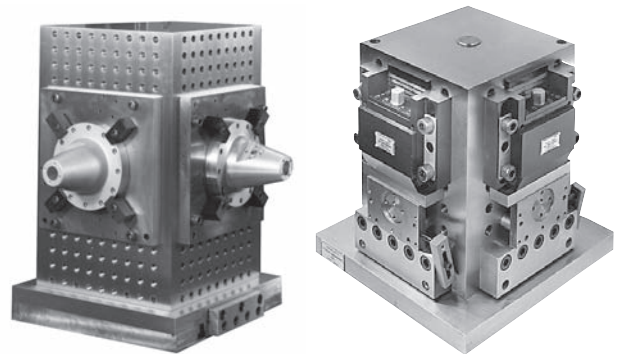
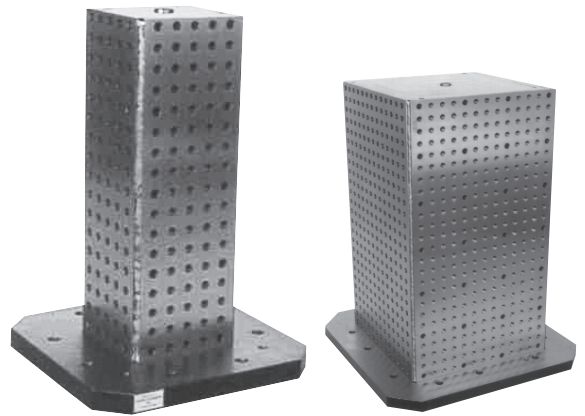
Parallelism of Qualified Surfaces .0005"/40"

Perpendicularity of qualified surfaces .0005"/12"

STEVENS 4-SIDED COLUMNS— PLAIN OR PATTERNED

FEATURES

- Custom sizes available—up to 40" square by 60" high. Also available **Semi-Finished Plain, Precision Milled Plain or Precision Milled with Stevens Grid Pattern.**
- Stevens Columns are made in a wide range of shapes and sizes with base plates sized to fit pallets or machine tables as needed.
- Stevens Columns are furnished with hole patterns as described on page 3 or plain for users who prefer to machine a pattern to suit their specific needs.
- Standard Stevens Columns with hole patterns on working faces are finished to flatness of .0005 in 12" and perpendicularity of .0005 in 12". Plain Columns are furnished finished or unfinished on their vertical surfaces as requested but are normally furnished fully machined on their bases to fit the machine table or pallet.
- Locating features for centering on the machine table or pallet are fully described on our website.
- Stevens Columns are made from steel because of its superior tensile strength and rigidity as opposed to cast iron.
- Closed construction stiffens structure and eliminates entry of coolant and chips into the interior.
- Fully stress relieved for long-term stability.



PRECISION MILLED PLAIN

- Faces and base are machined flat and perpendicular .0005/12".

SEMI FINISHED PLAIN

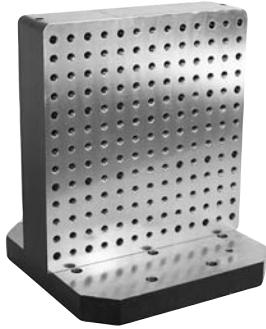
- Stock left on vertical faces to machine features needed by the customer.
- Bottom of the base is machined flat .0005/12".



WHY STEEL?

- All Stevens Primary Tooling - Subplates, 4-sided Columns, Silo Columns and 2-sided Angle Plates are made from steel, which has an elastic modulus twice that of cast iron. The result is a far more rigid workholder with less deflection under a given cutting pressure.
- Higher thread strength of steel vs. cast iron eliminates thread pull-out problems associated with cast iron.
- The use of steel and the stiffer closed design of Stevens Columns result in less dead weight versus equivalent cast iron structures resulting in higher payloads per pallet and less wear and tear on machine and pallet changer.

STEVENS 2-SIDED ANGLE PLATES



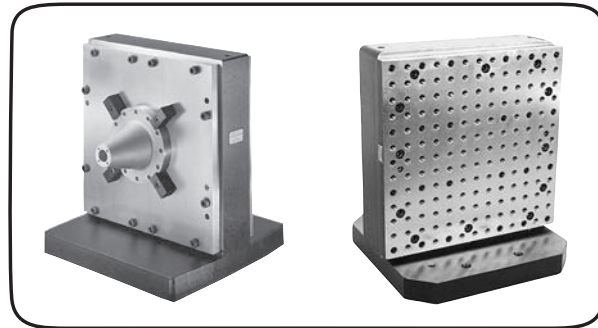
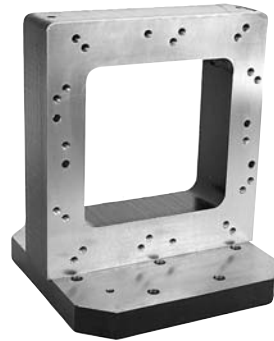
FEATURES

- Accurate precision ground faces and base provide repeatable setup location.
- Flatness .0003/12"; Perpendicularity .0005/12".
- Base hold-down holes are included.
- Base locating features included.
- Custom sizes available—Up to 50" wide x 60" high.
- Available in two styles: Precision Ground Plain or with Stevens Grid Pattern.

STEVENS 2-SIDED WINDOW ANGLE PLATES

FEATURES

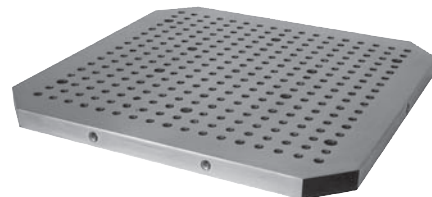
- Opening provides access so spindle can reach the back of the workpiece.
- Project subplates or tooling plates repeatably mount to both faces.
- Stiffness of angle plates far exceeds that of equivalent cast iron structures.
- Accurate precision ground faces and base provide repeatable setup location.
- Flatness .0003/12"; Perpendicularity .0005/12".
- Base hold-down holes are included.
- Base locating features included.
- Custom sizes available—Up to 50" wide x 60" high.



Gridplates and tooling plates are available for mounting on window angle plates.

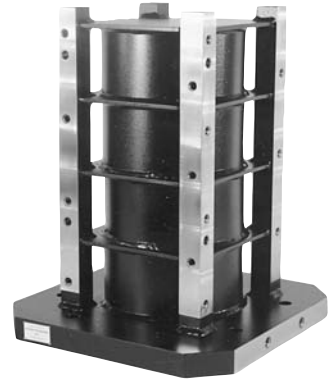
STEVENS SUBPLATES

- Subplates mounted onto machine pallet become an accurate reference for machine setups.
- Stevens grid allows for commonality of fixture mounting across various sizes and models of machines in your plant.



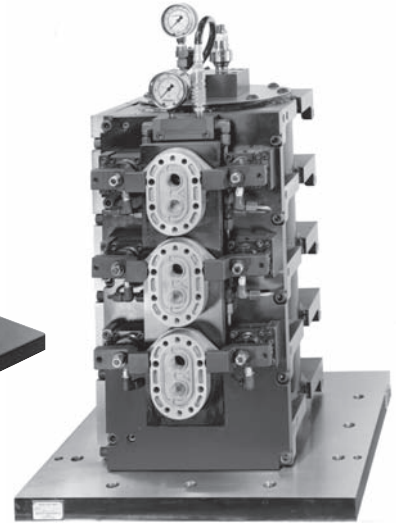
SILO™ COLUMNS*

- Either subplates or tooling plates may be accurately and repeatably mounted on any of four faces of Silo Columns, allowing greater flexibility than conventional tombstones.
- The Silo approach minimizes the number of columns and machine pallets required to maintain steady production flow on horizontal machining centers.
- Excellent repeat accuracy of location of subplates and tooling plates eliminates need for probing or indicating, further reducing setup time.
- Design optimized for stiffness; dead weight of cast iron structures is eliminated.
- Fully stress relieved for long-term dimensional stability.
- Solid top bulkhead (standard) keeps chips and coolant out of interior. Open access to interior with removable cover is optional.
- Base location features are included.



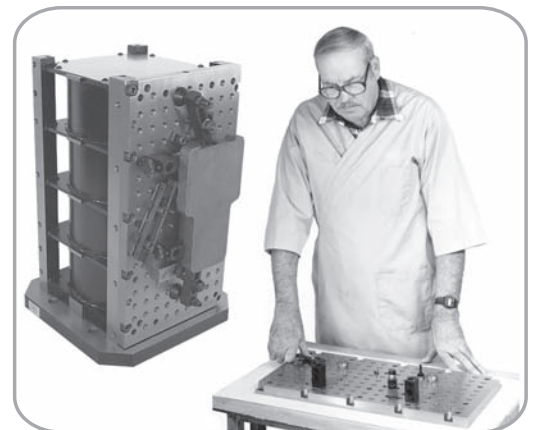
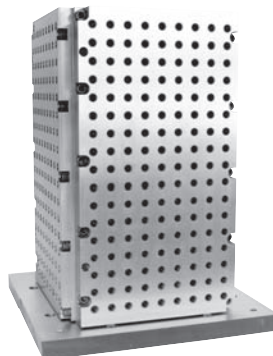
SILO TOOLING PLATES

- Permanent fixtures made from Silo Tooling Plates can be easily and quickly doveled and screwed to the Silo Column.
- Silo Columns are ideal for hydraulic clamping fixtures when ordered with optional top cover. Hydraulic components such as accumulators and intensifiers may be mounted inside the Column. Hydraulic lines can be run through the wall or optional top cover.
- Tooling plates are available in steel or aluminum. Steel tooling plates are precision ground, free machining, and provide greater durability. Aluminum tooling plates reduce weight. Use Stevens Span-Comp™ Bushings to assure repeatability of location.



SILO SUBPLATES

- Silo Subplates can be used to build setups on a bench away from the machine. Stevens setup components are designed for this purpose.
- Any number of subplates or tooling plates can be prepared in advance of actual machining time.



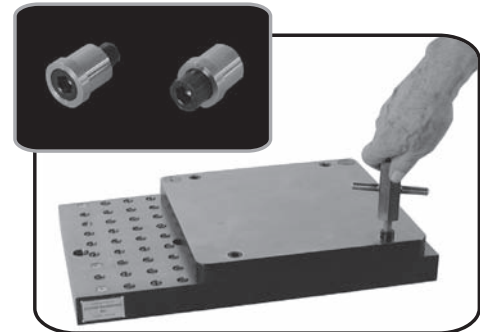
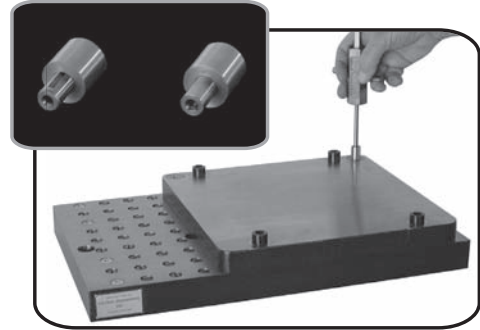
* Patent #355,200

STEVENS LOCATOR CAPSULES

SAVE LOST TIME IN MAKING SETUP CHANGES AND ROUNDING UP LOOSE DOWELS & SCREWS.

Captured screw and captured dowel assemblies are permanently installed in holding fixtures for location and attachment to vertical faces of columns and angle plates. Captured dowels are retained in precision bushings which are installed in the fixture. Two captured dowel assemblies align the fixture when the dowel is pushed into a bushing or bored hole in the surface below. Captured screws are retained in a housing which is installed in the fixture. Two or more captured screws holds the fixture in place.

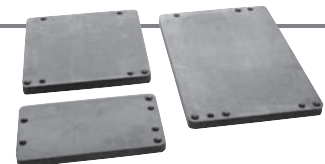
- When inserted into corresponding holes below, locator capsules lie flush with the fixture surface eliminating cutter path interference.
- In captured dowel assemblies, concentricity between the pull dowel and the O.D. of its bushing is held to .0003, providing exceptional location accuracy.
- The pull dowel may be removed from its bushing if necessary by taking out the retaining screw on its lower end.
- The screw may be removed if necessary by pushing the screw upward past the seal.
- A spring actuated mechanism in the screw pushes it upward near the top of its travel, preventing the screw from hanging up in the threaded hole below.



* Patents Pending

STEEL & ALUMINUM TOOLING PLATES

- Designed for use in making permanent holding fixtures which can quickly and repeatably mounted on Stevens subplates, parallels, angle plates, etc.
- Available from stock for quick fixture turnaround.
- Steel plates are precision ground flat within .001", and parallel within .0005". Aluminum plates are controlled on thickness to +/- .005".
- Jig bored and bushed locating holes provide for accurate mounting. Aluminum Plates use one standard bushing and one Span-Comp Bushing to provide precise position and repeatability when mounted on Stevens subplates. Span-Comp Bushings precisely locate the plates while allowing for greater thermal expansion of aluminum relative to steel.

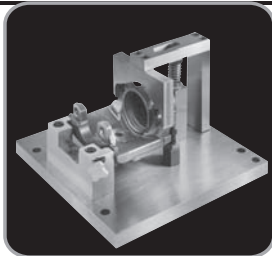


Steel Tooling Plates

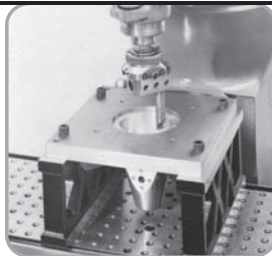


Aluminum Tooling Plates

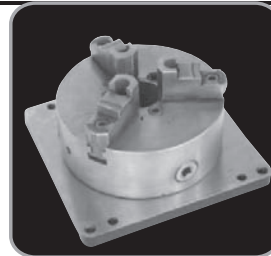
Applications



This brake caliper fixture made with Stevens tooling plate will quickly dowel to the primary table tooling.



Bridge fixtures use Stevens tooling plates and parallels which pin together for quick alignment to machine axes.



Stevens tooling plates are ideal for mounting chucks or collet fixtures to primary table tooling.

STEVENS MODULAR VISES

MODEL 626 (P/N 20210)

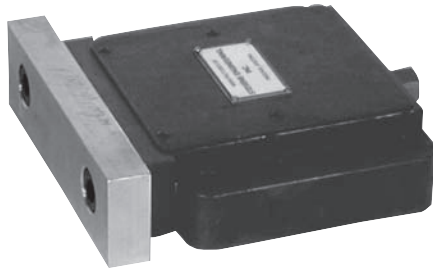
A pull-down mechanism prevents the work from rising as the vise is tightened.

The faces of the fixed and movable jaw assemblies are designed to allow mounting KURT style hard and soft jaws.

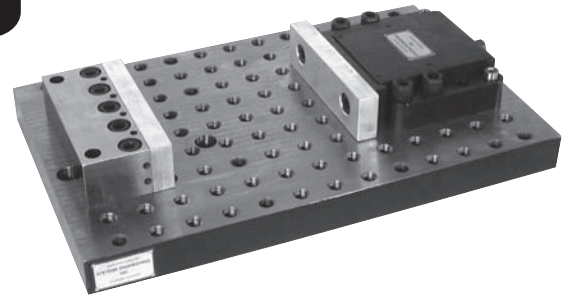
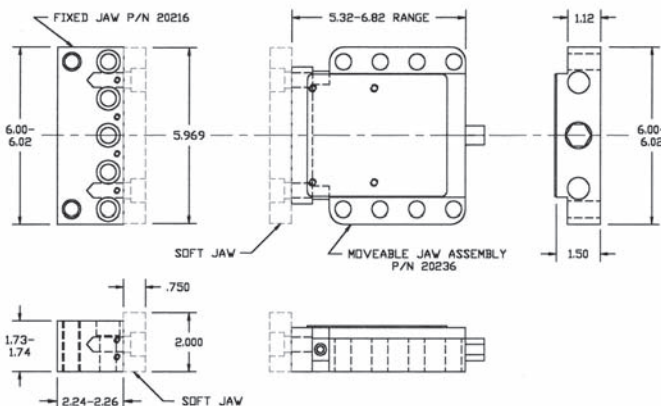
Model 626 Features

- Compact design makes handling easy and setup quick.
- Use of high strength materials assures durability under heavy use and retention of accuracy over years of service.
- Included with the Model 626 Vise are the fixed jaw, the movable jaw assembly, hinge handle, work stop, mounting hardware and instruction sheet.
- Stevens rest pads and shim sets are used to elevate the work to the desired height.

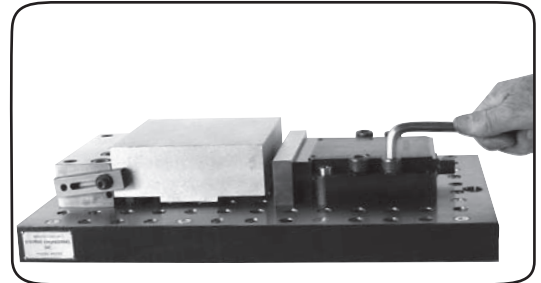
For more detailed information, please visit our website.



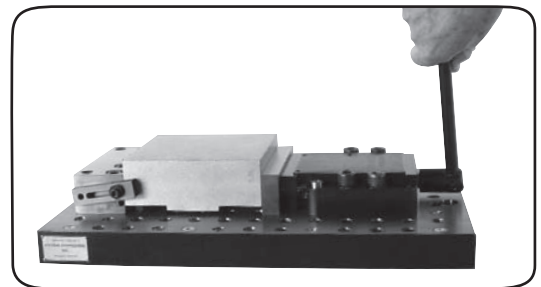
The movable jaw assembly may be ordered separately.



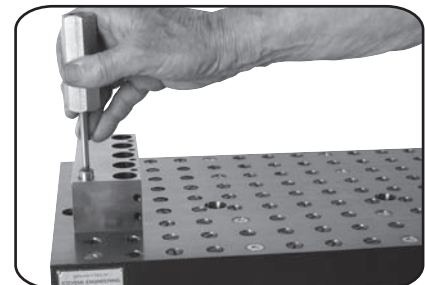
Subplate ordered separately.



The vise is furnished with a hardened movable jaw plate. The fixed jaw is already fully hardened.



Designed for use on Stevens grid patterns, the separate fixed and movable jaw assemblies may be positioned at any desired interval allowing a wide range of workpiece lengths to be held.

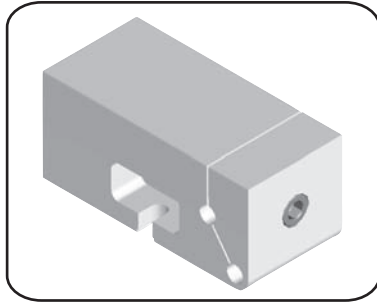


Pull dowels inserted through bushed holes in the fixed jaw and into corresponding holes below align the jaw face parallel to X, Y, or Z machine axes. When several vises are mounted, the fixed jaw faces will lie in the same plane.

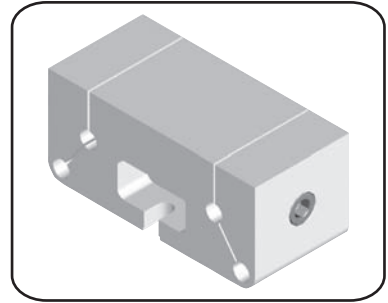
STEVENS SOFT BRICK VISE

SOFT-BRICK VISE*

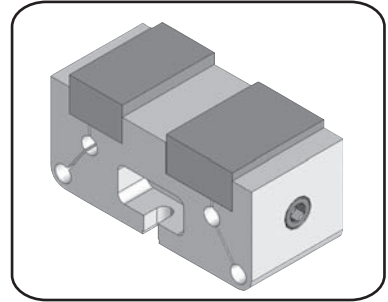
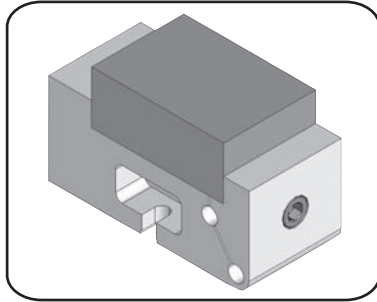
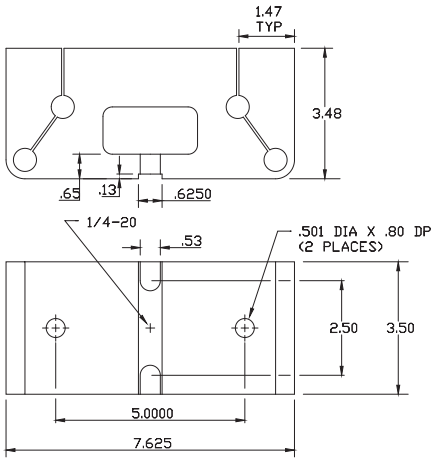
A totally new concept in workholding, the Stevens Soft-Brick vise eliminates the need for changing jaws on soft jaw vises. The vise needs no soft jaws because the vise itself is a soft jaw. Made from 6061 aluminum, the low cost vise can be machined by users with cavities to fit specific workpieces.



1-Station Soft-Brick Vise (P/N 20222)

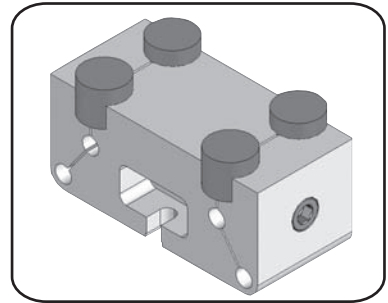
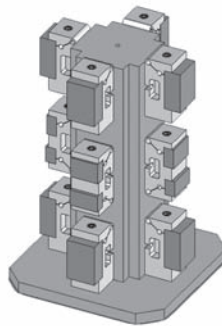


2-Station Soft-brick Vise (P/N 20223)



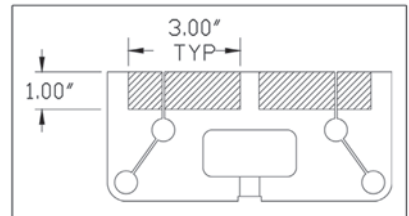
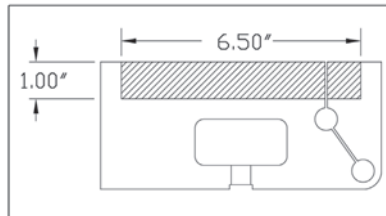
Soft-Brick Vise Design Features

Patent-pending design incorporates a jaw lock pin to clamp the empty vise while machining the cavity. Then the jaw-lock pin is removed and the workpiece can be clamped with up to 5,000 lbs. of clamping pressure. Hardened steel male and female threads and thrust bearing provide durability.



- Compact and easy to mount.
- Soft-Brick vises weigh only 9 lbs. and may be used for small workpieces or can be ganged together for larger workpieces.
- A universal mounting pattern will fit onto any Stevens subplate grid pattern, and T-slotted machine table, or onto the faces of a tombstone.

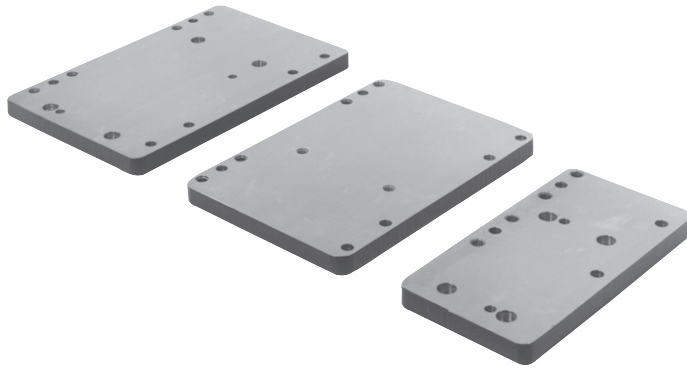
MACHINABLE AREA



* Patent #556004



STEVENS VISE ADAPTERS

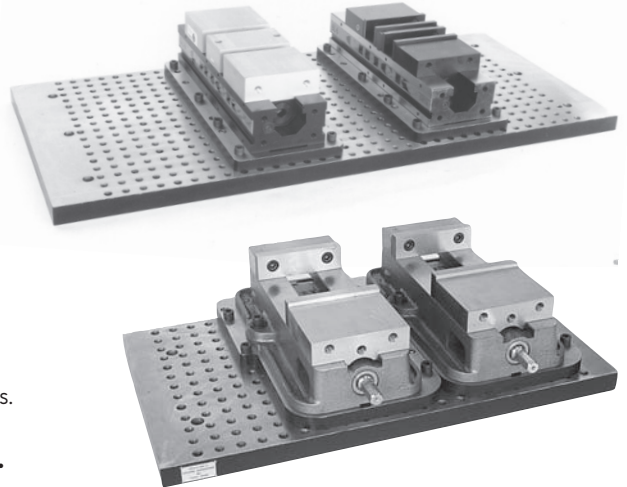


- Stevens pull dowels inserted through bushings in the adapter into bushed holes in the primary component below aligns the fixed jaw with respect to the X or Y axes.
- With multiple vise setups, fixed jaw locations will lie in the same plane using Stevens Vise Adapters.
- Stevens Vise Adapters are precision ground to a uniform thickness.

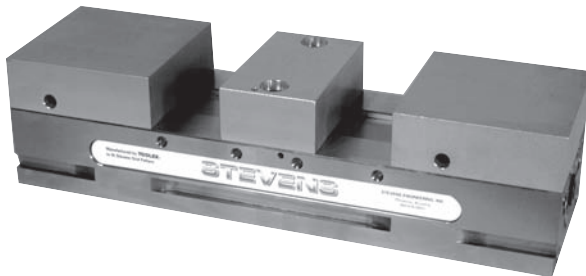
For more detailed information, please visit our website.

Quick, accurate and repeatable vise setups are easy with vises mounted on Stevens Adapters.

Stevens Vise Adapters are available for a number of different makes and models of vises including KURT, TOOLEX, and CHICK.



STEVENS TWO STATION VISE



Two-Station Vise (P/N 20235)

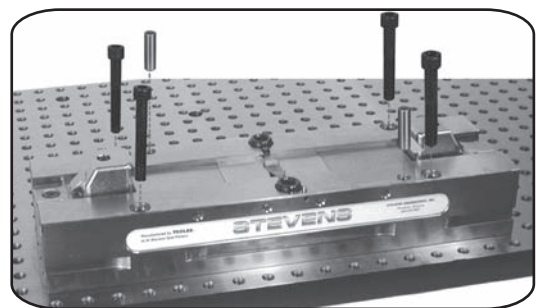
Hardened ductile-iron vise with machinable **TOOLEX**-style aluminum jaws will clamp either one or two workpieces for machining.

Includes vise with soft jaw set, vise handle, and tool kit.

Unlike competitors' vises, which must be awkwardly lifted up to load over pins or keys for alignment, the Stevens Two Station Vise may be slid into position. Pull dowels are inserted from the top to align with bushings in the column or angle plate.

Two Station Vise Features

- Fits standard Stevens grid pattern.
- Vise mounts with pull dowels and cap screws parallel to either X or Y axes—no need to align the vise.
- Quicker and more repeatable setup changes.
- Fixture offsets may be stored and downloaded instead of being indicated manually.
- Soft jaws can be easily machined to any configuration.
- Movable and fixed jaws are reversible.
- Hard jaw sets are also available.
- All jaw sets snap in easily and repeatably.

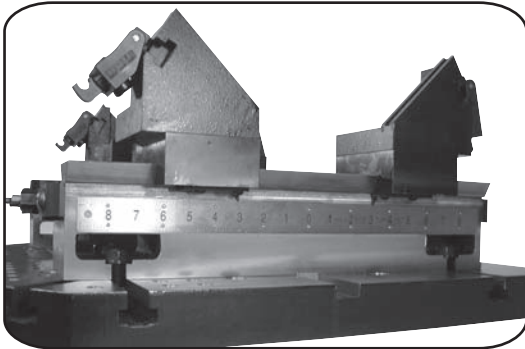


UNIVERSAL VALVE BODY FIXTURE

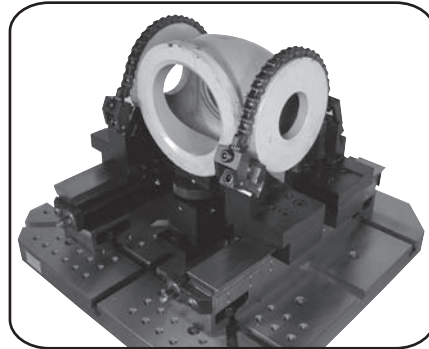
P/N 20185

Designed for holding varying shapes and sizes of valve bodies.

The assembly consists of a base plate, two carrier assemblies on each of which are mounted one left hand and one right hand half vee. Right hand and left hand Acme shafts may be used to move the half vees together or apart either in unison or individually as required. The two carrier assemblies may be slid to any required position on the base to accommodate various lengths of work pieces. A cross bore support is used to locate and hold a cross bore member if required.



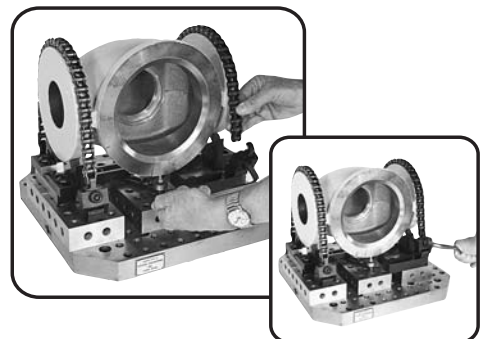
Pointers, mounted on the under surfaces of the vees, indicate on the scale the position of the right hand and left hand vees relative to the center of the carrier.



The half vees are designed to use P/N 20149 chain clamps for securing the work prior to machining. A variety of clamping methods may be used for securing the cross bore member, including chain clamps.

STEVENS CHAIN CLAMP

- Fast initial setup. Socket head cap screws are used for mounting each end of the chain clamp to a subplate or T-slotted table.
- Each standard duty kit P/N 20149 (clamping force up to 6,000 lbs.) includes a cam-locking hook assembly P/N 20150, a take-up unit P/N 20151 for adjusting chain tension, and a chain set P/N 20152. Any length chain up to 40 inches can thus be quickly assembled for various workpiece diameters.
- Each heavy duty kit P/N HD20149 (clamping force up to 12,000 lbs) includes a cam-locking hook assembly P/N HD20150, a take-up unit P/N HD20151, and a chain set P/N HD20152.
- Additional lengths of roller chain may be added for holding extra large workpieces.



The modular fixture above utilizes two chain clamps to secure the valve body casting. A standard Allen wrench is used to operate the cam-locking hook assembly.



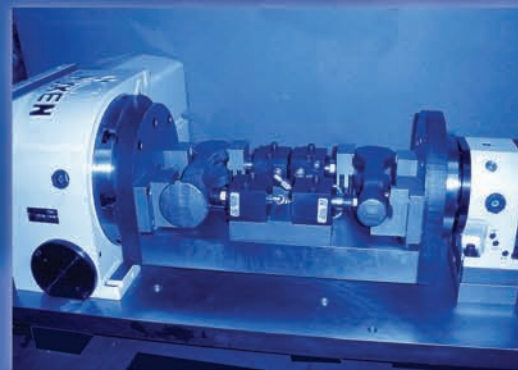
**Stevens offers a wide range of solutions
proven to raise productivity.**

**Workholding for
Vertical Machining Centers.**



**Stevens Modular Components
are used to quickly build fixtures.**

**Larger production quantities may
require dedicated fixtures.
Stevens designs and builds
fixtures with hydraulic, pneumatic,
or manual clamping.**



Stevens Engineering Inc.

3946 W. Clarendon Ave, Phoenix, AZ 85019-3608

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