The final component of the SquareTech system is the holding of the workpiece.

The 90° indexing fixture accepts the Matrix pallet and drawbar from System 3R. The pallets can be either manually loaded and indexed or integrated to a fully automated manufacturing cell.

The following options are available for mounting of the workpiece:

- Directly to Matrix pallet.
- To a reference system.
- To a manual vise.
- To a magnetic chuck.
Mounting directly to Matrix Pallet

The workpiece can be mounted directly to the Matrix pallet (approx 5” diameter) utilizing a series of predrilled holes. The pallet is also available in a 6” automation ready version which allows for custom hole layouts for specific applications. Larger sub-plates are easily implemented for custom mounting, jigs, etc.

Mounting to a Reference System

Many facilities are already using System 3R, Erowa or Hirschmann referencing systems. Already mounted components can be used by mounting the preferred referencing system manual chuck to the face of the Matrix pallet. The Matrix pallet is still used for the indexing function. When the squaring procedure is finished, the pre-mounted components can be moved to the next process.

Mounting to a Manual Vise

Two styles of manual vises apply themselves well to SquareTech

- Self Centering
- Precision toolmaker

The self centering style of vise has many jaw options available to satisfy various part geometries. The repeatability of location of these vises is 0.002” on center. Most applications will use a sacrificial portion of the workpiece for workholding then remove that section when the process is finished.

The precision toolmaker style of vise requires a workpiece with parallel sides, in order to function properly. This vise also only allows for centering in one direction. The benefit is that workpiece location will repeat exactly and squareness to the indexing feature is predetermined.

Mounting to a Magnetic Chuck

While selecting a magnet chuck, careful consideration must be given to the size, shape, type of material and process to be applied to the workpiece.

Two styles of magnetic chucks apply themselves well to SquareTech

- Permanent.
- Electro-permanent.

Permanent magnetic chucks are a cost effective solution for use in this application. The benefit here is that only one workpiece surface is utilized for part holding. Many sizes and shapes are available with varying holding performance. In general the limiting factor most situations is that the part is smaller than the magnetic chuck contact surface. This limits the access to the workpiece.

The ultimate solution when magnetically holding a workpiece is the use of an electro-permanent magnetic chuck, which has be specifically designed for workpieces mounted on its centerline.

This magnet concept was originally applied to conventional milling applications only. Its unique characteristics allow the use of top tooling. Top tooling is a consumable plate which allows the transfer of magnetism to the workpiece. The top tooling can be machined away until a pedestal of material is remaining which is undersize of the workpiece, giving full access for machining.
Top tooling is removable and can be reused on repeat jobs or refashioned to fit new workpieces. Recent advancements in surface coating applications to top tooling have resulted in holding performance doubling.

This is an application driven area. These magnets have successfully completed jobs with part sizes below 1 sq. in to over 100 sq. in.

Please contact us with your application. The options in work holding are continuously improving. Applications which were impossible only a couple of years age are now common.

Peter Schmidt is available to answer questions regarding your project at: pete@hschmidt.com