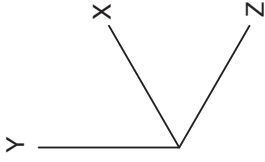# How to Use QwikChange Machinable Jaws

STEP 1

Determine the necessary part orientation.
Analyze all the machining operations that must be performed to finish a part. Since a workpiece may need to be fixtured several times, develop a machining process that requires a minimum number of workpiece clampings.
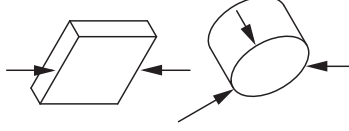
To minimize the number of clampings, evaluate the available tooling and the capabilities of the machining center. Also consider utilizing special cutting tools to provide a more accurate part and reduce the part cycle time.

STEP 2

Select the workpiece features that will be used as locating points. The choice of locating points is crucial for workpiece consistency. A feature that will be machined into a workpiece must be referenced from a single datum in X, Y, and Z directions. Select a consistent feature that will provide suitable datum surfaces for program reference. In most instances, programs used to machine a workpiece during the second and third clamping should be referenced from a feature machined during the first clamping.

In certain applications, it may be helpful to machine an additional feature (i.e., a blind hole or the perimeter of a casting) into a workpiece to use as a locating feature for a later operation. Never select a feature that will duplicate the locating points along a single axis (i.e., do not use two different X-axis stops).

STEP 3

Select the workpiece features that will be fixturing points. Choose the points and/or surfaces that will be used to actually clamp the workpiece. It is best to clamp a workpiece on the features used as locating points.

Since these features will be subjected to substantial clamping forces, choose features that will not deform or fail during clamping and that will completely capture a part without introducing any unbalanced forces (i.e., clamping on the draft of a casting will tend to push the part out of the fixture).
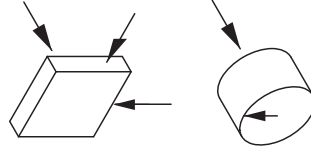
STEP 4

Design your jaws to interface with the selected locating and clamping features. Always design locating interfaces into the fixed jaw to provide maximum accuracy and repeatability. Keep in mind that movable the jaws have some freedom of motion to accommodate variations in part size.

Do not design jaws based on the limitations of old-fashioned vises. QwikChange™ Machinable Jaws can be adapted to utilize a wide variety of tooling components such as dowel pins, spring plungers and gripper inserts.
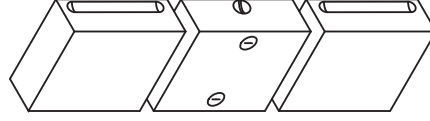
QwikChange™ Machinable Jaws can be manufactured to fixture virtually any workpiece. These jaws combine the accuracy of a dedicated fixture and the rigidity of a vise with the ability to change entire set-ups in minutes. The following steps detail how to prepare the machinable jaws for your production applications.
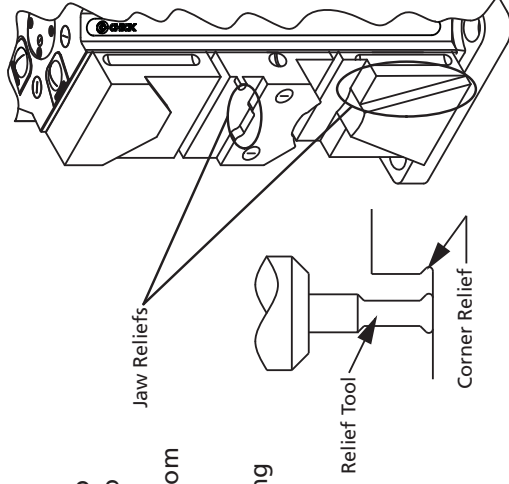
STEP 5

Place blank jaws on the workholding system and clamp a small spacer into each jaw opening. The spacers should be round (dowel pins recommended) and allow a slight amount of jaw travel in both directions. Spacers should be placed on the centerline of the workholding system to reach a height just under the cut of the jaws. This configuration will ensure maximum accuracy of the fixtures.

STEP 6

Machine the jaws. For maximum accuracy, the jaws should be cut by the machine used for actual manufacturing. If secondary operations are needed, be sure to reference these operations from other machined surfaces.

After machining, inspect the jaws before unclamping to ensure that they interface properly with the profiles and contours of the workpiece. If the fixtures have not been manufactured correctly, adapt the program to correct the error.

Note: Do not machine into the jaw towers!

STEP 7

Incorporate reliefs into the fixture design. Jaw reliefs can be added to QwikChange™ Machinable Jaws to minimize contact points, add tool clearance and improve chip flow from the workpiece.

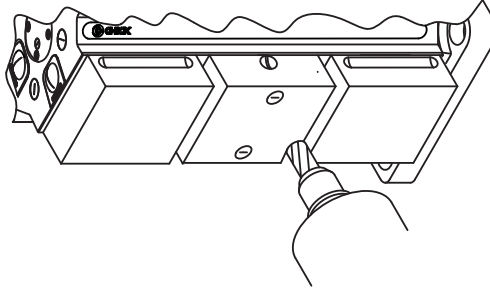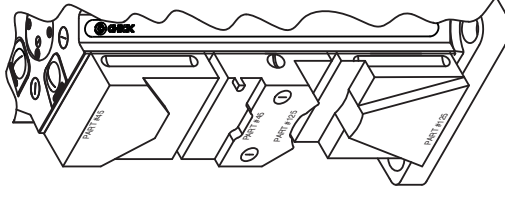Corner reliefs should be added using a relief tool (dovetail cutter).

Jaw Reliefs

Relief Tool

Corner Relief

STEP 8

Mark the location and orientation of each jaw. Clearly stamp or engrave on each jaw the production job for which it is designed and its orientation on the workholding system. The jaws must always be installed in the same configuration in which they were machined to ensure accuracy and repeatability in future set-ups.