

Cutting Glass

Types of Cutters

There are many different kinds of glass cutters. Some are easier to use than others but the difference is mostly just personal preference.



From left to right, “Thomas Grip” cutter, “Toyo” pistol grip cutter, conventional wide tip cutter for thick glass, old style cutter for tapping, old style ball cutter for setting beneath score.

The difference in how well a cutter works isn't as much in the type of cutter but in the person using it. Although many cuts are done by just scoring and breaking, glass cutting should be treated as three separate actions; the score, the run, and the break.

Making the Score

Don't Blame the Glass

There are many different kinds of glass. Some artisans claim some kinds are easier to cut than others. I disagree. I think the difference is mostly that some glass is more forgiving of poor scores. Smooth surface machine rolled glass is an even consistency and will obey even poor scores. Not so much with hand-rolled, textured surface, or streaked glass. A poor score is likely

to not follow your score. If you make good scores, all glass can be reasonably relied on to follow your instructions and break where you direct it to. In spite of that, I seriously suspect that “Youghiogheny” is a native American word that means “I'll break wherever I please”.

Keep Even Pressure

The most important part of good glass cutting is a smooth even consistent pressure score. The target is 6 to 8 lbs of pressure that never increases or decreases at any part of the score. A great way to practice is with a bathroom scale. It's near impossible to feel any change in pressure during a score, but if you place a piece of glass on the scale and score it, you can read any pressure change and recognize where you change pressure as you score. You are most likely to change pressure on curves. It makes no difference whether you push or you pull when scoring as long as you maintain an even pressure throughout the score.



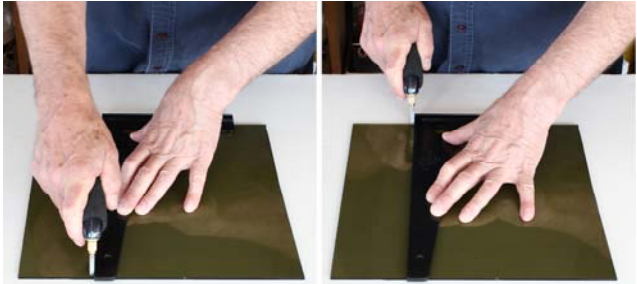
Practicing scoring on a scale

Complete the Score

Start the score on one edge of the glass, draw the cutter at a smooth even speed and smooth even pressure entirely across the glass. Do not

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stop short of the edge but run the cutter right off the opposite edge of the glass.

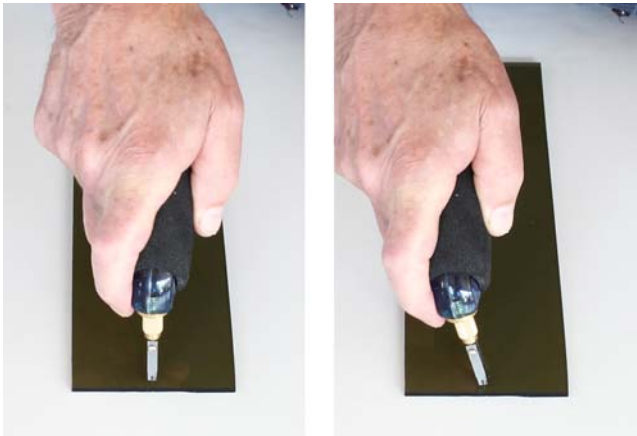


Start on one edge **Run off the other edge**

It makes no difference if you push or pull when you score. All that matters is that you get a smooth even pressure when you score. Do NOT stop your score before the edge. Start the score as near the edge of the glass as possible, run the score at a steady pressure and steady speed across the glass and right off the edge.

Hold the Cutter Vertical

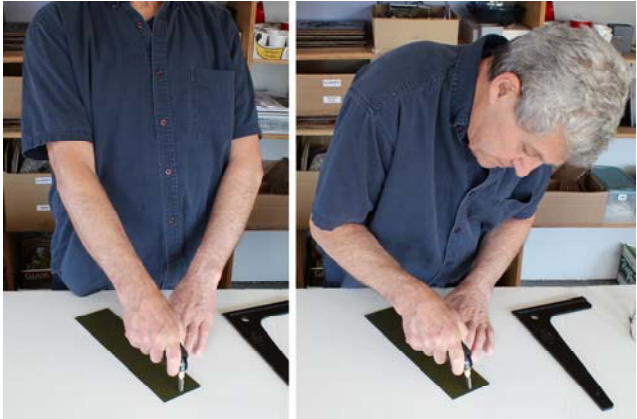
Hold the cutter as perfectly vertical as you can. Do NOT lean it front or back and do NOT tilt it to either side. If your cutter is held vertical, the glass will break on a clean 90 degree square edge. If your cutter is tilted to the side when you score, the glass will break on an angle and is more likely to veer off the score.



Right way **Wrong way**

Adopt a Cutting Stance

Good posture makes bad cutting. Instead of standing straight and reaching out, bend over as far as you can to reach across the glass without extending your arm.



Poor cutting stance **Good cutting stance**

Minimize Arm Movement

Try to move your arm as little as possible. Keep your elbow pressed against your waist as much as you can while you score the glass. Instead of moving your arm back and forth away from your body, try to keep your arm steady and move your entire body back and forth.

Running the Score

Reverse Press

When a score is too curved to trust just breaking it, you need to run the score before breaking it. One of the most reliable ways to run a score is the Reverse Press. After making the score, turn the glass over and press down on the back of the score. Put both thumbs right on the back of the score and stand up straight to apply pressure. Start at one edge of the glass and, as the score begins to crack, move your hands along the score to complete it. You want to apply a firm pressure entirely along the score.

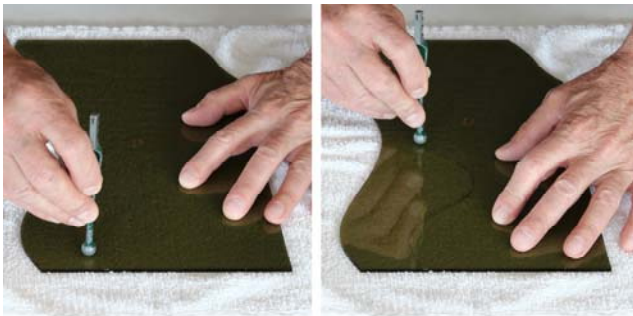
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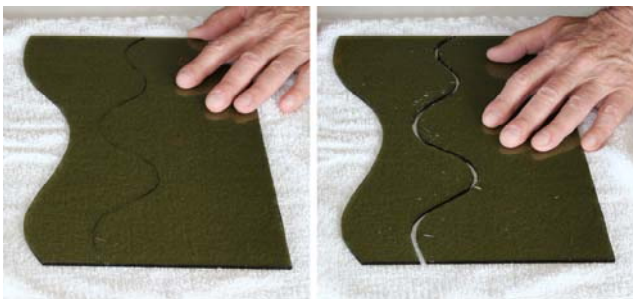
Running a score with reverse press

Tapping

Tapping to run a score is one of the oldest and still most effective ways to run a very complex shaped score. After completing the score, turn the glass over and tap on the back of the score. Start at one edge of the glass and, as the score begins to crack, move your hands along the score to run it entirely across to the other edge of the glass. You don't need to tap hard but instead want to set up a steady rhythmic tapping like a miniature jack hammer. It's the vibration from the tapping that runs the score.



Tapping a score



The score separated from tapping

Breaking the Glass

Table Edge Break

This is the most efficient and most reliable way to get a clean straight line break with a clean square edge. Score the glass, position it on the edge of your table with the score just slightly (about 1/4 inch) off the edge of the table, lift it 3 or 4 inches up and quickly press it down against the table. Don't come down slowly. Do it quickly to create a cushion of air beneath the glass to produce a perfectly even pressure entirely along the score.

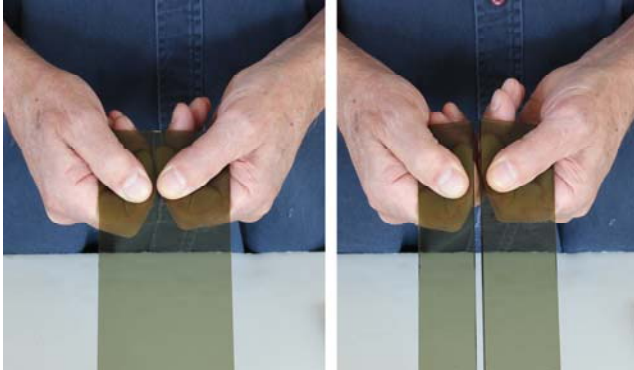


Break a score on a table edge

Two Hand Break

This is usually the most popular choice for glass artisans. After scoring the glass, hold it with your thumbs on either side of the score right up against the score and quickly turn both hands down to break along the score. It always works better if you break a score from one edge of the glass than holding it in the middle or part way along the score. Breaking quickly will increase the likelihood the break will follow your score. Breaking slowly will encourage it to veer off the score.

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Breaking a score with two hands

Breaking with Breaking Pliers

It's not possible to get an adequately firm grip on a thin strip of glass to break with two hands. That's what Breaking Pliers are for. Hold the thin strip with breaking pliers in one hand and the rest of the glass with your other hand and break the same as you do for the two hand break – remembering to break from one edge and not the middle.



Breaking with Breaking Pliers



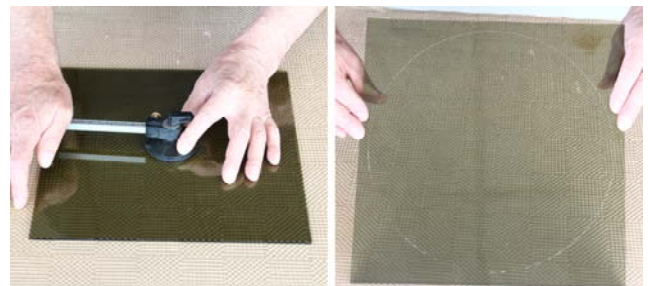
Breaking off a thin strip with breaking pliers

Breaking with Running Pliers

Although these are primarily intended for thick glass, many glass artisans like using them for 3mm glass. These are designed to provide a mechanical assist to the traditional two hand break.

Cutting Circles

You can score a circle by hand if you prefer but using a circle cutter makes it a lot easier to get a smooth evenly scored circle. It makes little difference what kind. The difference is only in the consistency of your score.



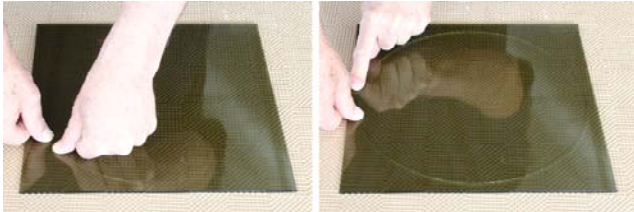
Scoring the circle

Completed score

The most effective way to break out a scored circle is the same as the Reverse Press. After scoring the circle, turn the glass over and press

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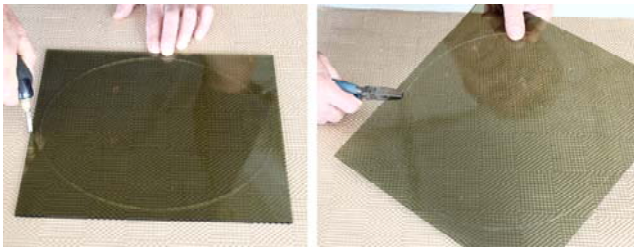
firmly on the back of the score and run the score entirely around the circle.



Running the score

Completing the run

To break out the circle, turn the glass back over to the originally scored side and score a break off score from the edge of the circle score to the edge of the glass. Score it on a gentle angle away from the circle without touching the circle score. This is ESSENTIAL. If the break off score touches the circle score or if it isn't on a gentle angle away, there's a good chance the break will run across the circle.



Scoring the cut off

Breaking out

Pick up the glass and, either with your hand, or with breaking pliers, break off the glass from the circle. If you produced a smooth even pressure score, and adequately ran the score, it should drop out quickly and easily.



Finished circle

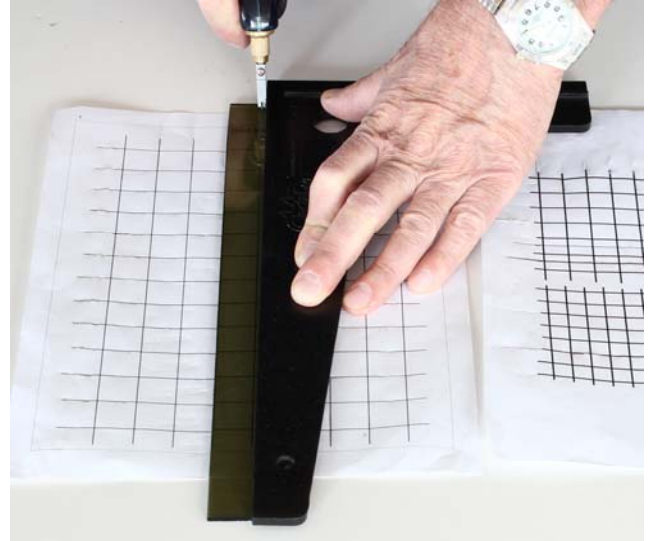
Scoring with a small lens cutter is done the same way but small circles can't be run on the reverse side so must be broken away with one or more cut away arcs.



Scored circle

Breaking away

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Cutting strips with a pattern

Production Cutting

If you need to cut a number of strips or squares, using a pattern as a guide can be quicker and as accurate as using a strip cutter. In the photo below the square is set slightly off the pattern line to allow for the space between the edge of the cutter head and the cutter wheel. If you're cutting a number of small squares, you can complete all the scores in both directions before breaking off the pieces. There's no reason you can't run a score over another score.

Machine Cutting

For cutting out the most extraordinarily intricate shapes or for high volume duplication, nothing beats a waterjet. The major cost for waterjet cutting is preparing the computer drawings. If you can prepare computer ready drawings, this is an inexpensive way to produce quality copies.

