

# Calibration and Adjustment

The Festool Kapex miter saw comes fully calibrated from the factory and should not require further calibration out of the box or after normal use. The following calibration techniques should only be necessary in the event that your

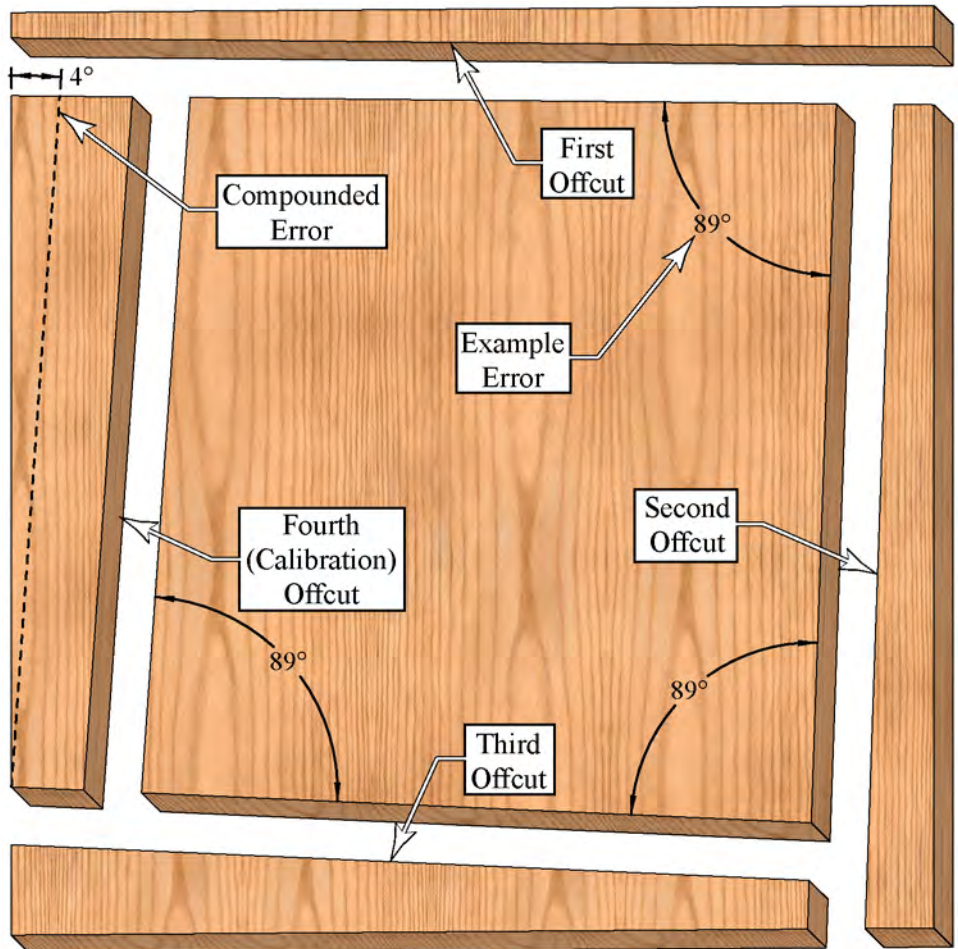
saw is knocked out of alignment, such as can happen during frequent, or unsecured transport. Use these procedures only when your saw needs service.

## Calibrating the Miter Angle

The calibration method described here is based on compounding an error by a factor of four. This makes it easier to detect extremely small calibration errors. However, care should be taken in over-using this calibration procedure because it has such a fine accuracy that it could be easy to get carried away and try to over-calibrate the saw. The factory calibration threshold is  $\pm 0.16^\circ$ , but this calibration procedure is capable of measuring errors as low as  $\pm 0.001^\circ$ , which is nearly impossible to obtain in actual practice.

The basis for this procedure is to make four successive cuts, where each new cut references from the previous cut. As a result, any angular error in the miter angle will propagate and be compounded with each cut. The final cutting error will have 4-times the actual error of the saw. In the diagram to the right, you can see that each successive offcut has a slightly larger angle than the previous offcut.

You may have heard of this method referred to as the "5-cut Calibration Method", but as long as you start out with a straight edge on the board, only 4-cuts are required. Furthermore, any additional cuts made after the fourth cut will not increase the accuracy, and it will remain at 4-times the original error.



## Getting Started

You will need a piece of scrap wood that is between 6 and 12 inches on a side. The scrap does not need to be perfectly square, but at least the first edge must be straight. The larger the piece, the more accurate your final measurement will be.

The material can be anything, but Medium Density Fiberboard (MDF) will give you the cleanest cuts, and therefore, the easiest to measure.

- ▶ High density plywood, such as Baltic birch, will also give very accurate results.
- ▶ Low-grade plywood may have rough edges, depending on the quality, and therefore, may provide the lowest accuracy.
- ▶ Solid wood can also be used, but you may experience burning on the rip-cuts if you are using a fine-tooth blade.

You will need a ruler to measure the length of the final offcut, and optionally, a dial caliper to accurately measure the difference in the width of the offcut at both ends. This width measurement is the most critical, so a dial caliper is recommended.



It does not matter whether your measurements are in metric units or imperial units.



## Measuring the Error

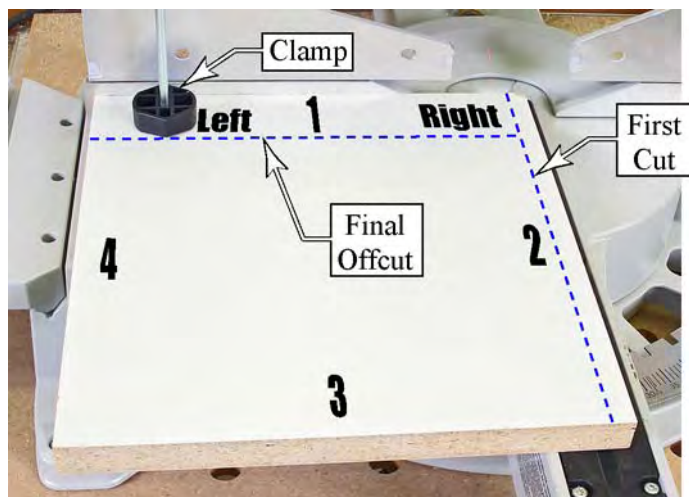
Before adjusting the saw, you first need to measure whether it is accurately calibrated to begin with. If you attempt to exceed the factory calibration threshold, you may end up actually making the saw less accurate.

- Number the sides of the scrap piece of wood from 1 to 4, starting with the best edge.
  - If you cut the wood on the left side of the blade (as shown in this example), then number the sides in a clockwise direction (as shown below).
  - If you cut the wood on the right side of the blade, then number the sides in a counterclockwise direction.
- On the #1 side, which will eventually become the final calibration offcut, label it "Left" and "Right" as shown. Do this regardless whether the cut is made on the left or right side of the sawblade.
- Place the scrap on the saw with the number "1" against the fence.



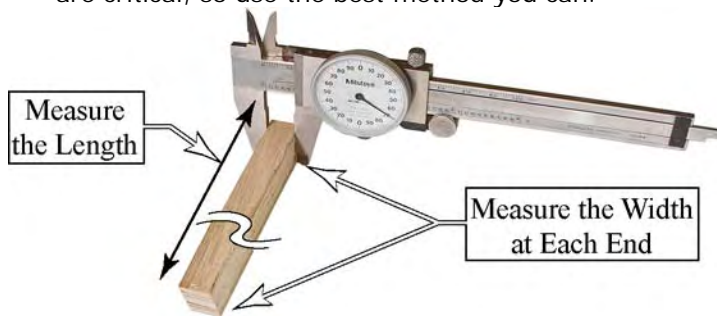
**WARNING!** This procedure involves cutting small workpieces. To reduce the risk of injury, always clamp the workpiece to the saw.

- Cut approximately 1/4-inch off the board, so that there is at least a 1/8-inch offcut. This offcut ensures that the sawblade will be stable because there is wood on both sides of the blade during the entire cut.



- Rotate the board with side #2 against the fence and repeat the same cut. Note that the side previously cut is now against the fence for each of the four cuts described below.
- Rotate the board to side #3 against the fence and repeat the same cut.
- Rotate the board to side #4 against the fence, but this time, make the cut a little wider, so that the offcut is large enough to handle without breaking it (approximately 1/4 to 1/2 inch wide).
- Discard the first three offcuts, but the fourth offcut is the calibration offcut.
- Measure the length of the fourth offcut. The accuracy of this measurement is not critical, so a standard tape measure or ruler will suffice.

- Measure the width of the fourth offcut at both ends (as labeled "Right" and "Left"). These two measurements are critical, so use the best method you can.



## Calculating the Error

The equation for calculating the error is shown below, however, the electronic version of this manual also contains a built-in calculator. To use the calculator, enter your measurements (in either mm or inches) in the boxes and click on the "Calc Error" button. The calculated error (angle) is displayed to the right of the button.

$$Error = \frac{1}{4} \times \text{Arc sin} \left[ \frac{\text{WidthLeft} - \text{WidthRight}}{\text{Length}} \right]$$

Built-in Electronic Calculator			
Width Left		Width Right	
Length			

If the answer is a negative number (Right side wider than Left side), then your saw is cutting too much to the left of center. If the answer is a positive number, your saw is cutting too much to the right of center.

## Adjusting the Saw

- With the miter handle out of the way, loosen only the middle screw on the miter gauge, and then move the miter handle back to zero.
- Engage the miter lock** by pressing down on the lock handle (see page 12). This locks the miter gauge to the miter handle, and prevents the gauge from moving until you are ready to move it.
- Loosen the remaining two screws on the miter gauge, and gently tap sideways on the miter handle to move the gauge as needed.
- Retighten all three screws.
- Repeat the calibration procedure to verify the results.

