

# Training Guide: Hot Wire Foam Cutter

## INTRODUCTION:

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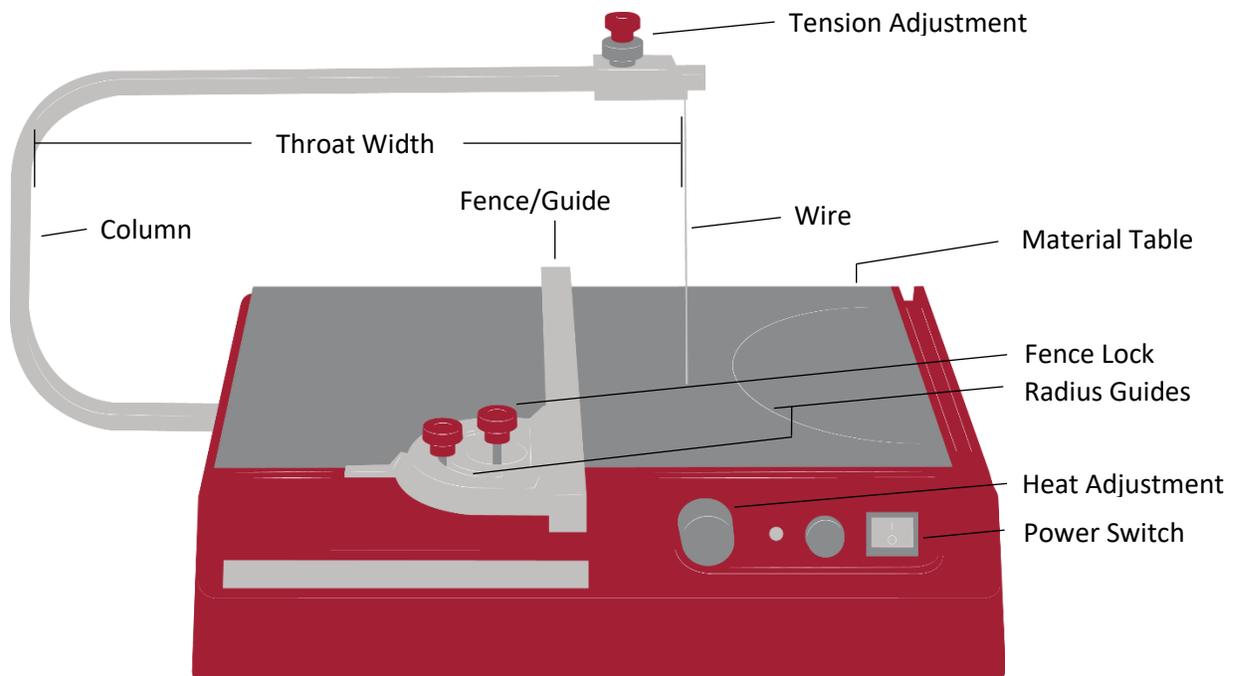
A hot wire foam cutter used for cutting and contouring foam. Foam mockups made by hot wire are often used in the preliminary stages of the design process, as this method is a quick and inexpensive way to see how parts will look or fit together.

A hot wire foam cutter can be safely used by most people. The wire is very hot, and should not be contacted by hand or any material that could burn or melt. The tool is quick to learn and good quality cuts can be achieved by a user after a quick introduction.

## STUDENTS WILL BE ABLE TO:

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- Make external cuts in foam at an appropriate speed
- Cut internal features at an appropriate speed after removing wire re-installing through a hole in the part
- Place wire and set the tension appropriately



## HOW IT WORKS AND HOW TO USE:

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A hot wire foam cutter consists of a table and an arm structure which holds a wire in tension. The wire heats up when electricity is run through it, allow it to cut through foam by melting its way through. The wire temperature is typically controlled by a knob on the machine that regulates the electric current going through the wire. It is best to use hot wire foam cutters in a well-ventilated environment.

### External cuts:

1. Draw desired cut on foam or apply pre-designed templates (can be cardstock, etc.)
2. Check that the wire is in a light tension (straight, but not as tight as a guitar string).
3. Turn on power to the hot wire.
4. On a sample or scrap piece, test the cutting speed and performance. Adjust the power setting to achieve a reasonable cutting speed and reduce smoke.
5. Feed material through wire slowly and gently, letting the wire do the work.
6. Turn off power and remove any shreds of foam that may be sticking to the wire.
7. Clean up any scrap material.

### Internal cuts:

1. Draw desired cut on foam or apply pre-designed templates (can be cardstock, etc.)
2. Make a hole through the foam somewhere inside the cut area.
3. Remove the wire from the mounting arm, thread it through the hole, and re-install it in the mounting arm. Adjust the wire so it's under light tension.
4. Turn on power to the hot wire.
5. On a sample or scrap piece, test the cutting speed and performance. Adjust the power setting to low and be ready to increase it as needed during cutting.
6. Feed material through wire slowly and gently, letting the wire do the work.
7. Turn off power and wait for wire to cool before handling.
8. Remove the wire from the mounting arm, remove it from the piece, and re-install it in the mounting arm. Adjust the wire so it's under light tension.
9. Clean up any scrap material.

## GUIDELINES FOR SAFELY OPERATING THE HOT WIRE:

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- Check wire before each use: it should be taut but without too much tension so that it's at risk of snapping
- Avoid touching wire while machine is on
- Use in a well ventilated area and avoid breathing foam fumes

## PRACTICE APPLICATIONS FOR STUDENTS:

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- Make external cuts in foam in a variety of shapes
- Remove wire and restring through hole in model to cut internal feature
- Set wire tension and electric power for effective cutting without excessive smoke