Oxy-Fuel Setup and Troubleshooting

The torch is held in position by the use of a machine torch holder that is attached to the Y axis gantry cassette. The solenoid switch is attached to the Oxygen air line, and is then wired to a 110 volt type of plug, that can be inserted into the Output #1 on the Machine Interface relay box. This will allow the cutting oxygen to be turned on only at the precise time when enough pre-heating has occurred.

I have included all the other information posted on our website to help you with cutting speeds, cutting errors, and setting up the dwell or delay timing for you oxy-fuel program.

The following table shows approximate tip sizes, cutting speeds, gas pressures, and kerf widths for cuts in different thickness of steel, using two-hose torches. It should be used as a rough guide only, as many variables affect the outcome.

METAL THICKNESS	TIP SIZE	SPEED I.P.M.	OXYGEN PRESSURE	ACETYLENE PRESSURE	KERF WIDTH
1/8"	000	28-32	20-25	3-5	.04"
1/4"	00	22-28	20-25	3-5	.05"
3/8"	0	16-24	25-30	3-5	.06"
1/2"	0	12-18	30-35	5-7	.06"
3/4"	1	10-16	30-35	5-7	.07"
1"	2	9-16	35-40	5-7	.09"
1 1/2"	2	8-12	40-45	5-8	.09"
2"	3	6-9	40-45	6-9	.11"
3"	4	5-7	45-50	6-10	.12"

COMMON ERRORS
OXY-FUEL CUTTING

CUTTING ERROR	CUT CONDITION
Cutting speed too low	Extensive gouging of cut face, and slag adhesion to lower edge
Cutting speed too high	Excessive angle or rake of drag lines (vertical or near vertical lines appearing on the face of the cut in all thermal cutting), concave cut face, slag adhesion
Torch tip too far from work	Top edge appears melted (pre-heat flames should barely contact plate surface)
Torch tip too close to work	Cut face is grooved, and has exaggerated drag lines
Insufficient oxygen pressure	Cutting flame will not penetrate work
Insufficient pre-heat	Horizontal ridge appears midway down face of cut. Difference in appearance of upper half of cut
Excessive pre-heat	Small beads appear on top edge. Top edge slightly rounded

Setting dwell in oxy-fuel cutting is a bit more complicated than in plasma cutting, but is easily accomplished. It is necessary for there to be two dwells -- one for pre-heat, and another for the torch to fully penetrate the material before starting to move. The illustrations below show how to configure your set-up file for this.

Output Lines Setup

Output Lines

Line	Description	Line	Description
1	Plasma	5	
2		6	
3		7	
4		8	

OK

Cancel

M Codes

M Code	Description	Output Line Action 1	2	3	4	5	6	7	8	Before/After Move	Del (se
50	Plasma On	On	-	-	-	-	-	-	-	After	3.00
51	Plasma Off	Off	-	-	-	-	-	-	-	After	2.00
		-	-	-	-	-	-	-	-	Before	0.00
		-	-	-	-	-	-	-	-	Before	0.00
		-	-	-	-	-	-	-	-	Before	0.00
		-	-	-	-	-	-	-	-	Before	0.00
		-	-	-	-	-	-	-	-	Before	0.00
		-	-	-	-	-	-	-	-	Before	0.00

In the Torchmate driver software, select **SET UP/OUTPUT LINES**. The window above will open. In the beginning with M Codes 50 and 51, change the last two columns so they appear as shown above. In this illustration, an incremental dwell time of 2 seconds has been set for pre-heat before the cutting oxygen comes on. We will be placing several back-to-back M51 commands at the beginning of each shape to be cut. Together they will add up to the total dwell time for pre-heating. If we set the dwell for pre-heat here at a full 8 or 10 seconds, the torch would dwell for that same period after completing the cut, blemishing the material.

A dwell of 3 seconds has been set for the torch to penetrate the material before starting to move. Now click on **OK** and exit the window.
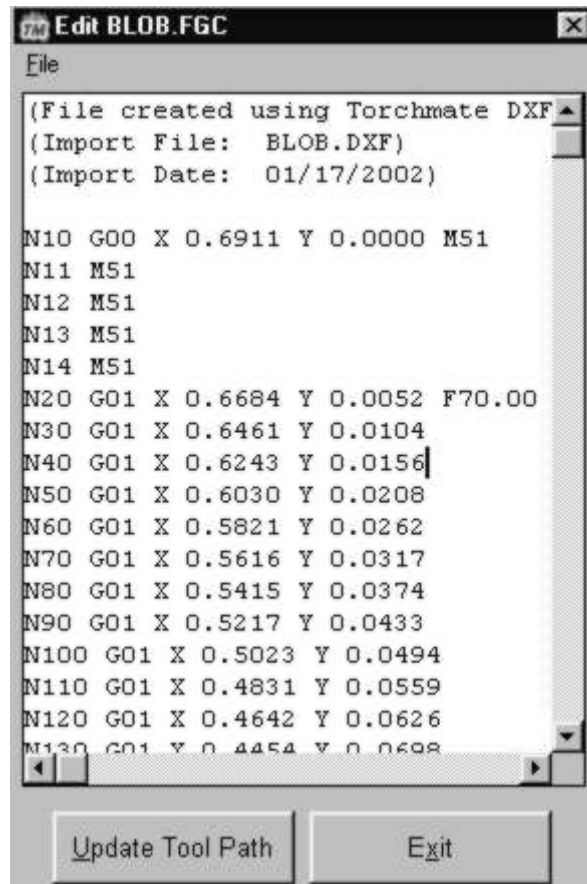
Next, with your G-code file loaded, select **FILE/EDITOR**. The G-code will appear in a window, as shown at right.

At the beginning of each shape to be cut is a G00 (rapid traverse with torch off) line. At the end of each such line of code, add a space, and then "M51". This will provide two seconds of pre-heat dwell.

Insert additional lines of code repeating the M51 command to get the total pre-heat time desired. Here, a total of 10 seconds (5 times 2 seconds) has been set. Then click on exit, and respond yes when asked if you want to change the G-code file.

Your machine will now dwell 10 seconds for pre-heat, and again for 3 seconds after the cutting oxygen comes on before the torch starts to move.

Place this same sequence of lines at the beginning of each shape to be cut. You can either do it in the Torchmate G-code editor, or in a standard text editor with a "find" feature that will locate each occurrence of G00 in your file. Number the inserted lines of code sequentially, as shown here.

```
Edit BLOB.FGC                                    ×
File

(File created using Torchmate DXF ▲
(Import File:   BLOB.DXF)
(Import Date:   01/17/2002)

N10 G00 X 0.6911 Y 0.0000 M51
N11 M51
N12 M51
N13 M51
N14 M51
N20 G01 X 0.6684 Y 0.0052 F70.00
N30 G01 X 0.6461 Y 0.0104
N40 G01 X 0.6243 Y 0.0156
N50 G01 X 0.6030 Y 0.0208
N60 G01 X 0.5821 Y 0.0262
N70 G01 X 0.5616 Y 0.0317
N80 G01 X 0.5415 Y 0.0374
N90 G01 X 0.5217 Y 0.0433
N100 G01 X 0.5023 Y 0.0494
N110 G01 X 0.4831 Y 0.0559
N120 G01 X 0.4642 Y 0.0626
N130 G01 X 0.4454 Y 0.0698

    Update Tool Path            Exit
```