

CNC CONTROL of the PLASMA CUTTING PROCESS

The Value of Plasma CUT CHARTS

- For decades CNC controls used for plasma cutting were concerned only with the cutting path.
- In the past, process control was the responsibility of the machine operator.
- The demands of industry require that today's CNC controls assume responsibility for BOTH path and process.
- Controlling path alone is no longer enough.

- Many CNC Controls today offer CUT CHARTS to control plasma process variables.
- Some controls offer CUT CHARTS only for plasma systems that accept a serial command.
- Some CNC control manufacturers charge extra for CUT CHARTS

- **All** Hypertherm CNC Controls include CUT CHARTS that control the plasma process to the fullest extent possible for **all** Hypertherm® plasma systems – and even some competitive models.
- If the plasma system cannot accept a serial command to change a process variable, the CUT CHART prompts the machine operator for the correct value.

NO EXTRA CHARGE

- The Hypertherm CNC control assumes responsibility for the plasma process to fullest extent possible for the configured plasma system.
- The following slides are screen captures of the Hypertherm Phoenix motion control software configured with CUT CHART support for operation with a Hypertherm HPR260 plasma system.

The screenshot displays the Phoenix Main Screen interface. On the left, a large preview window shows a circular cut chart with a yellow path and green nodes, labeled "BoltHoleFlan" and "Preview Window". A red box highlights the text: "Machine operator touches CUT CHART button to set the plasma process parameters." A red arrow points from this box to the "Plasma 1 Cut Chart" button in the bottom toolbar. The right side of the screen features a "Current Speed - ipm" gauge with a scale from 0 to 1200, a "Help" button, a directional keypad, and buttons for "Cut Mode" (set to "Trial"), "Kerf" (0.066 in), and "Trial Speed" (1200 ipm). Other buttons include "MultiTasking", "CutPro Wizard", "Remote Help", "Shape Manager", "Files", "Current Part Options", "Setups", "View Sheet", "Change Cut Mode", "Change Consumable", and "Zero Positions".

Plasma configured in CNC

Plasma 1 Cut Chart - Rev E

Plasma Shield

Help

HPR - Process Selection

Torch Type

Material Type

Specific Material

Process Current

Plasma / Shield Gases

Material Thickness

Preflow Settings

Mixed Gas %

Cut Speed ipm

Kerf in

Pierce Time sec

Cut Height Delay sec

Creep Time sec

Cut Height in

Transfer Height % in

Pierce Height % in

Set Arc Voltage volts

Set Arc Current amps

Cancel

OK

7:11:33 PM

Save Process Reset Process Save Cut Charts Load Cut Charts Change Consumables

Drop down menus used by machine operator to set up a cutting process.

Plasma 1 Cut Chart - Rev E

Plasma Shield
Auto Manual Auto Manual

Help

HPR - Process Selection

Torch Type:

Material Type:

Specific Material:

Process Current:

Plasma / Shield Gases:

Material Thickness:

Preflow Setting:

Cutflow Setting:

Mixed Gas: %

Cut Speed: ipm

Kerf: in

Pierce Time: sec

Cut Height Delay: sec

Creep Time: sec

Cut Height: in

Transfer Height: % in

Pierce Height: % in

Set Arc Voltage: volts

Set Arc Current: amps

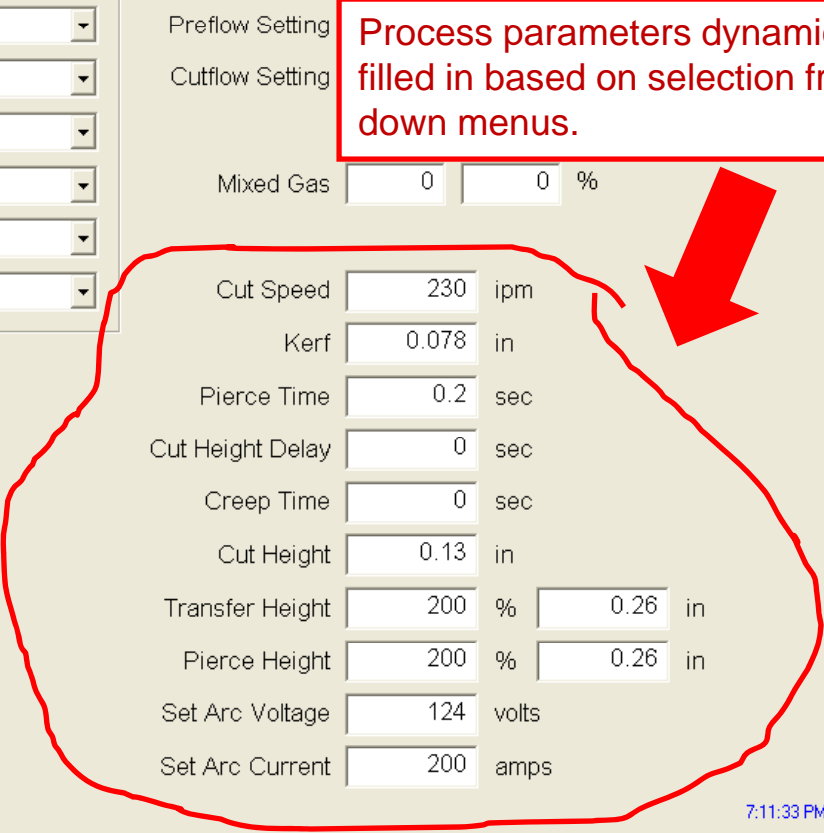
Cancel

OK

7:11:33 PM

Save Process Reset Process Save Cut Charts Load Cut Charts Change Consumables

Process parameters dynamically filled in based on selection from drop down menus.



Plasma 1 Cut Chart - Rev E

Help

HPR - Process Selection

Torch Type	HPR
Material Type	Mild Steel
Specific Material	Mild Steel Stainless Steel Aluminum
Process Current	200
Plasma / Shield Gases	O2 / Air
Material Thickness	0.188"

	Plasma		Shield	
	Auto	Manual	Auto	Manual
Preflow Setting	23	24	42	65
Mixed Gas	0	0		
Cut Speed	230			
Kerf	0.078			
Pierce Time	0.2			
Cut Height Delay	0			
Creep Time	0			
Cut Height	0.13			
Transfer Height	200	%	0.26	in
Pierce Height	200	%	0.26	in
Set Arc Voltage	124	volts		
Set Arc Current	200	amps		

Operator selects material type

Cancel

OK

7:16:00 PM

Save Process Reset Process Save Cut Charts Load Cut Charts Change Consumables

Plasma 1 Cut Chart - Rev E

Help

HPR - Process Selection

Torch Type:

Material Type:

Specific Material:

Process Current:

Plasma / Shield Gases:

Material Thickness:

	Plasma		Shield	
	Auto	Manual	Auto	Manual
Preflow Setting	<input type="text" value="23"/>	<input type="text" value="24"/>	<input type="text" value="42"/>	<input type="text" value="65"/>
Cutflow Setting	<input type="text" value="74"/>	<input type="text" value="69"/>	<input type="text" value="18"/>	<input type="text" value="28"/>

Gas 1: Gas 2: Mixed Gas: %

Cut Speed: ipm

Kerf: in

Pierce Time: sec

Cut Height Delay: sec

Creep Time: sec

Cut Height: in

Transfer Height: % in

Pierce Height: % in

Set Arc Voltage: volts

Set Arc Current: amps

Operator selects current

Cancel


OK

7:18:11 PM

Double-Click here to Add or Remove a Process Current

Save Process Reset Process Save Cut Charts Load Cut Charts Change Consumables

Plasma 1 Cut Chart - Rev E

 [Help](#)

HPR - Process Selection

Torch Type	HPR
Material Type	Mild Steel
Specific Material	None
Process Current	200A
Plasma / Shield Gases	O2 / Air
Material Thickness	0.188

	Plasma		Shield	
	Auto	Manual	Auto	Manual
Preflow Setting	23	24	42	65 %
Cutflow Setting	74	69	18	28 %

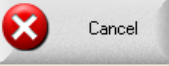
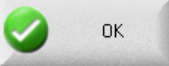
	Gas 1	Gas 2
Mixed Gas	0	0 %

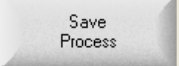
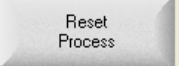
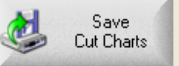

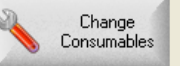
Operator selects gases

Kerf	0.078	in
Pierce Time	0.2	sec
Cut Height Delay	0	sec
Creep Time	0	sec
Cut Height	0.13	in
Transfer Height	200 %	0.26 in
Pierce Height	200 %	0.26 in
Set Arc Voltage	124	volts
Set Arc Current	200	amps

[Double-Click here to Add or Remove a Plasma / Shield Gases](#)

7:20:01 PM

Plasma 1 Cut Chart - Rev E

Help

HPR - Process Selection

Torch Type: HPR

Material Type: Mild Steel

Specific Material: None

Process Current: 200A

Plasma / Shield Gases: O2 / Air

Material Thickness: 0.188"

	Plasma		Shield	
	Auto	Manual	Auto	Manual
Preflow Setting	23	24	42	65 %
Cutflow Setting	74	69	18	28 %

Gas 1 Gas 2

Mixed Gas: 0 0 %

Cut Speed: 230 ipm

Kerf: 0.078 in

Cut Height Delay: 0 sec

Creep Time: 0 sec

Cut Height: 0.13 in

Transfer Height: 200 % 0.26 in

Pierce Height: 200 % 0.26 in

Set Arc Voltage: 124 volts

Set Arc Current: 200 amps

Cancel

OK

7:22:42 PM

Save Process Reset Process Save Cut Charts Load Cut Charts Change Consumables

Operator selects thickness

Double-Click here to Add or Remove a Material Thickness

Plasma 1 Cut Chart - Rev E

Help

HPR - Process Selection

Torch Type	HPR
Material Type	Mild Steel
Specific Material	None
Process Current	None WEAR PLATE
Plasma / Shield Gases	O2 / Air
Material Thickness	0.25"

	Plasma		Shield	
	Auto	Manual	Auto	Manual
Preflow Setting	22	25	49	75 %
Cutflow Setting	76	70	46	70 %

Gas 1 Gas 2

Operator can create CUT CHARTS for custom material types

Cut Speed	245	ipm
Kerf	0.1	in
Pierce Time	0.3	sec
Cut Height Delay	0	sec
Creep Time	0	sec
Cut Height	0.11	in
Transfer Height	300 %	0.33 in
Pierce Height	300 %	0.33 in
Set Arc Voltage	150	volts
Set Arc Current	260	amps

Double-Click here to Add or Remove a Specific Material

7:25:26 PM

Cancel OK

Save Process Reset Process Save Cut Charts Load Cut Charts Change Consumables

Plasma 1 Cut Chart - Rev E

Plasma Shield
Auto Manual Auto Manual

Pre Values in blue indicate user values

Cut Chart 1 2 3 4 5 6 7 8 9 10

Gas 1 Gas 2

Mixed Gas 0 %

Cut Speed 120 ipm

Kerf 0.089 in

Pierce Time 0.6 sec

Cut Height Delay 0 sec

Creep Time 0 sec

Cut Height 0.13 in

Transfer Height 200 % 0.26 in

Pierce Height 219.23 % 0.285 in

Set Arc Voltage 132 volts

Set Arc Current 200 amps

7:31:13 PM

Cancel

OK

Save Process Reset Process Save Cut Charts Load Cut Charts Change Consumables

HPR - Process Selection

Torch Type HPR

Material Type Mild Steel

Specific Material None

Process Current 200A

Plasma / Shield Gases O2 / Air

Material Thickness 0.5"

Changes made to CUT CHARTs are SAVED by pressing SAVE PROCESS button

Plasma 1 Cut Chart - Rev E

HPR - Process Selection

Torch Type: HPR
Material Type: Mild Steel
Specific Material: None
Process Current: 200A
Plasma / Shield Gases: O2 / Air
Material Thickness: 0.5"

	Plasma		Shield	
	Auto	Manual	Auto	Manual
Pre				
Cut Chart				
Gas 1				
Gas 2				
Mixed Gas			0	%
Cut Speed	115	ipm		
Kerf	0.089	in		
Pierce Time	0.5	sec		
Cut Height Delay	0	sec		
Creep Time	0	sec		
Cut Height	0.13	in		
Transfer Height	200	%	0.26	in
Pierce Height	200	%	0.26	in
Set Arc Voltage	128	volts		
Set Arc Current	200	amps		

7:34:38 PM

Save Process **Reset Process** Save Cut Charts Load Cut Charts Change Consumables

Cancel OK

Help

Values return to factory setting

Press RESET PROCESS button to return that process screen to factory settings.

Plasma 1 Cut Chart - Rev E

HPR - Process Selection

Torch Type

Material Type

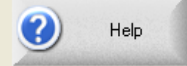
Specific Material

Process Current

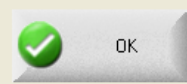
Plasma / Shield Gases

Material Thickness

	Plasma		Shield		
	Auto	Manual	Auto	Manual	
Preflow Setting	<input type="text" value="23"/>	<input type="text" value="24"/>	<input type="text" value="42"/>	<input type="text" value="65"/>	%
Cutflow Setting	<input type="text" value="74"/>	<input type="text" value="69"/>	<input type="text" value="18"/>	<input type="text" value="28"/>	%
Mixed Gas	Gas 1	Gas 2			%
	<input type="text" value="0"/>	<input type="text" value="0"/>			
Cut Speed	<input type="text" value="115"/>				ipm
Kerf	<input type="text" value="0.089"/>				in
Pierce Time	<input type="text" value="0.5"/>				sec
Cut Height Delay	<input type="text" value="0"/>				sec
Creep Time	<input type="text" value="0"/>				sec
Cut Height	<input type="text" value="0.13"/>				in
Transfer Height	<input type="text" value="200"/>	%	<input type="text" value="0.26"/>	in	
Pierce Height	<input type="text" value="200"/>	%	<input type="text" value="0.26"/>	in	
Set Arc Voltage	<input type="text" value="128"/>				volts
Set Arc Current	<input type="text" value="200"/>				amps



Press SAVE CUT CHARTS to save all charts to a memory stick for storage outside of the control.



7:34:38 PM

Save Process Reset Process Save Cut Charts Load Cut Charts Change Consumables

Plasma 1 Cut Chart - Rev E

HPR - Process Selection

Torch Type:

Material Type:

Specific Material:

Process Current:

Plasma / Shield Gases:

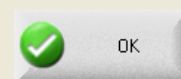
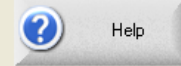
Material Thickness:

	Plasma		Shield		
	Auto	Manual	Auto	Manual	
Preflow Setting	<input type="text" value="23"/>	<input type="text" value="24"/>	<input type="text" value="42"/>	<input type="text" value="65"/>	%
Cutflow Setting	<input type="text" value="74"/>	<input type="text" value="69"/>	<input type="text" value="18"/>	<input type="text" value="28"/>	%
Mixed Gas	Gas 1		Gas 2		%
	<input type="text" value="0"/>	<input type="text" value="0"/>			
Cut Speed	<input type="text" value="115"/>				ipm
Kerf	<input type="text" value="0.089"/>				in
Pierce Time	<input type="text" value="0.5"/>				sec
Cut Height Delay	<input type="text" value="0"/>				sec
Creep Time	<input type="text" value="0"/>				sec
Cut Height	<input type="text" value="0.13"/>				in
Transfer Height	<input type="text" value="200"/>	%	<input type="text" value="0.26"/>		in
Pierce Height	<input type="text" value="200"/>	%	<input type="text" value="0.26"/>		in
Set Arc Voltage	<input type="text" value="128"/>				volts
Set Arc Current	<input type="text" value="200"/>				amps

Press **LOAD CUT CHARTS** to load cut charts from a memory stick. Updated charts are available from time to time at www.hypertherm.com



Save Process Reset Process Save Cut Charts **Load Cut Charts** Change Consumables



7:34:38 PM

Plasma 1 Cut Chart - Rev E ? Help

HPR - Process Selection

Torch Type:

Material Type:

Specific Material:

Process Current:

Plasma / Shield Gases:

Material Thickness:

Plasma: Auto Manual Shield: Auto Manual

Preflow Setting

Cutflow Setting

Mixed Gas

Cut Speed: ipm

Kerf: in

Pierce Time: sec

Cut Height Delay: sec

Creep Time: sec

Cut Height: in

Transfer Height: % in

Pierce Height: % in

Set Arc Voltage:

Set Arc Current: amps

7:34:38 PM

Cancel OK

Save Process Reset Process Save Cut Charts Load Cut Charts **Change Consumables**

Press CHANGE CONSUMABLES button to view correct consumables based on drop down selections.

Oxy Fuel - Max Torch Tip Life

Oxy Fuel Torch 1

4.17 minutes

10 pierces

40.353 inches

0 minutes / pierce

Last Torch Tip Installed

15 Oct 2008 7:39 PM

Plasma - Max Nozzle Life

Plasma Torch 1

360 minutes

2500 pierces

0 arc errors (actual)

7760 inches

0.438 minutes / pierce

Last Nozzle Installed

15 Oct 2008 7:39 PM

Plasma - Max Electrode Life

Plasma Torch 1

360 minutes

2500 pierces

0 arc errors (actual)

7760 inches

0.438 minutes / pierce

0 volts / minute

Last Electrode Installed

Help

Correct consumable part numbers displayed for operator reference.

HPR Mild Steel 200A

220398

220356

220355

220354

220353

220352

Cancel

OK

New Torch Tip

New Nozzle

New Electrode

Manual Options

Reset Database

Upload Database

Save Database

Plasma - Max Nozzle Life

Plasma Torch 1

360 minutes

2500 pierces

0 arc errors (actual)

7760 inches

0.438 minutes / pierce

Last Nozzle Installed

15 Oct 2008 7:39 PM

Plasma - Max Electrode Life

Plasma Torch 1

360 minutes

2500 pierces

0 arc errors (actual)

7760 inches

0.438 minutes / pierce

10 volts / minute

Last Electrode Installed

15 Oct 2008 7:39 PM

Help

HPR Mild Steel 200A

220398

220356

220355

220354

220353

220352

Cancel

OK

New Nozzle

New Electrode

Manual Options

Reset Database

Upload Database

Save Database

Screen can also be used to track consumable life. Date stamp is entered each time New Nozzle or New Electrode buttons are pressed.

www.retroplasma.com

Thank you