



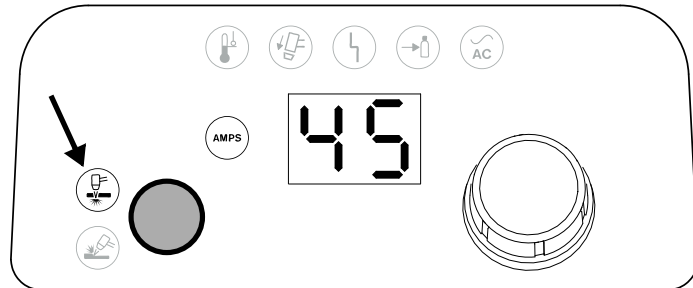
## 7 Cut with the Machine Torch

- If you are using **unshielded** consumables (for example, a deflector instead of a shield), be careful to maintain the correct torch height in order to avoid damaging the nozzle from slag or from accidental contact with the workpiece.

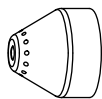
 Hypertherm does not recommend the use of any other consumables in the Duramax Lock machine torch except for those listed in this manual. The use of any other consumables could adversely affect system performance.

 For help installing the consumables onto the torch, see page 46. Do not use worn or damaged consumables. See *Inspect the consumables* on page 161.

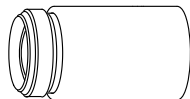
When you use the following shielded and FineCut consumables, select Cut mode on the front panel. See page 51.



### Mechanized shielded consumables



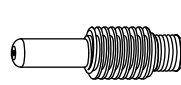
220817  
Shield



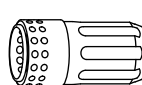
220854  
Retaining cap



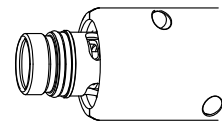
220941  
Nozzle



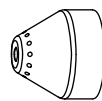
220842  
Electrode



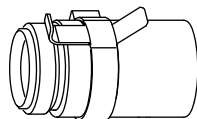
220857  
Swirl ring



### Mechanized shielded consumables with ohmic retaining cap



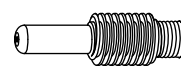
220817  
Shield



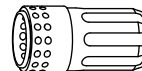
220953  
Ohmic retaining cap



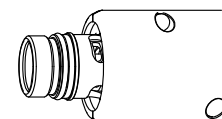
220941  
Nozzle



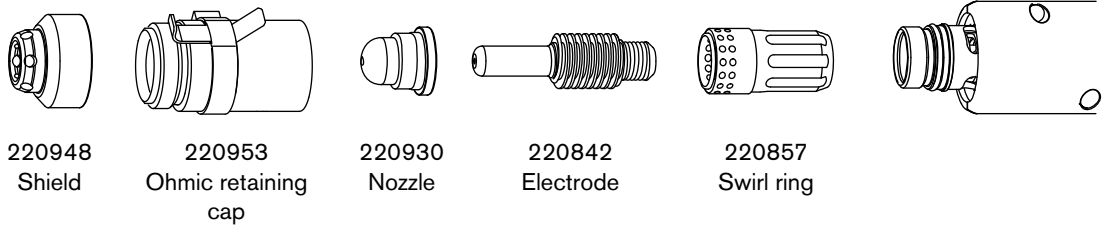
220842  
Electrode



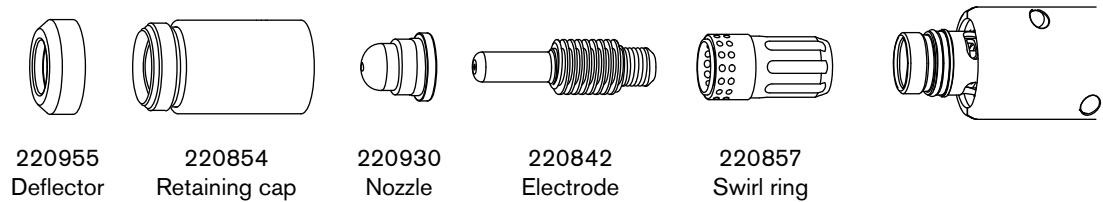
220857  
Swirl ring



## FineCut shielded consumables with ohmic retaining cap



## FineCut unshielded consumables



## Consumable life

Many factors influence how often you need to change the consumables on your machine torch:

- **Poor gas supply quality**
  - It is extremely important to maintain a clean, dry gas line. The presence of oil, water, vapors, and other contaminants in the gas supply can degrade cut quality and consumable life. See page 35 and page 39.
- **Cutting and gouging technique**
  - Whenever possible, start cuts from the edge of the workpiece. This helps to extend the life of the shield and the nozzle.
  - Maintain a proper pierce height. Refer to the cut charts starting on page 125.
  - Maintain a proper torch-to-work distance (standoff) when gouging. See page 82.
- **Shielded versus non-shielded consumables**
  - Non-shielded consumables use a deflector instead of a shield. Non-shielded consumables generally have a shorter life than shielded consumables.
- **Thickness of metal being cut**
  - In general, the thicker the metal being cut, the more quickly the consumables become worn. For best results, do not exceed the thickness specifications for this system. See page 22.



See page 161 for guidelines on when to replace worn consumables.

# 8

## Guidelines for Marking

You can use the Marking consumables on the Duramax Lock machine torch to perform marking, scoring, and dimpling applications on mild steel, stainless steel, and aluminum using air or argon.



For marking cut charts, refer to page 136 and page 137.

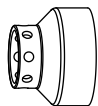


The Marking consumables can also be used on the Duramax Lock hand torches for hand marking applications.

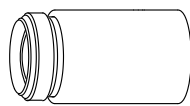
### Marking consumables (10 – 25 A)

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A maximum output current of 25 A is recommended for marking applications. Using the Marking consumables at higher amperages can shorten the life of the nozzle. It may also result in deeper marks than desired and poorer results overall.



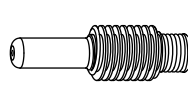
420542  
Shield



220854  
Retaining cap



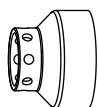
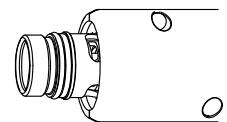
420415  
Nozzle



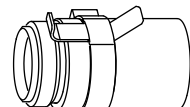
220842  
Electrode



220857  
Swirl ring



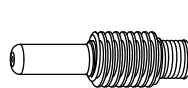
420542  
Shield



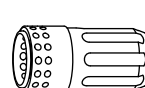
220953  
Ohmic retaining cap



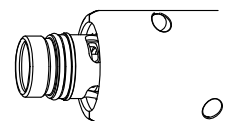
420415  
Nozzle



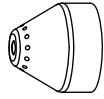
220842  
Electrode



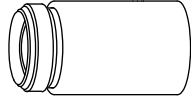
220857  
Swirl ring



Mild Steel – 45 A – Air – Shielded



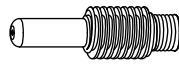
220817



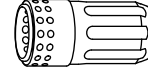
220854  
(220953 for  
ohmic sensing)



220941



220842



220857

Metric

Material Thickness	Torch-to-Work Distance	Initial Pierce Height		Pierce Delay Time	Best Quality Settings		Production Settings		Kerf Width
					Cut Speed	Voltage	Cut Speed	Voltage	
mm	mm	mm	%	seconds	mm/min	volts	mm/min	volts	mm
2	1.5	3.8	250	0.2	5560	128	7910	125	1.4
3					3960	128	5590	127	
4				0.4	2800	128	3960	128	1.5
6					1430	130	2110	127	
8					0.6	1020	133	1385	
10				780		136	920	134	
12				1	540	140	690	138	1.9
16	Edge Start				310	146	400	141	2.1
20				170	152	240	147	2.3	
25				110	157	145	154	3	

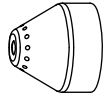
English

Material Thickness	Torch-to-Work Distance	Initial Pierce Height		Pierce Delay Time	Best Quality Settings		Production Settings		Kerf Width
					Cut Speed	Voltage	Cut Speed	Voltage	
inches	inches	inches	%	seconds	in/min	volts	in/min	volts	inches
16 GA	0.06	0.15	250	0.1	249	128	320	124	0.053
14 GA					225	128	320	125	0.054
10 GA				0.4	129	128	181	128	0.057
3/16					85	129	122	127	0.059
1/4					0.6	48	130	72	127
3/8				33		136	38	133	0.069
1/2				1	18	141	24	139	0.077
5/8	Edge Start				13	146	16	141	0.082
3/4				7	151	10	145	0.086	
7/8				6	154	7	151	0.103	
1				4	157	6	154	0.119	

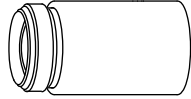
Gas flow rate – slpm / scfh

151 / 320	Hot (cutflow)
184 / 390	Cold (postflow)

### Stainless Steel – 45 A – Air – Shielded



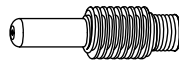
220817



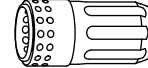
220854  
(220953 for  
ohmic sensing)



220941



220842



220857

#### Metric

Material Thickness	Torch-to-Work Distance	Initial Pierce Height		Pierce Delay Time	Best Quality Settings		Production Settings		Kerf Width
					Cut Speed	Voltage	Cut Speed	Voltage	
mm	mm	mm	%	seconds	mm/min	volts	mm/min	volts	mm
2	1.5	3.8	250	0.1	5620	126	7830	129	0.6
3				0.2	3285	129	4725	128	0.9
4				0.4	1995	130	2960	129	1.1
6				0.6	1145	131	1695	131	1.2
8					830	134	1100	134	1.4
10				0.8	605	137	870	137	1.6
12	4.6	300	1.2	380	141	540	139	1.8	
16	Edge Start			240	145	320	142	2.4	
20				160	149	205	146	3.1	

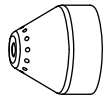
#### English

Material Thickness	Torch-to-Work Distance	Initial Pierce Height		Pierce Delay Time	Best Quality Settings		Production Settings		Kerf Width
					Cut Speed	Voltage	Cut Speed	Voltage	
inches	inches	inches	%	seconds	in/min	volts	in/min	volts	inches
16 GA	0.06	0.15	250	0.1	237	125	320	128	0.017
14 GA				0.2	230	126	320	129	0.022
10 GA				0.4	90	130	134	128	0.041
3/16				0.5	63	131	93	130	0.044
1/4					40	131	59	131	0.047
3/8				0.8	26	137	29	136	0.061
1/2	0.18	300	1.2	12	142	19	140	0.075	
5/8	Edge Start			10	145	13	142	0.096	
3/4				7	148	9	145	0.116	
7/8				5	151	6	149	0.137	

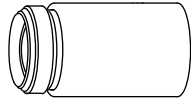
#### Gas flow rate – slpm / scfh

151 / 320	Hot (cutflow)
184 / 390	Cold (postflow)

### Aluminum - 45 A - Air - Shielded



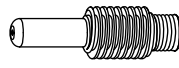
220817



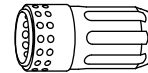
220854  
(220953 for  
ohmic sensing)



220941



220842



220857

#### Metric

Material Thickness	Torch-to-Work Distance	Initial Pierce Height		Pierce Delay Time	Best Quality Settings		Production Settings		Kerf Width			
					Cut Speed	Voltage	Cut Speed	Voltage				
mm	mm	mm	%	seconds	mm/min	volts	mm/min	volts	mm			
2	1.5	3.8	250	0.1	7890	121	9585	134	1.3			
3				0.2	4850	130	7120	129		1.5		
4				0.4	3670	133	5650	129				
6							0.5	2060	139	3095	132	1.6
8							0.6	1330	139	1830	136	1.7
10							0.7	860	142	1015	140	1.9
12					Edge Start			620	144	745	142	2
16					360	152	340	148	2.5			

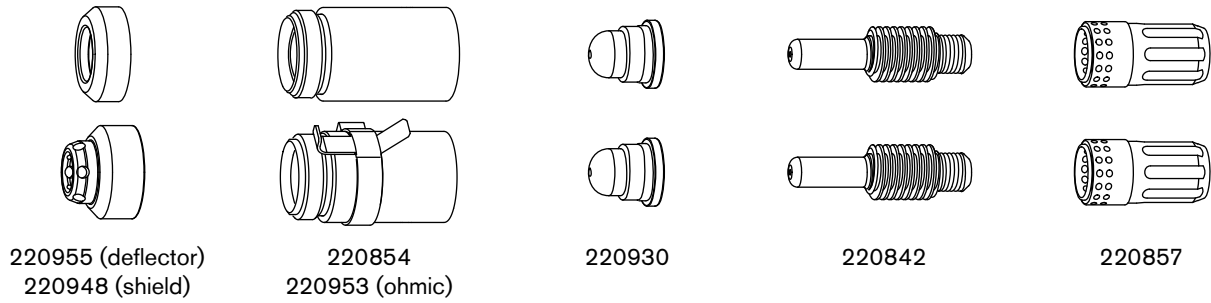
#### English

Material Thickness	Torch-to-Work Distance	Initial Pierce Height		Pierce Delay Time	Best Quality Settings		Production Settings		Kerf Width		
					Cut Speed	Voltage	Cut Speed	Voltage			
inches	inches	inches	%	seconds	in/min	volts	in/min	volts	inches		
1/10	0.06	0.15	250	0.2	240	126	320	131	0.056		
1/8				0.4	170	131	263	128	0.060		
3/16				0.4	120	134	184	130	0.061		
1/4				0.5	70	137	104	132	0.063		
3/8				0.7	36	141	42	139	0.073		
1/2				Edge Start			21	145	26	143	0.082
5/8							15	152	14	148	0.100
3/4				8	158	9	153	0.117			

#### Gas flow rate - slpm / scfh

151 / 320	Hot (cutflow)
184 / 390	Cold (postflow)

**Mild Steel – FineCut – Air – Shielded and Unshielded**



**Metric**

Material Thickness mm	Current A	Torch-to-Work Distance mm	Initial Pierce Height		Pierce Delay Time seconds	Recommended		Kerf Width mm	
			mm	%		Cut Speed mm/min	Voltage volts		
0.5	40	1.5	3.8	250	0.0	8250	78	0.7	
0.6						8250	78		
0.8						8250	78		
1	45				0.4	1.2	1.3	8250	78
1.5								6400	78
2								5250	82
3								2750	83
4								1900	84

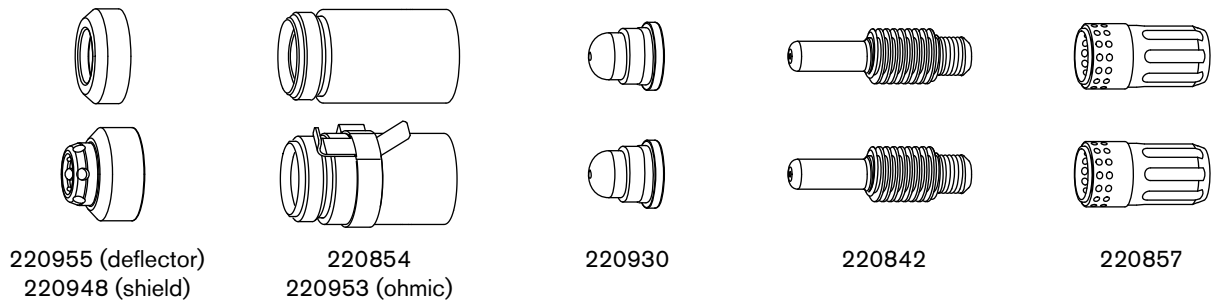
**English**

Material Thickness inches	Current A	Torch-to-Work Distance inches	Initial Pierce Height		Pierce Delay Time seconds	Best Quality Settings		Kerf Width inches			
			inches	%		Cut Speed in/min	Voltage volts				
26 GA	40	0.06	0.15	250	0.0	325	78	0.025			
24 GA						325	78	0.029			
22 GA						325	78	0.024			
20 GA	45				0.2	0.043	0.046	0.1	325	78	0.020
18 GA									325	78	
16 GA								0.4	250	78	0.046
14 GA									220	82	0.049
12 GA									0.5	120	83
10 GA	95	84	0.051								

**Gas flow rate – slpm / scfh**

155 / 330	Hot (cutflow)
215 / 460	Cold (postflow)

**Stainless Steel – FineCut – Air – Shielded and Unshielded**



**Metric**

Material Thickness mm	Current A	Torch-to-Work Distance mm	Initial Pierce Height		Pierce Delay Time seconds	Recommended		Kerf Width mm			
			mm	%		Cut Speed mm/min	Voltage volts				
0.5	40	0.5	2.0	400	0.0	8250	68	0.6			
0.6						8250	68				
0.8						8250	68	0.5			
1	0.1				8250	68					
1.5	45				0.5	2.0	400	0.2	8250	68	0.6
2								0.4	6150	70	1.0
3									4800	71	
4								0.5	2550	81	1.4
		0.6	1050	84				1.5			

**English**

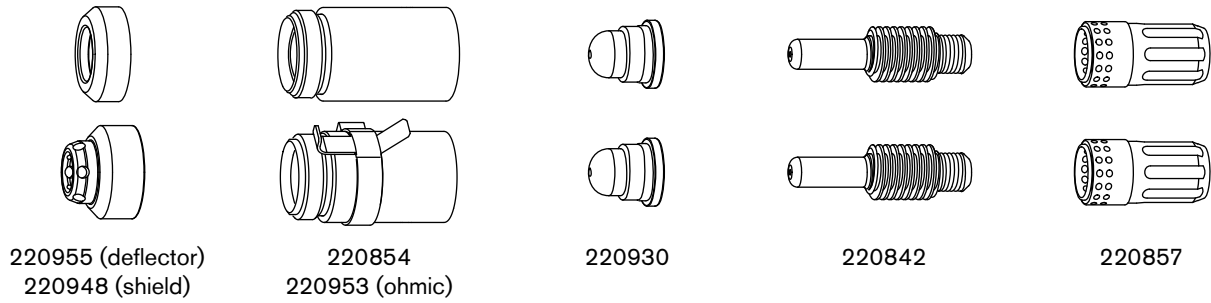
Material Thickness inches	Current A	Torch-to-Work Distance inches	Initial Pierce Height		Pierce Delay Time seconds	Best Quality Settings		Kerf Width inches			
			inches	%		Cut Speed in/min	Voltage volts				
26 GA	40	0.02	0.08	400	0.0	325	68	0.024			
24 GA						325	68	0.021			
22 GA						325	68	0.018			
20 GA	45				0.02	0.08	400	0.1	325	68	0.017
18 GA								0.2	325	68	0.036
16 GA									0.4	240	70
14 GA								200		70	0.040
12 GA								0.5		120	80
10 GA	0.6	75	83	0.055							

**Gas flow rate – slpm / scfh**

155 / 330	Hot (cutflow)
215 / 460	Cold (postflow)



### Mild Steel – FineCut Low Speed – Air – Shielded and Unshielded



#### Metric

Material Thickness mm	Current A	Torch-to-Work Distance mm	Initial Pierce Height		Pierce Delay Time seconds	Recommended		Kerf Width mm
			mm	%		Cut Speed mm/min	Voltage volts	
0.5	30	1.5	2.25	150	0.0	3800	69	0.6
0.6						3800	68	
0.8						3800	70	
1*	40				0.4	3800	72	0.8
1.5*						3800	75	
2	45				0.5	3700	76	0.7
3						2750	78	1.3
4						1900	78	1.5

#### English

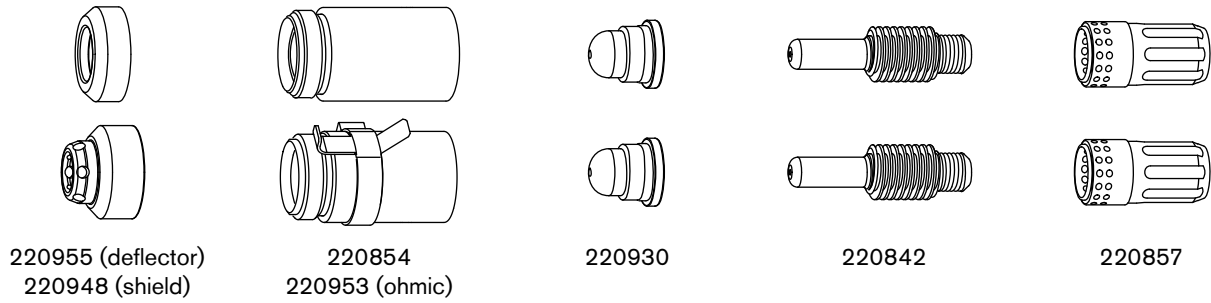
Material Thickness inches	Current A	Torch-to-Work Distance inches	Initial Pierce Height		Pierce Delay Time seconds	Best Quality Settings		Kerf Width inches
			inches	%		Cut Speed in/min	Voltage volts	
26 GA	30	0.06	0.09	150	0.0	150	70	0.026
24 GA						150	68	0.024
22 GA					0.1	150	70	0.025
20 GA	150					71		
18 GA	40				0.2	150	73	0.031
16 GA*						0.4	150	75
14 GA*	45				0.5		150	76
12 GA						120	78	0.052
10 GA		95	78	0.051				

#### Gas flow rate – slpm / scfh

155 / 330	Hot (cutflow)
215 / 460	Cold (postflow)

\* Not a dress-free cut.

### Stainless Steel – FineCut Low Speed – Air – Shielded and Unshielded



#### Metric

Material Thickness mm	Current A	Torch-to-Work Distance mm	Initial Pierce Height		Pierce Delay Time seconds	Recommended		Kerf Width mm			
			mm	%		Cut Speed mm/min	Voltage volts				
0.5	30	0.5	2.0	400	0.0	3800	69	0.7			
0.6						3800	69				
0.8						3800	69				
1	40				0.5	2.0	400	0.15	3800	69	0.6
1.5								0.4	2900	69	0.5
2									2750	69	1.3
3								45	0.5	2.0	400
4	0.6				1050	80	1.5				

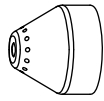
#### English

Material Thickness inches	Current A	Torch-to-Work Distance inches	Initial Pierce Height		Pierce Delay Time seconds	Best Quality Settings		Kerf Width inches				
			inches	%		Cut Speed in/min	Voltage volts					
26 GA	30	0.02	0.08	400	0.0	150	69	0.028				
24 GA						150	69					
22 GA					0.1	150	69	0.025				
20 GA	150					69						
18 GA	40				0.02	0.08	400	0.2	145	69	0.023	
16 GA								0.4	115	69		0.022
14 GA									110	69		
12 GA	45				0.02	0.08	400	0.5	120	80	0.049	
10 GA		0.6	75	80				0.055				

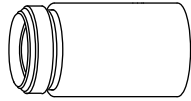
#### Gas flow rate – slpm / scfh

155 / 330	Hot (cutflow)
215 / 460	Cold (postflow)

### Stainless Steel – 45 A – F5 – Shielded



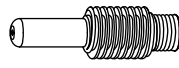
220817



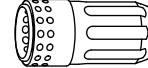
220854  
(220953 for  
ohmic sensing)



220941



220842



220857

#### Metric

Material Thickness	Torch-to-Work Distance	Initial Pierce Height		Pierce Delay Time	Best Quality Settings		Production Settings		Kerf Width
					Cut Speed	Voltage	Cut Speed	Voltage	
mm	mm	mm	%	seconds	mm/min	volts	mm/min	volts	mm
8	1.5	3.8	250	0.8	630	150	860	144	2.1
10					435	153	525	147	2.3
12		Edge Start			340	156	440	150	2.5

#### English

Material Thickness	Torch-to-Work Distance	Initial Pierce Height		Pierce Delay Time	Best Quality Settings		Production Settings		Kerf Width
					Cut Speed	Voltage	Cut Speed	Voltage	
inches	inches	inches	%	seconds	in/min	volts	in/min	volts	inches
1/4	0.06	0.15	250	0.6	32	147	47	141	0.082
3/8				0.8	18	152	22	146	0.090
1/2		Edge Start		12	157	16	151	0.098	

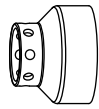
#### Gas flow rate – slpm / scfh

149 / 315	Hot (cutflow)
184 / 390	Cold (postflow)

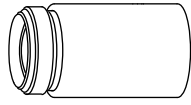


F5 is not recommended for thicknesses less than 7 mm or 1/4 inch or for use with FineCut consumables.

### Marking and Dimpling – Air – Shielded



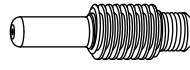
420542



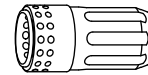
220854  
(220953 for  
ohmic sensing)



420415



220842



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#### Mild steel

Current A	Torch-to-Work Distance		Initial Marking Height		Delay Time seconds	Marking Speed		Arc Voltage volts	Width		Depth	
	mm	in	mm	in		mm/min	in/min		mm	in	mm	in
<b>Light marking</b>												
10	6.4	0.25	6.4	0.25	0	2540	100	134	2.79	0.11	<0.02	<0.001
<b>Heavy marking</b>												
10	4.6	0.18	4.6	0.18	0	2540	100	111	2.79	0.11	0.09	0.0035
<b>Dimpling</b>												
10	6.4	0.25	—	—	0.05	—	—	—	1.98	0.078	0.25	0.01

#### Stainless steel

Current A	Torch-to-Work Distance		Initial Marking Height		Delay Time seconds	Marking Speed		Arc Voltage volts	Width		Depth	
	mm	in	mm	in		mm/min	in/min		mm	in	mm	in
<b>Light marking</b>												
10	5.1	0.2	5.1	0.2	0	5080	200	98	2.03	0.08	<0.02	<0.001
<b>Heavy marking</b>												
10	6.4	0.25	6.4	0.25	0	3175	125	133	2.54	0.1	0.08	0.003
<b>Dimpling</b>												
10	6.4	0.25	—	—	0.05	—	—	—	2.03	0.08	0.23	0.009

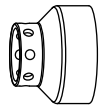
#### Aluminum

Current A	Torch-to-Work Distance		Initial Marking Height		Delay Time seconds	Marking Speed		Arc Voltage volts	Width		Depth	
	mm	in	mm	in		mm/min	in/min		mm	in	mm	in
<b>Marking</b>												
11	2.5	0.1	5.1	0.2	0	5080	200	98	0.89	0.035	<0.02	<0.001
<b>Dimpling</b>												
10	3.2	0.125	—	—	0.1	—	—	—	0.89	0.035	0.09	0.0035

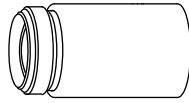
#### Gas flow rate – slpm / scfh

137 / 290	Hot (cutflow)
141 / 300	Cold (postflow)

### Marking and Dimpling – Argon – Shielded



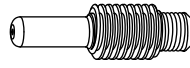
420542



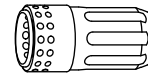
220854  
(220953 for  
ohmic sensing)



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#### Mild steel

Current A	Torch-to-Work Distance		Initial Marking Height		Delay Time seconds	Marking Speed		Arc Voltage volts	Width		Depth	
	mm	in	mm	in		mm/min	in/min		mm	in	mm	in
<b>Light marking</b>												
10	2.0	0.08	2.0	0.08	0	3175	125	44	1.22	0.048	<0.02	<0.001
<b>Heavy marking</b>												
15	1.5	0.06	1.5	0.06	0	3175	125	44	1.22	0.048	<0.02	<0.001
<b>Dimpling</b>												
20	3.2	0.125	—	—	0.2	—	—	—	0.99	0.039	<0.02	<0.001

#### Stainless steel

Current A	Torch-to-Work Distance		Initial Marking Height		Delay Time seconds	Marking Speed		Arc Voltage volts	Width		Depth	
	mm	in	mm	in		mm/min	in/min		mm	in	mm	in
<b>Light marking</b>												
12	2.5	0.1	2.5	0.1	0	3175	125	46	1.40	0.055	<0.02	<0.001
<b>Heavy marking</b>												
15	2.5	0.1	2.5	0.1	0	2540	100	46	2.16	0.085	0.02	0.001
<b>Dimpling</b>												
10	3.2	0.125	—	—	0.2	—	—	—	0.94	0.037	0.18	0.007

#### Aluminum

Current A	Torch-to-Work Distance		Initial Marking Height		Delay Time seconds	Marking Speed		Arc Voltage volts	Width		Depth	
	mm	in	mm	in		mm/min	in/min		mm	in	mm	in
<b>Marking</b>												
16	0.5	0.02	0.5	0.02	0	4445	175	42	0.63	0.025	<0.02	<0.001
<b>Dimpling</b>												
20	0.5	0.02	—	—	0.4	—	—	—	0.66	0.026	0.04	0.0015

#### Gas flow rate – slpm / scfh

120 / 255	Hot (cutflow)
123 / 260	Cold (postflow)