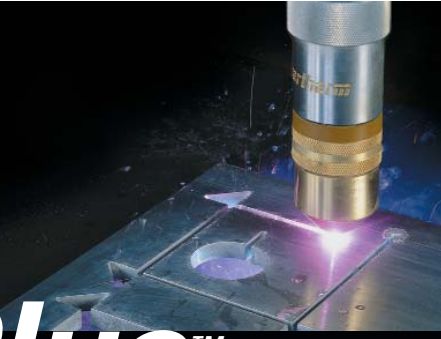


SilverPlus is a proven technology that dramatically extends electrode life and significantly reduces operating cost. This remarkable technological advance is now available on the HT4400 HySpeed® plasma system cutting with 300-amp and 400-amp oxygen process.



# HT4400® SilverPlus™ Quick Set-up



### To achieve maximum SilverPlus electrode life

A fully used SilverPlus electrode will have a pit depth of .080" (2 mm), versus the recommended .040" (1 mm) pit depth for standard parts.

**Purge torch:** After each consumable part change, purge the torch for at least 30 seconds to remove residual moisture, which will damage the silver electrode.

**Adjust gas flows:** Plasma gas flow rate is critical. High flow will cause rapid electrode wear and hard starting. Low flow will cause uncontrolled arcing. (See charts below)

**Adjust arc voltage:** As the electrode wears, the torch will get closer to the plate. To compensate for this, increase arc voltage in 3 to 5-volt increments, up to 15 volts higher than the initial setting.

**Avoid ramp-down errors:** Ramp-down errors can occur when ending cuts off the plate or when leading out of dropped parts as the arc stretches. These "blowouts" shorten electrode life by 10 or more starts per occurrence.

Part number	Description
1. 220412	Electrode, 300/400-amp oxygen
2. 120939	Swirl ring, 400-amp oxygen
3. 120940	Swirl ring (ccw), 400-amp oxygen
4. 120913	Swirl ring, 300-amp oxygen
5. 120914	Swirl ring (ccw), 300-amp oxygen
6. 120934	Nozzle, 400-amp oxygen
7. 120935	Nozzle (ccw), 400-amp oxygen
8. 120794	Nozzle, 300-amp oxygen
9. 120795	Nozzle (ccw), 300-amp oxygen
10. 120786	Retaining cap
11. 120907	Retaining cap, with IHS tab
12. 120984	Retaining cap, underwater

### To achieve maximum nozzle life

With careful use, the standard 300-amp or 400-amp nozzle will last as long as the new SilverPlus electrode.

**Pierce at correct height:** Piercing too low causes molten metal (spatter) to build up on the nozzle, causing damage to the orifice. This is the most common cause of premature nozzle failure. Piercing too high can cause slow arc transfer and misfires. In most applications, a pierce height of 1/4" (6 mm) – 3/8" (10 mm) works well.

**Adjust gas flows:** Preflow gas protects the nozzle from damage, especially during piercing. Make sure the preflow settings are adjusted according to the cut chart.

**Adjust arc voltage:** As parts wear, increase arc voltage in 5-volt increments to keep the nozzle from dragging on the plate. Damage to the nozzle may occur if the torch contacts the plate during cutting.



HT4400, 300-amp cut chart

Test preflow and cutflow adjust (psi)							Test preflow verify (psi)		Test cutflow verify (psi)		Material thickness		Arc voltage	Torch-to-work distance		Cutting speed		Initial pierce height		Pierce delay time	
Plasma		Shield		Plasma		Shield		PG1	PG2	PG1	PG2	(in)	(mm)	volts	(in)	(mm)	ipm	mm/m	in.	mm	seconds
MV1	MV2	MV3	MV4	MV5		MV6	MV7														
46	0	0	10	24		35	35	20	42	46	35	1/4**	6**	120	0.062	2	190	4830	0.13	3	0.3
												3/8**	10**	125	0.125	3	160	4060	0.25	6	0.5
												1/2	12	130	0.157	4	120	3050	0.31	8	0.7
												5/8	15	135	0.188	5	100	2540	0.38	10	0.9
												3/4	20	140	0.188	5	80	2030	0.38	10	1.1
												7/8	22	145	0.188	5	70	1780	0.38	10	1.3
												1	25	145	0.188	5	55	1400	0.38	10	1.5
												1-1/8	30	150	0.188	5	50	1270	*	*	*
												1-1/4	32	155	0.25	6	45	1140	*	*	*
												1-1/2	35	155	0.25	6	35	890	*	*	*

# HT4400, 400-amp cut chart

Test preflow and cutflow adjust (psi)								Test preflow verify (psi)		Test cutflow verify (psi)		Material thickness		Arc voltage	Torch-to-work distance		Cutting speed		Initial pierce height		Pierce delay time
Plasma		Shield		Plasma		Shield		PG1	PG2	PG1	PG2	(in)	(mm)	volts	(in)	(mm)	ipm	mm/m	in.	mm	seconds
MV1	MV2	MV3	MV4	MV5		MV6	MV7														
68	0	0	10	43		38	38	36	43	68	38	3/8**	10**	135	0.125	3	195	4950	0.25	6	0.4
												1/2**	12**	138	0.157	4	160	4060	0.31	8	0.5
												5/8	15	140	0.157	4	120	3050	0.31	8	0.6
												3/4	20	142	0.157	4	95	2413	0.31	8	0.7
												7/8	22	145	0.188	5	80	2032	0.38	10	0.8
												1	25	145	0.188	5	70	1778	0.38	10	1
												1-1/8	30	145	0.188	5	60	1520	0.38	10	1.4
												1-1/4	32	148	0.188	5	55	1400	0.38	10	1.9
												1-1/2	35	150	0.188	5	40	1020	*	*	*
													40	155	0.188	5	37	929	*	*	*
													50	175	0.25	6	17	421	*	*	*
													2		175	0.25	6	15	381		

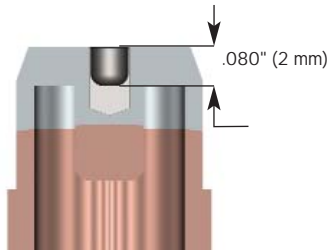
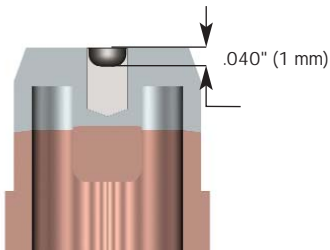
\* Piercing is not recommended.  
 \*\* Cuts on these thicknesses may result in increased cut angle variation and surface roughness. Reduce cut speeds by 5-10% for improvement with some materials.

### Half-used electrode

Whereas a standard copper electrode would be fully used, this SilverPlus electrode is only half consumed. The pit in the center of the part measures .040" (1 mm). Electrodes are often removed prematurely due to cut quality deterioration caused by nozzle damage. A new nozzle will restore cut quality and allow full electrode use.

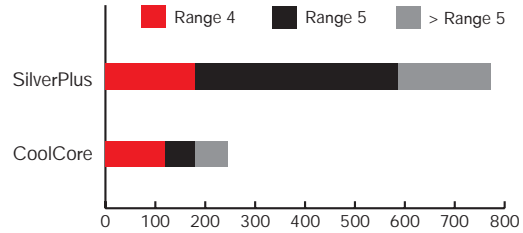
### Fully-used electrode

This SilverPlus electrode has provided full use. The pit depth is .080" (2 mm). The operator increased the arc voltage by 15 volts from the first cuts made with this electrode to the last. This maintains a constant distance between the torch and the work piece through the life of the electrode.



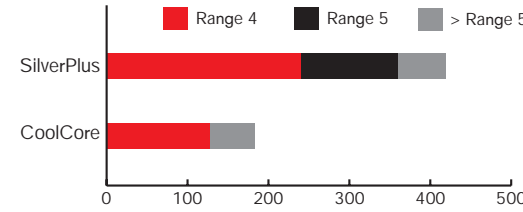
### 300-amp oxygen 20/20 parts life and cut quality

(Cut quality over life of consumables)  
 20-second tests with 20% rampdown errors on 3/4" (20 mm) steel



### 400-amp oxygen 20/20 parts life and cut quality

(Cut quality over life of consumables)  
 20-second tests with 20% rampdown errors on 3/4" (20 mm) steel



The cut quality ranges, shown in these test results, meet the ISO 9013-2002 industrial standard that defines cut quality of thermally cut parts. This standard defines how cut angles are measured. The lower the range (Range 1 is lowest), the smaller the angle on the cut face. Range 4 represents an angle of approximately 3.75 and range 5 is approximately 6 degrees. > Range 5 is above 6 degrees.

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### Relative consumable cost of cut

3/4" (19 mm) mild steel at 400 amps

