



**SilverLine® electrode and CoolFlow™ nozzle  
for InnerLogic® ProLine2200®**



# Cutting Costs

**Patented SilverLine electrodes and patent-pending CoolFlow nozzles improve cut quality and double life!**



SilverLine electrodes have a solid silver end that offers three distinct advantages over traditional copper or silver foil designs:

- 1) The hafnium-silver bond is stronger, allowing a deeper pit depth in the hafnium as the electrode is used.
- 2) The heat transfer properties of silver and silver oxides are superior, which improves heat dissipation during use and slows the rate of hafnium wear.
- 3) The design is more robust, minimizing the effect of ramp-down errors and hard failures.

CoolFlow nozzle technology optimizes nozzle design inside and out, to improve heat transfer and service life. Our engineers used state-of-the-art computer modeling software to analyze coolant flow to the nozzle, and heat transfer from the plasma arc. The design has several new features and benefits:

- 1) Optimized cooling groove minimizes coolant stagnation and maximizes convective cooling, to keep the nozzle and seal cool.
- 2) Setback angled seal allows the o-ring to be positioned out of the hot zone for improved sealing reliability.
- 3) Thicker nozzle walls improve conduction cooling and provides excellent cap and shield alignment.
- 4) Rear sealing o-ring prevents coolant leaks.

The CoolFlow nozzle technology lowers front o-ring seal temperature by 50% while reducing peak temperature at the nozzle orifice by as much as 50° Celsius.

The combined effect of SilverLine electrodes and CoolFlow nozzles is up to twice the process life and half the operating cost. (See graphs on reverse side)



# Head to Head

## SilverLine electrode and CoolFlow nozzle

New SilverLine electrodes and CoolFlow nozzles go head to head with InnerLogic (Kaliburn)



### Our testing process

We used a rigorous Hypertherm laboratory test protocol to benchmark SilverLine electrodes and CoolFlow nozzles against the original equipment manufacturer (OEM). The 20-second cut test involves repeated piercing and cutting of mild steel plate with precise measurement of cut angularity at intervals during the test. 1/2-inch mild steel (13 mm) was used for benchmarking 200-amp cut quality over life; 1/4-inch (6 mm) steel was used for 100-amp testing.

### Results

**At 200 amps** SilverLine electrodes and CoolFlow nozzles lasted on average twice the life of the OEM.

InnerLogic parts averaged 248 range 3 cuts (bevel < 2.58°), on 1/2-inch plate (13 mm), 631 range 4 cuts (angle < 5.15°), and 804 cuts to failure.

Centricut parts averaged 612 range 3 cuts, 1152 range 4 cuts, and 1959 cuts to failure.

**At 100 amps** SilverLine electrodes and CoolFlow nozzles lasted on average more than twice the life of the OEM.

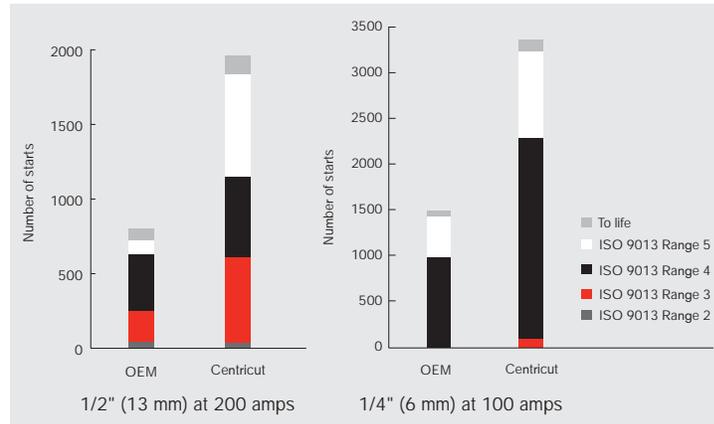
InnerLogic parts averaged 990 range 4 cuts (bevel < 8.13°) on 1/4-inch plate (6 mm), and 1,504 cuts to failure.

Centricut parts averaged 2,295 range 4 cuts, and 3,375 cuts to failure – more than twice the life of the OEM.

### OEM vs. Centricut parts

20-seconds of mild steel cutting per start.

Cut quality measured according to ISO 9013.



### The bottom line

The bottom line: under the same operating conditions, SilverLine electrodes and CoolFlow nozzles last longer than OEM parts and lower the cost of cutting.

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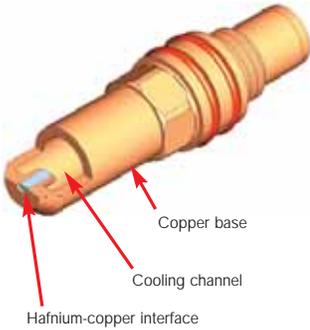
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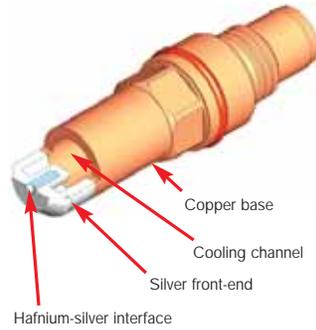
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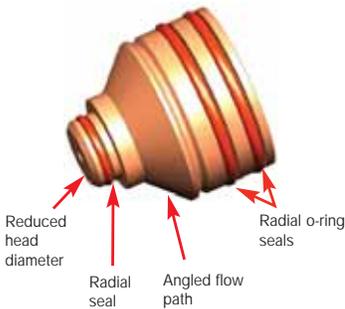
### OEM electrode



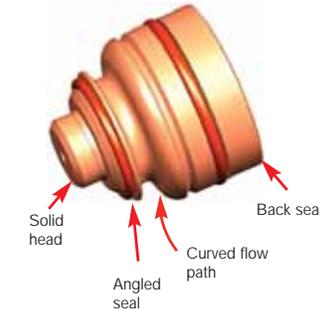
### Centricut SilverLine electrode



### OEM nozzle



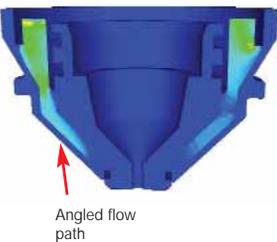
### Centricut CoolFlow nozzle



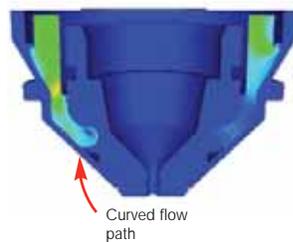
### Cooling Comparison

Cooling velocity profiles

### OEM nozzle



### Centricut CoolFlow nozzle



CoolFlow nozzles have a curved flow path that lowers front o-ring temperature by 50% and reduces peak nozzle temperature.