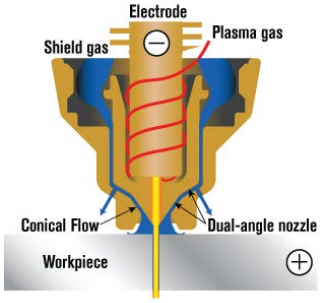
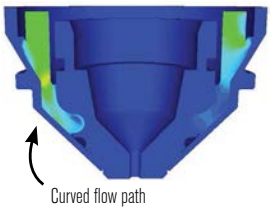
Hypertherm technology benefits

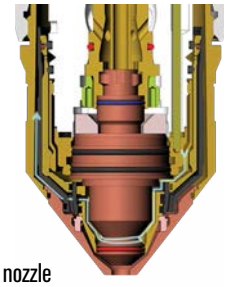
Hypertherm designs consumables to achieve fast cutting speeds, long life, and superior cut quality for high productivity and low operating costs.



Conical Flow



CoolFlow



Cool nozzle

Advanced axial swirl ring allows the long vented nozzle with exposed vent holes and swirl ring to align near the tip of the electrode, ensuring the correct amount of gas flow and optimal consumable life.

Chambered swirl ring gradually reduces gas pressure at the end of the cut to stabilize the hafnium insert prior to arc termination; this extends nozzle and electrode life.

Coaxial-assist™ jet increases cutting speed and cut quality by extending the tip of the nozzle into the exit of the shield.

Conical Flow™ nozzle technology increases arc energy density for superior cut quality with little dross.

CoolCore® allows for improved cooling of the electrode through effective removal of heat from the hafnium.

CoolFlow™ delivers enhanced cooling of the nozzle through key features such as a deep groove, angled o-ring seal and specific shoulder contact for increased nozzle life and cut quality.

Cool nozzle feature on the on the XPR 300 amp oxygen process provides liquid cooling directly to the nozzle bore. This cooling is a significant factor in increasing cut quality over the life of the consumables by over 40%.

Dimpled electrode extends electrode life by preventing material from blowing on the nozzle when first ignited.

HDi® technology delivers HyDefinition® quality to thin stainless steel cutting from 3 mm to 6 mm.

HyLife® extends electrode life and lowers operating costs.

HySpeed® technology utilizes Coaxial-assist jet technology to boost cutting speeds as much as 50% over conventional designs.

LongLife® ramps current and gas flow up and down in a tightly controlled manner to reduce electrode and nozzle erosion.

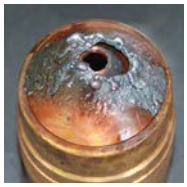
Plasma dampening delivers increased arc density and cut speeds on thin stainless while maintaining arc stability and smoother cut edges.

PowerPierce® liquid cooled shield technology repels molten metal during piercing. Enables robust production pierce capability up to 50 mm (2") mild steel and 75 mm (3") stainless steel and aluminum. Delivers speed and thickness capabilities.

300 pierces at 50 mm (2")

HPR400XD with PowerPierce technology

41 pierces at 45 mm (1-3/4")

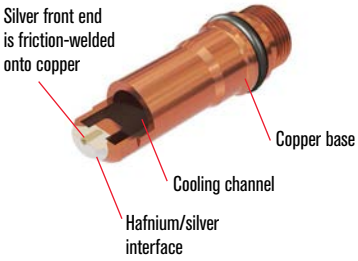


Competitor A without PowerPierce technology

Quick-disconnect torch allows for ease of mounting and changing of the torch.

QuickLock™ electrode delivers easy 1/4 turn tightening, reducing job setup time.

SilverPlus® silver front end tip which dramatically extends electrode life, reduces the number of change outs and significantly reduces operating cost.



TrueFlow™ allows for centered electrode alignment with the water tube to ensure optimal cooling, which increases life and produces a higher and consistent cut quality.

Vent-to-shield technology mixes hydrogen reclaimed from the vented plasma gas with the shield gas to reduce angularity and deliver more consistent edge color on stainless steel up to 12 mm.

QuickLock electrode

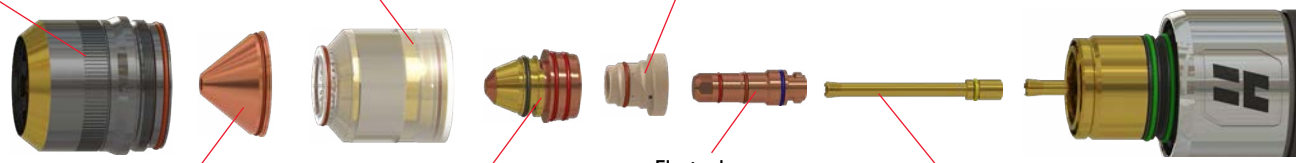
Vented shield is electrically isolated to prevent double arcing, the vent holes around the orifice stabilize the arc, cool the consumables, and protect them from spatter. These features improve piercing capabilities and increase consumable life.

Vented Water Injection™ (VWI) process features a vented N_2 plasma and an H_2O shield. Edges are square, angularity is reduced and surface finish is excellent on non-ferrous materials, especially aluminum.

Swirl ring
The main function of the swirl ring is to control the swirling action of the plasma gas flow around the electrode in order to center the cutting arc on the electrode and through the nozzle, and to constrict the cutting arc for faster cut speeds and thicker cut capability.

Nozzle cap
The inner retaining cap's primary function is to hold the nozzle and swirl ring in place while directing coolant flow to the exterior of the nozzle.

Shield cap
The outer retaining cap holds the shield in place over the nozzle (or inner retaining cap, if applicable) and directs secondary gas or shield gas to the shield.



Shield
The main function of the shield is to protect and cool the other consumables, especially the nozzle from molten splatter. In some cases, the shield also contributes to the swirling action of the plasma gas.

Nozzle
The primary function of the nozzle is to shape, direct, and constrict the plasma arc.

Electrode
The primary function of the electrode is to provide power to the plasma arc. It is the starting point and electrical contact point of the plasma arc.

Water tube
The water tube is crucial for effective electrode cooling.

Systems	Breakthrough plasma technologies									HyPerformance® Plasma										LongLife® air and oxygen plasma						Air plasma						
	X-Definition™ cut quality	Vented Water Injection™	Arc response technologies™	3 Plasma gas mixing for non ferrous	Cool nozzle	50 degree True Bevel™	Argon-assist	WiFi	Lowest operating cost	True Hole® technology	True Bevel™ technology	Patented PowerPierce® technology for extreme piercing capability	HDi® thin stainless technology	Remote (CNC) gas switching capability	More process options for optimizing cut quality	Highest cut speeds	Mark, cut, and bevel with same consumables	HyDefinition® technology	Can be used on the largest machine frames	100% duty cycle	Quick-disconnect torch	Thicker cutting capability	Oxygen and multi-gas capability for improved cut quality, faster cut speeds, and improved weldability	Lower operating cost	Serial communications enable full control from the CNC	Bevel capability up to 45°	Automatic gas technology minimizes operator intervention	Built and tested to withstand the harshest conditions	Good weldability	Fast cut speeds per recommended thickness	Good cut quality	Low operating cost
XPR®	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●	●
HPRXD®										●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
MAXPRO200®																				●	●	●	●	●	●	●	●	●	●	●	●	●
Powermax®																										●	●	●	●	●	●	●

XPR300®

The most significant advance in mechanized plasma cutting technology redefines what plasma can do.

Industry leading cut quality – X-Definition

The XPR advances HyDefinition® cut quality by blending new technology with refined processes for next generation, X-Definition™ cutting on mild steel, stainless steel and aluminum.

- Consistent ISO range 2 results on thin mild steel and extended range 3 cut quality on thicker mild steel and stainless steel
- Superior results on aluminum using Vented Water Injection™ (VWI)

Optimized productivity and reduced operating costs

- Operating costs reduced by over 50%
- Up to 15% higher cut speeds on thicker materials
- Consumable life increases of over 40%
- 20% thicker piercing on stainless steel and 30% thicker on mild steel

Engineered system optimization and ease of use

- Increases consumable life 3 times that of competitor's systems by eliminating the impact of ramp down errors
- Reduces the impact of catastrophic electrode blowouts which can damage the torch at high current levels
- Automatic system monitoring and specific troubleshooting codes for improved maintenance and service prompts
- EasyConnect™ torch lead and one hand torch-to receptacle connection for fast and easy change-outs
- QuickLock™ electrode for easy consumable replacement
- WiFi in the power supply can connect to mobile devices and LAN for multiple system monitoring and service

Process control and delivery

Three GasConnect console options offer unmatched mild steel cut quality with each console delivering successively enhanced cutting capabilities on stainless steel and aluminum. All consoles can be fully controlled through the CNC for high productivity and ease of use.

Core™ console

Vented Water Injection™ (VWI) console

OptiMix™ console

Technologies	
Chambered swirl ring	gradually reduces gas pressure at the end of the cut to stabilize the hafnium insert prior to arc termination; this extends nozzle and electrode life.
Conical Flow™	nozzle technology increases arc energy density for superior cut quality with little dross.
CoolFlow™	delivers enhanced cooling of the nozzle through key features such as a deep groove, angled o-ring seal and specific shoulder contact for increased nozzle life and cut quality.
Cool nozzle	feature on the 300-amp oxygen process provides liquid cooling directly to the nozzle bore. This cooling is a significant factor in increasing cut quality over the life of the consumables by over 40%.
HyDefinition®	vented nozzle technology aligns and focuses the plasma arc for powerful precision cutting, superior quality, and consistency.
LongLife®	ramps current and gas flow up and down in a tightly controlled manner to reduce electrode and nozzle erosion.
PowerPierce®	liquid cooled shield technology repels molten metal during piercing. Enables robust production pierce capability up to 50 mm (2") mild steel and 75 mm (3") stainless steel and aluminum. Delivers speed and thickness capabilities.
Plasma dampening	delivers increased arc density and cut speeds on thin stainless while maintaining arc stability and smoother cut edges.
QuickLock™ electrode	delivers easy 1/4 turn tightening, reducing job setup time.

TrueFlow™	allows for centered electrode alignment with the water tube to ensure optimal cooling, which increases life and produces a higher and consistent cut quality.
Vented shield	is electrically isolated to prevent double arcing, the vent holes around the orifice stabilize the arc, cool the consumables, and protect them from spatter. These features improve piercing capabilities and increase consumable life.
Vent-to-shield	technology mixes hydrogen reclaimed from the vented plasma gas with the shield gas to reduce angularity and deliver more consistent edge color on stainless steel up to 12 mm (1/2").
Vented Water Injection™ (VWI)	process features a vented N_2 plasma and an H_2O shield. Edges are square, angularity is reduced and surface finish is excellent on non-ferrous materials, especially aluminum.

XPR300® consumables

Technologies

Chambered swirl ring

Conical Flow™

CoolFlow™

Cool nozzle

HyDefinition®

LongLife®

PowerPierce®

Plasma dampening

QuickLock™ electrode

TrueFlow™

Vented shield

Vent-to-shield

VWI™

Mild steel consumables

Amperage	Process	Shield cap	Shield	Nozzle retaining cap	Nozzle	Swirl ring	Electrode	Water tube
30 A	O_2/O_2	420200	420228	420365	420225	420407	420222	420368
80 A	O_2/Air	420200	420246	420365	420243	420242	420240	420368
130 A	O_2/Air	420200	420255	420365	420252	420242	420249	420368
170 A	O_2/Air	420200	420513	420365	420261	420260	420258	420368
300 A	O_2/Air	420200	420491	420365	420279	420406	420276	420368

Non-ferrous by amp

40 A	N_2/N_2	420200	420291	420365	420288	420314	420303	420368
	Air/Air	420200	420291	420365	420288	420314	420294	420368
60 A	N_2/N_2	420200	420309	420365	420297	420323	420303	420368
	$F5/N_2$	420200	420309	420365	420297	420323	420303	420368
	N_2/H_2O	420200	420300	420365	420296	420323	420303	420368
	Air/Air	420200	420309	420365	420297	420323	420294	420368
80 A	N_2/N_2	420200	420309	420365	420306	420323	420303	420368
	$F5/N_2$	420200	420309	420365	420306	420323	420303	420368
	N_2/H_2O	420200	420300	420365	420290	420323	420303	420368
	Air/Air	420200	420309	420365	420306	420323	420294	420368
130 A	N_2/N_2	420200	420318	420365	420315	420314	420356	420368
	H_2-Ar-N_2/N_2	420200	420318	420365	420315	420323	420356	420368
	N_2/H_2O	420200	420469	420365	420315	420314	420356	420368
170 A	N_2/N_2	420200	420327	420365	420324	420314	420356	420368
	H_2-Ar-N_2/N_2	420200	420327	420365	420324	420323	420356	420368
	N_2/H_2O	420200	420472	420365	420324	420314	420356	420368
	Air/Air	420200	420513	420365	420524	420260	420258	420368
300 A	N_2/N_2	420200	420362	420365	420359	420323	420356	420368
	H_2-Ar-N_2/N_2	420200	420362	420365	420359	420358	420356	420368
	N_2/H_2O	420200	420475	420365	420359	420323	420356	420368

Non-ferrous by process

N_2/N_2	40 A	420200	420291	420365	420288	420314	420303	420368
	60 A	420200	420309	420365	420297	420323	420303	420368
	80 A	420200	420309	420365	420306	420323	420303	420368
	130 A	420200	420318	420365	420315	420314	420356	420368
	170 A	420200	420327	420365	420324	420314	420356	420368
	300 A	420200	420362	420365	420359	420323	420356	420368
$F5/N_2$	60 A	420200	420309	420365	420297	420323	420303	420368
	80 A	420200	420309	420365	420306	420323	420303	420368
Air/Air	40 A	420200	420291	420365	420288	420314	420294	420368
	60 A	420200	420309	420365	420297	420323	420294	420368
	80 A	420200	420309	420365	420306	420323	420294	420368
	170 A	420200	420513	420365	420524	420260	420258	420368
N_2/H_2O	60 A	420200	420300	420365	420296	420323	420303	420368
	80 A	420200	420300	420365	420290	420323	420303	420368
	130 A	420200	420469	420365	420315	420314	420356	420368
	170 A	420200	420472	420365	420324	420314	420356	420368
	300 A	420200	420475	420365	420359	420323	420356	420368
H_2-Ar-N_2/N_2	130 A	420200	420318	420365	420315	420323	420356	420368
	170 A	420200	420327	420365	420324	420323	420356	420368
	300 A	420200	420362	420365	420359	420358	420356	420368

Please refer to page 57 for mirror-image cutting consumables.

XPR300® torch assembly options

Torch assembly options

	Part number	Description
	428383	Standard lead: 2 m (6.6')
	428384	Standard lead: 2.5 m (8.2')
	428385	Standard lead: 3 m (9.8')
	428386	Standard lead: 3.5 m (11.5')
	428387	Standard lead: 4.5 m (14.8')
1	420500	Torch mount sleeve assembly: Standard
	420501	Torch mount sleeve assembly: Short
	420502	Torch mount sleeve assembly: Extended
2	420220	Quick-disconnect torch receptacle
3	420221	Quick-disconnect XPR torch
4	420368	Water tube
	428488	Torch assembly, 300 A mild steel consumables

1

2

3

4

Additional parts available (not shown)

Part number	Description
104119	Consumables removal tool
027055	Silicone lubricant for o-rings
428618	Mild steel consumables starter kit (torch included)
428619	Stainless steel consumables starter kit (torch included)
428616	Mild steel consumables starter kit
428617	Stainless steel consumables starter kit
428639	Torch rebuild and filter without coolant preventive maintenance kit
428640	Torch rebuild and filter with coolant preventive maintenance kit
428641	Electronics preventive maintenance kit (208–240 V)
428642	Electronics preventive maintenance kit (380–600 V)
809480	XPR300 plasma instruction manual

See page 58 to learn about the value of preventive maintenance.