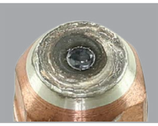
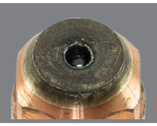
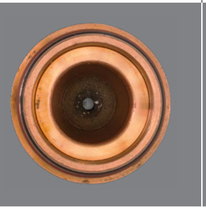
HYPERTHERM
A Hypertherm Associates Brand

Consumable inspection visual aid

Electrode

Underused		Still usable		Fully used		Overused	
A new electrode wears rapidly for the first 10% of life. Copper body should remain clean and shiny even at end of life; signs of grayish heat discoloration could indicate a cooling issue within the torch.		Even with little use, it is normal for an electrode to show marks and discoloration. Make sure the o-ring(s) feel flexible and lubricated at all times. Heat can affect o-rings after use. The hafnium insert should not lose its circular shape and should be fully centered.		The hafnium is eroded, but copper is intact. Color is dark, and/or white. Some cut quality is lost, with increased angularity on the cuts.		Unacceptable cut quality and angularity on cut. When pit depth gets too deep, heat transfer properties start to fail and electrode melts rapidly and causes misfires. This is close to a full blow-out and severe failure of all consumables and potentially the torch and system. The material around the hafnium is eroded and a crater has formed at the tip of the electrode.	
	SilverPlus: 1.25 mm (.050") pit-depth is approximately half life.		SilverPlus: Pit-depth should be less than 2 mm (.080"). There should be no severe discoloration of the silver.		SilverPlus: Pit-depth is 2.5 mm (.100").		SilverPlus: Pit-depth is greater than 3 mm (.100").
	Copper: .5 mm (.020") to ~.6 mm (.025") pit-depth is approximately half life.		Copper: Pit-depth should be less than ~.9 mm (0.035").		Copper: Pit-depth is 1.5 mm (0.060").		Copper: Pit-depth is greater than 2 mm (0.060").

Nozzle

	Top: The orifice bore is perfectly round with sharp edges and no nicks. Cut quality is still optimal.		Top: The orifice should maintain its circular shape, with no dings or notches. Cut quality is still optimal. Make sure the o-rings feel flexible and lubricated at all times. Heat can affect them after use.		Top: The nozzle loses its round orifice, becoming oval or with notches. Cut quality is lost as the shape and dimension of the orifice is damaged.		Top: The copper is eroded around the orifice causing a loss of plasma constriction and damage to the shield. This is close to a full blow-out and severe failure of all consumables and potentially the torch and system.
	Internal: Gas impurities, hafnium wear off, and some black or gray swirl marks are normal. Orifices should be round with no nicks or heavy arc marks. Any white material is hafnium oxide and can be easily cleaned out.		Internal: Gas impurities, hafnium wear off, and some black or gray swirl marks are normal. Orifices should be round with no nicks or heavy arc marks. Any white material is hafnium oxide and can be easily cleaned out.		Internal: Too much debris and contamination inside the nozzle obstructs the flow of plasma.		Internal: Excessive debris and contamination inside the nozzle obstructs the flow of plasma.

Shield

	The internal and external orifices are round with sharp edges, and the bleed orifices are not plugged. Use a light spray of water based anti spatter spray on front of the shield after installed; this can minimize spatter build-up.		The internal and external orifices are round, and the bleed orifices are not plugged. It is good practice to polish the front face of the shield with an abrasive pad to minimize spatter sticking to it.		The shield loses its round orifice and sharp edges, becoming oval or with notches. Too much debris and contamination inside the shield will obstruct the flow of plasma.		The shield loses its round orifice and sharp edges, becoming oval or with severe notches. This can cause nozzle orifice damage during pilot arc because the arc is not centered. Replace shield if any deep scratches or gouges present. This may indicate the torch has crashed into the plate.