

Silver electrode wear



New condition

In this example the electrode is an ultrasonically welded copper-silver composition design with silver on the forward portion of the electrode and copper on the back end. In the center of the part is an unused hafnium insert.



Normal wear (1/2 life)

An electrode with a normal wear pattern that has been removed prematurely for another reason. The pit depth measures 1,25 mm. This part may be burned another 100 starts or more to a pit depth of 2,5 mm before approaching failure.



Normal wear (fully used)

This electrode has a normal wear pattern. The hafnium pit is well-centered and uniform in shape, indicating good alignment of consumables and a proper plasma gas swirl. The depth of the pit is approximately 2,5 mm. The front edges of the part are sharp and distinct, there is no severe discoloration of the silver. Some grayish coloring from oxides on the front surface of the part are normal.



Moisture on start

This example shows that moisture was present during starting of the arc. The part has a rough swirling arc track from the wrench flats to the face of the electrode. Moisture in the pre-flow gas causes high frequency spark to damage the silver. Pre-flow gas should be checked for moisture. Hold a mirror or welding lens under the torch with gas flowing through the system (in the test or gas check mode only). There should be no sign of moisture on the surface used.



Coolant leaks

Coolant leaks are the easiest issue to spot. Severe arcing of the electrode face characterized by pitting and pocks in the silver face. The front surface is rough and black with shiny melted spots. This problem is often caused by a slow leak inside the torch assembly from improperly lubricated O-rings, or loose, improperly installed or misaligned consumables.



Off-center burn

This is easily spotted problem is characterized by an off-centered pit on the face of the electrode. This usually indicates a severe gas flow problem caused by a broken or clogged swirl ring, or misaligned consumables in the torch. If a complete change of consumables does not correct the problem, it may indicate a damaged torch.



Blow out

This is an electrode that has been run to catastrophic failure. This will cause damage to the nozzle when molten material is blown out of the end of the electrode and into the nozzle plenum. If run long enough all consumables and possibly the torch will be destroyed.