

Why wet grind?

In this technical paper, we explore the effects of wet grinding versus dry grinding on Tungsten electrodes used in TIG welding. Through a preliminary experiment, we examine the post-welding condition of Tungsten electrodes ground using both methods after a 10-minute TIG welding session.

Benefits of wet grinding

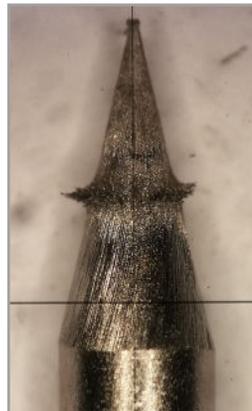
- The liquid for cooling prevents the electrode from overheating and results in a polished and even surface of the Tungsten electrode.
- The liquid serves as a barrier against dust generated during the grinding process. By effectively suppressing dust emissions, wet grinding reduces the risk of inhalation and exposure to hazardous particles, promoting a safer working environment for welders.
- Enhances the durability and longevity by hindering destruction of the electrode caused by the halo effect.
- Ensures consistent performance during welding operations by maintaining a similar penetration level of the weld pool.

Dry grinding

Before welding



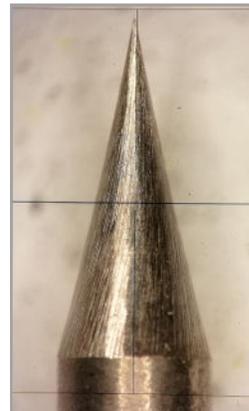
After 10 min. of welding



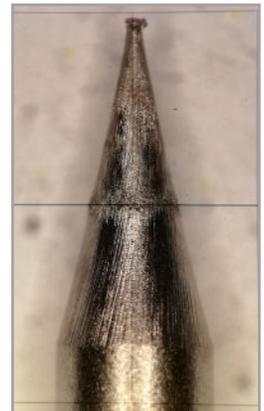
Wet grinding

Ultima-TIG

Before welding

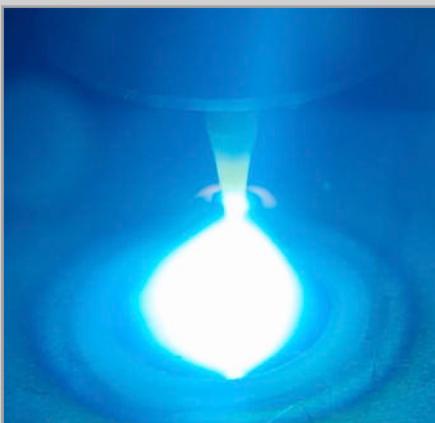


After 10 min. of welding



Halo effect

Halo effect



The Halo effect occurs during TIG welding further up on the tip of the electrode, which creates a beard-like protrusion, as shown in the second photo above under "Dry grinding".

This beard-like protrusion damages the electrode, which negatively affects the weld quality, particularly noticeable in the penetration of the weld pool, which is indicated on the next page.

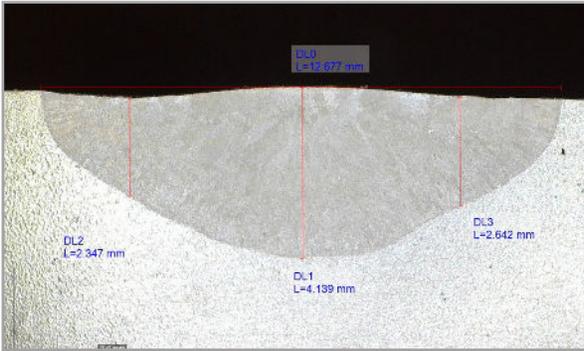
Dry-ground electrodes show faster degradation compared to wet-ground electrodes, which is demonstrated above.

This highlights the importance of wet grinding to prolong the longevity of the electrode tip and ensure better welding results.

Dry grinding

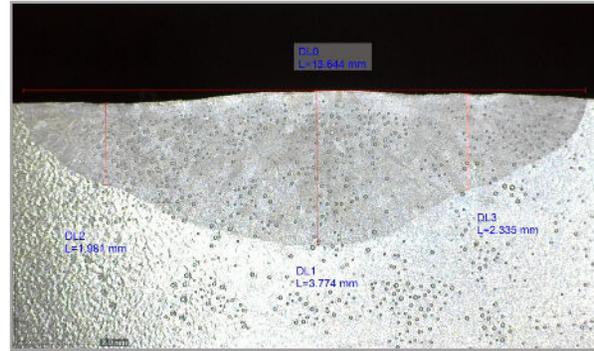
After 1 ignition and 75 sec. of welding

Penetration: 4,14 mm



After 5 ignitions and 12 min. of welding

Penetration: 3,77 mm

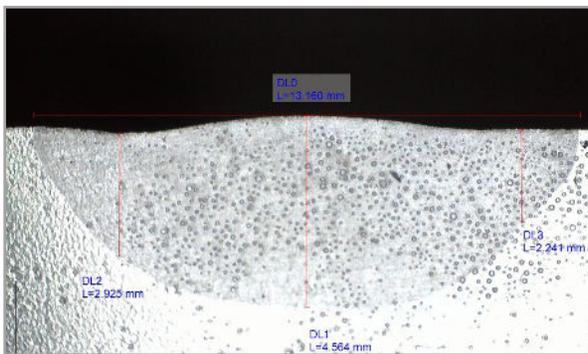


Wet grinding

Ultima-TIG

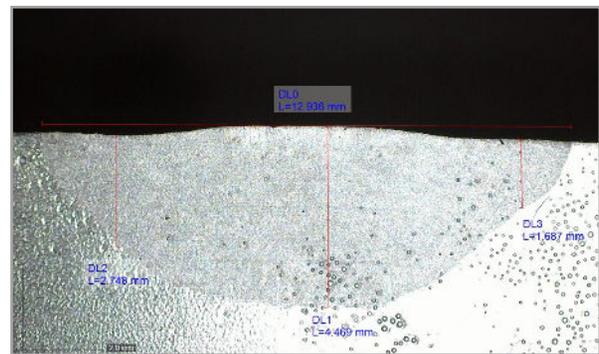
After 1 ignition and 75 sec. of welding

Penetration: 4,56 mm



After 5 ignitions and 12 min. of welding

Penetration: 4,47 mm



Safety

Safety is a key factor when grinding Tungsten electrodes.

The Ultima-TIG wet grinder's enclosed chamber reduces the risk of accidents compared to open bench grinders. Its dust collection system prevents harmful Tungsten particles from being inhaled, protecting the user's health. Proper disposal of the collected dust further reduces exposure risks.

The secure design also prevents direct contact with the grinding disc, eliminating the chance of burns or cuts. Additionally, the electrode holder ensures safe handling and reduces the danger of overheated electrodes, making the Ultima-TIG a safer choice for welders.



Welding conditions

- Electrodes ground at 30°
- 5 welds of 150 seconds each
- All welds are effectuated at 200 Amps
- Weldingspeed: 89 mm/min
- Base material: Stainless steel AISI 304.