Grinding Tungsten Electrodes

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Weld Like a Pro
An ARC-ZONE.COM
Product Selection Guide

General

MIG/GMAW TIG/GTAW Stick/SMAW Plasma General/Multiprocess

The included grind angle (taper) and tip flat diameter (geometry) of a tungsten electrode great affect the size and quality of the weld bead and penetration.

Introduction

With precision application like orbital tube and pipe welding or plasma arch welding, it is important that electrodes are precision ground consistently once a welding procedure is established. Arc-Zone recommends using a dedicated tungsten grinder, which allows you to pre-set the angle. A tungsten grinding machine is also safer than a bench grinder and some offer dust collection.

For highly mechanized welding operations purchasing pre-ground electrodes may be the best solution.

Always purchase your pre-ground tungsten electrodes from a trusted source like Arc-Zone.com because manufacturing and grinding methods can greatly affect tungsten electrode performance.

Whatever your TIG/GTAW or plasma arc welding application, the electrode should be properly cut and tapered.

Selecting the Grinding Angle

Follow your equipment supplier's suggested grind angle specifications first because they have performed tests to determine the optimal electrode preparation for their equipment. If specifications do not exist or you would like to change those settings to potentially improve and optimize your particular welding operation, use the following chart and table.

Sharper Electrode (Narrow Angle)	Blunter Electrode (Wider Angle)
Wider weld bead	Narrower weld bead
Easier arc starting	More difficult arc starting
Less amperage	More amperage
Improved arch stability	Increased potential for arc wander
Less weld penetration	More weld penetration
Shorter electrode life	Longer electrode life

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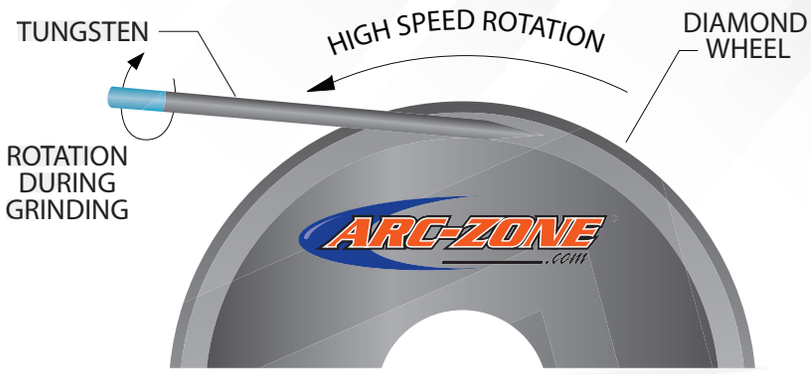
Grinding Electrodes

Use a dedicated tungsten grinder to avoid contamination of the electrode and to maximize welding performance. Grind-ing wheels should be made of diamond or borazon. Grind longitudinally and con-centrically so that the line on the ground surface move in the same direction as the length of the tungsten electrode and the electrode has no flat spots.



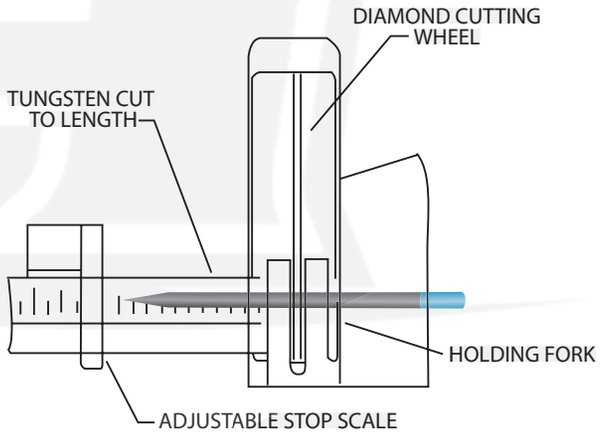
Cutting Electrodes

Tungsten alloys are dense and very brittle and can splinter or shatter, causing fractures in tungsten electrodes. This can lead to arc instability or "break off" during welding, creating gross weld defects.

When you need to cut your electrode to a specific length or remove contamination from the tip, be sure to cut the electrodes correctly. Incorrect cutting methods damage the integrity of the tungsten alloys, shorten arch time, and in-crease the potential for tungsten contamination in the weld.

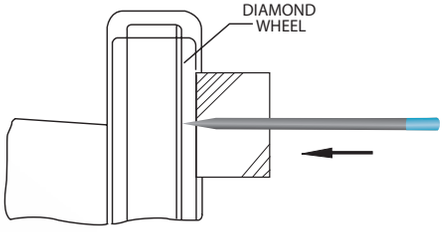
To ensure quality cuts:

- Use a diamond wheel with the electrode secured on both sides of the cut.
- Do not bend electrodes until they fracture.
- Do not cut tungsten electrodes with wire cutters or pliers.
- Do not notch the electrode on the grinding wheel and then snap it off.



Flat Tips

Pointed tips can burn off and drop into the weld puddle resulting in weld contamination and poor weld quality. After grinding the angle (taper), knock off the tip of the electrode as demonstrated in the il-lustration. You may also grind a new flat tip prior to re-grinding when reconditioning an old electrode.



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Safety Guide

- Never grind tungsten electrodes on belt sand-ers or the sides of standard grinding wheels.
- Do not breath grinding dust.
- Do not wear loose clothing, which may get caught in moving parts.
- Do not operate electrical equipment in or around standing water.
- Wear approved safety glasses.
- Use an electrode grinding wand when grind-ing by hand to minimize burns and cuts. Splin-tered electrodes can penetrate the operator's hands and eyes.
- Use an exhaust system when grinding radio-active thoriated tungsten electrodes.
- Some discoloration may occur beyond the HAZ. Depending on the criticalness of the weld, that may be acceptable.

About ARC-ZONE.com

Jim Watson

Jim is CEO and founder of Arc-Zone.com. He is a master fabricator with years of hands-on experience in his own shop and also as a winning motorcycle racer, car builder, and chief mechanic for a top motor-sports team. He also has extensive experience in manufacturing, technical sales, and product development. Before launching Arc-Zone.com, he held leadership positions in some of the most respected com-panies in the welding industry.

Arc-Zone.com

Under Jim's direction, Arc-Zone.com has led the industry in product innovation and online sales and service, becoming the world's leading supplier of high-quality, high-performance welding and metal working tools and accessories.