

# tungstenselection



MAXIMIZE ARC STARTING AND IMPROVE ARC TIME  
WITH HIGH-QUALITY TUNGSTEN ELECTRODES



Selecting the proper tungsten electrodes greatly improves weld quality and productivity while lowering costs for your Gas Tungsten Arc Welding (GTAW/TIG) and Plasma Arc Welding (PAW) operations.

## 1. CHOOSE ELECTRODES FROM A TRUSTED SOURCE

Although tungsten electrodes may look the same from one company to another, high-quality tungsten has been manufactured to ensure a dense grain structure which allows for better migration of oxides to the tip of the electrode.

With high-quality tungsten, you'll experience easier arc starting, improved arc time and better weld quality with minimized contamination. Arc-Zone.com's ArcTime™ and Amplify™ brand electrodes are sourced from the world's finest producers and meet or exceed ISO 6848 and AWS A5.12 standards. Arc-Zone.com® delivers the industry's most complete line of premier tungsten electrodes including: ArcTime™, Amplify™, CK Worldwide™, DGP® Multi-Strike™, Miller®, and Weldcraft®.

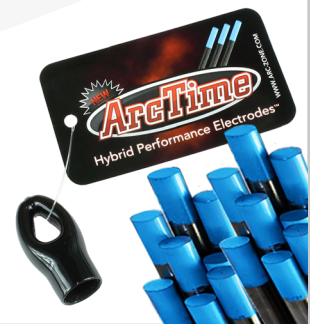


## 2. DETERMINE THE BEST TUNGSTEN/TUNGSTEN ALLOY FOR YOUR APPLICATION

Since the development of the TIG welding process, many improvements have been made in the production of electrodes. Most significantly is the addition of oxides to pure tungsten, creating tungsten alloys that provide the same level of emission as pure tungsten at much lower temperatures, improving starting performance of the electrode, arc stability, and tip life.

Each oxide has a different physical characteristic affecting tungsten performance. Electrodes are color coded, indicating the type of oxide used in the mix. Note: Color-coding is not standardized for all mixes, and it varies from the U.S., Europe, and Japan.

For most hand-held welding operations, Arc-Zone® recommends the ArcTime™ Hybrid Tungsten Electrode. For other applications, particularly automated welding, the best way to determine which tungsten alloy is best suited for your application is through testing. The following list is provided as a guide.



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## ArcTime™

### Hybrid All Purpose Tungsten Electrodes

This non-radioactive performance proven formula combines rare earth materials with tungsten to produce the best all-purpose tungsten electrode on the market. Experience reliable arc starting even after numerous ignitions.

Color Code: Sky Blue™ (US). Not std in Europe or Japan.



### 2% CERATED

Suitable for low-amp, DC orbital tube, pipe, thin sheet, and small part applications. This formula offers low current capacity, low arc ignition, good arc stability and is non-radioactive.

Color Code: Orange (US). Gray (Europe and Japan).



### 2% ICE-T™

Radioactive tungsten formula for easy arc starting, good arc stability and current capacity, and resistance to weld pool contamination. Vapors, grinding dust and disposal of thorium dioxide raise health, safety and environmental concerns. Use only when contractually required by FAR specification.

Color Code: Pink



### 1.5% LANTHANATED

Another good general purpose non-radioactive replacement for 2% Thoriated, and similar in performance to 2% lathanated. It features excellent ignition and re-ignition properties and good service life.

Color Code: Gold (US). Not std. in Europe or Japan.



### 2% LANTHANATED

This formula is a good general purpose non-radioactive replacement for 2% Thoriated. It has excellent ignition performance, low-burn-off rate, excellent re-ignition, and good service life.

Color Code: Blue (US). Not std. in Europe. Yellow-Green (Japan).



### 2% THORIATED

This formula is a popular general purpose electrode due to the excellent arc behavior and good tip life. This is a radioactive formula, however. Vapors, grinding dust and disposal of thorium dioxide raise health, safety and environmental concerns. Use only when contractually required by FAR specification.

Color Code: Red (US, Europe and Japan).



### 1% ZIRCONIATED

Used for radiographic-quality welding where tungsten contamination must be minimized. Balls-up easily in AC applications, good arc starting and current capacity. Non-Radioactive.

Color Code: Brown (US) White (Europe). Not std. in Japan.



### PURE TUNGSTEN

Pure tungsten has a high work-function which makes it difficult to start and maintain a stable arc. High burn-off rate results in short service life.

Color Code: Green (US, Europe and Japan)



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### 3. SELECT THE PROPER SIZE

Tungsten is generally sold in packages of 10 pieces in a variety of standard diameters from .020" (0.5mm) to .250" (6.4mm). The most common length is 7.00"(175mm) in the U.S. and 6.00" (152mm) in Europe. The most common diameters are: 1/16" (1.6mm), 3/32" (2.4mm), 1/8" (3.2mm).

Electrode diameter affects welding performance and weld bead shape. Again, the best way to determine which tungsten is best suited for your application is through testing. However, the following chart may serve as a general guide.

### 4. TUNGSTEN ELECTRODE RATING FOR WELDING CURRENTS

Electrode Diameter	Direct Current		Alternating Current	
	Straight Polarity	Reverse Polarity	Unbalanced Wave	Balanced Wave
	DCEN	DCEP		
.020" (0.5 mm)	5-2	n/a	5-15	10-20
.040" (1.0 mm)	15-80	n/a	10-60	20-30
1/16" (1.6 mm)	70-150	10-20	50-100	30-80
3/32" (2.4 mm)	150-250	15-30	100-160	60-130
1/8" (3.2 mm)	250-400	25-40	150-210	100-180
5/32" (4.0 mm)	400-500	40-55	200-275	160-240
3/16" (4.8 mm)	500-750	55-80	250-350	190-300
1/4" (6.4 mm)	750-1100	80-125	325-450	325-450

Different electrode materials will vary slightly from these guidelines. Use of gases other than Argon will also change the recommended currents. Use this chart as a general guide. Also keep in mind that for a given amount of amperage, larger diameter electrodes will last longer but will be harder to start. Excessive current will cause the electrode to melt and drop off. Insufficient current will lead to an unstable arc.

For further assistance in selecting the correct tungsten electrode for your welding application, refer to the Arc Zone Pro TIG Calculator, or contact an Arc-Zone.com® technician via email at [info@arc-zone.com](mailto:info@arc-zone.com), or call worldwide: **760-931-1500**.



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# tungsten grinders



## TUNGSTEN GRINDER SELECTOR GUIDE



Tungsten Grinder	Style	Grind Angles	Minimum Length	Degree Scale	Tip Flat Capable	Cut-Off Capable	Dust Collection	Tungsten Diameters
Sharpie Standard Tungsten Grinder	Hand-Held	20° Fixed	1-1/4" (31.7mm)	fixed	✓	✓		.040"-1/8" (1.0mm-3.2mm)
Sharpie Deluxe Tungsten Grinder	Hand-Held	15° - 45°	1-1/4" (31.7mm)		✓	✓		.040"-1/8" (1.0mm-3.2mm)
Power Point DCS	Hand-Held	15° - 45°	1-1/4" (31.7mm)		✓	✓	fully enclosed	.040"-1/8" (1.0mm-3.2mm)
Turbosharp X	Hand-Held w/ Bench Bracket	20° - 60°	3/4" (19mm)	✓	✓		fully enclosed	.040"-1/4" (1.0mm-6.4mm)
Orbitalum ESG+	Hand-Held w/ Bench Bracket	15°, 18°, 22.5°, 30° or 15°, 30°, 45°, 60°	< 1/2" (12mm)	fixed	✓	✓ +	optional enclosure	.040"-5/32" (1.0mm-4.0mm)
Neutrix	Hand-Held w/ Bench Bracket	15° - 180°	1/2" (13mm)	✓ +	✓		fully enclosed	.040"-5/32" (1.0mm-4.0mm)
Turbo 4	Portable Bench-Top	5° - 60°	1/2" (13mm)	✓	✓	✓	semi-enclosed	.040"-5/32" (1.0mm-4.0mm)
Piranha 2	Portable Bench-Top	10° - 60°	3/4" (19mm)	✓	✓	✓	semi-enclosed	.040"-3/32" (1.0mm-2.4mm)
Super Turbo	Portable Bench-Top	5° - 60°	1/2" (13mm)	✓	✓		semi-enclosed	1/16"-5/32" (1.0mm-4.0mm)
Piranha 3A	Bench-Top	10° - 60°	3/4" (19mm)	✓	✓	✓	semi-enclosed	.040"-3/16" (1.0mm-4.8mm)
Neutra LTG	Bench Mounted	10° - 50°	1/2" (13mm)	✓	✓		fully enclosed	.040"-3/16" (1.0mm-4.8mm)
TIG 10/175	Bench Mounted	10° - 180°	13/32" (10mm)	✓ +	✓ +	✓	optional vacuum	.040"-3/16" (1.0mm-4.8mm)
DGP-3-V2	Grinding Station	6° - 120°	0.2" (3mm)	✓ +	✓	✓ +	vacuum	.040"-3/16" (1.0mm-4.8mm)
Ultima TIG	Semi-Portable Bench-Top	15° - 180°	0.6" (15mm)	✓ +	✓ +		fully enclosed	.040"-3/16" (1.0mm-4.8mm)
Ultima TIG-Cut	Semi-Portable Bench-Top	15° - 180°	0.3" (7mm)	✓ +	✓ +	✓ +	fully enclosed	.040"-5/32" (1.0mm-4.0mm)

✓ + Degree Scale = Precision Grind Angle | ✓ + Tip Flat = Precision Tip Flat | ✓ + Cut Off = Precision Cut Off



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