Tungsten Electrode and Gas Selector Chart

BASE METAL TYPE	THICKNESS RANGE	DESIRED RESULTS	WELDING CURRENT	ELECTRODE TYPE	SHIELD GAS	TUNGSTEN PERFORMANCE CHARACTERISTICS
ALUMINUM ALLOYS AND MAGNESIUM ALLOYS	All	General Purpose	ACHF	Pure (EW-P)	Argon	Balls easily, low cost, tends to spit at higher currents, used for non-critical welds only.
				Zirconiated (EW-Zr)	Argon	Balls well, takes higher current, with less spitting and with better arc starts and arc stability than pure tungsten.
				2% Thoriated (EW-Th2)	75 Argon 25 Helium	Higher current range and stability, better arc starts, with lower tendency to spit, medium erosion.
	Only thin sections	Control penetration	DCRP	2% Ceriated (EW-Ce2)	Argon Helium	Lowest erosion rate, widest current range, AC or DC, no spitting, best arc starts and stability.
	Only thick sections	Increase penetration or travel speed	DCSP	2% Thoriated (EW-Th2)	75 Argon 25 Helium	Best stability at medium currents, good arc starts, medium tendency to spit, medium erosion rate.
				2% Ceriated (EW-Ce2)	Helium	Low erosion rate, wide current range, AC or DC, no spitting, consistent arc starts, good stability.
COPPER ALLOYS, Cu-NI ALLOYS AND NICKEL ALLOYS	All	General Purpose	DCSP	2% Thoriated (EW-Th2)	75 Argon 25 Helium	Best stability at medium currents, good arc starts, medium tendency to spit, medium erosion rate.
				2% Ceriated (EW-Ce2)	75 Argon 25 Helium	Low erosion rate, wide current range, AC or DC, no spitting, consistent arc starts, good stability.
	Only thin sections	Control penetration	ACHF	Zirconiated (EW-Zr)	Argon	Use on lower currents only, spitting on starts, rapid erosion rates at higher currents.
	Only thick sections	Increase penetration or travel speed	DCSP	2% Ceriated (EW-Ce2)	75 Argon 25 Helium	Low erosion rate, wide current range, AC or DC, no spitting, consistent arc starts, good stability.
MILD STEELS, CARBON STEELS ALLOY STEELS STAINLESS STEELS AND TITANIUM ALLOYS	All	General Purpose	DCSP	2% Thoriated (EW-Th2)	75 Argon 25 Helium	Best stability at medium currents, good arc starts, medium tendency to spit, medium erosion rate.
				2% Ceriated (EW-Ce2)	75 Argon 25 Helium	Low erosion rate, wide current range, AC or DC, no spitting, consistent arc starts, good stability.
				2% Lanthanated (EWG-La2)	75 Argon 25 Helium	Lowest erosion rate, widest current range on DC, no spitting, best DC arc starts and stability.
	Only thin sections	Control penetration	ACHF	Zirconiated (EW-Zr)	Argon	Use on lower currents only, spitting on starts, rapid erosion rates at higher currents
	Only thick sections	Increase penetration or travel speed	DCSP	2% Ceriated (EW-Ce2)	75 Argon 25 Helium	Low erosion rate, wide current range, no spitting, consistent arc starts, good stability.
				2% Lanthanated (EWG-La2)	Helium	Lowest erosion rate, highest current range, no spitting, best DC arc starts and stability.

TECHNICAL INFORMATION

RECOMMENDED TUNGSTEN ELECTRODES & SHIELDING GASES FOR TIG WELDING

Tungsten Electrode Tip Preperation

General Purpose

DCSP (EN) or DCRP (EP)

General Purpose

ACHF

Ball tip by arcing on clean metal at low current on DCRP (EP), then slowly increase currentt o form desired ball diameter. Return setting to AC

Tungsten Electrode Grinding Preperation

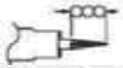
Shape by grinding longitudinally, never radially! Remove the sharp pointt o leave a truncated point with a flat spot. Diameter offl at spot determines the amperage capacity (see below).

Use a medium (<60grit) aluminum oxide wheel.

The included angle determines weld bead shape and size. Generally, as the included angle increases, penetration increases and bead width decreases.

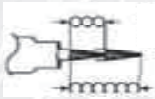
Tungsten Electrode Tip Extension

Standard Parts



General purpose 3X dia

With Gas Lens Cup Parts



General purpose 3X dia

max 6x dia

In draft free areas

Tungsten Electrode Tip Shapes and Current Ranges

Thoriated, ceriated and lanthanated tungsten electrodes maintain a point much better than the pure or zirconiated tungsten electrodes, which have a tendency to ball up when heated, and for this reason are typically used for DCSP welding. If used on AC, thoriated and lanthanated electrodes often split. Regardless oft he electrode tip geometry selected, iti s importantt hat a consistentti p configuration be used once a welding procedure is established. Changes in electrode geometry can have a significanti nfluence not only on the weld bead width and depth of penetration, but also on the electrical characteristics oft he arc. Below is a guide for electrode tip preparation for a range of sizes with recommended current ranges.

Electrode Diameter		Diameter at Tip		Constant Included Angle	Current Range	Pulsed Current Range
MM	IN	MM	IN	Degrees	Amps	Amps
1.0	0.040	0.125	0.005	12	5-15	5-25
1.0	0.040	0.250	0.010	20	5-30	15-60
1.6	1/16"	0.500	0.020	25	15-50	20-100
1.6	1/16"	0.800	0.030	30	20-70	30-140
2.3	3/32"	0.800	0.030	35	25-90	35-180
2.3	3/32"	1.100	0.045	45	30-150	35-250
3.2	1/8"	1.100	0.045	60	35-200	40-300
3.2	1/8"	1.500	0.060	90	40-250	40-350