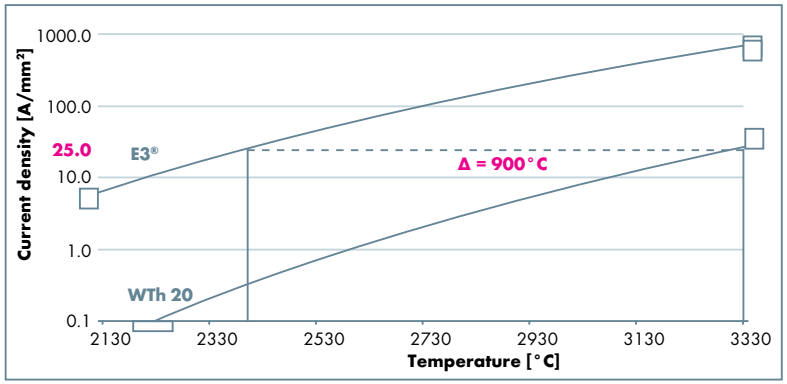
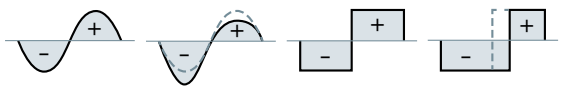
Tungsten electrodes

- The welder is no longer exposed to radiation
- Reduced environmental impact. Remaining pieces and grinding dust are no longer treated as hazardous
- No special safeguards required for storage and transport
- Electrode tip remains "cooler" than thoriated types
- Superior repeatable ignition characteristics
- Increased arc stability
- Reduced burn off
- Higher current carrying capacity
- Lower degradation to the electrode tip
- Increased application flexibility

Higher electrical rating



	E3® purple	WLa 15 gold	WLa 20 blue	WCe 20 grey	WP green	WZr 08 white
DC negative	+++	++	+++	+	–	–
Alternating current	+++	+	+	+	+	++
Arc stability	++	+	++	+	–	++
Ignitability	++++	++	+++	+	–	+
Service life	++++	++	+++	+	+	++
High-alloy steels suitability	++++	+++	+++	+++	–	–
Aluminium suitability	++++	+	+	+	++	++



WP electrodes are not suitable for alternating current welding with the rectangular pulse waveform. In contrast, E3® electrodes achieve best welding results with high service life if the following parameters are complied with:

Rectangular sinusoidal pulse
- Grinding angle: 60°
- Smallest possible igniting current

Rectangular pulse
- Frequency: max. 75 Hz
- Balance: 25 % + / 75 % –

E3® electrodes remain approx. 900 °C colder than WTh 20 electrodes with the same load.

After 150 strikings the E3® electrode displays considerably less wear.

Tungsten electrodes

E3®[2]

Electrodes with rare earth (mixed oxides). In comparison to thoriated electrodes this electrode is less harmful to the environment and not radioactive. The electrodes offer excellent ignition characteristics and consistent welding properties. They are universal and suitable for all applications in the whole range of DC and AC welding for non-alloyed and high-alloyed steel, aluminium, titanium, nickel, copper and magnesium alloys. Because of their great ignition properties they are also suitable for automated welding. Due to the low electrode temperature, they offer an increased current carrying capacity and longer service life than thoriated electrodes.
Colour-coding: **E3® = purple**

WLa 10 / 15 / 20

Lanthanated electrodes are suitable for applications in DC and AC welding. Their main areas of application are the welding of non-alloyed and high-alloyed steel, aluminium, titanium, nickel, copper and magnesium alloys. These electrodes are also suitable for the use in micro-plasma welding. Ignition characteristics are enhanced with increased amounts of lanthanum oxide (La2O3). The overall service life and current carrying capacity is lower than the E3® electrodes.
Colour-coding: **WLa 10 = black / WLa 15 = gold / WLa 20 = blue**

WCe 20

By adding cerium oxide (CeO_2), these electrodes have an increased capacity compared to pure tungsten electrodes, however the WCe electrodes have a lower capacity than the E3® and WL electrodes. Main areas of application are in the DC and AC welding of non-alloyed and high-alloyed steel, aluminium, titanium, nickel, copper and magnesium alloys in the low and middle current range.
Colour-coding: **WCe 20 = grey**

WP

Undoped electrodes – consist of pure tungsten. The main area of application for this type of electrode is the AC welding of aluminium alloys with excellent arc stability. The WP-electrodes are not suitable for DC welding.
Colour-coding: **WP = green**

WZr 08

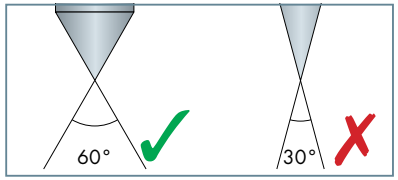
Tungsten electrodes with the addition of zirconium have a lower risk of contaminating the weld from deposits of tungsten. The main area of application for this electrode is AC welding. They are limited in their suitability for DC welding.
Colour-coding: **WZr 08 = white**

Tungsten electrodes per DIN EN ISO 6848 (10 pcs.)

Length: 175 mm[1] **Electrodes-Ø**	E3®[2] purple	WLa 10 black	WLa 15 gold	WLa 20 blue	WCe 20 grey	WP green	WZr 08 white
1.0 mm	700.0304.10	700.0157	700.1183	700.0219	700.0166	700.0003	700.0028
1.6 mm	700.0306.10	700.0158	700.1184	700.0220	700.0167	700.0007	700.0030
2.0 mm	700.0307.10	700.0159	700.1185	700.0221	700.0168	700.0009	700.0032
2.4 mm	700.0308.10	700.0160	700.1186	700.0222	700.0169	700.0012	700.0034
3.2 mm	700.0310.10	700.0162	700.1187	700.0223	700.0170	700.0016	700.0036
4.0 mm	700.0311.10	700.0163	700.0255	700.0242	700.0171	700.0018	700.0037

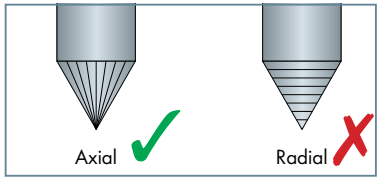
[1] Tungsten electrodes in 150 mm length on demand.
[2] According to DIN EN ISO 6848.

Important for best results: angle and direction of grinding



E3® electrodes generate the best welding result if they are ground at an angle of 60° and are used within their amperage-range.

More acute angles should only be used in low current ranges. However, changing to a thinner electrode would be better.



Along with the grinding quality, the arc is influenced by the direction of grinding.

The arc can break off with a radial grinding direction. In addition, this considerably reduces the service life of the electrodes.