WTh 钍钨电极系列

Thorium-Tungsten Electrode

钍钨电极是一种广泛使用的添加氧化物的电极，操作简单， 电流负荷大，引弧容易， 电弧稳定，断弧间隙大，损耗小，使用寿命长，再结晶温度高，导电率好，机械切割性能好。钍钨电极广泛用于碳钢、不锈钢、镍合金和钛金属的焊接，是高品质焊接的首选材料。

Thorium-Tungsten Electrode is widely used as an additive oxide electrode. It can be operated easily, has a high current load and produces arc easily and steadily. In addition, the gap of the breaking arc is big, loss less and longer life. With higher re-crystallized temperature, better conductivity and mechanical cutting property, thorium-tungsten electrode is applied to welding carbon steel, stainless steel, nickel alloy and titanium metal. It becomes the first selection material for high quality welding.

Trade mark 牌号	Added impurity 添加氧化物	Impurity quantity % 含量	Impurities Content % 杂质含量	Tungsten Content% 钨含量	Electric discharged Power ev 电子逸出功率	Color sign 色标	Standard 标准
WT10	ThO_2	0.9~1.2	<0.2	余量 Balance	2.0-3.9	Yellow 黄	IS06848 AWS A5.12M
WT20	ThO_2	1.8~2.2	<0.2	余量 Balance	2.0-3.9	Red 红	
WT30	ThO_2	2.8~3.2	<0.2	余量 Balance	2.0-3.9	Purple 紫	
WT40	ThO_2	3.8~4.2	<0.2	余量 Balance	2.0-3.9	Orange 橙	

WCe 铈钨电极系列

Cerium-Tungsten Electrode

铈钨电极没有放射性污染，属于绿色环保钨制品，仅用很小的电流就能轻松起弧，而且维弧电流也较小。它常用于管道，不锈钢制品和细小精密部件的焊接。

Cerium-Tungsten Electrode is a non-radioactive and environmentally friendly tungsten electrode. It can start performing arc under the condition of low electric current. It can be used for welding of pipe, stainless and fine parts.

Trade mark 牌号	Added impurity 添加氧化物	Impurity quantity % 含量	Impurities Content % 杂质含量	Tungsten Content% 钨含量	Electric discharged Power ev 电子逸出功率	Color sign 色标	Standard 标准
WC20	CeO_2	1.8~2.2	<0.2	余量 Balance	2.7~2.8	Grey 灰	IS06848 AWS A5.12M

WLa 镧钨电极系列

Lanthanum-Tungsten Electrode

镧钨电极的导电性能最接近 2% 钍钨电极，电焊工不需要改变任何焊接操作程序就能方便快捷的使用这种电极替代钍钨电极而免受钍钨电极的放射性危害。如果无过载电流，寿命比钍钨更长，在大多数使用中起弧更容易。尤其擅长防止热冲击，短期焊接中重复点火的情况下，焊接良好避免污染。镧钨电极另一优点表现在电流高而烧损率最小。

The electric conductivity of Lanthanum-Tungsten Electrode is most closed to that of 2% Thoriated Tungsten Electrode. Welders can easily replace Thoriated Tungsten Electrode with Lanthanum - Tungsten Electrode at either AC or DC and do not have to make any welding program changes. If there is no overloaded current, Lanthanum-Tungsten Electrode has longer life than Thoriated Tungsten Electrode. Especial for preventing thermal shock, short cycle and repeated welding, this could help to reduce contamination. Another advantage of Lanthanum-Tungsten Electrode is being able to bear high current and have the lowest burn-loss rate.

Trade mark 牌号	Varieties 种类	Impurity quantity % 含量	Impurities Content % 杂质含量	Tungsten Content% 钨含量	Electric discharged Power ev 电子逸出功率	Color sign 色标	Standard 标准
WL10	La_2O_3	0.8~1.2	<0.2	余量 Balance	0.8-1.2	Black 黑	ISO 6848 AWS A5.12M
WL15	La_2O_3	1.3~1.7	<0.2	余量 Balance	1.3-1.7	Gold 金	
WL20	La_2O_3	1.8~2.2	<0.2	余量 Balance	1.8-2.2	Sky Blue 天蓝	

WZr 锆钨电极系列

Zirconium-Tungsten Electrode

锆钨电极在交流条件下焊接性能良好，并且具有良好的抗腐蚀性。尤其在高负载电流情况下，锆钨电极表现出来的优越性能是其他电极不可替代的。在高负载电流下，锆钨电极的端部能保持圆球状而减少渗钨的现象，适合用于交流条件下的镁铝及其合金的焊接。

Zirconium-Tungsten Electrode bears a fine performance in welding under the condition of AC and has a good corrosion resistance. Especially in the case of high load of current, the excellent performance of Zirconium-Tungsten electrode is far better than that of other electrodes. When in the high load current, the top of its electrode can keep globular to reduce the seepage of tungsten. It is suitable for welding magnesium, aluminum and their alloy under alternating current.

Trade mark 牌号	Added impurity 添加的氧化物	Impurity quantity % 氧化物的含量	Other impurity 杂质含量	Electric discharged Power ev 电子逸出功率	Color sign 色标	Standard 标准
WZ3	ZrO_2	0.2~0.4	<0.2	2.5~3.0	Brown 棕	ISO 6848 AWS A5.12M
WZ8	ZrO_2	0.7~0.9	<0.2	2.5~3.0	White 白	

WP 纯钨电极系列

Pure-Tungsten Electrode

纯钨电极不添加任何稀土氧化物，电子发射能力最小，引弧电压高，载流能力差，易烧损，适合交流条件下和要求不严格的场合。

Pure Tungsten Electrode is the electrode without any addition of oxide. The electron emission capability is the smallest. It requests a high voltage for arc derivation and has a low current capacity and easily burnt. Consequently, it is commonly used in condition of AC and low welding requirements.

Trade mark 牌号	Added impurity 添加的氧化物	Added impurity% 掺杂质	Impurities Content % 杂质含量	Tungsten Content% 钨含量	Electric discharged Power ev 电子逸出功率	Color sign 色标	Standard 标准
WP	—	—	<0.2	余量 Balance	4.5	GREEN 绿	ISO 6848 AWS A5.12M

WY 钇钨电极系列

Yttrium-Tungsten Electrode

钇钨在焊接弧束细长，压缩程度大， 在中、大电流时熔深比较大， 目前主要用于军事工业和航空、航天工业。

Yttrium-Tungsten Electrode produces a slim arc and a level of compression when used in welding. It has a deeper melting depth in medium and high current. It is mainly in the military, aviate and astronautic industries.

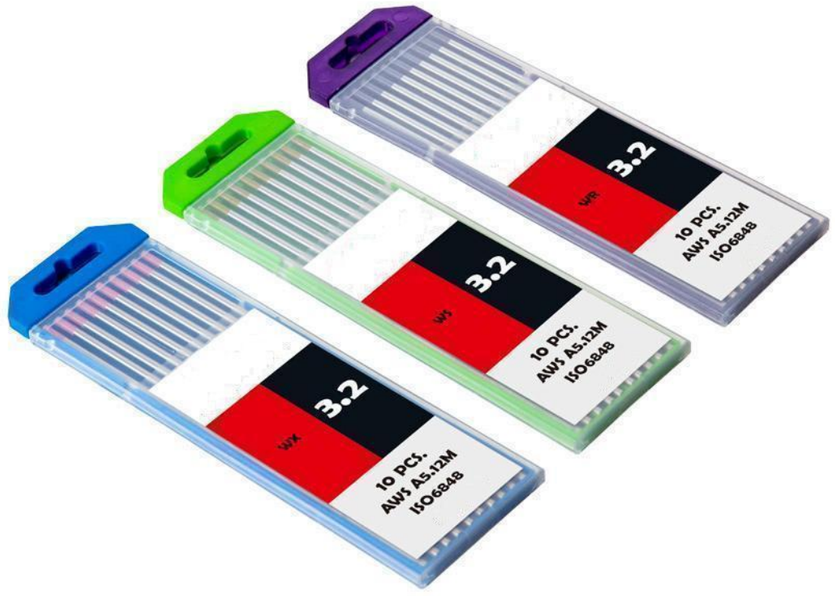
Trade mark 牌号	Added impurity 添加的氧化物	Added Impurity Content% 添加的氧化物的含量	Impurities Content % 杂质含量	Tungsten Content% 钨含量	Electric discharged Power ev 电子逸出功率	Color sign 色标	Standard 标准
WY20	Y_2O_3	1.8-2.2	<0.2	余量 Balance	2.0-2.9	Blue 蓝	ISO 6848 AWS A5.12M

WR 复合多元钨电极系列

Composite Tungsten Electrode

复合钨是在钨中添加两种以上的稀土氧化物，各种添加元素相得益彰，互为补充，使其焊接性能更出众。

Composite tungsten electrode is the Tungsten material with two or more rare earth oxide additives. Every additive works to the benefit of others and serves as a complement at the same time to make its welding performance more outstanding.



Trade mark 牌号	Added impurity 添加的氧化物	Added impurity% 掺杂质	Impurities Content % 杂质含量	Tungsten Content% 钨含量	Electric discharged Power ev 电子逸出功率	Color sign 色标	Standard 标准
WX	---	1.0-4.0	<0.2	余量 Balance	2.45-3.1	Pink 粉	ISO 6848 AWS A5.12M
WS	---	1.8-2.2	<0.2	余量 Balance	2.45-3.1	Yellowish-green 黄绿	
E3	---	1.0-4.0	<0.2	余量 Balance	2.45-3.1	Purple 紫	

钨电极的选择

电极直径 Diameter of Electrode		直流电 /A DC/A				交流电 /A AC/A	
		电极接负极（-） Negative Contact（-）		电极接正极（+） Positive Contact（+）			
In Inch	mm	纯钨 WP	釷钨 WTH	纯钨 WP	釷钨 WTH	纯钨 WP	釷钨 WTH
0.02	Ø0.5	2~20	2~20	—	—	2~15	2~15
0.04	ø1.0	10~75	10~75	—	—	15~55	15~70
1/16”	ø1.6	60~150	60~150	10~20	10~20	45~90	60~125
2/25”	ø2.0	75~180	100~200	15~25	15~25	65~25	85~160
3/32”	ø2.4	120~220	150~250	15~30	15~30	80~140	120~210
1/8”	ø3.2	160~310	225~330	20~35	20~35	150~190	150~250
5/32”	ø4.0	275~450	350~480	35~50	35~50	180~260	240~350
3/16”	ø4.8	380~600	480~650	50~70	50~70	240~350	330~460
1/4”	ø6.4	575~900	750~1000	70~125	70~125	325~450	450~600

牌号和极性对照表

Electrode type and polarity depending on the welding material

1: 最好 best;　2: 较好 better;　--: 不推荐 not recommended

材料 Material	牌号 Electrode Type	直流 DC		交流 AC
		负极 Electrode Negative（-）	正极 Electrode Positive (+)	
铝 Aluminum (thickness ≤ 2.5mm)	WP WZ8	2	2	1
铝 Aluminum (thickness>2.5mm)	WP WZ8	2	--	1
铝合金 Aluminum Alloys	WC20 WP WZ8	2	--	1
镁 Magnesium	WP WZ8	--	2	1
镁合金 Magnesium Alloys	WC20 WP WZ8	--	2	1
碳钢 Carbon Steel	WL15 WL20 WC20 WT20	1	--	--
不锈钢 Stainless Steel	WL15 WL20 WC20 WT20	1	--	--
铜 Cooper	WL15 WL20 WC20 WT20	1	--	--
青铜 Bronze	WL15 WL20 WC20 WT20	1	--	2
铝铜 Aluminum Bronze	WP WZ8	2	--	1
硅铜 Silicon Bronze	WL15 WL20 WC20 WT20	1	--	--
镍及其合金 Nickel and Its Alloys	WP WZ8	1	--	2
钛及其合金 Titanium and Its Alloys	WL15 WL20 WC20 WT20	1	--	2