

铸造系列1 —— 镁基牺牲阳极

Casting Series I —— Magnesium Based Sacrificial Anode

镁基牺牲阳极有纯镁、Mg-Mn 系合金和 Mg-Al-Zn-Mn 系合金等三类，比其他牺牲阳极密度小、容量大、电位负、极化率低，(镁的标准电极电位为-2.73V(EH)，在海水中的稳定电位为-1.45V) 对钢铁的驱动电压大，特别适用于电阻率较高的土壤和淡水中金属构件的保护，是制作牺牲阳极理想材料。

镁合金牺牲阳极以铸造和挤压工艺生产梯形、D型、棒状(圆棒、矩形棒)各牌号的镁阳极，如土壤及水中常用的为 D 形和梯形截面的铸造阳极；在家用或工业用热水器用挤压的圆柱形阳极；在高电阻率土壤中或套管内多用带状高电位镁阳极；在水下常用半球形阳极；在低电阻率环境中可用复合阳极。镁还用于制造燃料电池，也能作光刻板。

光鈺严控质量要求，不断优化铸造与挤压的生产工艺，为客户量身订制高效、耐用、环保、多样化、具竞争优势品项的镁牺牲阳极材料。

Magnesium based sacrificial anodes can be classified into pure magnesium, Mg Mn alloy and mg Al Zn Mn alloy. Compared with other sacrificial anodes, magnesium based sacrificial anodes have lower density, larger capacitance, negative potential and lower polarizability (the standard electrode potential of magnesium is -2.73v (EH), and the stable potential in tap water is -1.45v) Because of the high driving voltage of steel, it is especially suitable for the protection of metal components in soil and fresh water with high resistivity.

Magnesium alloy sacrificial anodes are made of trapezoidal, D-shaped and rod-shaped magnesium anodes (round rod and rectangular bar) by casting and extrusion process. For example, D is commonly used in soil and water. The results show that the new anode has the following advantages: cast anode with V-shaped and trapezoidal cross-section; extruded cylindrical anode used in domestic or industrial water heater; ribbon high potential magnesium anode in high resistivity soil or casing; hemispherical anode commonly used in underwater; composite anode in low resistivity environment. Magnesium is also used to make fuel cells, as well as photorefractive.

MACH strictly controls the quality requirements, continuously optimizes the casting and extrusion production process, and customizes the magnesium sacrificial anode materials with high efficiency, durability, environmental protection, diversification and competitive advantages.

技术要求

Technical Requirement And Standards

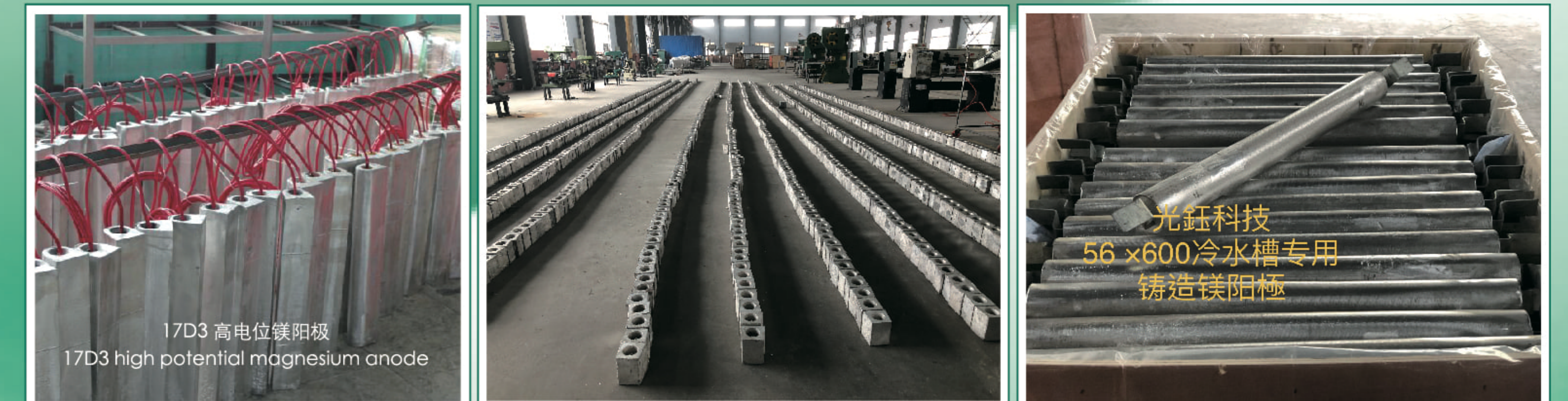
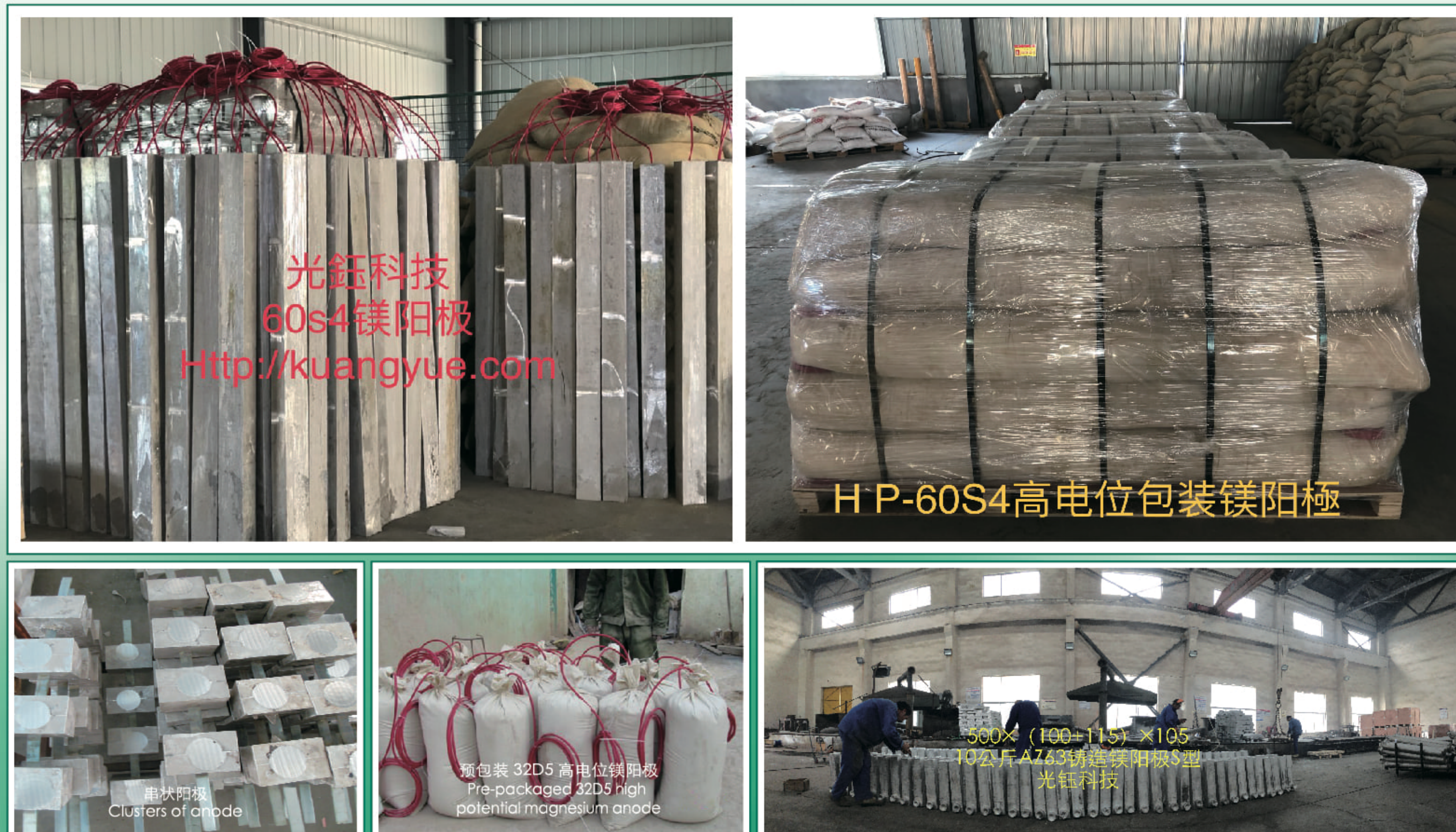
执行标准: ASTM B843
GB/T17731
AS2239

牌号 Type		化学成分 (质量分数) Chemical composition (by mass)													
		合金元素 Alloying elements				杂质, 不大于 Impurities less than									
	余量 Balance	Mg%	Al%	Zn%	Mn%	Fe%	Cu%	Ni%	Si%	Ce%	Zr%	Ca%	Be%	Ti%	其他元素 Other elements 单个 Each 总计 Total
AZ63B	余量 Balance	5.3~6.7	2.5~3.5	0.15~0.60	0.003	0.01	0.002	0.08	-	-	-	-	-	-	0.30
AZ31B	余量 Balance	2.5~3.5	0.60~1.4	0.20~1.0	0.003	0.01	0.001	0.08	-	-	0.04	-	-	-	0.30
MIC	余量 Balance	≤0.01	-	0.50~1.3	0.01	0.01	0.001	0.05	-	-	-	-	-	-	0.30

电化学性能 Electrochemical Performance				
牌号 Type	开路电位 Open circuit potential (-V,Cu/CuSO)	闭路电位 Closed-circuit potential (-V,Cu/CuSO)	实际容量 Actual capacity (A.h/kg)	电流效率 Current efficiency %
AZ63B	1.57~1.67	1.52~1.57	≥1 210	≥55
AZ31B	1.57~1.67	1.47~1.57	≥1 210	≥55
MIC	1.77~1.82	1.64~1.69	≥1 100	≥50

梯形镁阳极重量及外形尺寸 The ladder magnesium anode weight and dimensions										
重量Weight(kg)	A/mm		B/mm		H/mm		L/mm			
	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)
1.4	-	76.2	-	-	-	-	76.2	-	114.3	-
2.3	2	76.2	72	-	52	-	76.2	52	190.5	350
4.1	4	86.3	95	66	75	-	89	75	336	350
7.7	8	101.6	95	81.3	75	-	101.6	75	459	700
-	11	-	110	-	90	-	-	88	-	700
14.5	14	127	120	106.7	100	-	127	102	536	700
22.8	22	178	150	150	130	-	178	125	429	700
27.2	-	106	-	87	-	-	106	-	1524	-

D形镁阳极重量及外形尺寸 D type magnesium anode weight and dimensions										
重量Weight(kg)	A/mm	B/mm	C/mm	R/mm	H/mm	I/mm	J/mm	K/mm	L/mm	
1.4	70	48	22	29	76	25	19	148	185	
2.3	70	48	22	29	76	25	19	254	305	
4.1	70	48	22	29	76	25	19	458	549	
7.7	89	48	22	38	95	38	29	546	641	
10.0	89	48	22	38	95	38	29	646	832	
14.5	140	48	22	62	146	38	29	419	505	
21.8	140	48	22	62	146	38	29	546	765	



铸造系列2 —— 高电位镁合金牺牲阳极

Casting Series 2 —— High Potential Magnesium Alloy Sacrificial Anodes

高电位镁合金牺牲阳极是镁锰合金(Mn的含量甚至达到 0.5%~1.3%), 其电化学性能满足开路电位大于 -1.7V, 电流效率大于50%。(超高电位阳极指开路电位 $\geq -1.85V$ 、相对 Cu/CuSO₄, 电流效率大于 60% 的镁阳极); 低电位镁合金牺牲阳极是镁铝锌合金, 主要有 AZ31 系列和 AZ63 系列。

高电位镁阳极分铸造与挤压二类, 主要用于高电阻率的土壤环境及淡水之中, 如对输油管道、海上钻井平台、港口码头和地下建筑等钢结构建筑的保护。生产过程要严控锰铁等元素, 降低有害杂质含量, 细化晶粒度减少铸造缺陷, 避免镁阳极自溶倾向, 否则电化学性能很难合格。透过铸造上短流程工艺、分层加热或低压转注技术, 光钇生产的高电位镁阳极产品经超声波探伤、缩孔、表面质量、无夹杂与氧化夹杂现象、电化学性能良好。

The high potential magnesium alloy sacrificial anode is Mg-Mn alloy (the content of Mn even reaches 0.5% ~ 1.3%), and its electrochemical performance meets the requirements of open circuit potential greater than -1.7V and current efficiency greater than 50%. (the ultra-high potential anode refers to the magnesium anode with open circuit potential $\geq -1.85V$, current efficiency greater than 60% relative to Cu/CuSO₄); low potential magnesium alloy sacrificial anode is Mg-Al-Zn alloy, mainly in cluding AZ31 series and AZ63 series.

High potential magnesium anode can be divided into casting and extrusion. It is mainly used in the soil environment with high resistivity and fresh water, such as the protection of steel structures such as oil pipe-lines, offshore oil drilling platforms, ports and underground buildings. In the production process, it is necessary to study and control the elements such as ferromanganese, reduce the content of harmful impurities, refine the grain size, reduce casting defects, and avoid the autolysis tendency of magnesium anode, otherwise, the electrochemical performance is very difficult to be qualified. Through the short casting process, stratified heating or low-pressure injection technology, the high potential magnesium anode products produced by Guangyu have good electrochemical performance through ultrasonic flaw detection, shrinkage cavity, surface quality, no inclusions and oxidation inclusions.



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<http://www.kuangyue.com>



技术要求

Technical Requirement And Standards

执行标准: ASTM B843
GB/17731
AS2239-2

化学成分 Chemical composition										
牌号 Type	合金元素 Alloying elements				杂质, 不大于 Impurities less than					
	%	Zn%	Mn%	Mg%	Fe%	Cu%	Ni%	Si%	其他元素 Other elements 第一 Each	总计 Total
MGAZ63B	5.3~6.7	2.5~3.5	0.15~0.60	Balance	0.003	0.01	0.001	0.08	-	0.30
MGAZ31B	2.7~3.5	0.6~1.4	0.2~1.0	Balance	0.003	0.01	0.001	0.08	0.05	0.30
MGMIC	≤ 0.01	-	0.5~1.3	Balance	0.01	0.01	0.001	0.05	0.05	0.30

电化学性能 Electrochemical Performance				
牌号 Type	开路电位 Open circuit potential (-V,Cu/CuSO ₄)	闭路电位 Closed-circuit potential (-V,Cu/CuSO ₄)	电流效率 Current efficiency %	发生电量 Generating current amount (A.h)/kg(CuSO ₄)
MGAZ63B	1.57~1.67	1.52~1.57	≥ 55	≥ 1210
MGAZ31B	1.57~1.67	1.52~1.57	≥ 55	≥ 1210
MGMIC	1.77~1.82	1.64~1.69	≥ 50	≥ 1100

阳极规格及外观尺寸 Anode Dimensions					
C型 C Type	型号 Type	直径 Diameter (mm)	重量 Weight (kg)	高电位阳极 L High Potential L (mm)	AZ63 阳极 L AZ63 anode L (mm)
		C25	75	2.56	336
	C36	114	3.7	202	193
	C41	114	4.2	230	220
	C77	110	7.8	431	412
	C100	110	10.2	560	536
	C145	146	14.7	494	472
	C227	178	22.9	520	497
	C274	114	28.2	1528	1462
D型 D Type	型号 Type	重量 Weight (kg)	A (mm)	规格 Specification B (mm)	C (mm)
	9D2	4.082	69.9	76.2	549.3
	14D2	6.350	69.9	76.2	850.9
	20D2	9.072	69.9	76.2	1212.9
	9D3	4.082	88.9	95.3	352.4
	17D3	7.711	88.9	95.3	641.4
	32D5	14.515	139.7	146.1	504.8
	48D5	21.772	139.7	146.1	765.2
	1.5Kg	1.5	80.0	70.0	190.0
	2.5Kg	2.5	80.0	70.0	300.0
S型 S Type	型号 Type	重量 Weight (kg)	A (mm)	规格 Specification B (mm)	C (mm)
	3S3	1.4	76.2	76.2	114.3
	5S3	2.5	76.2	76.2	190.5
	9S2	4.1	50.8	50.8	685.8
	9S3	4.1	76.2	76.2	342.9
	17S2	7.7	50.8	50.8	1295.4
	17S3	7.7	76.2	76.2	647.7
	20S2	9.1	50.8	50.8	1524.0
	32S3	14.5	76.2	76.2	1143.0
	32S5	14.5	127.0	127.0	533.4
	40S3	18.1	76.2	76.2	1524.0
	48S5	21.8	127.0	127.0	787.4
	60S4	27.2	101.6	127.0	1524.0
序号 No.	镁重 Weight (kg)	规格 (长 × 宽 × 高) Size (length × width × height)			
1	4±0.2	350×(75+95)×75			
2	8±0.2	700×(75+95)×75			
3	11±0.3	700×(90+110)×88			
4	14±0.3	700×(120+100)×102			
5	22±0.5	700×(130+150)×125			

◆ 外形尺寸可根据用户需要生产。Different dimensions can be custom-made for the clients.