

## **MAGNESIUM ANODES**

Magnesium has got a very electronegative potential compared to other sacrificial anodes and self corrosion rate is too much, if not alloyed. Other impurities particularly iron and other heavy metals can significantly affect the efficiency of the Mg anodes. The addition of zinc causes the Mg anode to corrode homogenously, at the same time, reduces the sensitivity of the anode to other impurities that is just described above.

The most common type of Mg anodes are high-potential and standard type (AZ-63). The high-potential Mg anode has a advantage of relatively high electronegative potential by adding small percentage of manganese to the alloy.

As Mg anode has the highest driving potential compared to other galvanic anodes, makes it better to use in high soil resistivity environments and fresh water. In addition to this, Mg anodes are not pollute and does not contaminate the electrolyte as it is also used in potable water tanks internal galvanic cathodic protection.

The Mg anodes are also useful in combination of usage with other (low potential) galvanic anodes. Because it has high driving potential than, for example, aluminum; which supports and speeds up the initial polarization of the structure.

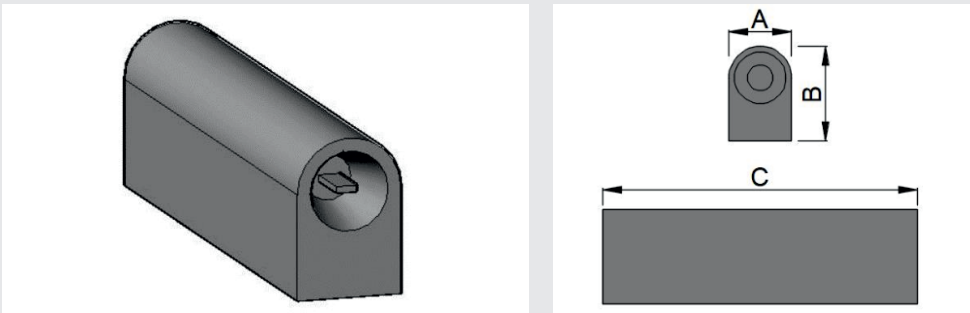
Type of applications with magnesium anodes are;

- Temporary protection of buried pipelines
  - Protection of well coated buried pipelines
  - Internal protection of water tanks
  - Protection of small marine structures
  - "Hot spot" locations for buried & submerged steel structures
  - Magnesium anode is suitable to be used in soil, mud, freshwater, brackish water and seawater.
- For buried applications, the bare Mg anode is assembled with cable, sealed with epoxy resin and packaged in a cotton bag.

### **Composition of Backfill**

- Gypsum 75%
- Bentonite 20%
- Sodium Sulphate 5%

KORTEK standard production and main stock of magnesium anodes for buried structure applications are as below;



## MAGNESIUM ANODES

Product Code	Bare Anode Weight		Width - A (mm)	Height - B (mm)	Length - C (mm)
	Lb	Kg			
MG-D01	3,5	1,58	84	73	270
MG-D02	5	2,26	87	78	270
MG-D03	10	4,5	100	100	290
MG-D03	17	7,7	140	110	510
MG-D04	22	10	140	120	595
MG-D05	32	14,5	145	145	600
MG-D06	44	20	138	162	800
MG-D07	60	27,2	80	155	1500

### ALLOY COMPOSITION

	Standard	High Potential
<b>Aluminum</b>	5.30-6.70%	0.01% max
<b>Zinc</b>	2.50-3.50%	-
<b>Manganese</b>	0.15-0.70%	0.50-1.30%
<b>Silicon</b>	0.10% max	0.05% max
<b>Copper</b>	0.02% max	0.02% max
<b>Nickel</b>	0.002% max	0.001% max
<b>Iron</b>	0.003% max	0.03% max
<b>Other Impurities</b>	-	0.05% max
<b>Total</b>	0.30% max	0.30% max
<b>Magnesium</b>	Balance	Balance

### ELECTROCHEMICAL PROPERTIES

	Standard	High Potential
Open Circuit Potential wrt Cu/CuSO <sub>4</sub>	1.50 - 1.55 Volts	1.70 - 1.75 Volts
Output Capacity	1200 A.h/kg	1100 A.h/kg
Current Efficiency	50%	50%