

MAGNESIUM ANODES

Typical application

Magnesium anodes are used for protecting buried pipelines and tanks, heat exchangers and chillers, large gate valves, evaporative condensers, hot water tanks, etc.

They are available in many shapes and sizes as well as either bare ingots or pre-packaged in cotton bags with chemical backfill.



Anodes Alloy

The SYNCOR supply the standard H1 alloys ASTM AZ63 the efficiency of the alloy it is 50-54% the capacity of them is 1100-1188 Ah/kg and produce an open circuit potential -1,50 to -1,60V (Copper/Copper Sulphate electrode)

SYNCOR also supply the High Potential alloy.

The efficiency of this alloy is 50-58%, the capacity 1100-1280 Ah/kg and the open circuit potential -1,70 to -1,78V (Copper/Copper Sulphate electrode). The chemical composition of these alloys is listed to the following table:

Alloy Compositions

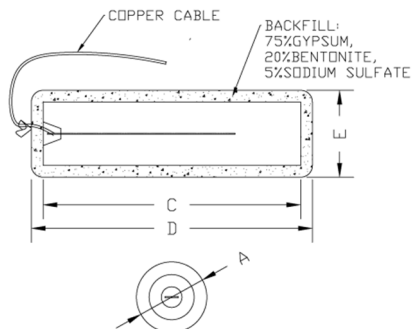
Element	AZ63	M1C High Potential
Aluminum	5.3 - 6.7 %	0.01 %
Zinc	2.5 - 3.5 %	
Manganese (Min)	0.15 - 0.7 %	0.50 – 1.30 %
Iron (Max.)	0.003 %	0.03 %
Nickel (Max.)	0.002 %	0.001 %
Copper (Max.)	0.02 %	0.02 %
Silicon (Max.)	0.10 %	0.05 %
Other single (Max.)		0.05 %
Total Other (Max.)	0.30 %	0.30 %
Magnesium	Balance	Balance
Electrochemical properties		
Capacity	1200Ah/kg	1250Ahr/Kg
Efficiency	50-54 %	50-58 %
Closed Circuit potential	-1.50 V	-1.70 V
Open circuit potential	-1.60 V	-1.78 V

Products

SYNCOR magnesium anodes can be supplied in a variety of dimension and weights to meet client's request.

The most common shape of them is Trapezoid "S" type cylindrical "C" type and D shape "D" type.

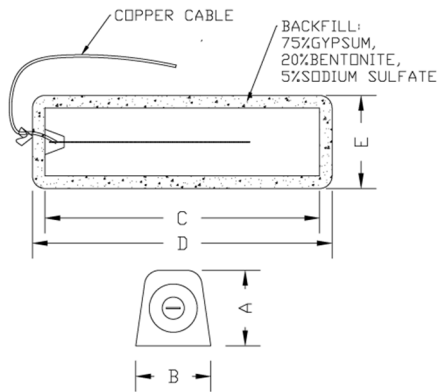
"C" shape Mg Sacrificial anodes



Type	Bare			Packed		
	Wt(Kg)	A(mm)	C(mm)	Wt(kg)	D(mm)	E(mm)
C25	2,5	70	336	6.5	390	130
C36	3,6	114	202	7.2	250	160
C41	4,1	114	230	8.0	280	160
C77	7,7	110	431	27.4	480	160
C100	10,0	110	560	28.2	610	160
C145	14,5	146	494	31.0	540	200
C227	22,7	178	520	34.5	570	230
C274	27,4	114	1524	56.8	1580	160

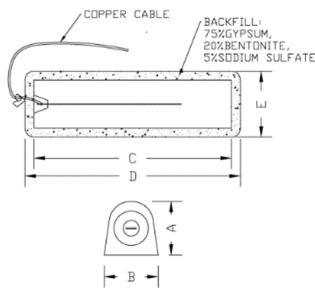
MAGNESIUM ANODES

S” shape Mg Sacrificial anodes



Type	Wt(Kg)	Bare			Packed		
		A(In)	B (In)	C(In)	Wt(kg)	D(in)	E(in)
3S3	1,4	3	3	4,5	4.1	7.5	6
5S3	2,3	3	3	7,5	6.4	10.5	6
9S2	4,1	2	2	27	21	30	5
9S3	4,1	3	3	13,5	11	16.5	6
17S2	7,7	2	2	51	32	54	5
17S3	7,7	3	3	25,5	20	28.5	6
20S2	9,1	2	2	60	37	63	5
32S3	14,5	3	3	45	41	48	6
32S5	14,5	5	5	21	32	24	8
40S3	18,1	3	3	60	47	63	6
48S5	21,8	5	5	31	45	34	8

“D” shape Mg Sacrificial anodes



Type	Wt(Kg)	Bare			Packed		
		A(mm)	B(mm)	C(mm)	Wt(Kg)	D(mm)	E(mm)
3D3	1.4	95	89	114	3.6	254	152
5D3	2.3	95	89	189	7.7	305	152
9D3	4.1	95	89	340	12.2	432	152
17D3	7.7	95	89	639	20	864	191
20D2	9.1	76	70	1518	31.8	1676	127
32D3	14.5	95	89	1149	41.3	1346	165
32D5	14.5	127	140	495	31.8	711	203
48D5	21.8	146	140	730	45.4	965	203

Backfill

Magnesium anodes used in soils require the use of a prepared backfill around the anode for the following reasons:

- Increase the effective surface area which lowers the anode-to-earth contact resistance.
- The bentonite clay absorbs and retains moisture.
- The gypsum provides a uniform, low resistance environment.
- The sodium sulfate (a depolarizing agent) minimizes pitting attack and oxide film formation.

Today, the standard backfill for magnesium and zinc consists of:

75% Hydrated Gypsum ($\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$)

20% Bentonite Clay

5% Sodium Sulfate (Na_2SO_4)

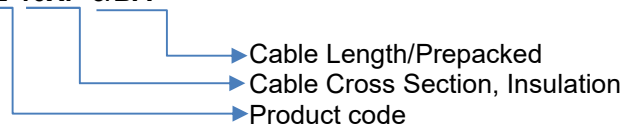
The backfill shall be firmly packaged around the anode by means of adequate vibration. Backfill material shall be of sufficient quantity to cover all zinc anode surfaces to a minimum thickness of 25mm.

Cable

The standard or pre-packaged anodes supplied with a connecting, 3 meter long, copper wire 1X10 XLPE/PVC unless otherwise specified.

Anode Code

9S2-10XP-3/BA



Example **9S2-10XP-3** or **9S2-10XP-3/BA** (prepacked product)



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