MSA™

Magnesium-Based Sacrificial Anode

AFZIR
Advanced Solutions
Strengthening Company

PRODUCT DESCRIPTION

The high cost of corrosion can be substantially reduced by installing a cathodic protection system to transfer the corrosion from the structure being attacked to an anode system.
MSA™ is a superior sacrificial anode for the protection of underground steel pipelines and structures, water heaters, water storage tanks etc.
By connecting a MSA™ magnesium anode to a structure of a different metal, electrical current is generated that polarizes the structure, making the entire surface cathodic and protection complete

PRODUCT FEATURES

- No need for an external power supply
- Ease of installation
- It has a backfill and cable
- Prevents corrosion of metal components of the structure
- Available in two standard and high potential modes

CHEMICAL COMPOUNDS

Element	Standard (%)	high potential (%)
Aluminium	5.3 – 6.7	Max 0.01
Zinc	2.5 – 3.5	---
Manganese	0.15 – 0.7	0.5 – 1.3
Silicon	Max 0.1	Max 0.05
Copper	Max 0.02	Max 0.02
Nickel	Max 0.002	Max 0.001
Iron	Max 0.003	Max 0.03
All other	Max 0.3	Max 0.3
Magnesium	Remaining	Remaining

Performance properties

	Standard	high potential
OPEN CIRCUIT POTENTIAL NEGATIVE VOLTS (Cu/CuSO4 ELECTROD)	-1.5	-1.7
CURRENT EFFICIENCY% (min)	60	50
ENERGY CAPABILITY amp-hr/kg (min)	1200	1200

PRODUCT USES

MSA™ magnesium anodes are effective and economical corrosion fighters that protecting a variety of steel structures in salt, brackish and fresh water including:

- All seagoing vessels (hull, ballast tanks, seachests, thruster tunnels, rudders)
- Metal structures buried in the ground
- Gas, oil pipelines
- Offshore platforms
- Offshore wind turbine foundations
- Offshore pipelines
- Wet infrastructure (docks, piers, locks, quay walls, jetties)
- Storage tanks

HOW TO USE

SURFACE PREPARATION

First, a pit must be dug at a distance of 1.5 to 5 meters from the desired metal. Because the MSA product has a backfill, it is best to moisten the soil before placing the sacrificial anode in the pit. Also,

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the sacrificial magnesium anodes of the backfill must be well immersed before being placed in the pit.

APPLICATION:

This product should be placed vertically in the dug pit. The cable connected to the anode must then be connected to the corresponding metal. Finally, the pit should be filled with soil.

PACKAGING

The anodes should be closed in cloth bags or permitted porous containers. The diameter of the package should be 50 mm larger than the anode. The backfill should also be packed in tight bags to prevent the anode from moving. Finally, the following coverages are obtained:
• At least 25 mm cover in the corners
• At least 50 mm from top, bottom and sides

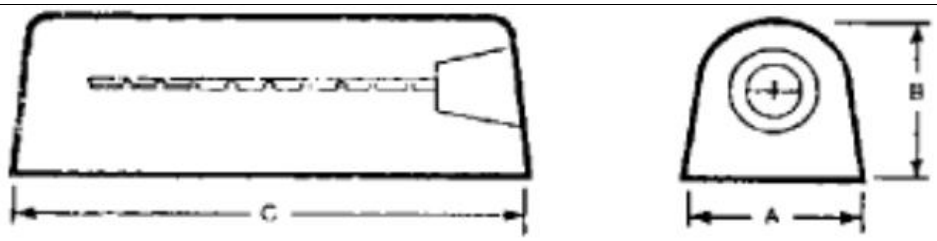
FIRST AID

In case of skin contact, wash thoroughly with soap and water. For eye contact, flush immediately with plenty of water; contact physician immediately. For respiratory problems, remove to fresh air. Wash clothing before reuse.

DISCLAIMER OF LIABILITY

AFZIR, LLC warrants its products to be free from manufacturing defects. Buyer determines suitability of product for use and assumes all risks. Buyer's sole remedy shall be limited to replacement of product. Any claim for breach of this warranty must be brought within six months of the date of purchase.
AFZIR shall not be liable for any consequential or special damages of any kind, resulting from any claim or breach of warranty, breach of contract, negligence or any legal theory.
The Buyer, by accepting the products described herein, agrees to be responsible for thoroughly testing any application to determine its suitability before committing to production.

SPECIFICATIONS OF MAGNESIUM SACRIFICIAL ANODE



Dimensions of the magnesium sacrificial anode weighing 32 pounds

Weight without backfill	32 lb (14.5 kg)
Weight with backfill	30 kg
A	140 mm
B	140 mm
C	540 mm

Dimensions of the magnesium sacrificial anode weighing 17 pounds

Weight without backfill	17 lb (7.7 kg)
Weight with backfill	20 kg
A	90 mm
B	90 mm
C	650 mm

Dimensions of galvanized steel core

Core length	75% of the anode length
The diameter of the hole in the center of the anode	12.7 mm
Distance and diameter of holes embedded in electroplated galvanized steel	Every 8 mm, a hole with a diameter of 6 mm

Compositions of Backfill

	gypsum (CaSo4)%		Bentonite Clay %	SodiumSulfate %	Approx. Resistivity inOhm-cm
	Hydrated	**Molding Plaster (Plaster of Paris)**			
A	25	---	75	---	250
B	50	---	50	---	250
C	---	50	50	---	250
D	75	---	20	5	50

Description

(A) Suitable for soils with low moisture
(B) Usually used with zinc anodes.
(C) Suitable for soils with high humidity or swamps. It is also compatible with both magnesium and zinc anodes.
(D) These types of backfill compounds have low specific strength. Supports (D) are used for areas with high soil strength to reduce strength between the anode and the ground.