

extruded magnesium anodes



End Configurations and Adaptor Caps

For magnesium anodes to provide protection, a positive electrical connection must be established and maintained between the anode and the structure being protected. To facilitate their use, anodes are furnished with various end configurations and/or adaptor caps. The standard end configurations are:

- 1: Both ends plain (saw cut)
- 2: One end plain, one end threaded
- 3: One end plain, one end capped
- 4: One end counterbored with core wire exposed (1.050 diameter and larger only)
- 5: One end plain, one end with core wire exposed
- 6: Core wire exposed on both ends
- 7: Link-type anode, one end welded steel plug with 9' to 12' anode sections joined with flexible connector to desired length

Composition & Conductivity

	GALVOROD™	GALVOMAG™ & GALVOMAG™
Mg %	Balance	Balance
Al %	2.5 – 3.5	0.010 Max
Mn %	0.20 – 1.0	0.50 – 1.3
Zn %	0.7 – 1.3	—
Ca max. %	0.04	—
Si max. %	0.05	—
Cu max. %	0.01	0.02
Ni max. %	0.0010	0.001
Fe max. %	0.002	0.03
Other Impurities max %		
Each	0.01	0.05
Total	0.30	0.30

Physical Tolerances

Shape Identification Number	Diameter (inches)	Core Centering (inches)	Core Wire Diameter (inches)	Straightness (inches)	Approximate Weight
DC-4400	0.500 – 0.020	Within .040	0.135	0.060 in 2 ft	0.015 lbs/in
DC-6066	0.675 – 0.020	Within .050	0.135	0.060 in 2 ft	0.025 lbs/in
DC-6836	0.700 – 0.020	Within 1/16	0.135	0.040 in 2 ft	1.027 lbs/in
DC-1070	0.750 – 0.020	Within 1/16	0.135	0.040 in 2 ft	0.031 lbs/in
DC-8125	0.800 – 0.020	Within 1/16	0.135	0.040 in 2 ft	0.035 lbs/in
DC-983	0.840 – 0.020	Within 1/16	0.135	0.040 in 2 ft	0.038 lbs/in
DC-6826	0.900 – 0.020	Within 1/16	0.135	0.040 in 2 ft	0.043 lbs/in
DC-982	1.050 – 0.020	Within 1/16	0.135	0.040 in 2 ft	0.057 lbs/in
DC-980	1.315 – 0.020	Within 1/16	0.135	0.040 in 2 ft	0.089 lbs/in
DC-2376	1.561 ± 0.016	Within 1/8	0.188	0.250 in 10 ft	1.5 lbs/ft
DC-2375	2.024 ± 0.024	Within 1/8	0.188	0.250 in 10 ft	2.5 lbs/ft
DC-6772	2.562 ± 0.24	Within 1/8	0.188	0.250 in 10 ft	4.0 lbs/ft
DC-1016 GALVOLINE™	3/8 x 3/4 in ± 0.015 Rectangle (1/8 R corners)	Within 1/16	0.135	Furnished in coils with sheared ends	0.243 lbs/ft

Areas of Application

There are four primary areas where extruded anodes offer important advantage in cost, performance, and ease of installation:

- Water heaters and water storage tanks, where a small diameter anode simplifies installation.
- Steel located in high resistivity electrolytes, where a small diameter anode gives a desirable current output-to-anode weight ratio.
- Gas service entrance piping, where a small diameter anode can be driven into the ground to provide convenient and inexpensive protection.
- Prepolarization of structures in seawater, where a small diameter anode gives short-term, high-current output.

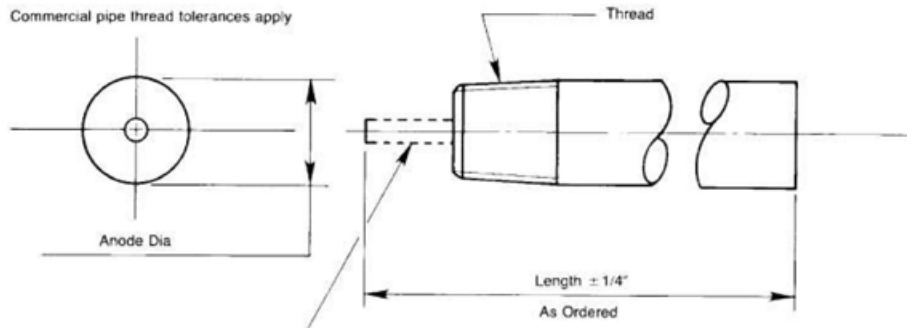
Anode rods are extruded in twelve standard diameters ranging from 0.500' to 2.5621, GALVOLINE™ ribbon anode is extruded as a 3/8" x 3/4" ribbon. Each anode has a steel core running lengthwise through its center.

Anode rods are available as either the standard GALVOROD™ anode or the high-current output GALVOMAG™ anode. GALVOLINE™ ribbon anode is manufactured with the high-current output composition.

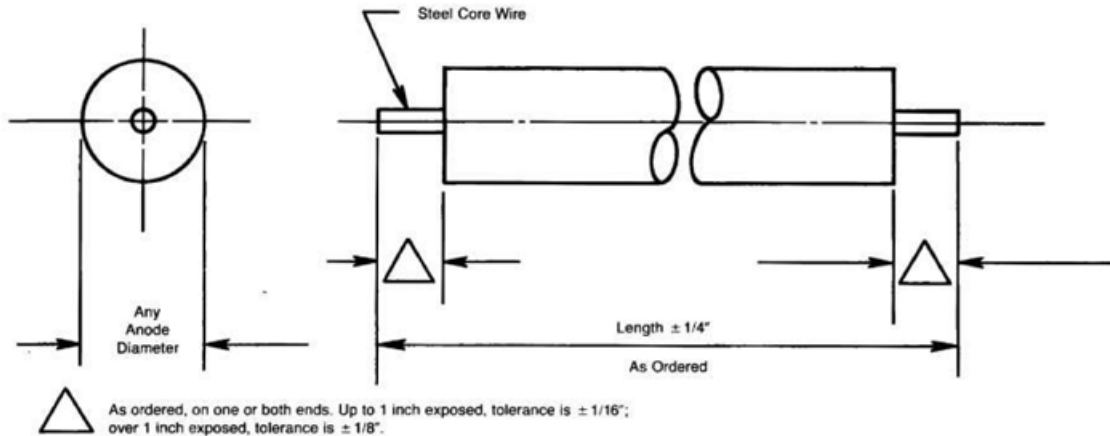
In most environments, the oxidation potential is 1.4 to 1.5 volts for GALVOROD™ and 1.6 to 1.7 volts for GALVOMAG™ (with respect to a copper-copper sulfate reference electrode). Because of its higher oxidation potential, GALVOMAG™ anodes of a given size deliver approximately 25% More current (milliamperes) than GALVOROD™ anodes of the same size. As electrolyte resistivity increases, the need for GALVOMAG™ anodes increases.

Current capacities for GALVOMAG™ and GALVOROD™ anodes are similar and will range from 500 to 600 ampere hours per pound, depending primarily on the operating rate (anode current density).

Threaded or Exposed Core Wire



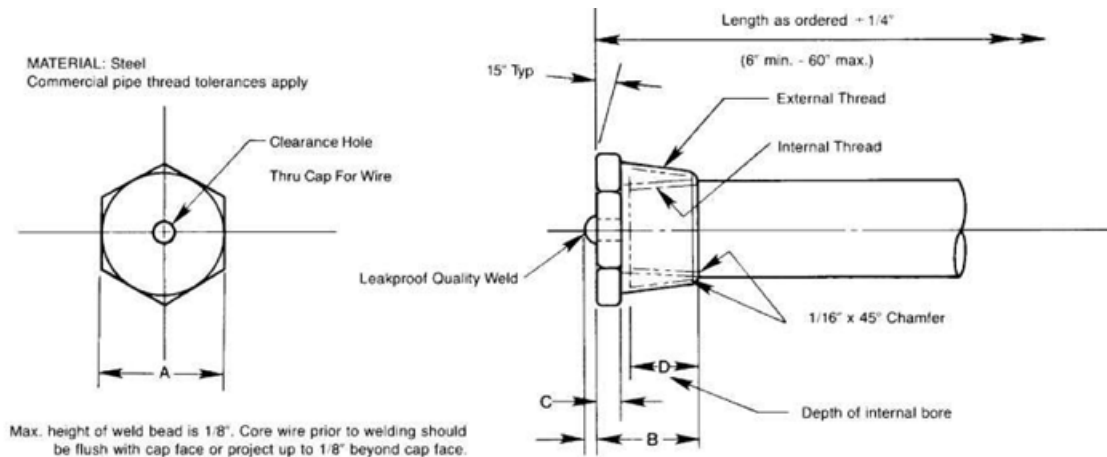
When rod is being prepared for weld screw-on cap a suitable length of core wire is left exposed.



Capped Anodes

Cap Number	Used on Anode (Diameter)	Dimensions for Diagram Below				Cap Threads	
		A	B	C	D	Internal	External
DS-1W	0.500	1.06	0.81	0.19	0.63	1/4-18 NPT	3/4-14 NPT
DS-2W	0.675, 0.700, 0.750	1.06	0.81	0.91	0.63	3/8-18 NPT	3/4-14 NPT
DS-3W	0.840, 0.900	1.06	0.81	0.19	0.63	1/2-14 NPT	3/4-14 NPT
DS-4W	1.050	1.31	1.19	0.44	1.00	3/4-14 NPT	1-11 1/2 NPT

Minimum backup torque to loosen cap from rod: DS-1W=5 ft•lb, DS-2W and DS-3W=20 ft•lb, DS-4W=50 ft•lb.



Flexible High Potential Underground Ribbon Anode Made with GALVOMAG™

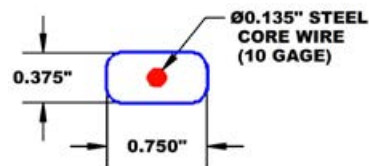
GALVOLINE made by Mag Specialties is made with GALVOMAG, the mark of quality in the cathodic protection industry. Developed and introduced over 50 years ago, GALVOMAG is the high potential alloy that all others are measured against. GALVOLINE by Mag Specialties has always been manufactured with this high current output magnesium alloy. Because of its higher oxidation potential, GALVOLINE is excellent in high resistivity electrolytes and is the best buy in reliable, long term cathodic protection.



GALVOLINE is a continuous magnesium ribbon anode with a steel core wire in the center of the cross section. GALVOLINE is sold in coils, delivered on pallets and is available all over the world for your next application.

Coils are:

- 32" OD x 18" ID x 8" wide
- 1000 foot length \pm 25 feet
- 240 pound nominal weight



Element	Composition, Wt. %
Aluminum, max.	0.010
Zinc	—
Manganese	0.5-1.3
Iron, max.	0.03
Silicon, max.	—
Copper, max.	0.02
Nickel, max.	0.001
Calcium, max.	—
Total Other Impurities, max.	0.30
Other Impurities Each, max.	0.05
Magnesium	balance

For more information on GALVOLINE and other magnesium cathodic protection products contact our technical sales specialists.

introducing GALVOMAG



Performance

The two properties critical to the performance of a sacrificial anode are oxidation potential (directly related to current output) and current capacity (or current efficiency which is directly related to anode life).

The typical open circuit potential of GALVOMAG, using ASTM Standard G97, is 1.675 to 1.75 volts with respect to a saturated calomel electrode. The inherently higher potential of GALVOMAG is the reason that GALVOMAG anodes have a current output 20 to 30 percent greater than H-1 anodes of a similar size.

GALVOMAG anodes, properly packaged and installed with the appropriate backfill material, also have high current capacities, typically delivering 500 to 550 ampere hours per pound in the ASTM Standard G97 test.

High operation performance is one of the reasons GALVOMAG anodes are the best buy in reliable, long-term cathodic protection.

Quality

GALVOMAG extruded anodes are of the same chemistry, electrochemical properties and high quality that you have come to expect over the years from Mag Specialties, Inc. When you invest in GALVOMAG anodes, you'll get exactly what you ordered. Our quality assurance process includes both composition analysis and performance testing of production anodes to ensure uniform adherence to high production standards.

And our quality process doesn't end with electrochemical properties. We also ensure that GALVOMAG extruded anodes are produced to high standards of core wire centering, surface finish, internal soundness, anode weight, and packaging.

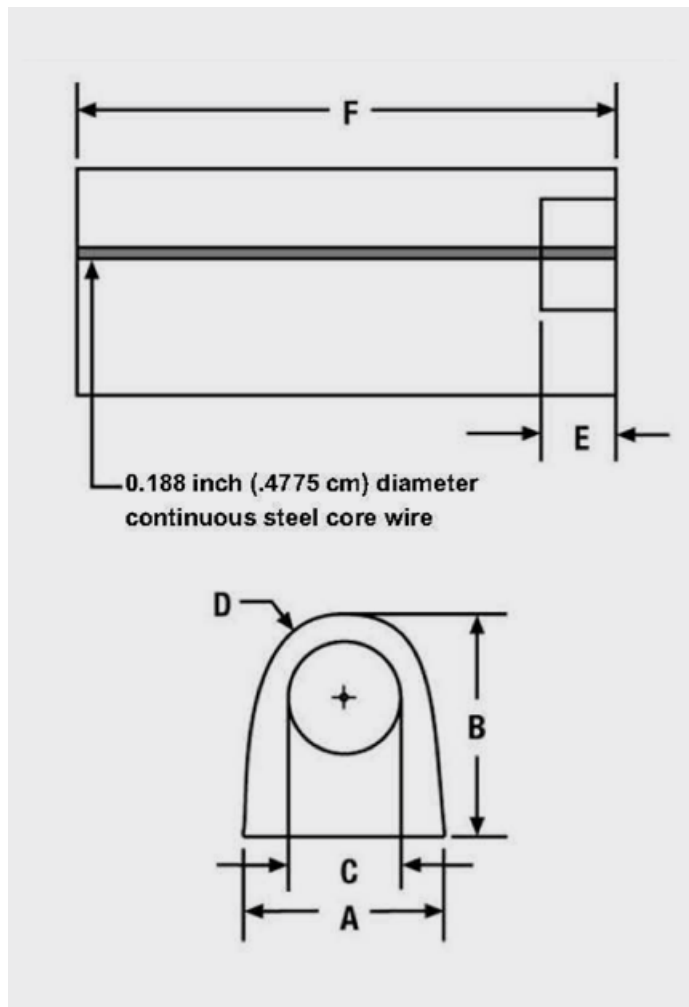
These things might not seem important on a product destined to spend its life underground but we realize that uniform surface finish, internal soundness and core wire centering translate into a more uniform consumption rate over the life of the anode. And we take extra care to produce anodes that weigh what you expect them to, with a variance typically less than a quarter of a pound from anode to anode.

Wide Variety Of Sizes And Shapes

GALVOMAG extruded anodes are available in a wide variety of standard and custom shapes and sizes. Specifically for underground application Mag Specialties, Inc. offers several standard sizes of large profile anodes.

Each GALVOMAG underground anode has a continuous steel core wire running lengthwise through the anode. Anodes arrive at your facility on a standard, palletized package, with one end of each anode counter-bored to expose the core wire. Anodes are ready for lead wire attachment, bagging and backfill.

Standard Anodes—Nominal Dimensions



Anode Composition

Element	GALVOMAG
Aluminum	0.010 max
Manganese	0.5 – 1.3 max
Iron	0.03 max
Copper	0.02 max
Nickel	0.001 max
Total Other Impurities	0.30 max
Other Impurities Each	0.05 max
Magnesium	balance

Nominal Weight	Part Number	Wt/Ft	Nominal Dimensions in Inches (Meters)						Pcs per Package
			A	B	C	D	E	(Ref) F	
1 lb (0.5 kg)	DC-2375-1 Round	2.544	2.024 (.0514)	(.0000)	1 - 1/2 (.0381)	1 - 1/8 (.0286)	1 (.0254)	5 (.1230)	
1 lb (0.5 kg)	DC-2376-1 Round	1.5432	1.561 (.0396)	(.0000)	1 - 1/2 (.0381)	1 - 1/8 (.0286)	1 (.0254)	8 (.2007)	

D-2 & R-2

1 lb (0.5 kg)	DC-8545-1 "D" Shape	5.1558	2 - 3/4 (.0699)	3 (.0762)	1 - 1/2 (.0381)	1 - 1/8 (.0286)	1 (.0254)	2 1/2 (.0623)	300
1 lb (0.5 kg)	DC-6772-1 Round	4.032	2.562 (.0651)	(.0000)	1 - 1/2 (.0381)	1 (.0270)	1 (.0254)	3.10 (.0788)	
9 lb (4.1 kg)	DC-8545-9 "D" Shape	5.1558	2 - 3/4 (.0699)	3 (.0762)	1 - 1/2 (.0381)	1 - 1/8 (.0286)	1 (.0254)	21 - 1/4 (.5398)	300
9 lb (4.1 kg)	DC-6772-9 Round	4.032	2.562 (.0651)	(.0000)	1 - 1/2 (.0381)	1 (.0270)	1 (.0254)	26.91 (.6835)	
14 lb (6.4 kg)	DC-8545-14 "D" Shape	5.1558	2 - 3/4 (.0699)	3 (.0762)	1 - 1/2 (.0381)	1 - 1/8 (.0286)	1 (.0254)	32 - 3/4 (.8319)	190
14 lb (6.4 kg)	DC-6772-14 Round	4.032	2.562 (.0651)	(.0000)	1 - 1/2 (.0381)	1 (.0270)	1 (.0254)	41.79 (1.0615)	
17 lb (7.7 kg)	DC-8545-17 "D" Shape	5.1558	2 - 3/4 (.0699)	3 (.0762)	1 - 1/2 (.0381)	1 - 1/8 (.0286)	1 (.0254)	39 - 3/8 (1.0001)	114
17 lb (7.7 kg)	DC-6772-17 Round	4.032	2.562 (.0651)	(.0000)	1 - 1/2 (.0381)	1 (.0270)	1 (.0254)	50.72 (1.2883)	125
20 lb (9.1 kg)	DC-8545-20 "D" Shape	5.1558	2 - 3/4 (.0699)	3 (.0762)	1 - 1/2 (.0381)	1 - 1/8 (.0286)	1 (.0254)	46 - 1/4 (1.1748)	112
20 lb (9.1 kg)	DC-6772-20 Round	4.032	2.562 (.0651)	(.0000)	1 - 1/2 (.0381)	1 (.0270)	1 (.0254)	59.65 (1.5151)	125

D-4 & R-4

17 lb (7.7 kg)	"D" Shape	13.336	4 - 3/4 (.1207)	4 - 1/2 (.1143)	1 - 1/2 (.0381)	2 (.0508)	1 (.0254)	(.0000)	
17 lb (7.7 kg)	DC-8839-24 Round	10.612	4.213 (.1070)	(.0000)	1 - 1/2 (.0381)	2 (.0508)	1 (.0254)	19.35 (.4915)	
24 lb (10.9 kg)	DC-8577-17 "D" Shape	13.336	4.213 (.1070)	4 - 1/2 (.1143)	1 - 1/2 (.0381)	2 (.0508)	1 (.0254)	21 - 1/4 (.5398)	108
24 lb (10.9 kg)	DC-8839-24 Round	10.612	2.562 (.0651)	(.0000)	1 - 1/2 (.0381)	2 (.0508)	1 (.0254)	27.26 (.6925)	
32 lb (14.5 kg)	DC-8577-32 "D" Shape	13.336	4 - 3/4 (.1207)	4 - 1/2 (.1143)	1 - 1/2 (.0381)	2 (.0508)	1 (.0254)	39 - 3/8 (1.0001)	110
32 lb (14.5 kg)	DC-8839-32 Round	10.612	4.213 (.1070)	(.0000)	1 - 1/2 (.0381)	2 (.0508)	1 (.0254)	36.31 (.9223)	
60 lb (27.2 kg)	DC-8577-60 "D" Shape	13.336	4.213 (.1070)	4 - 1/2 (.1143)	1 - 1/2 (.0381)	2 (.0508)	1 (.0254)	21 - 1/4 (.5398)	55
60 lb (27.2 kg)	DC-8839-60 Round	10.612	2.562 (.0651)	(.0000)	1 - 1/2 (.0381)	2 (.0508)	1 (.0254)	67.97 (1.7265)	

Mag Specialties also offers a wider variety of shapes including D-3 & R-3, and D-5 & R-5.

Please ask a sales rep for detailed data sheets of the above.