KATRADIS

EST. 1936

GROUP OF COMPANIES

Cathodic Protection

Nika-Anodes

The ultimate Protection
for Your Vessel

Cd
CADMIUM
FREE

KATRADIS GROUP OF COMPANIES
in its continued effort for better customer service and support is pleased to announce that all of its affiliated establishments maintain stocks of KATRADIS products ready for immediate delivery.

Read more: **www.katradis.com**

Anodes

What is the role of Anodes for your vessel

- Extend Metal Lifespan: Protect metal components from harsh marine environments, ensuring durability.
- Shield exposed or paint-compromised metal surfaces from corrosion.
- Prevent Hidden Damage: Guards against corrosion beneath paint layers, preserving structural integrity.
- Cost-Effective Solution: Reduce maintenance and repair expenses by minimizing damage.

Principle of cathodic protection

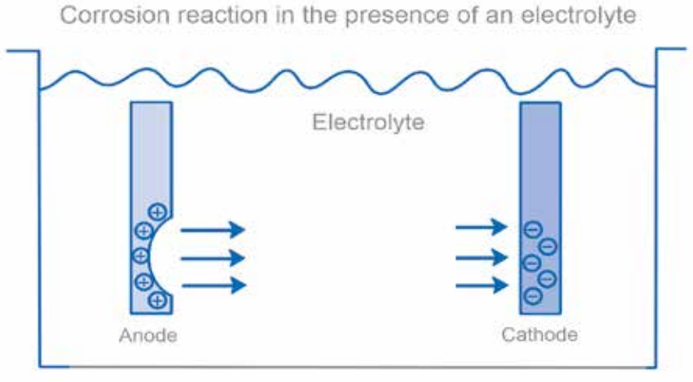
Corrosion occurs when metal reacts with its environment, especially in seawater, where this process is accelerated by electrochemical reactions. Metal loss occurs through oxidation in unprotected areas, leading to pitting. The area losing electrons is the anodic area, while the area consuming electrons is the cathodic area. Cathodic protection works by supplying electrons to the metal, reducing the corrosion rate and slowing its dissolution. This is achieved by either slowing the anodic reaction or accelerating the cathodic reaction.

Applications of Cathodic Protection

Cathodic protection can be applied in two ways:
1.Impressed Current: Using an external power source to supply electrons.
2. Sacrificial Anodes: Attaching metal anodes that corrode in place of the protected metal, supplying electrons naturally.

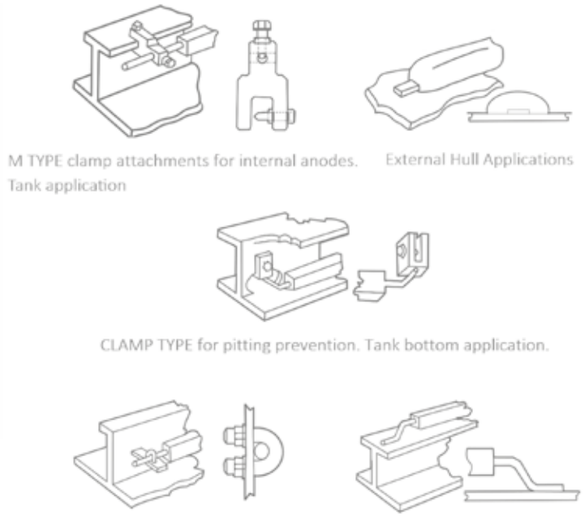
The impressed current method

By this method the electrical current is delivered to the metal surface from a D.C. power source through an auxiliary anode i.e. the current is forced in or impressed.



ANODE LOCATION

The calculated anodes must be installed in equal distances around the hull, about 6 meters apart. The 15% - 20% of the total calculated QTY must be installed to the stern and rudder area of the vessel. The anodes should not be mounted in the zone close to the propeller's edges.



M TYPE clamp attachments for internal anodes. Tank application

External Hull Applications

CLAMP TYPE for pitting prevention. Tank bottom application.

INTERNAL CATHODIC PROTECTION

The cathodic protection of the ship's tanks is effected with sacrificial anode system. Of course, this type of protection can be applied only to water ballast or cargo/ballast tanks. Zinc aluminum or magnesium anodes may be used but for the installation precautions must be taken for avoiding hydrogen evolution (in the case of magnesium) and sparking (in the case of aluminum). The final selection of the alloy to be used will also depend on the ballast water (seawater), the compatibility of the alloy with any cargo, which might be carried in the tank, the size of the protected tank and the type of the vessel.

CALCULATIONS

External Protection

The number of anodes for the protection of the hull is calculated based on the following criteria:

A. CURRENT REQUIREMENTS

The wetted surface of the hull times protective current density.

$$\text{Current (Amp)} = \frac{\text{Protected area (m2) x current density (mA/m2)}}{1000}$$

B. SYSTEM DESIGN LIFE

The total weight of anode material required is:

$$\text{Weight (kg)} = \frac{\text{Current (Amps) x design life (years) x 8766}}{\text{Capacity of material (Amph/kg) x 0,9}}$$

As a result the number of anodes selected must at least satisfy both the total current and total weight requirements as follows:

$$\text{Number of anodes} = \frac{\text{Current required}}{\text{Individual current output}}$$

$$\text{Number of anodes} = \frac{\text{Weight required}}{\text{Individual Net Anode Weight}}$$

Methods for Hull and Tank Anodes installations

The system life should be at least four (4) years. The above-recommended current densities are applicable to ships for which the normal ballast trip is longer than approx. 5 days. In case the trip is shorter than 5 days, then the above densities should be increased by 20%.

THE RECIPES FOR ZINC AND ALUMINIUM ANODES

Specification Code	US MIL SPEC A18001J
Cu	0.005 max
Al	0.10 - 0.50
Fe	0.005 max
Cd	0.025 - 0.07
Pb	0.006 max
Zn	REMAINDER
Potential Ag/AgCl (mV)	-1050
Electromechanical Capacity (Amp. Hours / kg)	780

Specification Code	
Fe	0.15 max
Si	0.05 - 0.20
Zn	3.50 - 5.00
Ti	0.01 - 0.05
In	0.02 - 0.05
Mn	0.15 - 0.50
Cu	0.01 max
Al	REMAINDER
Potential Ag/AgCl (mV)	-1100
Electromechanical Capacity (Amp. Hours / kg)	2700

Cadmium-Free Anodes for a Cleaner Environment

Cadmium is a heavy metal known for its **extreme toxicity.** It ranks among the most harmful substances on Earth, with detrimental effects on both human health and the environment. The use of cadmium in various industrial applications, including anodes, has long been a cause for concern. At **Katradis**, our commitment to environmental responsibility is reflected in the production **of cadmium-free zinc* anodes**. These anodes deliver superior corrosion protection for vessels and marine structures **while minimizing environmental impact.** Unlike traditional anodes that contain cadmium, our eco-friendly alternatives help protect both your assets and marine ecosystems.

Key Benefits of Cadmium-Free Anodes:

- Environmentally Friendly
- Compliance with International Regulations
- Effective Corrosion Protection
- Sustainable Choice

A Collaborative Effort for a Greener Future

KATRADIS and the National Technical University of Athens have joined forces to tackle this issue head-on. Their Research and Development team embarked on a mission to create an innovative alloy composition for zinc anodes that eliminates the need for cadmium. The result? NIKA Anodes Cadmium-Free.

Key Applications:

- Marine Vessels
- Offshore Platforms
- Ballast Tanks
- Ports and Marinas
- Yachting and Fishing Industries

Our cadmium-free sacrificial anodes provide sustainable, corrosion protection for marine and industrial structures, including ships, offshore platforms, pipelines, and harbor infrastructure.
Compliant with modern regulations, they extend equipment lifespan while supporting a cleaner marine ecosystem. With fast global delivery and a wide stock, Katradis offers reliable solutions for vessels, industrial applications, and yachting needs.

***Aluminum anodes never contained cadmium, they were always cadmium-free.**

Zinc Anodes

Anode available types: **Hull, Tank and Bolt-On**

Material: **Zinc**

Standard: **ASTM F1182-07 & DNV-RP-B401**

Our Zinc Anodes deliver top-tier corrosion protection while prioritizing environmental sustainability. Specifically engineered for marine applications, these anodes protect submerged metal components from electrochemical degradation. Unlike traditional zinc anodes, our cadmium-free formula eliminates the need of cadmium, ensuring compliance with environmental regulations while maintaining exceptional performance. Designed for durability and efficiency, they extend the lifespan of marine vessels and structures without harming the sea's ecosystems.

Chemical Composition – Standard

Element	% Concentration Lowerr Limit	% Concentration Upper Limit
Zn	99,2%	n/a
Al	0,10%	0,50%
Cd	0,025%	0,07%
Fe	n/a	Max 0,005%
Pb	n/a	Max 0,006%
Cu	n/a	Max 0,005%

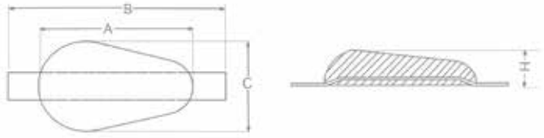
Chemical Composition – Cadmium free

Element	% Concentration Lowerr Limit	% Concentration Upper Limit
Zn	99,2%	n/a
Al	0,10%	0,50%
In	0,02%	0,03%
Cd	n/a	Max 0,001%
Fe	n/a	Max 0,005%
Pb	n/a	Max 0,006%
Cu	n/a	Max 0,005%

Cd
CADMIUM FREE

Hull Type – Tear drop shape

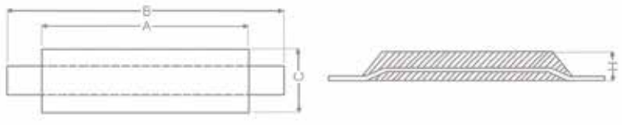
A tear-drop hull shape is a streamlined design commonly used in naval architecture for reducing drag and improving hydrodynamics. This hull type is often found in submarines, high-speed vessels, and some specialized marine applications where efficiency and smooth water displacement are priorities.



Product code	Dimensions (mm)				Weight (kg)		Insert Dimensions (mm)	
	A	B	C	H	Net	Gross	Width	Thickness
N10ZH	110	220	70	30	0,82	1,0	25	4
N30ZH	170	260	105	50	2,86	3	25	4
N75ZH	285	400	150	50	6,8	7,5	40	6
N95ZH	285	400	155	55	8,5	9,5	50	8

Hull Type

A Hull Type Anode is a sacrificial anode specifically designed to protect a vessel£s hull from galvanic corrosion. These anodes are crucial in marine environments, where metal surfaces submerged in seawater are prone to electrochemical degradation.

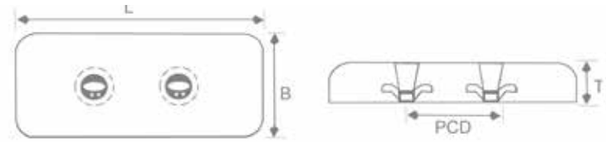


Product code	Dimensions (mm)				Weight (kg)		Insert Dimensions (mm)	
	A	B	C	H	Net	Gross	Width	Thickness
N10ZH	110	220	70	30	0,82	1,0	25	4
N20ZH	180	260	65	40	1,8	2,0	25	4
N55ZH	300	400	90	45	4,8	5,5	40	6
N125ZH	460	600	110	40	11,4	12,5	40	6
N165ZH	525	650	120	45	14,5	16,5	50	8
N230ZH	680	800	125	45	20,5	23,0	50	8

Other weights available upon request

Bolt-On type

A Bolt-On Type Anode is a sacrificial anode designed for easy installation and secure attachment to a vessel's hull, offshore structures, or other submerged metal surfaces. These anodes are crucial for cathodic protection, preventing galvanic corrosion in marine environments

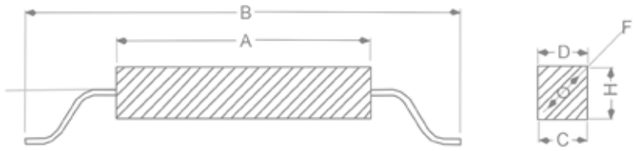


Product code	PCD	Dimensions (mm)			Weight (kg)	
		L	B	T	Net	Gross
N55ZBH	160mm	300	150	25	5,3	5,5
N65ZBH	160mm	300	150	30	6,3	6,5
N74ZBH	160mm	300	150	35	7,2	7,4
N100ZBH	160mm	300	150	45	9,8	10,0
N110ZBH	160mm	300	150	55	10,8	11,0
N130ZBH	160mm	300	150	60	12,8	13,0
N150ZBH	160mm	300	150	60	14,8	15,0

Other PCDs and weights available upon request

Tank Type

A Tank Type Anode is a sacrificial anode specifically designed for corrosion protection in ballast tanks, water tanks, fuel tanks, and other enclosed metal structures. These anodes help prevent galvanic corrosion by sacrificing themselves to protect the tank's metal surfaces.



Product code	Dimensions (mm)				Weight (kg)		Rod Diameter (mm)	
	A	B	C	H	Net	Gross		
N80ZT	250	500	45	75	72	7,4	8,0	Φ14
N115ZT	535	900	38	65	57	10,7	11,5	Φ14
N135ZT	450	860	45	75	72	12,5	13,5	Φ14
N170ZT	750	1130	38	65	57	15,6	17	Φ14

Other weights available upon request

ZINC CASTING ROUNDS L=600 MM

Zinc Casting Rounds are cylindrical zinc ingots used in metal casting, galvanizing, and alloy production. They are manufactured with high-purity zinc and are widely used in marine, industrial, and manufacturing applications.

D (MM)	20	25	30	40	50	60	70	80	90	100	110	120	130	150
WEIGHT (KGS)	1.4	2.1	3.0	5.0	8.2	11.0	16.0	21.0	27.0	32.0	44.3	48.0	57.0	76.0

For more information please check regularly our website: http://www.katradis.com/anodes

Aluminum Anodes

Anode available types: **Hull, Tank and Bolt-On**

Material: **Aluminum**

Standard: **DNV-RP-B401**

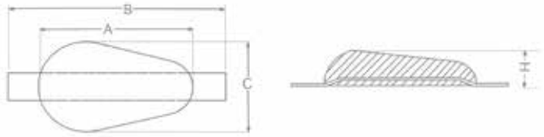
Our Aluminum Anodes offer an advanced solution for protecting marine structures and vessels from corrosion in marine environments. Their lightweight composition provides superior efficiency and longevity compared to traditional zinc anodes, reducing fuel consumption and maintenance costs. While being cadmium-free they ensure eco-friendly protection while meeting international environmental standards. NIKA Aluminum Anodes deliver reliable, long-lasting defense against electrochemical degradation without compromising sustainability.

Chemical Composition

Element	% Concentration Lowerr Limit	% Concentration Upper Limit
Al	95,00%	97,00%
Zn	3,50%	5,00%
In	0,02%	0,05%
Ti	0,01%	0,05%
Mn	0,15%	0,50%
Cu	n/a	0,003%
Fe	n/a	0,15%
Si	n/a	0,12%

Hull Type – Tear drop shape

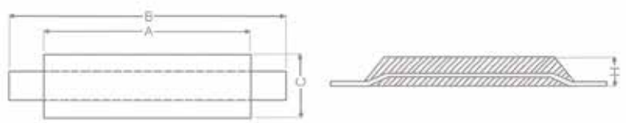
A tear-drop hull shape is a streamlined design commonly used in naval architecture for reducing drag and improving hydrodynamics. This hull type is often found in submarines, high-speed vessels, and some specialized marine applications where efficiency and smooth water displacement are priorities.



Product code	Dimensions (mm)				Weight (kg)		Insert Dimensions (mm)	
	A	B	C	H	Net	Gross	Width	Thickness
N06AH	110	220	70	30	0,42	0,6	25	4
N15AH	165	260	105	50	1,35	1,5	25	4
N40AH	285	400	150	50	2,7	4	50	8

Hull Type

A Hull Type Anode is a sacrificial anode specifically designed to protect a vessel's hull from galvanic corrosion. These anodes are crucial in marine environments, where metal surfaces submerged in seawater are prone to electrochemical degradation.

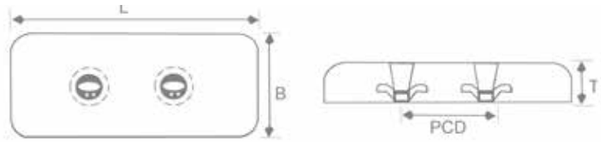


Product code	Dimensions (mm)				Weight (kg)		Insert Dimensions (mm)	
	A	B	C	H	Net	Gross	Width	Thickness
N10AH	115	260	70	35	0,8	1,0	25	4
N30AH	300	400	90	45	2,3	3,0	40	6
N55AH	460	600	110	40	4,5	5,5	40	6
N80AH	525	650	120	45	6,0	8,0	50	8
N105AH	680	800	125	45	8,1	10,5	50	8
N125AH	795	1000	125	45	9,5	12,5	50	8
N155AH	1000	1200	120	45	11,8	15,5	50	8
N200AH	840	1000	145	60	17,0	20,0	50	8

Other weights available upon request

Bolt-On type

A Bolt-On Type Anode is a sacrificial anode designed for easy installation and secure attachment to a vessel's hull, offshore structures, or other submerged metal surfaces. These anodes are crucial for cathodic protection, preventing galvanic corrosion in marine environments

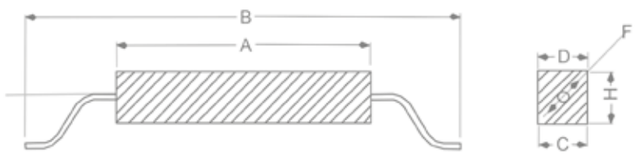


Product code	PCD	Dimensions (mm)			Weight (kg)	
		L	B	T	Net	Gross
N25ABH	160mm	300	150	30	2,3	2,5
N30ABH	160mm	300	150	35	2,8	3,0
N35ABH	160mm	300	150	45	3,3	3,5
N40ABH	160mm	300	150	55	3,8	4,0
N50ABH	160mm	300	150	60	4,8	5,0
N55ABH	160mm	300	150	65	5,3	5,5
N80ABH	160mm	300	150	80	7,8	8,0
N110ABH	160mm	310	250	60	10,8	11,0
N155ABH	160mm	320	260	72	15,3	15,5
N153ABH	340mm	535	195	55	15,1	15,3
N158ABH	340mm	535	195	60	15,6	15,8

Other PCDs and weights available upon request

Tank Type

A Tank Type Anode is a sacrificial anode specifically designed for corrosion protection in ballast tanks, water tanks, fuel tanks, and other enclosed metal structures. These anodes help prevent galvanic corrosion by sacrificing themselves to protect the tank's metal surfaces.



Product code	Dimensions (mm)				Weight (kg)		Rod Diameter (mm)	
	A	B	C	H	Net	Gross		
N50AT	500	850	38	65	57	4,2	5,0	Φ14
N100AT	750	1110	75	45	70	8,8	10,0	Φ14

Other weights available upon request

Type Approval Certificate

This is to certify that the undernoted product(s) has/have been tested with satisfactory results in accordance with the relevant requirements of the Lloyd's Register Type Approval System.

Manufacturer	**KATRADIS MARINE ROPES INDUSTRY S.A.**
Address	11 Psaron & Anapafseos Str., Drapetsona, Piraeus, 186 48, Greece
Type	Sacrificial Anodes
Description	Aluminium, Zinc and Zinc (Cadmium Free) sacrificial anodes for cathodic protection
Trade Name	Nika
Application	Sacrificial anodes for cathodic protection of marine and offshore vessels and structures. Hull, tank and bolt on types.
Specified Standard	Manufacturer's specifications
Ratings	Electrochemical Capacity Aluminium: Anode Potential: -1050 mV Anode Capacity: 2700 Ah / Kg

Richard Dawson

MNDE Group Manager to Lloyd's Register EMEA
A member of the Lloyd's Register group

71 Fenchurch Street, London, EC3M 4BS, United Kingdom

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Type Approval Certificate

	Zinc and Zinc - Cadmium Free: Anode Potential: -1030 mV Anode Capacity: 780 Ah / Kg
Additional Tests	Not applicable.
Other Conditions	1. Type approval does not replace the need for standard inspection and survey procedures required by the Rules and Regulations associated with the regions where marketed and used. 2. Products should comply with all relevant health, safety and environmental legislation where marketed and used.

This certificate is not valid for products, designs, ratings or operating parameters which have been varied from the specimen tested. The manufacturer should notify Lloyd's Register EMEA of any modification or changes to the equipment in order to obtain a valid Certificate.

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KATRADIS

EST. 1936

GROUP OF COMPANIES

High Quality Products since 1936

Since 1936, **Katradis Group** has evolved to a **global leader in marine solutions**. Now in its third generation, we specialize in **cadmium-free zinc** and **aluminum sacrificial anodes** for corrosion protection, offering eco-friendly, high-performance solutions for hulls, tanks, marinas and offshore structures.

The Group operates a state-of-the-art 50.000m² factory in Greece, that produces **top-tier mooring rope solutions** and **high quality cathodic protection systems.**

Trusted worldwide in marine, offshore, port and marina development, aquaculture and yachting sectors, Katradis is committed to quality, innovation and sustainability, ensuring **long-lasting protection** and operational efficiency for marine assets.

Katradis **Global Network**

We are wherever you need us.

With the support of an extensive global network of affiliated establishments, agents, suppliers and representatives, we provide our customers with immediate service around the world.

90
Years serving the marine industry

73
Service points all around the world

38.715
Marine products produced per year

10.046
Vessels equipped with our products

Our Global Network

Africa: Egypt (Alexandria, Port Said, Suez) I South Africa (Durban, Cape Town) • **Asia:** Singapore (Singapore) I Korea (Pusan) I China (Hong Kong, Shanghai, Qingdao, Zhenjiang & other ports) • **Europe**: Belgium (Antwerp, Zeebrugee) I Germany (Hamburg) I Netherlands (Rotterdam, Amsterdam) I Spain (Algeciras, Cadiz, Las Palmas) ITurkey (Istanbul) I Bulgaria (Varna) I Greece (all ports) I Cyprus (all ports) • **Middle East**: U.A.E. (Fujairah, Dubai) • **North America**: Canada (Montreal) I USA (Houston, New Orleans, New York) • **Central America**: Panama (Panama) • **South America**: Buenos Aires

NIKA-ANODES
The ultimate Cathocic Protection for Your Vessel

Katradis anodes.

Protecting
the marine industry.

Anodes against corrosion
and damages for your business.

www.katradis.com

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High Quality Synthetic Mooring Ropes for LNG / LPG Carriers and Tankers - Steel Wire Ropes
Sacrificial Anodes - Anchors & Anchor Chains - Port Development Equipment - Vessel Deck Equipment

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