

ProAct™

MMO TUBULAR ANODE

PRODUCT DESCRIPTION

MMO tubular anodes can be used as bare anodes in freshwater and marine environments, or configured as remote anode assemblies for the cathodic protection of large offshore steel structures. Their tubular design supports straightforward installation and broad current distribution for project-specific protection requirements.

For soil applications, MMO tubular anodes are typically supplied as prepackaged canister anodes for shallow groundbeds or deep-well groundbeds. Prepackaged MMO tubular anodes, also known as MMO canister anodes, consist of an external steel canister containing one or more MMO tubular anodes, conductive coke breeze backfill, a protected cable routing system, and a venting arrangement where required to help mitigate gas blockage and support reliable current output and long-term operation.

PRODUCT PERFORMANCE

Coating Performance & Service Life

- A unique MMO coating formulation and automated coating process help provide uniform coating thickness, low and consistent coating loss rate, and long anode service life.

Electrical Performance Reliability

- A high-conductivity, well-sealed cable connection design supports stable current output and long-term operational reliability.

Protection Efficiency

- Multi-unit canister anode assemblies provide effective current distribution and may reduce installation costs by 15-35% compared with conventional solutions.



PRODUCT FEATURES

System Configuration Flexibility

- Available in shallow groundbed, deep-well groundbed, anode string, and remote anode configurations to suit different cathodic protection requirements.

Structural Design

- Integrated vent tubes and high-permeability coke breeze backfill help prevent gas blockage and promote effective anode surface utilization.

Custom Engineering Capability

- Anode configuration can be customized according to required service life and application environment.

Reference	Title
API RP 651	CATHODIC PROTECTION OF ABOVE GROUND PETROLEUM STORAGE TANKS
NACE RP0285	CORROSION CONTROL OF UNDERGROUND STORAGE TANK SYSTEMS BY CATHODIC PROTECTION
NACE TM0294	TESTING OF EMBEDDABLE IMPRESSED CURRENT ANODES FOR USE IN CATHODIC PROTECTION OF ATMOSPHERICALLY EXPOSED STEEL-REINFORCED CONCRETE
NACE RP0572	DESIGN, INSTALLATION, OPERATION, AND MAINTENANCE OF IMPRESSED CURRENT DEEP ANODE BEDS
EN 12954	CATHODIC PROTECTION OF BURIED OR IMMERSED METALLIC STRUCTURES-GENERAL PRINCIPLES AND APPLICATION FOR PIPELINES
EN 13636	CATHODIC PROTECTION OF BURIED METALLIC TANKS AND RELATED PIPING

PRODUCT PARAMETERS

Substrate Composition								
Standard	Fe %	C %	N %	H %	O %	Other Impurities (Single)%	Other Impurities (Total)%	Ti %
ASTM B338 Gr. 1	≤0.20	≤0.08	≤0.03	≤0.015	≤0.18	≤0.1	≤0.4	Remainder
Electrochemical Properties								
Environment	Current Density A/m²				Life (year)			
Soil	100				25			
Seawater	600				25			
Coating								
Coating crystal density is 6-12 g/cm³, coating resistivity is 9-11 mΩ·cm								
Coating Thickness								
≥ 8.0 μm								
Assembly								
Cable-to-anode resistance					≤0.001Ω			
Cable-to-anode sealing					Helium leak detection, no leakage			
Cable-to-anode connection					Pull strength ≥ 50 kg			

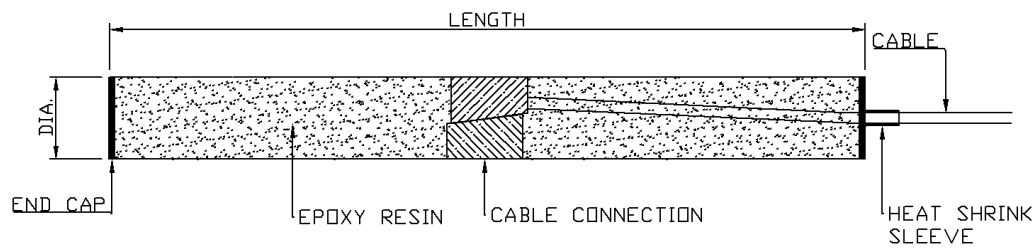
MODELS AND SPECIFICATIONS

MMO Tubular Anode

Model	Outer Diameter	Wall Thickness	Length	Surface Area	Current Output	Lifespan	Coating Thickness
AT-MMO-T16-500	16 mm	1.0 mm	500 mm	0.025 m²	2.5 A	25 years	≥8μm
AT-MMO-T16-500-Se	16 mm	1.0 mm	500 mm	0.025 m²	15 A	25 years	≥8μm
AT-MMO-T16-1000	16 mm	1.0 mm	1000 mm	0.05 m²	5 A	25 years	≥8μm
AT-MMO-T16-1000-Se	16 mm	1.0 mm	1000 mm	0.05 m²	30 A	25 years	≥8μm
AT-MMO-T19-500	19 mm	1.0 mm	500 mm	0.03 m²	3 A	25 years	≥8μm
AT-MMO-T19-500-Se	19 mm	1.0 mm	500 mm	0.03 m²	18 A	25 years	≥8μm
AT-MMO-T19-1000	19 mm	1.0 mm	1000 mm	0.06 m²	6 A	25 years	≥8μm
AT-MMO-T19-1000-Se	19 mm	1.0 mm	1000 mm	0.06 m²	36 A	25 years	≥8μm
AT-MMO-T25-500	25 mm	1.0 mm	500 mm	0.04 m²	4 A	25 years	≥8μm
AT-MMO-T25-500-Se	25 mm	1.0 mm	500 mm	0.04 m²	24 A	25 years	≥8μm
AT-MMO-T25-1000	25 mm	1.0 mm	1000 mm	0.08 m²	8 A	25 years	≥8μm
AT-MMO-T25-1000-Se	25 mm	1.0 mm	1000 mm	0.08 m²	48 A	25 years	≥8μm

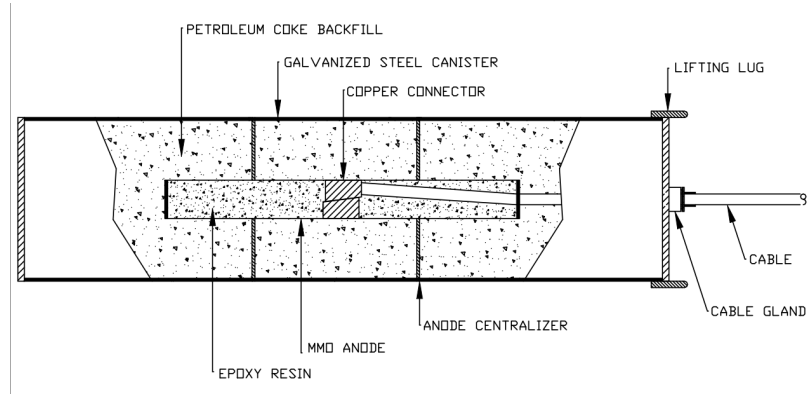
MMO TUBULAR ANODE

AT-MMO-T32-1000	32 mm	1.0 mm	1000 mm	0.1 m ²	10 A	25 years	≥8μm
AT-MMO-T32-1000-Se	32 mm	1.0 mm	1000 mm	0.1 m ²	60 A	25 years	≥8μm
AT-MMO-T32-1220	32 mm	1.0 mm	1220 mm	0.12 m ²	12 A	25 years	≥8μm
AT-MMO-T32-1220-Se	32 mm	1.0 mm	1220 mm	0.12 m ²	72 A	25 years	≥8μm



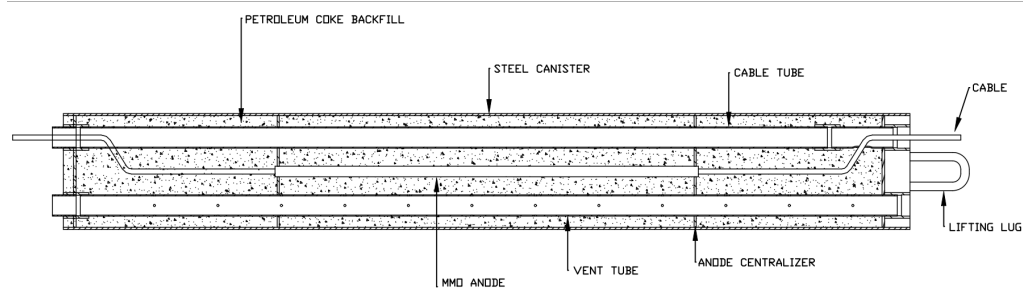
MMO Canister Anode for Shallow Groundbed

Model	MMO Anode Size	Canister Size	Current Output	Application
AT-MMO-S25-100	φ 25×1000mm	φ 100×2000mm	8A	Long Distance Pipeline, Stations
AT-MMO-S25-150	φ 25×1000mm	φ 150×2000mm	8A	Long Distance Pipeline, Stations
AT-MMO-S25-200	φ 25×1000mm	φ 200×2000mm	8A	Long Distance Pipeline, Stations



MMO Canister Anode for Deep Well Groundbed

Model	MMO Anode Size	MMO Anode Qty	Canister Size	Current Output	Application
AT-MMO-D25-219-4000	φ 25×1000mm	2	φ 219×4000mm	16A	Long Distance Pipeline, Stations
AT-MMO-D25-219-6000	φ 25×1000mm	3	φ 219×6000mm	24A	Long Distance Pipeline, Stations
AT-MMO-D25-273-4000	φ 25×1000mm	2	φ 273×4000mm	16A	Long Distance Pipeline, Stations
AT-MMO-D25-273-6000	φ 25×1000mm	3	φ 273×6000mm	24A	Long Distance Pipeline, Stations

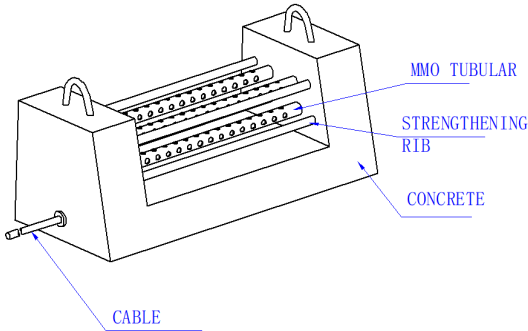


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Remote Anode

Model	MMO Anode Size	MMO Anode Count	Remote Anode Size	Current Output	Applications
AT-MMO-Y16-4	φ16×1000mm	4	250×300×630mm	60A	Wind Power Foundation, Submarine Pipeline, Offshore Oil Production Equipment
AT-MMO-Y25-4	φ25×1000mm	4	250×300×630mm	96A	Wind Power Foundation, Submarine Pipeline, Offshore Oil Production Equipment



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