

PRODUCT DATA SHEET / CONFIGURATION GUIDE

MMO Tubular Titanium Anodes

REVISION

Rev A

14 August 2026

Project-configured anodes for impressed-current cathodic protection



REPRESENTATIVE CONCEPT VISUALIZATION

01

Electrolyte and exposure

Soil, coke, fresh water, brackish water, seawater or another specified environment.

02

Required current duty

System and per-anode current, duty cycle, available DC voltage and installation arrangement.

03

Required design life

Evaluated against active area, current density, cumulative charge and product-relevant qualification evidence.

FIRST-PRINCIPLES PRODUCT POSITION

Project-configured MMO tubular anodes with a declared design basis, controlled cable connection and order-specific inspection documentation.

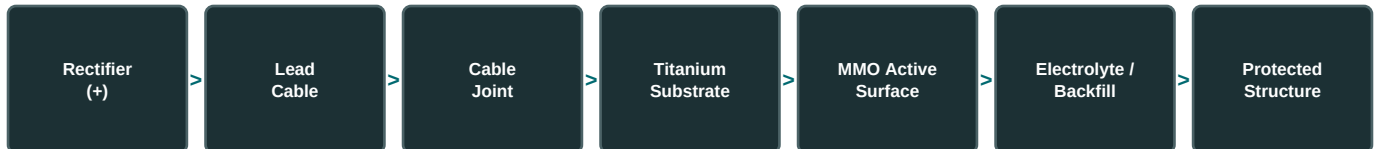
Current rating and design life are condition-dependent. Contractual values are only those stated in the accepted quotation, approved drawing/BOM and project inspection and test plan.

PRODUCT PAGE cathprocp.com/mmo-tubular-titanium-anodes.html

THE COMPLETE CURRENT PATH

Reliable output depends on every interface in the circuit.

The MMO coating is the catalytic current-discharge surface. The joint, substrate, active coating, electrolyte and protected structure must operate as one controlled ICCP circuit.



THREE CALCULATIONS THAT CONTROL THE PROPOSAL

01

Current density

Operating current / active coated area.
The proposed range must be supported for the stated electrolyte and coating system.

02

Cumulative charge

Operating current x operating time. Life requires a declared duty cycle, active area and relevant qualification basis.

03

System resistance

Available DC voltage / total circuit resistance. Backfill, electrolyte, spacing, cables and geometry influence output.

CRITICAL INTERFACES

Titanium substrate Product form, grade, dimensions, active length, surface preparation and traceability.

MMO coating Electrolyte-compatible system, controlled application, batch and agreed qualification evidence.

Electrical connection Order-defined cable-to-titanium joint with agreed continuity or resistance inspection.

Seal and strain relief Protection selected for handling, installation depth, immersion and chemical exposure.

Lead cable Conductor, insulation, voltage rating, supplied length, identification and termination.



Representative external cable-exit concept. Internal joint construction is not shown and remains order-specific.

SELECT THE SUPPLY CONFIGURATION

Match the physical supply to the installation method.

Final construction is defined by the RFQ, client specification, accepted drawing, bill of materials and inspection plan.

01

Bare MMO tubular anode

Order-defined titanium tube, coated active area, inactive areas, geometry and identification.

02

Cable-connected anode

Finished tube with order-defined lead cable, electrical joint, environmental seal and strain relief.

03

MMO anode string

Multiple anodes with project-defined leads, elevations, circuit arrangement and installation hardware.

04

Canistered / deep-anode package

Project-scoped anodes, canister or coke interface, cables and specified groundbed components.



Cable-connected assembly: define the tube, cable, joint, seal and inspection together.



Bare product family: different lengths are not automatically interchangeable.

APPLICATION FIT IS CONDITIONAL

Application	Primary design inputs	Typical supply decision
Pipeline groundbeds	Soil resistivity, current, voltage, geometry and interference	Bare, string or canistered arrangement
Deep-anode systems	Borehole, active column, coke, venting, elevations and cables	String or project-configured package
Tank applications	Water chemistry or foundation, current distribution and mounting	Cable-connected or mounted anodes
Fresh / brackish / seawater	Conductivity, chloride, temperature, flow and exposure	Application-qualified coating and cable
Replacement anodes	Existing drawing, duty, failure history and interfaces	Drawing-defined technical review

DO NOT ASSUME ONE COATING, CURRENT DENSITY OR CABLE CONSTRUCTION SUITS EVERY ELECTROLYTE.

ORDER-SPECIFIC TECHNICAL SCHEDULE

Define the fields before any value becomes contractual.

This guide does not substitute competitor catalogue values for CathPro product data. Final values appear in the accepted quotation, approved drawing/BOM and project ITP.

Specification field	Information to define	Confirmation document
Service environment	Protected structure, electrolyte, chemistry, temperature, flow, installation and jurisdiction.	RFQ and approved design basis
Titanium substrate	Product form, grade, standard, OD, wall thickness, overall length, active length and tolerances.	MTC, approved datasheet and GA
Coating system	Application-specific system, active area, batch reference and required qualification or witness scope.	Approved datasheet, ITP and qualification record
Electrical duty	Required current, proposed current density, duty cycle, cumulative-charge basis and declared conditions.	Accepted technical proposal
Cable assembly	Conductor, insulation, voltage rating, length, joint, seal, strain relief, exit and termination.	Approved drawing, BOM and cable schedule
Installation package	Bare, mounted, string, canistered or deep-anode configuration and related accessories.	Project GA and BOM
Inspection and documents	Dimensions, visual, continuity, agreed resistance/seal tests, MTC, CoC, ITP and third-party points.	Document register and inspection release

PROJECT EVIDENCE PACKAGE

01

Product definition

Approved datasheet, GA, BOM, active-area definition and cable schedule.

02

Substrate traceability

Material certificate, grade, product form and heat or lot linkage as ordered.

03

Coating records

Controlled-process, batch and agreed qualification-coupon evidence.

04

Assembly inspection

Dimensions, visual, continuity and agreed connection, seal or cable records.

05

Release documents

ITP, inspection report, CoC and third-party records as ordered.

06

Shipping records

Packing list, identification, mass, handling guidance and origin support.

Accelerated life testing is normally qualification evidence from a defined specimen or coupon. It should not be represented as a destructive test performed on every finished production anode.

STANDARDS BY SCOPE

No single standard certifies the complete MMO tubular anode and ICCP system.

The purchase documents must identify the required edition, product form, grade, test method, specimen relationship, acceptance criteria and evidence.

Reference	What it controls	Correct application
ASTM B338-17(2026)	Titanium and titanium-alloy tube	Substrate reference only; not MMO coating or finished-anode performance.
ISO 19097-2:2018	ALT for MMO in soil and natural waters	Qualification under declared conditions; not a universal field-life guarantee.
NACE TM0108-2012	ALT for catalyzed titanium anodes	Project-specified method with material-specific correlation and acceptance.
ISO 15589-1:2026	On-land pipeline CP systems	System lifecycle reference; not a standalone anode certificate.
NACE SP0169-2024	Underground or submerged piping	General system and protection-practice reference.
NACE SP0572-2024	Impressed-current deep-anode systems	Deep-anode design, installation and operation; not a coating specification.

SEND THESE INPUTS FOR A TECHNICALLY COMPLETE RFQ

- 1 Protected structure and application
- 2 Project country and client specification
- 3 Electrolyte, conductivity or resistivity
- 4 Chloride, pH, temperature and flow
- 5 Required total and per-anode current
- 6 Duty cycle and required design life
- 7 Tube dimensions, active area or drawing
- 8 Cable construction, rating and length
- 9 Installation / string / canister arrangement
- 10 Inspection, MTC, ITP and witness needs
- 11 Quantity, destination and Incoterm
- 12 Required delivery date and attachments

NEXT STEP

Send the application data, BOQ, drawing or client specification.

CathPro will identify the missing design-basis inputs and confirm the product, inspection and document scope before quotation.

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