Conductive Polymer Anode

Pre-packaged linear anode for impressed current cathodic protection

Technical Data Sheet CP-DS-PA-001 | Revision C | 27 October 2026

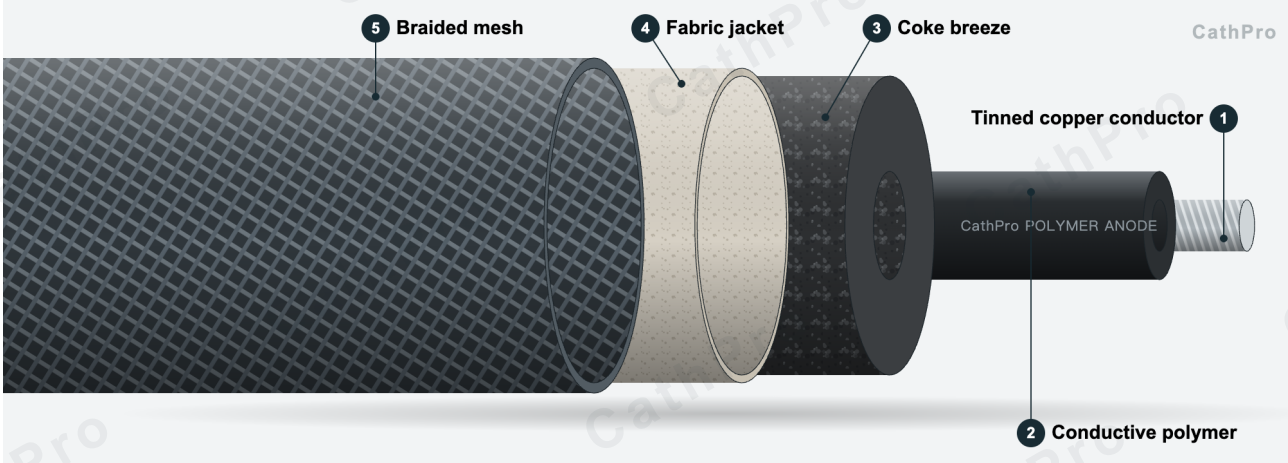


Figure 1 – Construction of the conductive polymer anode, pre-packaged version (schematic, not to scale; item numbers as in Section 3)

1 Description

The CathPro conductive polymer anode is a flexible linear anode for impressed current cathodic protection (ICCP). A tinned copper conductor carries the current along the anode with very little voltage drop; a continuous extrusion of carbon-loaded conductive polymer seals the copper against corrosion and lets the current pass to the surroundings along the full length. There are no wire-to-cable nodes.

The standard version is pre-packaged: the polymer-coated conductor is centred in calcined petroleum coke inside a fabric jacket and a protective braid, so no separate backfill is needed on site. Like the MMO/Ti flexible anode (data sheet CP-DS-FA-001) it is a flexible linear anode; the two differ in the current-discharging element.

2 Typical applications

- **Pipelines with poor or damaged coating:** even current distribution along the pipe; laid in the same trench, or by horizontal directional drilling alongside the pipe without touching it.
- **High-resistivity soil:** the anode lies close to the structure, so the circuit resistance stays low.
- **Complex pipe networks and areas with many buried structures:** current flows mainly to the nearby protected structure, limiting interference with other structures.
- **Storage tank bottoms:** laid in the sand pad as parallel runs or concentric rings and led out to an anode junction box (see API RP 651 and AMPP SP0193).
- **Limitations:** not recommended in oily wastewater or saline water.

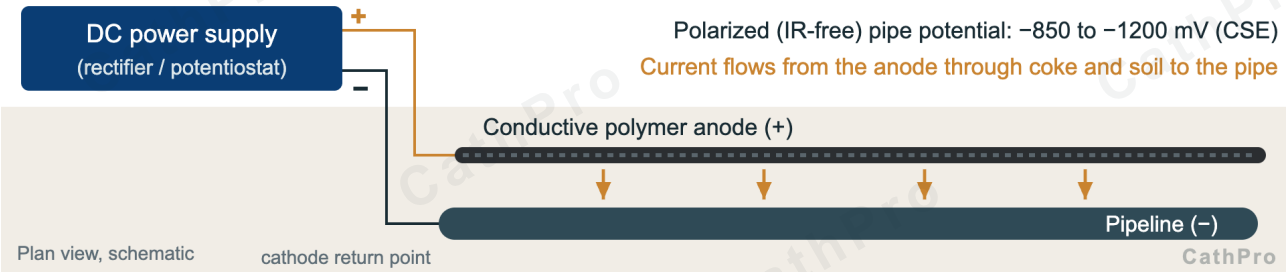


Figure 2 – Working principle: the power supply drives current from the anode through coke and soil to the pipeline

3 Construction

No.	Component	Description
1	Copper conductor	Tinned copper, 16 mm², class 2 stranded (IEC 60228); low-resistance bus bar.
2	Conductive polymer	Carbon-loaded polymer extruded continuously over the conductor, outer diameter 13 mm; seals the copper and discharges current along the full length.
3	Coke breeze	Pre-packaged calcined petroleum coke; takes over most of the electrochemical reaction, lowers the resistance to earth and extends anode life.
4	Fabric jacket	Acid-resistant, permeable woven fabric holding the coke and keeping the conductor centred.
5	Braided mesh	Non-conductive protective braid improving abrasion and damage resistance for trench or HDD installation.

4 Technical data

Parameter	Value
Copper conductor	16 mm² tinned copper, class 2 stranded (IEC 60228)
Conductive polymer outer diameter	13 mm
Maximum output current	52 mA/m without backfill; 82 mA/m in coke backfill (pre-packaged)
Design life	20 years at the maximum output current
Minimum bending radius	150 mm bare anode; 500 mm recommended for the pre-packaged anode
Minimum installation temperature	−18 °C
Pre-packaged anode	outer diameter approx. 38 mm, mass approx. 1.5 kg/m (coke breeze, fabric jacket and braid)
Reel lengths	up to 500 m per reel; lengths to order
Lead cables	per project, e.g. 1 × 16 mm² copper cable with HMWPE or PVDF/HMWPE insulation, 25 m at each end
Accessories	in-line joint kit, tee joint kit, end cap kit

Values for the standard product. The accepted quotation and the project data sheet govern each order; operating above the maximum output current shortens anode life.

5 Comparison with the MMO/Ti flexible anode

Item	Conductive polymer anode	MMO/Ti flexible anode
Discharging element	conductive polymer over copper	MMO-coated titanium wire
Connection to the cable	continuous, no nodes	nodes every ≤ 5 m
Output per metre	max. 52 mA/m bare, 82 mA/m in coke	26–104 mA/m, by wire size and design life
Design life	20 years at maximum output	25–50 years (rating table)
Breakpoint location	—	available (FApro type)
Acceptance basis	CathPro data sheet CP-DS-PA-001 and project specification	CathPro data sheet CP-DS-FA-001
Typical use	pipelines with poor coating; high-resistivity soil; complex pipe networks; tank bottoms. Not in oily wastewater or saline water	station areas; higher current demand or longer life; tank bottoms; airport aprons

6 Installation guidelines

- On receipt, check size, length, reel number and certificate; braid and fabric jacket must be intact, with no coke leakage.
- Keep reels standing on their flanges for handling and storage; never lay them flat. Protect the anode from sharp objects.
- Unreel by rotating the reel; do not drag the anode or pull it over the ground. Repair any damage to the fabric jacket before laying.
- Bending radius not less than 150 mm for the bare anode and 500 mm for the pre-packaged anode; avoid kinks and twisting. Do not install below −18 °C.
- Lay parallel to the pipeline at least 300 mm and at least half the pipe diameter from it, level with the pipe bottom (Figure 3); keep the anode slack, with an allowance for settlement.
- The anode must not touch buried metal. Where it crosses pipelines, earth electrodes or other anodes, protect it with an insulating sleeve.
- Backfill with sieved soil and compact in layers; no stones against the anode.
- Make joints and end seals with the matching kits. Connect the lead cables to the positive terminal of the power supply via an anode junction box.

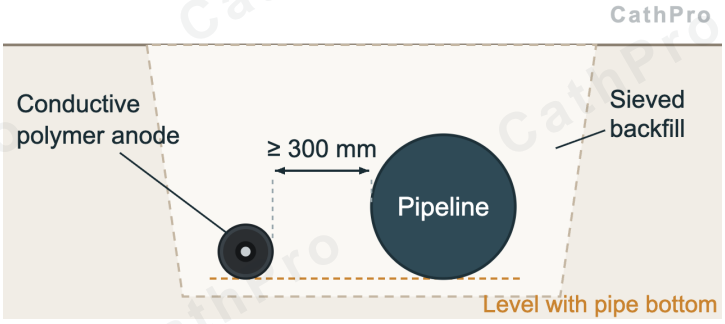


Figure 3 – Laying parallel to a pipeline: clearance ≥ 300 mm and ≥ half the pipe diameter, anode level with the pipe bottom

7 Inspection and quality documents

- Each reel: appearance, outer diameter, length and conductor continuity (DC resistance); coke packing uniform, braid undamaged.
- Documents: certificate of conformity, inspection certificate (EN 10204 type 3.1 on request), reel length list and packing list. Witness or third-party testing on request — please state it in the order.

8 Packing and storage

- Reels with moisture-proof wrapping, marked with product name, size, length, batch number, production date and unreeling direction.
- Store clean and dry or protected from moisture; keep the protective wrapping until installation.

9 Ordering information

1. Conductor size; pre-packaged (standard) or other version.
2. Total length, reel lengths and segment requirements.
3. Lead cables at both ends: type, size and length (e.g. 1 × 16 mm², 25 m at each end).
4. Accessories: numbers of in-line joints, tee joints and end caps.
5. Design data and documents: current demand, design life, soil resistivity; applicable project specification; third-party testing if required.

10 Referenced standards

- ISO 15589-1 Cathodic protection of pipeline systems — Part 1: On-land pipelines
- API RP 651 Cathodic protection of aboveground petroleum storage tanks; AMPP SP0193 External cathodic protection of on-grade carbon steel storage tank bottoms
- IEC 60228 Conductors of insulated cables
- EN 10204 Metallic products — Types of inspection documents

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