



**Long-line flexible anode for impressed-current cathodic protection of buried pipelines.**

## Product description

### ANODEFLEX 500 cathodic protection.

**Construction:** Two basic elements:

**Central Copper Conductor:** #6 AWG, serving as a low resistance busbar to deliver the required current over considerable distance without incurring substantial longitudinal voltage drop.

**Conductive polymer:** 0.5 inch (13 mm) in diameter extruded polymer jacket which seals the copper conductor from external elements ie: chemical attack, and allows the flow of current.

Anodeflex 500 is a long-line, flexible, cable-like anode, which is placed in continuous close proximity to the target structure. Hence, uniform distribution of cathodic protection current is achieved on applications where many conventional anode ground beds do not work. Key to the product's performance is the central, conductive-polymer coated copper conductor. This unique construction allows current to flow long distances down the center conductor, while allowing sufficient cathodic protection current to continuously pass through the conductive polymer all along the length of the anode. In contrast to conventional CP systems, AnodeFlex 500 is placed in the ground in close proximity to the steel surface to be protected and provides uniform distribution of protective current to each point evenly along the length of the steel surface, maintaining the steel-to-soil "instant-off" potential in the required window of -850mv (-950mv if SRB's Present) and -1200mv. The central anode cable is surrounded by high conductivity coke breeze, which is added separately at the time of installation. The improved current distribution increases anode efficiency and helps prevent over-voltage problems such as hydrogen generation and associated rapid coating disbondment. In addition, interference to foreign structures is minimized.

On poorly coated pipelines, where optimal polarization can no longer be achieved, Anodeflex 500 can often be installed as an alternative to expensive recoating. Both on single and multi-parallel pipelines, safe levels of polarization will be restored at every point. The system avoids difficult field recoating and greatly reduces environmental disturbance.

The anode is installed the same way as for a standard low voltage cable. AnodeFlex is delivered on easy-to-handle reel spools with sufficient lengths for most applications. Several lengths of the anode can be arranged in simple circuit designs. AnodeFlex can be ploughed in or simply laid in an existing ditch.

AnodeFlex 500 is centrally laid in a 4" x 4" coke breeze backfill in a shallow trench and covered with soil, or the anode and coke breeze may be ploughed directly into the ground using cable ploughing techniques. In those soil conditions where the coke breeze cannot be maintained around the polymeric cable during its entire lifetime due to the risk of being washed away, than Anodeflex 1500-01 with pre-packaged coke breeze is recommended.

## Product features/benefits

- Anode is always in close proximity to the pipeline**  
 Distributes current uniformly over total length of pipeline  
 No over- or under-protected areas. Prevents accelerated coating disbondment.  
 More effective & economical (than a series of discrete anodes).  
 Independent of variations in soil resistivity.
- Pipeline Rehabilitation without Excavation**  
 No loss in revenue or service.  
 No safety concerns as needed for working on live lines  
 Environmentally friendly.  
 Significantly extends the lifetime of the existing coating.
- Low cost and ideal alternative to recoating.
- Long continuous circuit lengths**  
 90% fewer joints compared to conventional anode systems.  
 Lower maintenance cost.
- Avoids interference and stray current problems**  
 Enhances long-term performance.  
 Focuses current on the target structure.  
 Improves protection and cost efficiency.
- Installation with modified cable laying equipment**  
 Fast, Easy, & Cost effective.

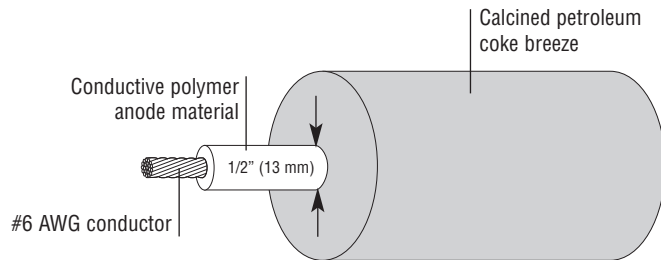
## Product selection guide

	AnodeFlex 500
<b>Recommended Max Design Current Output in Soil</b>	52 mA/m (16 mA/ft) if installed in a 4" coke breeze column

## Product dimensions

	AnodeFlex 500
<b>Nominal diameter</b>	0.5 in. (13 mm)
<b>Weight</b>	0.175 lbs/ft (260 g/m)
<b>Length</b>	Up to 2000 ft (Up to 610 m)
<b>Coke breeze requirements</b>	Calcinated petroleum coke (fluid or delayed) Predominately spherical or round Bulk density > 65 lb/ft <sup>3</sup> = 961 kg/m <sup>3</sup> Fixed carbon > 99% Resistivity (10 bar) <= 0.1 Ohm-cm Ash <= 0.5 % No volatiles at 950°C Size as small as possible, but must meet 1% between 1.2 mm (Mesh 16) and 12.7 mm (1/2in.), 99% < 1.2 mm

## Product properties: AnodeFlex 500



Property	Test method	Typical Value
<b>Copper Conductor</b>		
Dimensions	ASTM B-263	6 AWG
Resistance	ASTM B-193	1.5 10 <sup>-3</sup> Ohm/m
<b>Conductive Polymer</b>		
Dimensions	ASTM B-263	Pass
Volume resistivity	ASTM B-193	1.5 Ohm-cm

## Ordering information

**ANODEFLEX type products are available:**

- as a spool

### Example: AFLX-500

#### Standard Ordering options

AFLX	AnodeFlex type product
500	Conductive polymer coated copper conductor

#### Accessories

AFLX-500-CAP	End cap kit
AFLX-500-TEE	Tee Connection kit
AFLX-500-SPLICE	In-line splice kit

**Important:** Like any cathodic protection system, the Tyco Adhesives AnodeFlex system must be optimized for particular design conditions. Severe environments may limit the life-time. AnodeFlex is a flexible carbon cable anode system. When all the active anode material available around the polymeric cable is consumed, the anode will no longer function. Tyco Adhesives warrants that AnodeFlex meets the internal Tyco Adhesives specification, but the purchaser must rely on its own engineering experience judgement and skill to ascertain whether or not AnodeFlex is fit for the particular purpose proposed by the purchaser.

All of the above information, including illustrations, is believed to be reliable. Users, however, should independently evaluate the suitability of each product for their application. Tyco Adhesives makes no warranties as to the accuracy or completeness of the information and disclaims any liability regarding its use. Tyco Adhesives' only obligations are those in the Standard Terms and Conditions of Sales for this product and in no case will Tyco Adhesives be liable for any incidental, indirect or consequential damages arising from the sale, resale, use or misuse of the product. Tyco Adhesives' specifications are subject to change without notice. In addition, Tyco Adhesives reserves the right to make changes in materials or processing, without notification to the Buyer, which do not affect compliance with any applicable specification.

# Tyco Adhesives

Corrosion Protection Group

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