AnodeFlex™ 3000

Cathodic Protection System

Long-line flexible anode for high output impressed-current cathodic protection of buried pipelines and of on-grade and buried storage tanks.

Product description

AnodeFlex 3000 Cathodic Protection

Construction: Five basic elements:

Central Copper Bus Cable: #6 or #8 AWG Halar Dual Insulated, (also available as single insulated HMWPE) serving as a low resistance busbar to deliver the required current over considerable distance without incurring substantial longitudinal voltage drop. Halar insulation seals the conductor from chemical attack and in the presence of chlorine, hydrochloric acid, sulfuric acid, or other strong oxidizing agents the material remains stable.

Copper-Cored, Titanium Wire, Mixed Metal Oxide coated Anode (MMO): Provides low attenuation for reduced splicing, in combination with prepackaged coke breeze, offers a low resistance groundbed designed for a minimum life of 20 years.

Coke Breeze: Pre-packaged, high performance calcined petroleum coke breeze, serving as the active matrix in which the electrochemical reactions take place. Designed for min. 20 years service life at max. current output of 656mA/m (200mA/ft). (see Anodeflex 3000 Data sheet for output details).

Fabric Jacket: Integrated woven, acid resistant and porous jacket holding the coke breeze in place around the anode.

Protective Braid: Tough, porous, non-conductive protective braid enhancing the abrasion and damage resistance of the jacket.

AnodeFlex 3000 is a long-life, flexible, wire anode, which can be placed remote to the target structure. Greater current output can be achieved on applications where close proximity anode groundbeds do not work. Key to the product's performance is the central, copper-core Titanium Wire mixed metal oxide coated anode. The anode is powered by a #6 or #8 AWG copper cable insulated with an inner layer of halar and outer layer of high molecular weight polyethylene. The unique construction of the anode and copper cable allow high current output with protection against low pH and chlorine attack. AnodeFlex 3000 is placed remote to the steel surface to be protected, thereby maintaining the steel-to-soil "instant-off" potential in the required window of -850 mV (-950 mV if SRB's present) and -1200 mV. The central MMO wire and cable are surounded by factory prepackaged, high conductivity coke breeze, held in place by a porous, woven acid-resistant jacket. This arrangement avoids handling loose coke breeze and simplifies field installation. The improved current distribution increases anode efficiency and maintains a low resistance groundbed. On poorly coated pipelines where optimal polarization can no longer be achieved, Anodeflex Systems are often 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 saves money by minimizing costly field recoating and greatly reduces environmental disturbances.

AnodeFlex 3000 is delivered on long length spools and because no additional coke breeze is required, the installation is as simple as laying a low voltage power cable. Proven heat-shrinkable splice kits, with tee splices and end sealing caps are available to complete any installation design.

Product features/benefits

- Anode can be remote to the pipeline
  Distributes current uniformly over total length.
  No over-or under-protected areas.
  Prevents accelerated coating disbondment.
  More effective & economical than a series of discrete anodes.
- Pipeline Rehabilitation without Excavation
  A fraction of the cost of recoating.
  Environmentally friendly.
  No loss of revenue or supply interruptions.
  No safety problems associated with working on live lines.
  Far quicker, up to1.25 miles (2 km) laying speed per day.
- Long continuous circuit lengths
  67% fewer joints compared to conventional anode systems.
  Lower maintenance cost.
- Flexible under tank bottom design
  Directional drill with no PVC, no backfill.
  Tight bend radius.
  Driving voltage is lower than conventional MMO.
- Pre-packaged coke breeze
  Simplifies field installation.
  Installation with standard cable laying equipment.
  Fast, easy & cost effective.

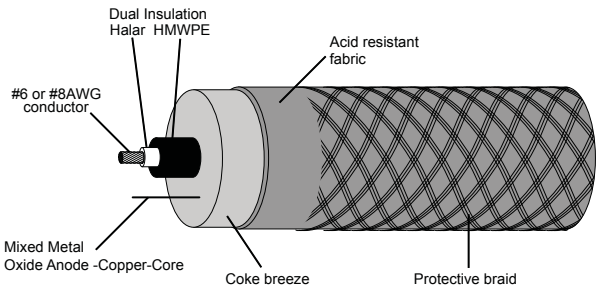
Product selection guide

	Max Output
AnodeFlex 3020	66 mA/m (20 mA/ft)
AnodeFlex 3100	328 mA/m (100 mA/ft)
AnodeFlex 3200	656 mA/m (200 mA/ft)

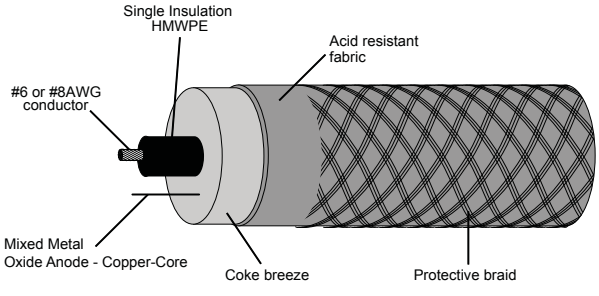
Product dimensions

Nominal diameter	35 mm (1.37 in)
Weight	1.5 Kg/m (1.0 lb/ft)
Length	494 m± 6 m (1620 ft± 20 ft)

DUAL INSULATION (DU)



Also Available as SINGLE INSULATION HMWPE (SI)



DS-AFLX-3000-REV11 AUG10 LEXP-0002

Property	Test method	Typical Value
Copper Conductor		
Dimensions	ASTM B-263	8 AWG
Coke Breeze		
Fixed carbon	ASTM D-3172	99.7%
Resistivity	G.L.C. - C - 12A @ 23ºC (73ºF), 10 bar (145 psi)	0.4 Ohm-cm
Fabric Jacket		
Weight	Min. 200 g/m^2	229 g/m^2
Bursting strength	ISO 3303	575 N
Abrasion resistance	ASTM D-4157	219 cycles to failure
Fluid resistance	Internal immersion test 6 months	Pass
Chlorine resistance	Internal immersion test 6 months	Pass
UV resistance	ASTM G-53 @ 60ºC (140ºF) , 8 hrs @ 50ºC (122ºF) , 4 hrs condensation	55% tear strength loss

Ordering information

ANODEFLEX type products are available on a spool.

Example: AFLX-3200-8		**Standard Ordering Options**	
AFLX	Product family	AFLX : Copper-core titanium wire MMO coated anode with copper conductor surrounded by pre-packaged high conductivity coke breeze	
3200	Product type/Current output	3020 66mA/m (20mAmps/ft) 3100 328mA/m (100mA/ft) 3200 656mA/m (200mA/ft)	
8	Copper conductor type	#8AWG-Halar Dual Insulated #6AWG-Halar Dual Insulated	Inner halar and outer HMWPE Inner halar and outer HMWPE
		#8AWG HMWPE Single insulated #6AWG HMWPE Single insulated	Outer HMWPE Outer HMWPE

Product Selection

	PCN	Conductor/Insulation Type	Output
AnodeFlex-3020-8-SI	542439-000	#8AWG HMWPEsingle insulated	66mA/m (20mAmps/linear ft)
AnodeFlex-3020-6-SI	226315-000	#6AWG HMWPEsingle insulated	66mA/m (20mAmps/linear ft)
AnodeFlex-3020-8-DU	744565-000	#8AWG-Halar Dual Insulated	66mA/m (20mAmps/linear ft)
AnodeFlex-3020-6-DU	916657-000	#6AWG-Halar Dual Insulated	66mA/m (20mAmps/linear ft)
AnodeFlex-3100-8-DU	581972-000	#8AWG-Halar Dual Insulated	328mA/m (100mAmps/linear ft)
AnodeFlex-3100-6-DU	644948-000	#6AWG-Halar Dual Insulated	328mA/m (100mAmps/linear ft)
AnodeFlex-3200-8-DU	355935-000	#8AWG-Halar Dual Insulated	656mA/m (200mApms/linear ft)
AnodeFlex-3200-6-DU	519428-000	#6AWG-Halar Dual Insulated	656mA/m (200mApms/linear ft)

Standard cutlength = 494 m ± 6 m (1620 ft ± 20 ft)
AnodeFlex 3020, 3100 &3200 are available on #8 & #6 Single (SI) or Dual(DU) insulation

Accessories

Description	PCN	Application
AFLX-3020-TEE-8-SI	676538-000	TEE splice for ANODEFLEX-3020-8-SI
AFLX-3020-TEE-6-SI	160636-000	TEE splice for ANODEFLEX-3020-6-SI
AFLX-3020-TEE-8-DU	592199-000	TEE splice for ANODEFLEX-3020-8-DU
AFLX-3020-TEE-6-DU	522543-000	TEE splice for ANODEFLEX-3020-6-DU
AFLX-3100-TEE-8-DU	111441-000	TEE splice for ANODEFLEX-3100-8-DU
AFLX-3100-TEE-6-DU	128149-000	TEE splice for ANODEFLEX-3100-6-DU
AFLX-3200-TEE-8-DU	576900-000	TEE splice for ANODEFLEX-3200-8-DU
AFLX-3200-TEE-6-DU	560589-000	TEE splice for ANODEFLEX-3200-6-DU

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