

PRODUCT DATA SHEET

**ANODEFLEX™ 3000-Cu Series**

**Product Information**

Anodefex 3000-Cu Series products are long-line flexible anodes for impressed-current cathodic protection of buried pipelines, in-plant piping and of on-grade or buried storage tanks.

Consists of:

- **Central Copper Conductor:** Dual insulated AWG #6 or #8 conductor cable for the MMO wire connected at fixed distances to deliver the required current without incurring substantial longitudinal voltage drop. Insulation protects the conductor from chemical attack in the presence of chlorine, hydrochloric acid, sulfuric acid or other strong oxidizing agents.
  - **Mixed Metal Oxide coated anode (MMO):** Titanium clad, copper wire with mixed metal oxide coating provides low attenuation in combination with prepackaged carbon backfill. Designed for minimum 20-year service life at maximum current output of up to 200mA/ft. / 656mA/m for 3200 product.
  - **Titanium clad copper with MMO coating**
  - **Carbon Backfill:** Pre-packaged, high performance calcined petroleum carbon backfill, serving as the active matrix in which the electrochemical reactions take place.
  - **Fabric Jacket:** Integrated woven, acid resistant and porous jacket holding the carbon backfill in place around the anode.
  - **Protective Braid:** Tough, porous, non-conductive protective braid enhancing the abrasion and damage resistance of the fabric jacket.
- The manufacturing process ensures a tightly packed fill material for optimum durability and performance. The synthetic jacket and protective braiding make the product ideal for installation through trenching or directional drilling.

Key Features & Benefits:

- Anode is in close proximity to the pipeline
- Distributes current uniformly over total length of pipeline
- No over or under protection
- Prevents accelerated coating disbondment
- More effective & economical than a series of discrete anodes
- Independent of variations in soil resistivity
- Pipeline Rehabilitation without excavation
- A fraction of the cost of recoating
- No loss of revenue or supply interruptions
- No safety problems associated with working on live lines
- Long continuous circuit lengths
- 90% fewer joints compared to conventional anode systems
- Low maintenance cost
- Avoids interference and stray current problems
- Enhances long-term performance
- Focuses current on the target structure
- Improves protection and cost efficiency
- Pre-packaging carbon backfill
- Loresco SC-3 product (or approved alternate)
- Ensures low resistance ground bed all the time
- Ensures the MMO anode & cable is centered
- Simplifies field installation, fast & cost effective
- Installation with standard cable laying equipment

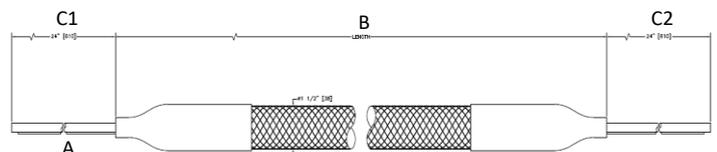
Product properties of Anodefex™ 3000-Cu Series		
Diameter	1.5" / 38mm	
Conductor wire type	Dual-insulated AWG #6 or #8	
MMO wire type	Titanium clad copper wire with mixed metal oxide coating	
Product weight	1lb/ft. / 1.5kg/m	
Fill material	Loresco™ SC-3 (or approved alternate)	
Fill volume	0.77lb/ft. / 1.15kg/m	
Casing (sock)	Synthetic fabric	
Braiding	Polypropylene filament	
Current output	Anodefex 3020	20 mA/ft. / 66 mA/m
	Anodefex 3100	100 mA/ft. / 328 mA/m
	Anodefex 3200	200 mA/ft. / 656 mA/m
Installation temperature	Min. 0°F / -18°C, no maximum	
Min. bend radius	20" / 500mm	

Shipping weights & dimensions				
Reel lengths	500', 1000', 1500', 2000' 100m, 200m 400m, 500m			
Pallet dimensions	44"x 48" x 52" - 64" high depending on reel length			
Pallet weights per reel length	500' reel	1000'	1500'	2000'
	700lbs	1260lbs	1830lbs	2330lbs
	100m reel	200m	400m	500m
	336kg	540kg	636kg	863kg
Handling	Handle with care. Keep reels on edge rails. Do not puncture the cable.			
Storage	Store in clean and dry environment or protect from moisture prior to installation. Unlimited shelf life.			

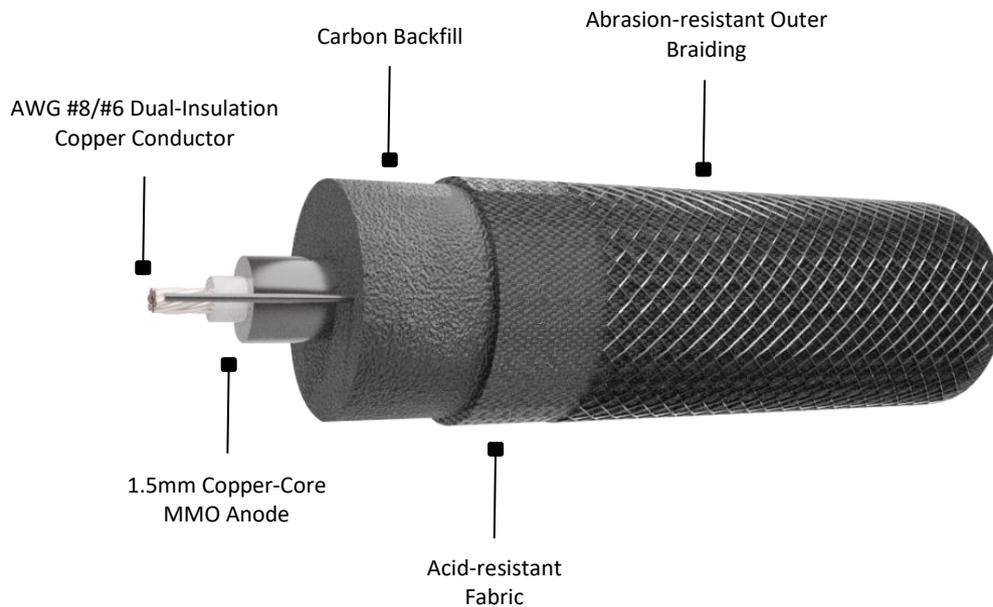
Ordering Information	
<b>Linear Anode Products</b>	<b>Maximum Output</b>
Anodefex 3020	20 mA/ft. / 66 mA/m
Anodefex 3100	100 mA/ft. / 328 mA/m
Anodefex 3200	200 mA/ft. / 656 mA/m
<b>Accessory Products</b>	<b>Application</b>
AFLX UNI-TEE	Tee splice kit
AFLX UNI-SPLICE	In-line splice kit
AFLX UNI-CAP	End cap kit

Other Information	
<b>Documentation</b>	Extensive information is available on our website. Design considerations and other documentation may be obtained by contacting your local distributor or by sending email to <a href="mailto:info@sealforlife.com">info@sealforlife.com</a>
<b>Ordering Information</b>	Specify wire gauge (A), cable length (B). Standard pigtail length (C) is 24" on each end.

**Assembly Schematic**



Typical Performance Properties		
Component / Property	Test Method	Typical Value
<b>Copper Conductor</b>		
Dimensions	ASTM B263	AWG # 8 or #6
Resistance	ASTM B193	1.5 x 10 <sup>3</sup> Ohm-cm
<b>Mixed Metal Oxide Wire</b>		
Wire size (diameter)	Measured	1.5mm
Wire types	Internal	Titanium clad copper core
Maximum current (20 year life)	Internal	20 – 200 mA/ft. 66 – 656 mA/m
<b>Carbon Backfill</b>		
Bulk density	ASTM D3172	74lbs/ft <sup>3</sup>
Fixed carbon	ASTM D3172	99.35%
Ash	ASTM D3172	<0.5%
<b>Fabric Jacket</b>		
Weight	Measured	Min. 200 g/m <sup>2</sup>
Bursting strength	ISO 3303	575N
Abrasion resistance	ASTM D4157	219 cycles
Fluid resistance	Internal 6 months immersion	Pass
Chlorine resistance	Internal 6 months immersion	Pass



**Specification language**

Anodefex 3000-Cu series products are long-line, flexible cable-like anode placed in continuous close proximity to the target structure. Uniform distribution of cathodic protection current achieved on applications where many conventional anode ground beds will not work or are difficult to install.

Product performance a result of the central insulated copper conductor, which allows current to flow long distances down the center conductor, and mixed-metal oxide (MMO) anode connected at regular intervals to the conductor cable. The mixed metal oxide is a crystalline, electrically-conductive coating that activates the titanium cladding and enables it to function as an anode. When applied on titanium, the coating has an extremely low consumption rate, measure in milligrams per year. The copper core MMO anode allows for longer lengths between connections in order to maintain consistent flow of cathodic current while minimizing voltage drop. System design should consider environmental factors such as adjacent structures, stray current and fluctuations in soil resistivity.

In contrast to conventional ground bed systems, Anodefex 3000-Cu series products are placed in the ground in close proximity to the steel surface to be protected and provides uniform distribution of protective current to the entire steel surface. This maintains the steel-to-soil "instant-off" potential in the required window of - 850mv and -1200mv. 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 from other structures and stray currents are virtually eliminated.

Anodefex 3000-Cu series products are delivered on long length spools and, because no additional carbon backfill is required, the installation is as simple as laying a low voltage power cable. Proven heat-shrinkable splice kits, Tee joints and end sealing caps are available to complete the installation.

	Seal For Life Industries Mexico S de R.L. de C.V. Tijuana, Mexico USA Tel: +1 858 633 9797 Mx Tel: +52 664 607 9105 mexico@sealforlife.com	Seal For Life Industries - Stopaq B.V. Stadskanaal, the Netherlands Tel: +31 599 696 170 Fax: +31 599 696 177 info@sealforlife.com	Seal For Life Industries BVBA Westerlo, Belgium Tel: +32 14 722 500 Fax: +32 14 722 570 belgium@sealforlife.com	Seal For Life India Private Ltd. Baroda, India Tel: +91 2667 264 721 Fax: +91 2667 264 724 india@sealforlife.com
	<b>Stopaq® - Covalence® - Polyken® - Powercrete® - Anodefex™</b>			

DISCLAIMER: Seal For Life Industries warrants that the product conforms to its chemical and physical description and is appropriate for the use stated on the technical data sheet when used in compliance with Seal For Life Industries' written instructions. Because many installation factors are beyond the control of Seal For Life Industries, the user shall determine the suitability of the products for the intended uses and assume all risks and liabilities in connection herewith. Seal For Life's liability is stated in its General Terms and Conditions of Sale. Seal For Life Industries makes no other warranty either express or implied. All information contained in this technical data sheet is to be used as a guide and is subject to change without notice. This technical data sheet supersedes all previous data sheets on this product.