

**DURAMMO®**  
Deep Anode System



Durammo® is the only complete, factory assembled, ready to install deep anode system available. Over 10,000 Durammo Deep Anode Systems, in operation for more than 600 million hours over 30 years, have successfully protected pipelines, wells, plants and infrastructure from corrosion. Patented MATCOR Kynex® connection technology and fast, reliable installation make Durammo the leading deep anode system in the world.

## PRODUCT DETAILS

100% factory made in MATCOR's USA, ISO 9001:2015 facility, Durammo is a complete deep anode system that installs in minutes without field assembly. Kynar® cables, SuperVent™, mixed metal oxide (MMO) anode, Kynex® connections, connection links, bottom weight and lowering rope are shipped complete on one reel, eliminating the time and risk involved in field assembly.

In addition to manufacturing, MATCOR provides complete design, engineering, construction, and installation for deep anode systems.

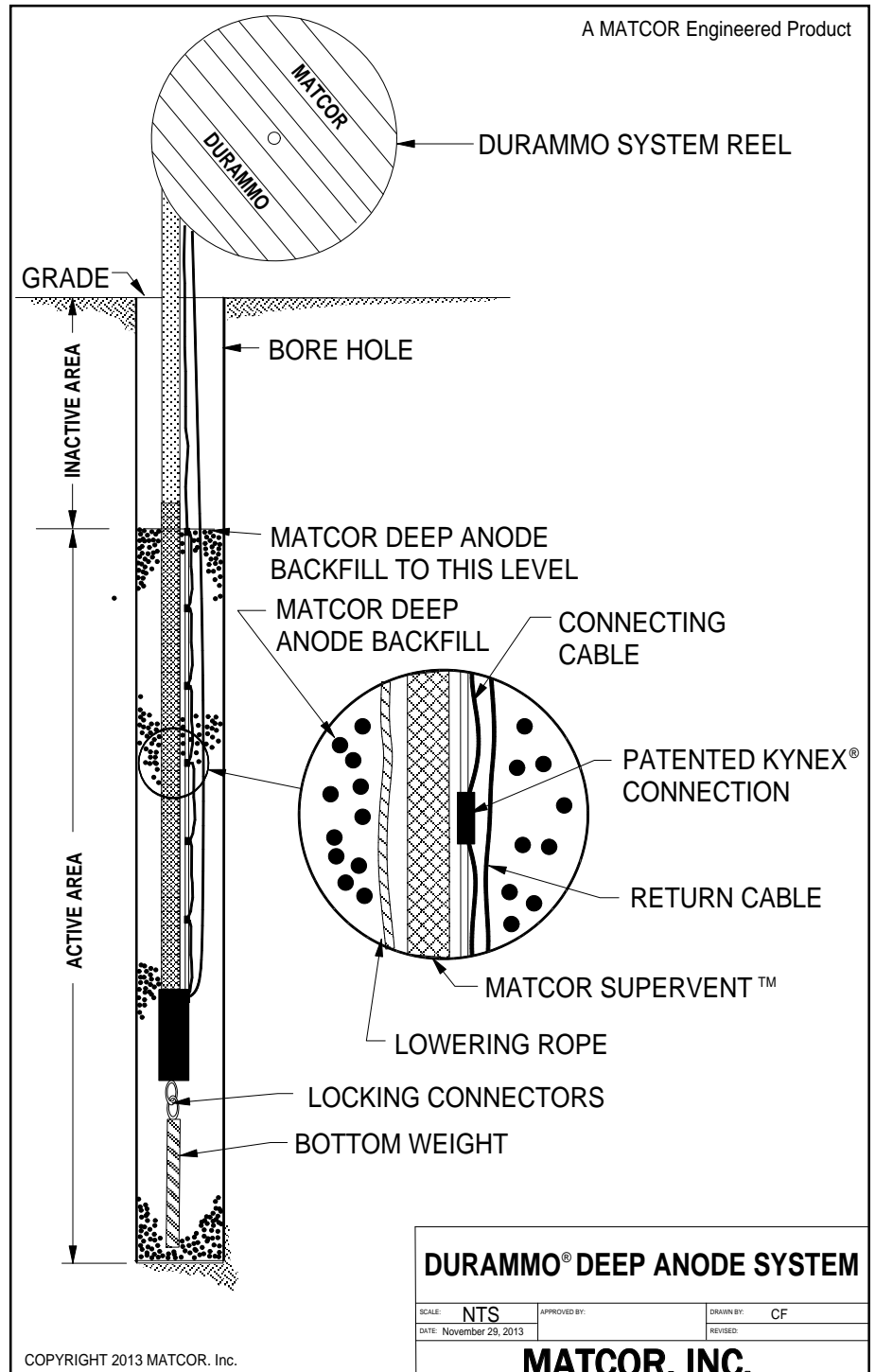


## BENEFITS

- Factory assembled, ready to install
- Fast and secure installation without dragging cables on the ground and risk of damage
- Reliable Kynex® connection technology
- SuperVent™ deep anode venting system provides the industry's best defense against vent blocking
- Most economical, longest life anode system available
- Redundant power feed to anodes
- Fewer cables required
- Kynar® cables to guard against chlorine attack
- Reduced shipping weight, cost and risk of damage
- Installs in 6-, 8- or 10-inch diameter hole in minutes

# DURAMMO®

## Deep Anode System



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## COMPONENTS

**Anode:** Durammo® uses a continuous MMO anode that extends the entire length of the active area, eliminating the need for adjusting resistors or a resistor junction box. Durammo's Kynex® anode connections provide uniform current distribution and minimize IR drop.

**Cables:** Kynar insulated cables minimize chlorine gas degradation. The patented design of the Durammo system uses fewer cables than the old method of using individual anodes.

**Kynex Connections:** MATCOR's patented Kynex anode to cable connection, made of the same material as the cable insulation, is an injection-molded encapsulation that creates a continuous outer cable connection, providing the best protection for the anode to cable connection.

**System Lowering Rope:** A lowering rope is included with the Durammo anode assembly. The rope is the full length of the system and can remain in the borehole.

**Bottom Weight:** A bottom weight that quick-couples to the bottom assembly is included with Durammo to help lower the system and keep it centered.



*MATCOR's patented Kynex® anode to cable connection is an injection-molded encapsulation that creates an outer cable connection that is one continuous piece.*



*A Durammo® Deep Anode System installation site.*

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**SuperVent™:** The MATCOR SuperVent pipe provides superior venting compared to other systems, and its fabric wrap makes it virtually immune to blockage.

**System Reel and Packaging:** The entire anode system, excluding the bottom weight, is delivered on a single custom reel. Once the weight is quick-coupled to the system, it is ready to install. There is no need to have a number of cable reels and anodes strung out over the ground. The system reel simply sits over the borehole.

The system reel and bottom weight are on a skid or in a single container for storage and stacking. MATCOR can provide low resistance carbon backfill suitable for pumping with the system or supply an approved alternative.

**Optional Casing Kit:** A Durammo Casing Kit is available to complete the installation. The kit is made of Schedule 80 PVC, and includes a support bar for the SuperVent, cables and lowering rope. A removable locking cap has a built-in vent.



***The MATCOR SuperVent™ pipe provides superior venting compared to other systems and its fabric wrap makes it virtually immune to blocking.***

### ADDITIONAL EQUIPMENT AVAILABLE FROM MATCOR FOR DURAMMO INSTALLATIONS:

- Rectifiers
- Cathodic protection cables
- Test stations
- Permanent reference electrodes
- Exothermic weld equipment and materials
- Warning tapes

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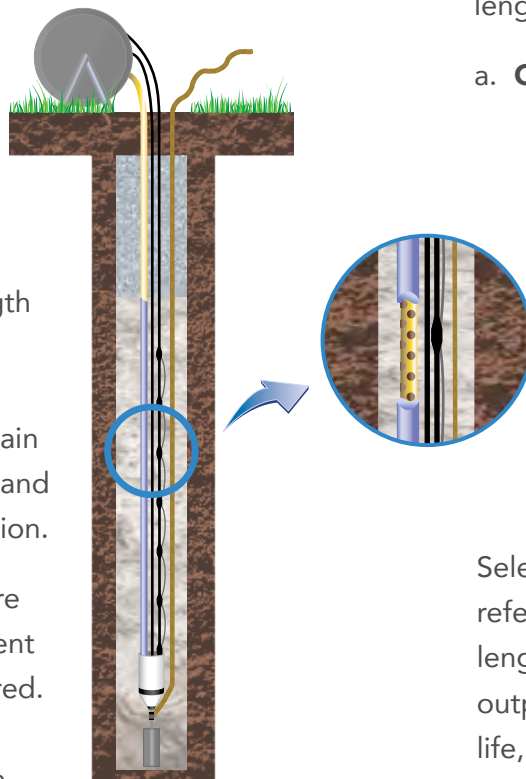
## DESIGN INSTRUCTIONS

MATCOR engineers can handle your complete Durammo® Deep Anode System design, from data collection to complete design drawings and specifications. However, if you have deep anode system design capability, Durammo is the easiest system to design and use. Durammo Deep Anode Systems are available in any total depth, active anode length and desired life.

The Durammo Deep Anode System performs like a single long anode. Uniform current distribution is possible along the entire length of the anode due to the computer designed cable connections and jumpers.

Two areas must be considered in the design: the active anode area and the inactive area. The active area is the length of the anode in the system. The inactive area is the length or depth of the system that does not produce current. The inactive area helps to gain distance from the structure and to increase current distribution.

Durammo anode systems are available in almost any current output rating and life required. Systems are available up to 1,000 ft. deep with a design life in excess of 100 years.



### *To order the Durammo Deep Anode System:*

1. Determine the required current output.
2. Determine the desired life of the anode system.
3. Measure the soil resistance for the area where the anode system is to be installed. An alternate method is to estimate the resistance, install the system and then measure the resistance of the installed system before ordering the rectifier.
4. There are several ways to determine the length of the active area:
  - a. **CHART 1** shows three typical systems:
    - S:** Standard output system with 100 ft. active length in a 250 ft. deep borehole
    - M:** Medium output system with 150 ft. active length in a 250 ft. deep borehole
    - H:** High output system with 200 ft. active length in a 250 ft. deep borehole

Select the appropriate system (S, M, or H) by referencing the output and life for the active length desired. For example, if the desired output is 50 amps, the S system has a 10-year life, the M system has a 23-year life and the H system has a 34-year life.

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## Deep Anode System

Once the length of the anode or the active anode depth is known, **CHART 2** provides the resistance per 1,000  $\Omega$ -cm soil. The chart is for an 8" diameter hole; however the difference in resistance for a 10" diameter hole of the same depth is minimal.

- b. If a low resistance deep anode system is required, then **CHART 2** helps determine the minimum length of the anode active area.
- c. Contact MATCOR to order the Durammo Deep Anode System with the active length and life required.
- d. Once the active anode depth is known, it is simple to determine the rectifier sizing.

If you need assistance, MATCOR's experienced engineering team can help with your deep anode calculations to determine the best system for your application.

CHART 1

### DURAMMO® DEEP ANODE SYSTEM DESIGN LIFE COMPARED TO CURRENT OUTPUT

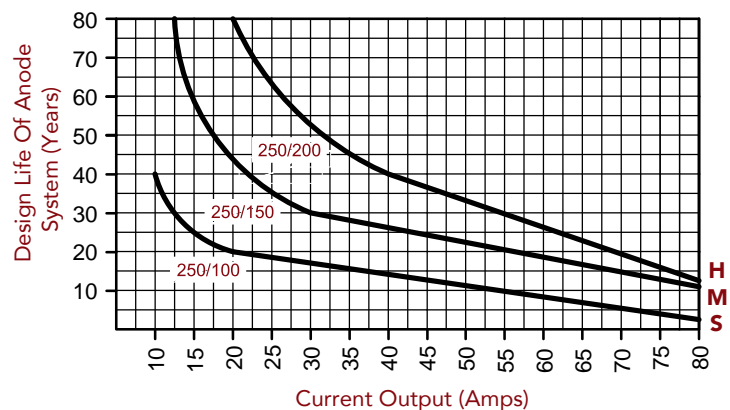
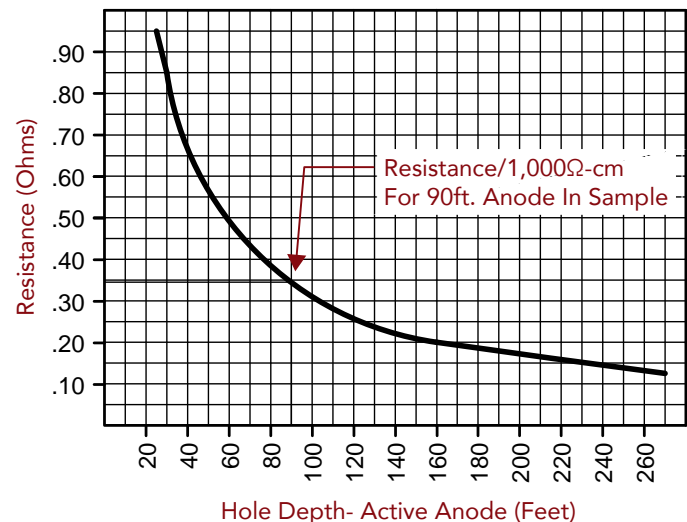


CHART 2

### DURAMMO® DEEP ANODE SYSTEM RESISTANCE OF ACTIVE AREA FOR 8" DIAMETER HOLE



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### INSTALLATION

Installation takes only minutes after the hole is drilled. The steps are simple:

- Set the system reel on a reel stand over the borehole
- Connect the bottom weight with the quick connector
- Wrap the lowering rope around the reel stand bar as a brake
- Lower the system into the borehole with the lowering rope
- Pump the coke backfill into the hole

Terminate the vent pipe and cables at the top of the hole; MATCOR's Durammo Casing Kit makes this simple.

### COMPLETE CONSTRUCTION AND INSTALLATION SERVICES

Experience, training and an impeccable safety record—not to mention the largest fleet of advanced drill rigs and installation equipment in the industry—make MATCOR the logical choice for your system installations and project management.

Contact MATCOR for additional information or assistance with designing, installing or ordering deep anode systems.



For more information, see the installation video at [matcor.com](http://matcor.com) or contact MATCOR.

#### REGIONAL OFFICES

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