



Technical Bulletin

## **Using Anti-Oxidants to Ensure Good Conductivity**

Anti-oxidant compounds are not a new invention or idea in the pursuit of good integrity or longevity of joint connections that make up telecommunication facilities. But their use has been popularized and improved in recent years with the advent of synthetic lubricants with wide temperature capacities and improved lubricity. Many important connections in radio and television work can be easily compromised over time by water condensation and vaporous atmospheric chemicals. When dissimilar metals are used in direct contact the effect can occur faster and with greater severity, especially outdoors. Examples of common trouble areas are ground terminal connections, radial system connections, RF connections, and even the bolted joints between stacked tower sections.

There is nothing inherently wrong with using dissimilar metals in direct contact. But if the joint is exposed to air, or if the joint commonly passes a great amount of current then the oxidation that occurs in the metals will accelerate and eventually the connection will fail. It may even heat to a point where the metals melt or burn.

An anti-oxidant performs two critical functions. First, the anti-oxidant compound material placed in the region between the two metal conductor's seals out air and moisture. The use of synthetic lubricants in the base compound ensures that the material is not miscible with water or other chemicals and cannot be driven out. The second function is that modern anti-oxidants are electrically conductive under pressure. This is accomplished by mixing copper, aluminum, lead, and/or graphite flakes in the 5-10 micron range into the lubricant vehicle and then applying the compound to the surfaces to be joined. The addition of metal particles into the mixture also creates a heavy compound which is more difficult to displace by weatherization.

The application of anti-oxidants is simple and easy. Both the metal surfaces to be joined should be cleaned and then either brushed with a wire wheel or emery paper. The ridges cut into the metals in this process are actually beneficial, and the scraping also ensures that bare metal is reached before anti-oxidants are applied. The compound may then be applied by any convenient means (brush or finger). Work the material around a small amount and don't be afraid to use the compound in a liberal manner. Remember that filling the air voids in the contact

joint is a critical necessity. Any extra compound will squirt out the side when the metals are joined together, and it's easy to scoop up the excess and push it back into the original container for later use.

The next step is to tighten, tighten, and tighten. Make sure the joint connection is plenty tight and that hardware will not back out in use. A weather covering is a good idea to help prevent external corrosion and to help keep hardware from moving. Washing down the outside of the joint with alcohol will drive off any excess anti-oxidant compound.

Use different compounds for different types of jobs. For copper-to-copper or copper-to-steel joints use a copper-loaded anti-oxidant such as our Model M-601 Series. For aluminum-to-aluminum or aluminum-to-copper use a complex compound such as our Model M-602 Series.

Anti-oxidants have no rated shelf life so they may be stored in virtually any location or condition. Be sure to stir the mixture before use to assure good mixing suspension of the metal flakes inside.

Sensible use of these compounds offer a high degree of reliability and long term satisfaction to users who want serious results in telecommunications work.

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