ConduDisc® FAQ

1. **What is the "jacket" material on the SAE ConduDisc®?**
   The jacket material of the ConduDisc® is a conductive carbonaceous polymer.

2. **What are the properties of the material?**
   It's a solid, high strength, low resistivity material that is environmentally neutral and maintenance free. It also exhibits low permeability to water so the metallic electrode inside it will last up to 60 years.

3. **What is the life of the ConduDisc®?**
   At least 60 years regardless of the type of soil.

4. **What is the life of buried galvanized steel, ground rod or plate?**
   An average of 10 years depending on the type of soil. ERICO wrote a white paper on the life expectancy of galvanized ground rods. Link to the white paper:
   https://www.erico.com/catalog/literature/LT0540.pdf

5. **What is the life of buried copper?**
   Copper should last 50 to 70 years, and possibly longer. Unfortunately, "aggressive" acidic water or soil can cause pitting-type corrosion and shorten the lifespan to 20 years or less. Other factors can facilitate the corrosion process of copper include soils which have elevated concentrations of sulfate, chloride, ammonia compounds, or sulfide; poor aeration, which supports anaerobic bacteria activity; large amounts of organic or inorganic acid; and large oxygen or neutral salt (especially chloride) differentials. Copper is also subject to corrosion by stray DC electricity.

6. **How does direct burial affect the life of ground system conductors?**
   "Direct Burial" conductors are subject to the corrosive effects of moisture in the soil as well as the pH of the soil resulting in loss of material, loss of performance and eventual failure.

7. **How does the coating extend the life of buried metals?**
   The coating prevents corrosion by acting as a protective, conductive layer between the buried metal and the soil. This is demonstrated in the "Resistance of Bare and Galvanized Steel Encased in ConduDisc® Surround to Electrolytic Corrosion" report found in the ConduDisc® Product Specification Manual. The report found that bare steel and galvanized steel encased in the ConduDisc® surround material experienced negligible corrosion after one month of electrolysis in an "aggressive" soil environment. This was a superior performance when compared to bare steel and galvanized steel in direct contact with the "aggressive" soil environment, which experienced up to 20% corrosion after one month of electrolysis.

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As discussed in the "Permeability Testing" report found in the ConduDisc® Product Specification Manual, the ConduDisc® surround material has a very low permeability to water of only 1.72 x 10^{-7} cm/second. This low permeability means that the galvanized steel plate and the high compression crimp connector are protected from any "aggressive" acidic water or soil present which extends the lifetime of these metals.

8. **What is the resistance to ground of a typical installed pole plate?**
   A pole plate is similar in resistance to ground as a 3-meter ground rod (provided that the surface area is the same). Given the challenges installing a "full length ground rod" in many locations, the ConduDisc® solution ensures a constant electrode surface area minimum.

9. **How does the performance of the ConduDisc® compare to other grounding methods?**
   The ConduDisc® has superior performance to other grounding methods as it does not degrade over time.

10. **Can the ConduDisc® be installed on wood, steel and concrete poles?**
    Yes, the ConduDisc® can be installed on wood, steel, concrete and composite poles.

11. **How do I attach the ConduDisc® to the pole?**
    The ConduDisc® can be lagged, spiked or bolted (steel or composite poles) to the base of the pole.

12. **What is the compressive strength of the ConduDisc®?**
    As demonstrated in the "Compression Testing of the ConduDisc®" report found in the ConduDisc® Product Specification Manual, the ConduDisc® has been subjected to loading of up to 16 771 kg (36 975 lbs) which is over twice the weight of the heaviest wooden utility poles. At a loading of 16 771 kg the ConduDisc® compresses 3.1 mm or 6.1% with no physical deterioration of the product. When compressed the ConduDisc® experiences elastic compression, as once the load is released the ConduDisc® will return to its original thickness with no deterioration of the product.

13. **How is the ground wire attached the to the plate?**
    The wire is attached by a high compression crimp connector that is thru-bolted to the internal ground plate prior to the ConduDisc® molding process.

14. **What are my wire gauge options?**
    Integrated ground wire attachments can be ordered with any gauge of wire preferred by the customer; however, we stock integrated ground wire attachments in the commonly required sizes of wire: #4 copper, 1/0 copper, 2/0 copper or #2 copperclad (copper weld) wire.

15. **Can the ConduDisc® be used on other grounding applications?**
    Yes, the ConduDisc® can be used wherever a ground rod or ground plate would be used.

16. **Do I need to use ConduFlow™ with the ConduDisc®?**
    The ConduDisc® can be used either with or without ConduFlow™. ConduFlow™ is an effective means of further reducing the resistance of the ConduDisc® by expanding the surface area of the electrode.

17. **What engineering & testing services can SAE supply if I want to know more about my local soil conditions?**
    SAE can provide soil resistivity testing and computer aided grounding analysis to design grounding systems to meet target values.

18. **Will the ConduDisc® withstand in-field fault current levels?**
    As discussed in the "Fault Current Withstand" report in the ConduDisc® Product Specification Manual, the ConduDisc® has been tested and withstood fault currents of up to 5000 amps for 500 milliseconds with minimal temperature rise.

19. **Will the ConduDisc® be damaged by winter conditions?**
    As discussed in the "ConduDisc® Freeze-Thaw Testing: Results and Analysis" report in the ConduDisc® Product Specification Manual, testing has demonstrated that the ConduDisc® will withstand at least 10 years of freeze-thaw conditions in situ with no significant degradation. Testing is ongoing to determine if the ConduDisc® can withstand 30 years of freeze-thaw conditions.

20. **Why is the ConduDisc® considered to be environmentally neutral?**
    As discussed in the "Leachate Data" report in the ConduDisc® Product Specification Manual, the ConduDisc® surround material was testing using a toxicity characteristic leaching procedure (TCLP) to demonstrate that it does not leach any harmful constituents to the environment. None of the tested constituents were above the Maximum Contaminant Level (MCL) established by the U.S. Environmental Protection Agency (USEPA) and are not expected to present a risk for migration in a typical groundwater environment. The MCL is the highest level of a contaminant that is allowed in drinking water.