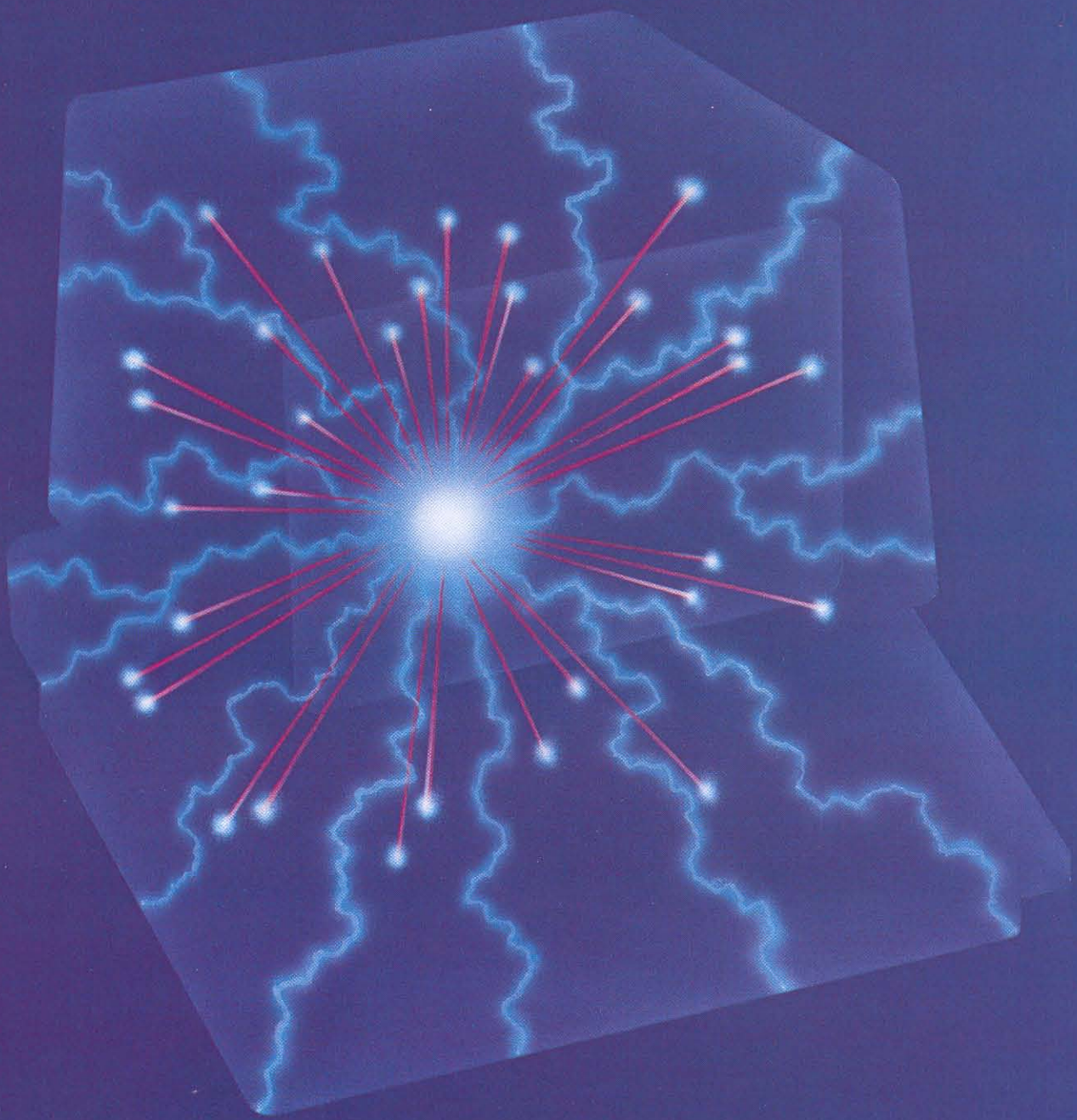
Acheson

Electrodag 550

takes EMI/RFI interference out of the picture

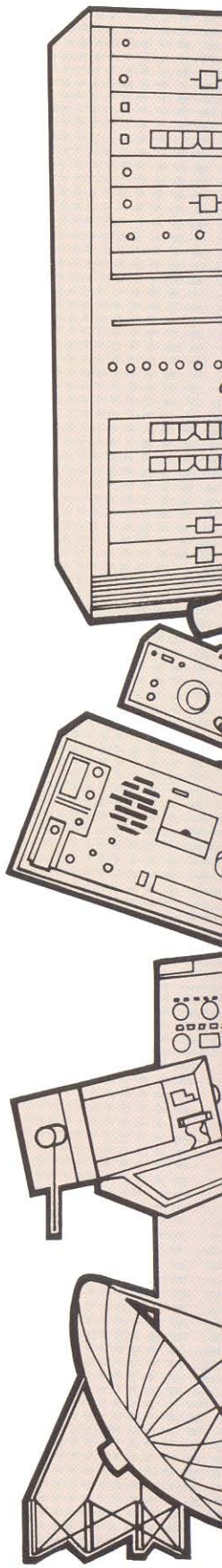


Electrodag 550 Coating — the new leader in EMI/RF

The Acheson Colloids Company has long been recognized as the market leader in nickel-based shielding coatings. Now, with the introduction of new advanced Electrodag® 550, Acheson's leadership position that was established with Electrodag 440, 439, and 439HS remains unchallenged. Line-proven and Underwriters Laboratory recognized, Electrodag 550 is a cost-effective, nickel-based coating offering the following benefits over existing competitive products:

- Exceptionally low resistance, both before and after environmental aging.
- Optimized attenuation at equivalent resistances.
- Superior burnish resistance.
- Compatibility with a wide range of decorative top coats and plastic substrates.
- Improved, consistent handling and application characteristics.

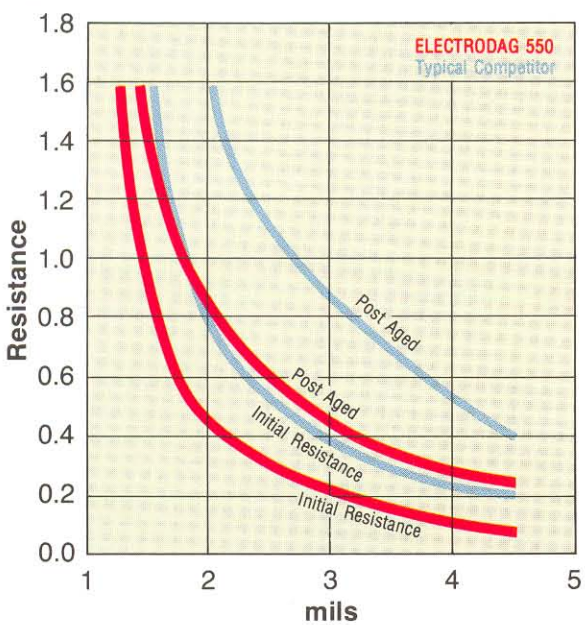
All nickel-based paints are not equal! . . . a very important point to remember. Electrodag 550 has been formulated by a company that understands the technical requirements of the marketplace. We invite you to compare the performance of Electrodag 550 to competitive products and judge for yourself.



Resistance Versus Film Thickness

Conductive coatings are typically formulated to be applied at sufficient — but not necessarily optimum — film thickness to insure uniformity of resistance. Electrodag 550 was formulated to be more conductive at lower film thicknesses. Figure I graphically illustrates this point. It plots the resistance of Electrodag 550 versus dry film thickness. Comparative resistance measurements were made utilizing a four-terminal, constant current resistance test fixture to minimize lead and contact resistance effect.

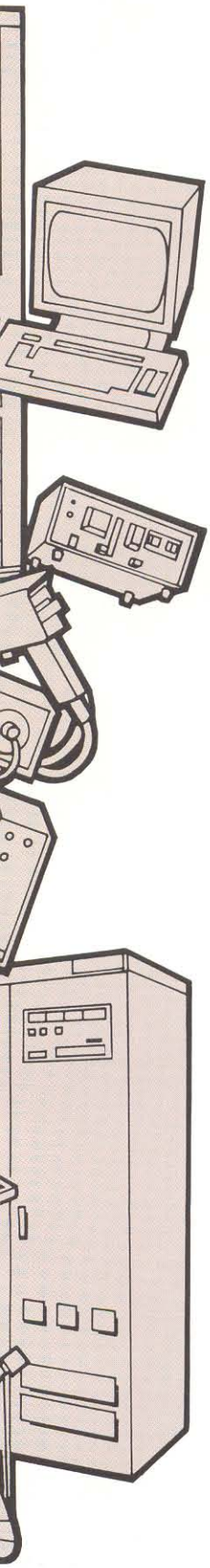
Figure I: Resistance vs. Film Thickness



Four curves are shown in Figure I. The two initial resistance curves compare the behavior of Electrodag 550 and the behavior of a typical competitive nickel coating after curing, but before aging or accelerated environmental testing. The remaining two curves depict the effect of accelerated aging on coating resistance. The detrimental effect of humidity on the competitive coatings (as measured after 72-hours exposure to 120°F, at 95 percent relative humidity) or temperature extremes (as measured after a series of eight cycles of 30 minutes at 160°F, five minutes at room temperature, and 30 minutes at -40°F) clearly indicate the superior durability of Electrodag 550.

These harsh accelerated tests were developed to rank the probable long term performance of various coatings in actual use. Electrodag 550 was formulated to start low and stay low. Environmentally aged Electrodag 550 exhibits lower resistance than many unaged competitive materials. By minimizing resistance, Electrodag 550 has a built-in extra measure of protection should the coating accidentally be applied with insufficient film build. Lower resistance at equivalent film build is an added plus to the OEM if the assembled product is checked for compliance by the FCC. Furthermore, with Electrodag 550, lower film thickness can safely be specified. This allows for closer manufacturing tolerances and reduced material cost.

shielding from the leader in conductive coating technology



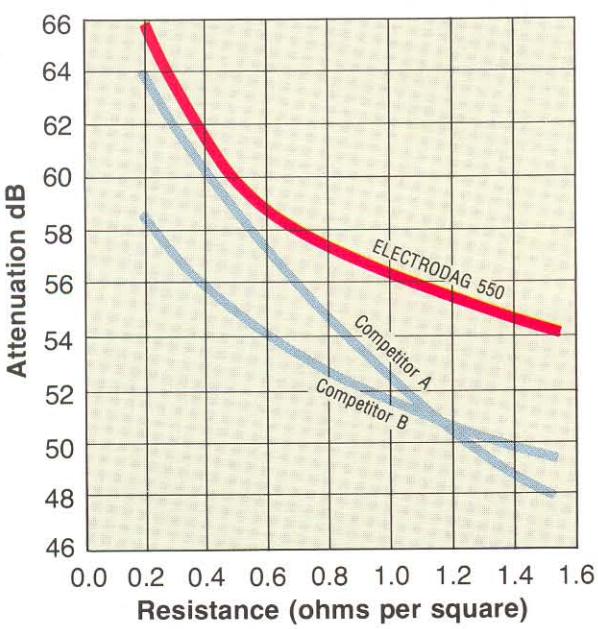
Superior Attenuation

The superior attenuation of Electrodag 550 is shown in Figure II. Although resistance is used in most on-line quality control tests, the OEM is ultimately concerned with limiting emissions. Therefore, at some point in the design process, coating attenuation on an actual part must be evaluated. While resistance measurement can be used for preliminary screening tests, the design engineer should be aware that resistance versus attentuation is not necessarily a straight-line relationship. Attenuation is related to impedance by the general formula

$$dB \cong \frac{Z_o}{4Z_c}$$

where Z_o is defined as the impedance of free space and Z_c is the coating impedance. Coating impedance in turn, is composed of a resistive and a reactive component. By considering only at a coating's resistance, the reactive component is overlooked. However, this reactive component plays a critical role in the coating's performance. Unfortunately, this is a principle that is sometimes overlooked by the paint company formulator. Formulation and manufacturing methodology can greatly affect coating impedance as can be seen below:

Figure II: Attenuation vs. Resistance



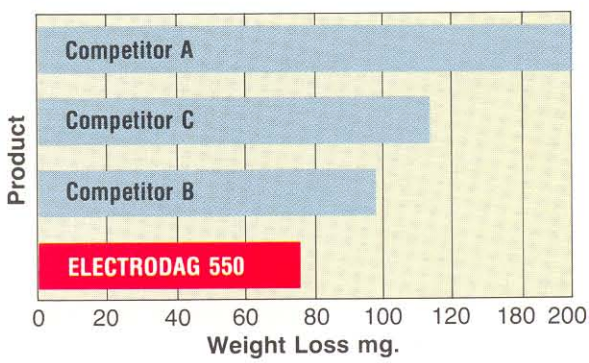
Electrodag 550 was specifically formulated with coating impedance in mind. The attenuation of Electrodag 550 has been maximized over a broad resistance range. While other products exhibit low resistance, they may not offer the same attenuation as Electrodag 550.

Superior Burnish Resistance

Figure III clearly demonstrates the superior burnish resistance of Electrodag 550 as measured with the Taber Abrasion Test. The data was collected under the following test conditions:

- CS-10 wheel
- 1000 cycles
- 500 gram load

Figure III: Taber Abrasion Test



The Taber Abrasion Test is a fundamental indicator of how well a coating will "wear" in service. The test is especially important for conductive coatings because the coating's grounding and shielding properties are affected by wear. Since the resistance of a coating film is inversely proportional to coating thickness, a paint film that wears away quickly at contact points can result in radiation leakage at the seam. Electrodag 550 has been formulated to minimize abrasion wear.

Compatibility with Paints and Plastics

Electrodag 550 was developed with companion decorative topcoats and plastic substrates in mind. It is compatible with a wide range of decorative coatings. Although

topcoating of conductive finishes is not often required, accidental overspray is a common occurence. If the conductive coating is sensitive to the topcoat, physical and electrical properties can be adversely affected. In severe cases, total coating failure can occur. Electrodag 550 is insensitive to most commonly used decorative coatings. Since decorative topcoat formulations differ considerably, Acheson Colloids Company is prepared to assist potential customers in the screening of decorative materials for mutual compatibility with Electrodag 550. Through its national distribution partner, The Sherwin Williams Company, a total package of mutually compatible Polane topcoats and Electrodag conductive coatings is available.

If topcoating is desired, provisions should be made during part masking to insure part-to-part and chassis-to-coating contact for grounding. Good grounding is essential to optimize the conductive coating's shielding performance against radiated noise.

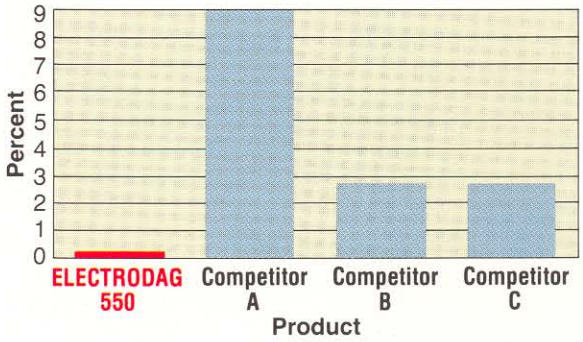
Electrodag 550 is Underwriters Laboratory recognized on the following plastic substrates: General Electric FL900, FN215, N190, SE-1, PC-180, CRT-200, HS-1000, HS-2000, and UV-180; Dow 6087SF and 6075; Borg-Warner Cycolac KJB, Cycolac KJC, Cycolac KJU and Cycolac KJW; and Georgia-Pacific 7165.

The U.L. test procedure, UL746C, incorporates ASTM 3359-B 1978 Tape Adhesion Test to determine cross hatch adhesion of coated plastic substrates as received and after an additional 56 day environmental test. The maximum allowable removal of coating after taping is 5 percent. Electrodag 550 meets this test. Additional plastic substrates can be submitted to Underwriters Laboratory upon customer request.

Improved Handling and Application Characteristics

Electrodag 550 is easy to mix and apply. Conventional nickel-based conductive coatings may hard settle upon storage, necessitating long, vigorous agitation prior to application. Figure IV compares Electrodag 550 as delivered to competitive materials.

Figure IV: Settling Rate (24 Hours Following Agitation)



Reformulation of conductive coatings to overcome these settling problems has a significant impact on electrical properties. Without the knowledge necessary to overcome this problem — gained through long experience with conductive coatings — lot-to-lot inconsistency may occur. This variability in delivered product presents numerous problems to the coater. Electrodag 550 eliminates this type of problem.

In summary, Electrodag 550 is a line-proven, stable, high performance, economical conductive coating. Remember all shielding coatings are not equivalent. Evaluate Electrodag 550. See how it performs in your application. For help in the United States, call 313-984-5581 or write

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Outside the United States contact the Acheson office closest to you.
Acheson — an industry leader since 1907.

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