

AQUADAG⁰ E

Water Based Colloidal Graphite Resistance Coating

Product Description :

AQUADAG E coating, an electrical / electronic industry standard for more than thirty years, offers unsurpassed versatility as a conductive or resistive coating and impregnant. AQUADAG E satisfies the most demanding design requirements due to its consistently high purity and uniformity of manufacture. These benefits, coupled with ease of application, make AQUADAG E the most desirable conductive coating for multi-purpose use.

Applications :

- Printed circuits – manufacture and repair
- Contact material in capacitors, resistors and other electronic components

Instructions For Use :

Dilution

For best results, stir the concentrate to break up the gel structure before adding water. Next, slowly add de-ionized water to the concentrate. When a fluid consistency is achieved, water can be added at a more rapid rate. Failure to achieve correct dilution can result in small gel structures remaining in the fluid. The presence of these structures can adversely affect performance. To ensure the absence of these structures, it is recommended that the final blend be strained through a 10 to 50 micron in-line cartridge filter depending on the viscosity and solids of the mixture. A high-speed and high-shear mixer is recommended to properly disperse the product.

Mixing

When mixing larger amounts (5 litres and up), you should first cover the bottom of the container with several centimeters of water and use a Cowles-type dissolver blade at 750 to 1200 rpm, or other high shear blade. Then add the AQUADAG E and slowly add additional water to the AQUADAG E while the mixer is stirring. After mixing is completed (approx. 30 minutes) the final mixture should be strained and run through the appropriate filters. For even more critical applications commercial dispersing systems such as an Ultra Turrax T 45 should be used following the initial 30-minute mix mentioned above. Vigorous or excessive agitation which might add air bubbles to the mixture should be avoided. For proper wetting and to prevent spoilage, the desired pH should be controlled by additions of ammonium hydroxide.

Application

Diluted AQUADAG E may be applied by flow, spray, brush, dip, or sponge methods. The optimum viscosity for each method is best established by pretesting. Suggested starting formulations are listed below :

| Method | kg of AQUADAG E | kg of water |
|-------------------|-----------------|-------------|
| Brush | 1 | 1 |
| Flow, dip, sponge | 1 | 3 |
| Spray | 1 | 5 |

Before coating, clean all grease and dirt from the surface to be coated. Preheating the substrate to 60°C will speed drying and lessen flow marks. Coating adhesion can be increased and the resistance decreased by drying at 65°C for 2 to 5 minutes. A longer cure at 200°C for up to 60 minutes will further stabilize the resistance.

Properties Of Material As Supplied :

| Property | Unit | Value |
|-----------------|--|-------------------------|
| Pigment | | Processed micrographite |
| Fluid Component | | Water |
| Diluent | | De-ionized water |
| Colour | Visual | Dark grey |
| Consistency | | Gel |
| Density | g/cm ³ | 1,12 |
| Solids Content | % by weight | 22 |
| | % by volume | 13 |
| pH | | 9,5 – 11,0 |
| Freezing Point | °C | 0 |
| Shelf Life | Months (from date of qualification under original seal) | 12 |

Properties Of Material As Cured :

| Property | Unit | Value |
|-----------------------------|---|-------|
| Maximum Service Temperature | °C | 200 |
| Coverage | m ² /kg at 25 µm dry film thickness | 4,9 |

Resistance

The electrical characteristics of the dry coating can be varied by adjusting the ratio of concentrate to diluent, the method of application, thickness, and the type and

degree of heat treatment. Resistance coatings have a negative temperature coefficient of resistance. Typical resistance values of the dry coating on a glass substrate are as follows :

| Application Method* | Thickness (Dry) | Cure Cycle | Resistance |
|---------------------|-----------------|-----------------------|-----------------|
| Dip 1 : 3 | 25 µm | 5 minutes / 150°C | 30 Ohm/square |
| Spray 1 : 5 | 12,5 µm | Preheat surface 100°C | 150 Ohm/square |
| Brush 1 : 1 | 7,5 µm | Air dry | 1000 Ohm/square |

* Ratio expressed as grams of AQUADAG E to grams of diluting water

Europe

Nijverheidsstraat 7
B-2260 Westerlo
Belgium
☎ +(32)-(0) 14 57 56 11
☎ Fax: +(32)-(0) 14 58 55 30

North America

46 Manning Road
Billerica, MA 01821
☎ 800-832-4929
☎ (978) 436-9700
☎ Fax: (978) 436-9704

Asia-Pacific

100 Kaneda, Atsugi-shi
Kanagawa-ken, 243-0807
Japan
☎ (81) 462-258-880
☎ Fax: (81) 462-221-347

NATIONAL STARCH MAKES NO REPRESENTATIONS OR WARRANTIES, EXPRESS OR IMPLIED, CONCERNING THE SUITABILITY OF THESE MATERIALS FOR USE IN IMPLANTATION IN THE HUMAN BODY, OR FOR ANY OTHER USE. These materials are not designed or manufactured for use in implantation in the human body. National Starch has not performed clinical testing of these materials for implantation. National Starch has neither sought, nor received, approval from the FDA for the use of these materials in implantation in the human body. No representative of ours has any authority to waive or change the foregoing provisions but, subject to such provisions, our engineers are available to assist purchasers in adapting our products to their needs and to the circumstances prevailing in their business. Nothing contained herein shall be construed to imply the non-existence of any relevant patents or to constitute a permission, inducement or recommendation to practice any invention covered by any patent, without authority from the owner of this patent. We also expect purchasers to use our products in accordance with the guiding principles of the Chemical Manufacturers Association's Responsible Care® program.

AQUADAG[®] E

Water Based Colloidal Graphite Resistance Coating

Storage And Handling :

AQUADAG E can be stored at temperatures between 5°C and 40°C. Do not allow the material to freeze. Product containers should be cleaned and tightly sealed after use.

| Storage Temperature (°C) | Usable Shelf Life (months) |
|-----------------------------|-------------------------------|
| 5 to 40 | 12 |

Health & Safety :

It is recommended to consult the Emerson & Cuming product literature, including material safety data sheets, prior to using Emerson & Cuming products. These may be obtained from your local sales office.

Attention Specification Writers :

The technical information contained herein is consistent with the properties of the material and should not be used in the preparation of specifications, as it is intended for reference only. For assistance in preparing specifications, please contact your local Emerson & Cuming office for details. Please contact Emerson & Cuming Quality Assurance for test method details.

(AQUADAG[®] is a registered trademark of Acheson Industries Inc.)

E25/08/00-GL