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# BQ221 Carbon Conductive Composition

## Polymer Thick Film Composition/ Data Sheet

All values reported here are results of experiments in our laboratories intended to illustrate product performance potential with a given experimental design. They are not intended to represent the product's specifications, details of which are available upon demand.

### BQ Series Description

The Biomedical Quality (BQ) Series is designed for use in a variety of different applications including, medical monitoring, diagnostics, drug delivery and electro-chemical and biological sensing. The series includes conductive Ag, Ag/C, and C compositions for electrical signal processing, Ag/AgCl compositions for multi-electrode (working/counter/reference) configurations, dielectric compositions for electrical isolation, and a range of novel materials including Pt, Au, Pt/C, and Zn based compositions designed for enhancing sensor performance.

### Product Description

BQ221 is a screen printable Carbon conductor designed to be used as a working electrode for high sensitivity biosensors.

### Product Benefits

- High Sensitivity
- Low Resistivity
- Long Screen Life

### Processing

- Screen Printing Equipment**  
Reel-to-reel, semi-automatic or manual
- Ink Residence Time on Screen**  
>2 hours
- Screen Type**  
Polyester or Stainless steel
- Typical Circuit Line Thickness Printed With Polyester Mesh 77-48Y PW**  
9µm
- Typical Cure Conditions**  
Box Oven: 130°C for 5 - 10 minutes  
IR Oven: 140°C for 1 minute
- Clean up solvent**  
Ethylene diacetate or methyl propasol acetate.

### Compatibility

Whilst DuPont has tested this composition, it is impossible or impractical to cover every combination of materials,

### Composition Properties

<b>Viscosity (Pa.s)</b>	<b>35 - 85</b>
Brookfield RVT, Utility cup & spindle (SC4-14/6R), @ 10 rpm, 25°C ± 0.2°C	
<b>%Solids (150°C)</b>	<b>32 - 34</b>
<b>Coverage (cm<sup>2</sup>/g)</b>	<b>280</b>
(Dependent on screen mesh size and type)	
<b>Thinner</b>	<b>8260</b>
<b>Shelf Life (Months)</b>	<b>6</b>

### Typical Physical Properties On 125µm Polyester Film

<b>Sheet Resistivity</b> (Ω/□/25µm)	<b>&lt;25</b>
<b>Abrasion Resistance</b> (ASTM D 3363-74 Pencil Hardness)	<b>4H</b>
<b>Solderability</b>	<b>Not Recommended</b>

customer processing conditions and circuit layouts.

It is therefore essential that customers thoroughly evaluate the material in their specific situations in order to completely satisfy themselves with the overall quality and suitability of the composition for its intended application(s).

### Printing

The composition should be thoroughly mixed before use. This is best achieved by slow, gently, hand stirring (to avoid air entrapment) with a clean burr-free flexible plastic spatula for 1-2 minutes. Metal spatulas are not recommended as they may abrade the plastic jar causing contamination of the composition. If settling is found after long periods of storage, the composition should be mixed and gently jar-rolled prior to use.

Printing should be performed in a clean and well ventilated area. Additional information on requirements for printing areas is contained in DuPont Technical Guide EUT 7.3 "Processing - Screen Printing Rooms", available on request. Note: optimum printing characteristics are generally

achieved in the room temperature range of 20°C-23°C. It is therefore important that the material, in its container, is at this temperature prior to commencement of printing.

### **Drying**

Dry in a well ventilated box oven, belt or conveyor furnace. Air flows and extraction rates should be optimized to ensure the complete removal of solvent from the paste.

### **Thinner**

BQ series compositions are optimized for screen printing applications and do not normally require thinning. Use the DuPont recommended thinner for slight adjustments to viscosity or to replace evaporation losses. The use of too much thinner or the use of a non-recommended thinner may affect the rheological behaviour of the material and its printing characteristics. Refer to table - "Composition Properties"

### **Storage and Shelf Life**

Containers may be stored in a clean, stable environment at room temperature (between 5°C - 30°C), with their lids tightly sealed. Storage in high temperature (>30°C) or in freezers (temperature < 0°C) is NOT recommended as this could cause irreversible changes in the material.

The shelf life of compositions in factory-sealed (unopened) containers, stored under room-temperature (between 5°C - 30°C) conditions is 6 months from date of shipment. For guidance regarding storage of material, please consult DuPont Technical Note EUT 7.2 "Shelf Life Policy".

### **General**

Performance will depend to a large degree on care exercised in screen printing. Scrupulous care should be taken to keep the composition, printing screens and other tools free of metal contamination. Dust, lint and other particulate matter may also contribute to poor yields.

### **Health/Safety considerations**

DuPont polymer compositions are intended for use in an industrial environment by trained personnel. All appropriate health / safety regulations regarding storage, handling and processing of such materials should be complied with. For information on health / safety regulations please refer to the specific product MSDS and to the DuPont Safety Guide EUT 7.1 "Practical Safe Handling of Thick Film Compositions".

This information corresponds to our current knowledge on the subject. It is offered solely to provide possible suggestions for your own experimentation. It is not intended, however, to substitute for any testing you may need to conduct to determine for yourself the suitability of our products for your particular purposes. This information may be subject to revision as new knowledge and experience become available. Since we cannot anticipate all variations in actual end-use conditions, DuPont makes no warranties and assumes no liability in connection with any use of this information. Nothing in this publication is to be considered as a license to operate under or a recommendation to infringe any patent right. **Caution: Do not use in medical applications involving permanent implantation in the human body. For other medical applications, see "DuPont Medical Caution Statement" H-50102.**