



DIAMOND
COATINGS



Diamox Indium Tin Oxide (ITO) Datasheet

INTRODUCTION

Diamond Coatings Limited, a privately-owned company, is a recognised leader in the production of vacuum coatings which includes the **DIAMOX** Indium Tin Oxide (ITO) range. The ITO coating is a highly conductive transparent coating which is available deposited on glass or plastic substrates.

Diamox ITO is used in a wide range of applications including electromagnetic/radio-frequency (EMI/RFI) shielding, electrostatic protection (both anti-static and electro static discharge), heated filters for electronic displays and the active component in touch screens. The company supplies a large number of OEM's in the electronic and electrical industries in Europe, USA and the Far East.

CAPABILITY

The Company has a reputation for innovation having developed the **Diamox** process and designed and built its own coating plant to deposit the indium tin oxide onto the substrate. The **Diamox** process is carried out at low temperatures in a vacuum, allowing a variety of plastics including polycarbonate, acrylic and polyester as well as glass to be coated. A flexible system for handling the substrate allows both flat and curved surfaces, as well as a range of injection moulded shapes, to be coated. The plant is capable of coating substrates up to 1000mm x 1000mm and with a sheet resistance between 8 and 1000 ohms/square.

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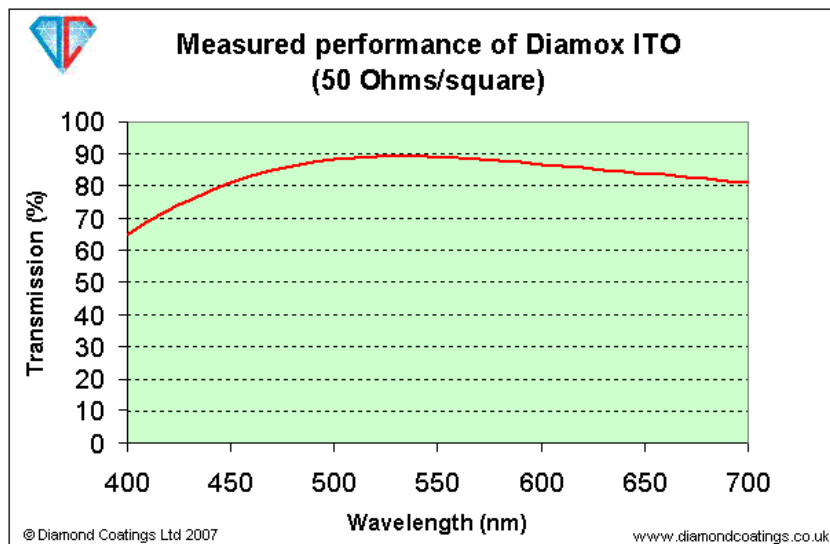


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Diamox coatings can be applied to free issue parts. Alternatively Diamond can provide fully machined and finished display filters in glass, polycarbonate or acrylic. Display components can be screen printed in standard or conductive inks and can also incorporate anti-glare and scratch resistant features.

PERFORMANCE CHARACTERISTICS

Transmission, absorption and reflectivity are determined by the characteristics and colour of the coated substrate, and by the chosen coating resistance. For optimum transmittance, the thickness of the coating is chosen to relate to the wavelength for each application. Normally coatings are designed for optimum transmittance at 500nm. An example transmittance curve is shown below.



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Optical performance can be further enhanced by combination with other materials and layers, please ask for details.

DURABILITY

Diamox coated polycarbonate has been subjected to the following accelerated tests:

- ◆ Thermal Cycling to MIL STD C 48497, 4.5.4.1. (5h at -60 oC followed by 5h at +70 oC)
- ◆ Salt Solution to MIL STD C48497, 4.5.5.2. (24h immersion in 5% NaCl solution)
- ◆ Humidity Cycling to MIL STD C 48497 (24h 50 oC 95%humidity)
- ◆ Coating adhesion was tested to ASTM D 3359-83 method B

There was no evidence of optical degradation or coating adhesion and only a small change in sheet resistance on thermal cycling.

SHEET RESISTANCE

Sheet resistances are available from 2.5 to 1000 ohms/square. The standard tolerance is +/-20%

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SHIELDING EFFECTIVENESS

Typical shielding effectiveness, measured using test methods consistent with MIL-STD-215, are summarized in Table 1.

TABLE 1 Shielding Performance of Diamox Coated Polycarbonate

Sheet Resistance

Frequency (Hz)

| | 100 | 1k | 10k | 1M | 10M | 100M | 1G |
|------------|-----|----|-----|----|-----|------|----|
| 10 ohms/sq | 70 | 69 | 76 | 58 | 57 | 35 | 26 |
| 20 ohms/sq | 66 | 69 | 75 | 69 | 59 | 28 | 23 |

SUBSTRATE AVAILABILITY

Glass and ceramic

Standard annealed soda lime glass is supplied as per BS EN 572 Parts 1 & 2 (1995) Other glass types and treatments are also available: special optical glasses, toughened and chemically strengthened glasses, borosilicate. Quartz and Sapphire is also routinely coated.

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Polycarbonate

Supplied as per BS EN ISO 11963 (1996).

Acrylic

Supplied as per BS EN ISO 7823 (Parts 1 & 2). A wide range of colours are available. The acrylic is coated with a scratch resistant coating before ITO coating to improve the adhesion properties.

Polyester (PET) film

175 micron PET film is available ex-stock, other thicknesses can be coated and/or supplied to order.

Other substrates

A wide range of other substrates are also coated, please contact us for further details.

QUALITY ASSURANCE

It is the objective of Diamond to produce coatings to high quality standards consistent with commercial product requirements and appropriate standards. Witness samples are included in each coating run and checked for light transmission and sheet resistance.

Diamond is registered to ISO 9001:2002 and employs the practice of quality control throughout the manufacturing process. Diamond Coatings undertakes continual quality assessment and improvements.

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