



DIAMOND COATINGS LIMITED

DIAMOX ITO COATINGS

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.

The **Diamox** ITO range is used for in a wide range of applications including electromagnetic/radio-frequency (EMI/RFI) shielding, electrostatic protection (ESP), optically clear 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 it's 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 1500 ohms/square.

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

Spectral

Transmission, absorption and reflectivity are determined by the characteristics and colour of the coated substrate. 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 between 525 & 600nm. Typical transmission for a 20 ohms/sq coating on glass is 84%

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° C followed by 5h at +70° C)

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° C 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.



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Sheet Resistance.

Sheet resistances are available from 8 to 1500 ohms/square.

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

<u>Sheet Resistance</u>	<u>Frequency Hz.</u>						
	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. Standard annealed glass is supplied as per BS EN 572 Parts 1 & 2 (1995) Special optical glasses, toughened and chemically strengthened glasses are also available.

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 has a scratch resistant coating before ITO coating to improve the adhesion properties.

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 ISO9001:2002 and employs the practice of quality control throughout the manufacturing process. The Company undertakes continual quality assessment and improvements.