

# PEN ENTRY MATERIALS

## Product Description

CPFilms' Pen Entry (PE) Film is designed for use in industrial, commercial, medical and consumer touch screens products; for example, those used in personal digital assistants (PDA), electronic pagers, cellular telephones and other displays. PE films feature a transparent conductive coating on a 175 microns thick polyester (PET) film exhibiting anti-glare and or clear hardcoat properties. The transparent, conductive coating on the PE film has a surface resistance of approximately 300 or 500 ohms/square and 88% visible light transmission (VLT). The 300 ohms/square products are identified as PE14 thru 17 and the 500 ohms/square products as PE20 thru 23 (see individual PE product note for additional information). Benefits include anti-newton ring property, excellent uniformity, enhanced durability, etc.

## Availability

For price and availability information, please contact our Sales Department. Evaluation samples and technical support are available.

## Substrate (PET/Anti-glare or Clear Hardcoat) Properties

|  | Typical Values             | Test Method                 |
|--|----------------------------|-----------------------------|
| PET Thickness                                  | 7.3 – 7.9 mil              | Micrometer                  |
| Hardcoat Thickness                             | 4 micron                   | CPFilms                     |
| Shrinkage Value (%)                            | 0.2                        | 150°C / 30mins              |
| VLT (%)  | 91                         | Hazegard Plus               |
| Haze (%)                                       | Antiglare 7.0<br>Clear 1.5 | Hazegard Plus               |
| 60 ° Gloss (GLU)                               | Antiglare 100<br>Clear 162 | BYK Tri gloss               |
| Yellow Index                                   | Antiglare 1.8<br>Clear 1.4 | Hunterlab                   |
| Coating Adhesion                               | 5B                         | CPFilms                     |
| Taber Abrasion (%)                             | Initial haze + 4           | CPFilms                     |
| Pencil Hardness                                | 3H                         | CPFilms                     |
| Steel Wool Test                                | No Scratches               | #0000, 200g 60 times        |
| Acetone & Ethanol Rub Test                     | No Deterioration           | 2Kg, 50 strokes             |
| Chemical Resistant (Acetone, Ethanol, Ammonia) | No Deterioration           | R.T. 24 hrs                 |
| Thermal Shock                                  | No Deterioration           | CPFilms                     |
| Humidity                                       | No Deterioration           | 60° C / 95% R.H.<br>720 hrs |
| Flexibility (Flex & Bend)                      | 0.5 inch                   | 180° (1 x)                  |

## PE Transparent Conductive ITO Properties (\*)

|                       | Typical values               | Test Method                |
|-----------------------|------------------------------|----------------------------|
| Resistance (ohms/sq.) | 500 or 300                   | CPFilms                    |
| VLT (%)               | 88                           | Hazegard Plus              |
| Color b               | 3.5                          | Hunterlab                  |
| Yellow Index          | 7.0                          | Hunterlab                  |
| Adhesion (R/Ro)       | 1.1                          | CPFilms                    |
| Abrasion (R/Ro)       | 1.1                          | CPFilms                    |
| Heat test (R/Ro)      | 1.1                          | 150°C / 30 minutes         |
| Humidity (R/Ro)       | 1.1                          | 60°C / 95% R.H. 24 hrs     |
| Pen durability Test   | Touches 600K<br>Scribes 310K | 0.8 Stylus radius/250grams |

**Note (\*):** Transmittance and resistance values depend on the base film. The above values are typical of PE product on optical grade polyester film with antiglare or clear hardcoat, but are not intended to be specifications. Data are typical values and not absolute.

**Note:** To the best of our knowledge, all information contained in this document is accurate. However, CPFilms, Inc. does not assume liability whatsoever for the accuracy or completeness of the information contained herein.

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