

KODAK HCF Film / ESTAR Base

—Put a century of science in your hands—



April 2015

KODAK HCF Film / ESTAR Base is a polyester (PET) film with a proprietary conductive PEDOT/PSS coated in-line during the polyester manufacturing process. The unique manufacturing process produces an exceptionally uniform material, which is optically clear with excellent surface quality.

The manufacturing process produces a flexible conductive film which is a cost-effective alternative to many other conductive films, including indium tin oxide (ITO).

KODAK HCF Film / ESTAR Base can be used as manufactured for many applications where resistive technology is required, or it can be patterned for use with projected capacitive technology.

If a pattern is required, there are currently two options to produce the pattern. The first is to print CLEVIOS™ SET-S as a mask and then process the sheet using CLEVIOS™ Etch to render areas of the sheet non-conductive. When the mask is removed, the result is an invisible pattern, allowing it to be used in display applications. To learn more about the use of CLEVIOS™ materials, please visit www.heraeus-clevios.com. The second method to pattern KODAK HCF Film / ESTAR Base is to use a laser patterning process. While Kodak has not patterned the material using a laser, customers have been successful using a Nd YAG with a wavelength of 1065 nm, max power set at 10 watts and a pulse frequency of 30 kHz. You may need to adjust your settings base on your laser and specific pattern requirements.

Uses

Projected Capacitive Applications

- Touch Displays
- Smart watches
- Appliance Touch Panels

Resistive Applications

- Point of Sales devices
- Resistive Touch Displays
- Kiosk applications
- Membrane Touch Switches

Physical Condition

Roll Integrity

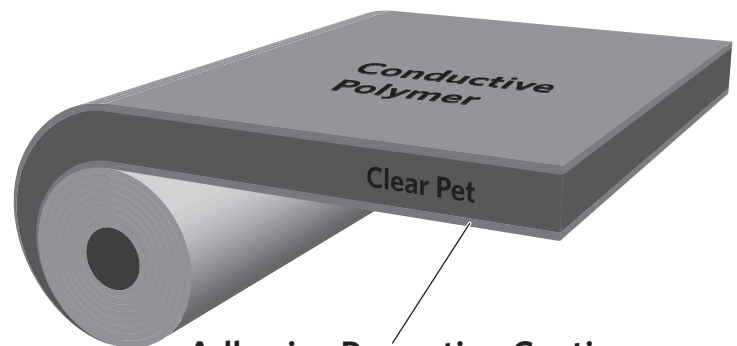
- The edge of the roll will be free of nicks, cuts or visible telescoping greater than ± 6.3 mm (0.25 inches)
- The roll will not contain gauge bands which visibly distort the film surface
- There are no splices or cutouts in the roll

Surface Quality

- Support will be free from surface imperfections which, by their severity or frequency, affect subsequent operations by the customer. Examples of such imperfections are:
 - scratches, bubbles, creases, holes, cinches, surface dirt
- Standards used for the above imperfections are current Kodak internal standards.

Packaging

- Standard core, fiber board or plastic core; inside diameter 152 mm \pm 3 mm (6 inches \pm 0.04 inch)
- Each roll is suitably wrapped to seal the product
- Each roll is horizontal, supported on core ends
- Each container is labeled with product and roll identification



Adhesive Promoting Coating or Conductive Polymer (dual sided)

KODAK HCF Film / ESTAR Base

Properties

Property	Typical Value						Test Method
	150 ohms /square		225 ohms /square		385 ohms /square		
Surface Resistivity	150 ohms /square		225 ohms /square		385 ohms /square		4 point probe
PEDOT/PSS Coating Thickness	<0.50 micron		<0.35 micron		<0.20 micron		Calculated nominal thickness
	Single Side	Dual Side	Single Side	Dual Side	Single Side	Dual Side	
Haze	<1%	<1%	<1%	<1%	<1%	<1%	ASTM D 1003
Visible Light Transmittance	>86%	>79%	>88%	>83%	>90%	>86%	ASTM D 1003
Adhesion	Dry Tape Adhesion, No Removal						Kodak Method
	Wet Adhesion Rating of Good						Kodak Method
Environmental Testing	60°C, 90% RH @ 240 hours <12% change						
Etching	Material can be laser and chemically etched to create a pattern						
Thermal Change	≤ 1.0% Average Machine Direction						30 minutes @ 150°C
	≤ 1.0% Average Transverse Direction						
Change in resistivity when exposed to:	Acetone		<10% change				Kodak Method 10 minutes @ 24°C
	IPA		<5% change				
	Methanol		<12% change				
	Toluene		<4% change				
	Water		<8% change				

Sizes Available

Ohms/Square	CAT No.	Class	Thickness (micron)	Width (mm) (1/2" knurl)	Length (m)
KODAK HCF Films Conductive one side, acrylic coating other side					
150	190 7591	6RF1-911T	127	1384	914
225	161 8644	6RF1-921T	127	1384	914
385	743 4467	6RF1-931T	127	1384	914
KODAK HCF Films Conductivity both sides					
150	123 9896	6RF1-912T	127	1384	914
225	172 9532	6RF1-922T	127	1384	914
385	743 3386	6RF1-932T	127	1384	914

Contact your Kodak Account Representative for other product sizes or specific requirements.

Typical Optical Properties

	6RF1-911T S150	6RF1-912T D150	6RF1-921T S225	6RF1-922T D225	6RF1-932T D385
L*	94.17	90.63	95.16	92.68	94.41
a*	-0.79	-1.1	-0.49	-0.68	-0.13
b*	-1.11	-2.14	-0.39	-1.07	-0.59
YI-E313	-2.18	-5.14	-1.08	-2.59	-1.24

MORE INFORMATION

Kodak has many publications to assist you with information about KODAK Products, Equipment, and Materials.

For the latest version of technical support publications for KODAK Industrial Materials Group, please visit Kodak online at <http://www.kodak.com/go/img>.

To find out what PET Films can do for your business, please send us an email at PETproducts@kodak.com.

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Revised 4-15
KODAK HCF Film / ESTAR Base
KODAK Publication No. E-4058