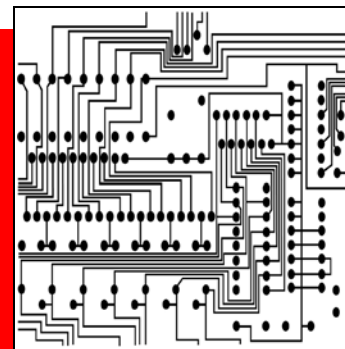


# KODAK ACCUMAX Photoplotter Film ARD7

—High Complexity PCB Starts With the Right Phototools—



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Creating high-complexity phototools starts with the right film. Now from Kodak, you get hard-line-edge quality and superior dimensional stability with KODAK ACCUMAX Photoplotter Film ARD7. ARD7 Film uses the latest Integrated-Booster-Technology (IBT processing)—technology pioneered by Kodak. ARD7 Film is specifically designed for PCB phototool creation. Some of its outstanding features are:

- Superior dimensional stability with Kodak’s exclusive one-sided gel coating structure—delivers low humidity coefficient of linear expansion of 0.0009% per % RH
- Extremely sharp line-edge quality with the latest in Integrated-Booster-Technology processing (Recommended for processing in IBT compatible developers such as KODAK ACCUMAX Rapid Access Developer and Replenisher)
- Coated on specially manufactured low-inclusion ESTAR support (0.007-inch, 0.18 mm)
- Permanent anti-static performance to resist the attraction of dust and dirt
- Excellent scratch and abrasion resistant overcoat
- Contains ultra-fine matte on the emulsion side to improve handling and vacuum draw-down to photo resist
- Dual red sensitivity at 633 nm and 670 nm for use with photoplotters using helium-neon (HN) or red-laser-diode (RLD) exposing sources

ARD7 Film is designed for the use with the following photoplotters:

Manufacturer*	Model
Mania Barco	BG-7300, BG-7400, BG-3800, BG-3900, BG-7500, SilverWriter
Dainippon Screen	RG 4000, RG 7000, RG 7500
First EIE SA	RP 24, RP 300, RP 500
Escher-Grad	EG-5000, EG-8200, EG-9000, EG-9400
Mania Barco (Gerber)	Crescent 30, Crescent 40
Glaser	Galaxy 3000, Galaxy 4000, Galaxy 6000
Lavenir	PULSAR 8000SE
Orbotech	LP 7008
Secma International	Swift 2028, Swift 2636, Swift 3242, Swift 4257, Swift 4763

\* Products are trademarks of the respective manufacturer.

## SUPPORT

Dimensionally stable support.

7-mil (0.18 mm)	ESTAR Thick Base
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## DARKROOM RECOMMENDATIONS

Darkrooms can be illuminated using an EncapSulite T20ND0.75 “cyan” filter. The light should be at least 4 feet (1.2 metres) from any area where the film will be handled. Where possible, the safelights should be located as to maximize room lighting for safety but minimize direct exposure to the film surface itself. The farther away the lights are located from the film, the greater the margin of safety. This filter should provide up to 4 minutes of acceptable safelight performance, under the stated conditions.

## STORAGE AND HANDLING

Keep unexposed film and processed film in a cool, dry place. Process film as soon as possible after exposure.



## EXPOSURE

The exposure required is a function of both the photoplotter characteristics and development conditions. Optimum exposure must be determined by means of a trial exposure series following the equipment manufacturer's recommended procedures. The calibration test will determine optimum exposure for required line width and D-max. The resulting image quality and D-max can be influenced by variations in time and temperature of development. Many customers may find that a change to the recommended time and temperature will provide a more suitable result for their particular exposing conditions.

### Exposure Conversion Factors

When converting from another film, the following exposure factors can be used as a starting point. Multiply your current laser intensity setting by the factors as a starting point. An exposure sweep of over and under exposure is strongly recommended to determine optimum laser intensity. Please note the factors assume processing in the recommended developer and processing conditions as specified by the manufacturer.

Converting to ARD7 From:	LD Exposure Multiplier	HN Exposure Multiplier
IPR7 / HPR7	x1	x1
VR7 / IMR7	x1	x1
ERF7	x1.0 to 0.8	—

**Note:** For Gerber Crescent 30 and 40 models, use a neutral density filter of 1.7 to 1.8 ND.

## RECIPROCITY

With recommended processing, the reciprocity speed change is negligible (1/3-photographic stop or less) within exposure range of 1/1000 second to 1 billionth second, there is no change in contrast.

## PROCESSING

**Notice:** Observe precautionary information on product labels and on the Material Safety Data Sheets.

	Size	CAT No.	Dilution
KODAK ACCUMAX Rapid Access Developer and Replenisher	5 L concentrate	887 5569	1:2 with water
KODAK Rapid Fixer and Replenisher	5 L concentrate	174 9837	1:3 with water

### Recommended Starting Points

Developer Temperature	Time
<b>ACCUMAX Rapid Access Developer</b>	
<b>35°C (95°F)*</b>	<b>45 seconds*</b>
38°C (100°F)	30 seconds
32°C (90°F)	60 seconds

\*Optimum starting point recommendation for ACCUMAX Developer.

**Fixer:** Use a starting temperature equal to or 1 to 2°C lower than the developer temperature.

### Replenishment Rates:

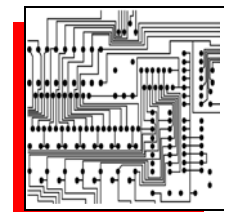
Developer*	Fixer†
465 mL / sq m	540 mL / sq m

\* Anti-oxidation replenishment rates should be set to achieve one tank turnover per week.

† As a starting point, do not add hardener to the fixer. If abrasion or transport problems occur in processing, a small amount of KODAK Rapid Fixer, Part B can be added (CAT No. 173 3013, 72-ounce bottle). Start with 8 mL of Part B per litre of well mixed, working strength fixer, and increase as necessary to a maximum of 25 mL per litre. Add Part B slowly and mix thoroughly.

### Recommendations at Setup:

- ✓ Confirm processing time and temperature with calibrated stopwatch and digital thermometer. Adjust control settings to achieve the desired set points
- ✓ Measure replenishment rates with a graduated cylinder or beaker. Adjust replenishment settings to deliver required volume of developer and fixer for sheet size being used.



## DIMENSIONAL STABILITY

Dimensional stability is an all-inclusive term. In photography, it applies to size changes caused by changes in humidity and in temperature, and by processing and aging. The dimensional properties of ESTAR Base may vary slightly in different directions within a sheet; the differences that may exist, however, are not always equal in both the length and width directions.

Differences in size change between length and width should be within 10 percent of each other.

### Thermal Coefficient of Linear Expansion:

Unprocessed or processed	0.001% per degree F 0.0018% per degree C
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### Humidity Coefficient of Linear Expansion:

Unprocessed	0.0011% per % RH
Processed	0.0009% per % RH

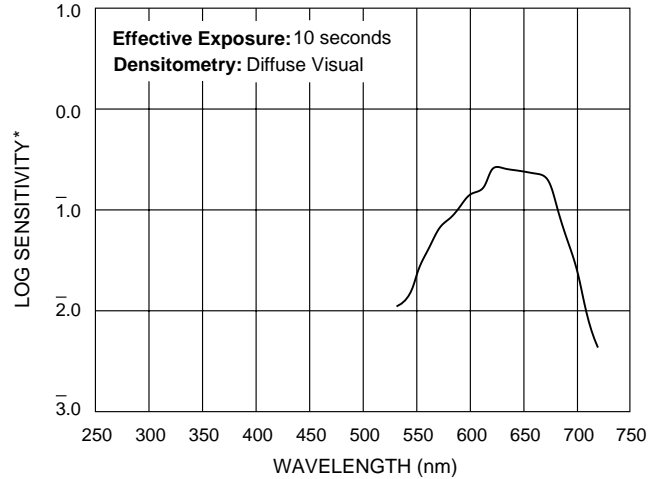
### Processing Dimensional Change:

Dependent upon drying conditions.

Recommended dryer temperature starting point	35°C (95°F)
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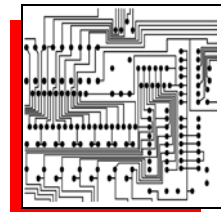
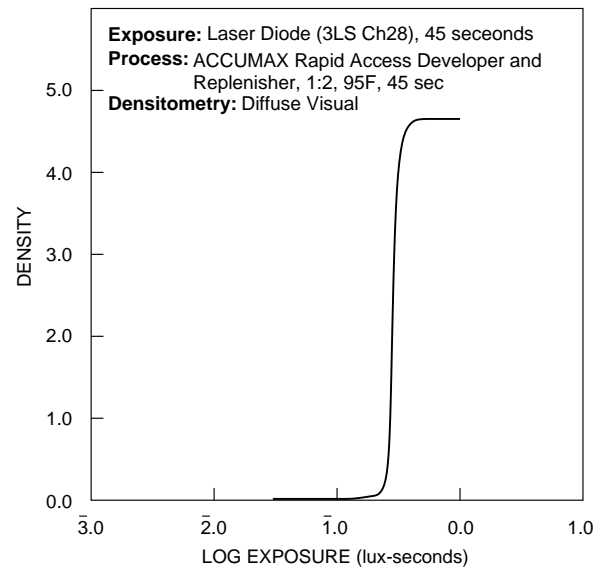
## CURVES

### Spectral Sensitivity Curve



\*Sensitivity = reciprocal of exposure ( $\text{erg}/\text{cm}^2$ ) required to produce specified density

### Characteristic Curve



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## MORE INFORMATION

For the latest version of technical support publications for Kodak products, visit Kodak on-line at:  
**<http://www.kodak.com/go/PCBproducts>**

If you have questions about Kodak products, call Kodak.

In the U.S.A.:

1-800-242-2424, Ext. 19, Monday–Friday

9 a.m.–7 p.m. (Eastern time)

In Canada:

1-800-465-6325, Monday–Friday

8 a.m.–5 p.m. (Eastern time)

From outside the US/Canada: 1-716-724-4000

**Note:** The Kodak materials described in this publication for use with ARD7 Film are available from dealers who supply Kodak products. You can use other materials, but you may not obtain similar results.

**NOTICE:** The sensitometric curves and data in this publication represent product tested under the conditions of exposure and processing specified. They are representative of production coatings, and therefore do not apply directly to a particular box or roll of photographic material. They do not represent standards or specifications that must be met by Eastman Kodak Company. The company reserves the right to change and improve product characteristics at any time.

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