

KODAK PROFESSIONAL ENDURA Day/Night Display Material



KODAK PROFESSIONAL ENDURA Day/Night Display Material is a translucent silver-halide color material designed for making display prints that can be viewed with both transmissive illumination and with reflected illumination without backlights.

This product is ideal for applications requiring the diversity of frontlit or backlit lighting, such as point-of-purchase advertising, retail signage, fast-food menus, directories in airports, sports arenas, museums, public buildings, bus and train stations, display conditions where the front light is intense, or where backlighting will attract added attention.

The 7-mil base features ESTAR Base for robust handling characteristics and increased durability.

KODAK PROFESSIONAL ENDURA Day/Night Display Material is specifically designed for use in laser film and paper recorders; it can also be exposed optically. Process Day/Night Display Material in KODAK EKTACOLOR Chemicals for Process RA-4, using a standard 45-second development time.

FEATURES	BENEFITS
Silver-halide material with day/night appearance for many applications	- Displays that work around the clock - Similar effect under different lighting options—frontlit, backlit, both front- and backlit - Excellent alternative to inkjet electrostatic imaging and silk-screen printing
Uses KODAK PROFESSIONAL ENDURA Imaging Emulsions	- Industry-standard print-life longevity - Same process requirements as papers
45- to 110-second development time, depending on processor's drying capability	- Increased productivity - Fits into current workflow
Wide color gamut	Accurate, consistent reproduction of colors and differentiation between similar colors
Existing calibration	- Easy adaptability to current printing equipment - Quick setup; consistent quality
Robust base	- Light weight; lower shipping costs - Balanced stiffness - Less curl, wider drying temperature range, less kinking, easier transport in CSI Lightjet writing devices

SIZES AVAILABLE

This material is available in wide rolls.

Sizes and catalog (CAT) numbers may differ from country to country. See your dealer who supplies KODAK PROFESSIONAL Products.

In. x ft (cm x m)	Spec	CAT no.
30 x 164 (76.2 x 50)	901*	804 9215
40 x 164 (101.6 x 50)	901*	825 3973
50 x 131 (127 x 40)	901*	805 9396

* Spec 901: unperforated, emulsion in, no leader or trailer, no edge markings.

STORAGE AND HANDLING

Store unexposed materials at 13°C (55°F) or lower in the original sealed package. High temperatures or high humidity may produce unwanted quality changes.

To avoid moisture condensation on material that has been refrigerated, allow it to warm up to room temperature before opening the package. For best results, remove the material from cold storage the day before you use it, or allow the material to warm up for the appropriate time from the following table.

Warm-Up Time (Hours) to Reach Room Temperature of 70°F (21°C)			
Size	From a Storage Temperature of		
	-18°C (0°F)	2°C (35°F)	13°C (55°F)
30-inch x 164-foot roll	12 hours	10 hours	7 hours
50-inch x 131-foot roll	14 hours	12 hours	9 hours

DARKROOM RECOMMENDATIONS

Handle these materials in total darkness. Be sure that your printing and processing darkrooms are lighttight. Carefully control stray light within your printing equipment.

Note: Using a safelight *will* affect your results. These materials are much faster than traditional materials. They are very sensitive to safelights; sensitometric shifts can occur before you observe any changes in D-min.

EXPOSURE

Digital Printing

Expose these materials in various types of digital enlargers and printers, such as —

- DURST Lambda 130 Laser Imagers
- Cymbolic Sciences International LIGHTJET Series or Digital Recorders
- ZBE Chromira 30

Because there are numerous manufacturers and models of digital writers, we cannot provide starting-point exposure calibration aims for all equipment. We recommend that you test the materials and calibrate your printer to achieve optimum results.

Equipment Calibration

For optimum results, follow your equipment manufacturer's recommendations for calibrating your printing equipment.

This material must be exposed in transmission space. You must also make sure that your densitometer is set to read the calibration strip in transmission space.

For best results, color manage images with the profiles located on our website:

CSI Lightjet 5000	www.kodak.com/go/icclightjet
DURST Lambda 130 Laser Imagers	www.kodak.com/go/icclambda

Calibrating the DURST Laser Imager

For DURST Lambda 130 Laser Imagers, basic calibration starting values follow. The values are based on readings from an X-RITE DTP-36 Densitometer.

DURST Lambda 130 Laser Imager

D-max	Basic Calibration (Starting Values)
R = 310 G = 315 B = 310	Y = 82.7 M = 30.3 C = 0.0 D = 89

IMPORTANT:

1. Using higher D-max values than those listed above may result in:
 - overexposure
 - small text closing up; unsharp text
 - oversaturated colors in step 21 (e.g., red becomes orange, etc.)
 - insufficient laser power for exposure to start
2. When using the above starting values for the basic calibration, load the paper as "New Paper Type," and do not copy an already calibrated channel.
3. Your Process RA-4 must be to aim and reach a density of 2.10 in each color on D-max of your process control strip; otherwise you may have problems reaching D-max. Also, you may experience a yellow halo around black text and you will not get a pure white.

Calibrating the LIGHTJET 5000 Printer

Targets for the Cymbolic Sciences International LIGHTJET 5000 Printer can be found at www.cymbolic.com.

Select **Service/Support**

Select **FTP site**

Select **LightJet 5000 and 430 materials files** shortcut

Select **LightJet 430 & 5000**

Select **LightJet-Fusion**

Select **LightJet5000**

Select **Intel**

To download an executable that when run will install the files in the correct place on the LightJet 5000 system, scroll down and select the aims you need.

Optical Printing

Note: This material was designed for digital and optical applications. Balance the density and color for the preferred viewing conditions (frontlit or backlit). The minor shifts under other viewing conditions will be acceptable in many situations.

There are two basic methods for exposure:

- A single "white-light" exposure using cyan, magenta and yellow filters.
- Three successive exposures through red, green and blue filters.

White-Light Exposure Method

Starting filter pack: 37M + 47Y

If the enlarger does not have dichroic filters for the filter pack, use KODAK Color Printing Filters (Acetate). Use the CP Filters only between the light source and the negative. This way, any number of filters can be used between the light source and the negative. If cyan filtration is necessary, use filters identified by the suffix "-2," as in "CP10C-2."

If a starting filter pack is not available, make a first test transparency with the filter pack recommended above for KODAK PROFESSIONAL Films. Since light quality, optical components, filters, and dial settings may vary considerably between enlargers, this filter pack is only a starting point. Adjust the exposure to produce a satisfactory density. If the color balance is not satisfactory, try a different filter or combination of filters. Once a good transparency has been made from a typical negative, use the same "filter pack" for trial exposures with other negatives.

LATENT-IMAGE KEEPING

For best results, process material on the same day you expose it. (If latent-image shifts occur, minimize them by keeping the interval between exposure and processing as consistent as possible.)

PROCESSING

Use KODAK EKTACOLOR Chemicals for Process RA-4 in continuous or roller-transport processors (non-belted). Your processor must be capable of handling the 7-mil polyester base. Use the same machine settings that you currently use for traditional print materials (you may need to raise the dryer temperature).

For more information, see KODAK Publication No. Z-130, *Using KODAK EKTACOLOR Chemicals* on our website at www.kodak.com/go/photochemicals.

Processing for Optimum Print Quality

Because of the unique design of this material, you may encounter different characteristics than you typical do with other types of transmission or reflective display materials. Below are some guidelines to help you achieve optimum print quality with this material.

Drying

The recommended drying time is 45 to 110 seconds. With each time there will be tradeoffs:

- 45 seconds is time efficient, but may not be robust enough for long lengths.
- 110 seconds is robust for drying, but not time efficient.

The type of processor will also be a determining factor. For example:

- Colex only has the above two options for drying.
- Kreonite can create multiple channels—their 60-second third channel offers time efficiency and drying robustness.

A dryer temperature increase of 5°F (2.78°C) has a marked improvement over normal dryer temperatures. This can be combined with any of the options above.

Sharpness

KODAK PROFESSIONAL ENDURA Day/Night Display Material will always be less sharp than KODAK PROFESSIONAL ENDURA Transparency Material. For the sharpest possible images, follow these guidelines:

- Using a 45 second processor time produces a sharper image than 110 seconds
- The higher the D-max aim, the higher the apparent sharpness (290 290 290 vs. 310 315 310).

Reflection vs. Transmission Viewing

This material was developed for optimal transmission and reflection viewing. To change the reflection viewing, reduce the contrast of the image in Photoshop or with device-imaging software. This will reduce transmission quality (flat-looking image). Or, tune the Day/Night Display Material profile for contrast.

VIEWING

This material is designed for both transmissive and reflective viewing.

Reflective (Frontlit) Viewing

Evaluate prints under lights of the same color quality and brightness that you will use to view the final prints. A good average condition is a light source with a color temperature of 5000 K $\pm$ 1000, a Color Rendering Index of 85 to 100, and an illuminance of at least 50 footcandles (538 lux). Fluorescent lamps such as cool white deluxe (made by several manufacturers) meet these conditions.

You can also use a mixture of incandescent and fluorescent lamps. For each pair of 40-watt cool white deluxe fluorescent lamps, use a 75-watt frosted, tungsten bulb.

Viewing conditions should meet ANSI Standard PH2.30-1989.

Transmissive (Backlit) Viewing

The degree of density will depend on the amount of light behind the transparency. Too much light will adversely affect the transparency quality by reducing the D-max and shadow densities excessively, resulting in a low-contrast image. With some illuminators, it may be necessary to use some neutral density or reduce the number of bulbs.

Color balance of the display transparency will depend on the color of the light source. A Color Rendering Index (CRI) of 90 or higher generally will give acceptable results. For best results, use cool white deluxe fluorescent bulbs.

For critical evaluation, use an illuminator that meets ANSI Standard PH2.30-1985.

POST-PROCESS TREATMENTS

Spotting and Retouching

Retouch or spot this material with the same methods used for KODAK EKTACOLOR Papers. The dye stability of this material will not be affected if the instructions given in KODAK Publication E-70, “Retouching Prints on KODAK EKTACOLOR and EKTACHROME Papers,” are followed.

Laminating Prints

You can laminate prints on KODAK PROFESSIONAL ENDURA Day/Night Display Material. Laminate both sides of identification cards to protect against moisture.

Notice: As part of their local fire codes, many municipalities have adopted the National Fire Protection Association (NFPA) 701-1999 *Standard Methods of Fire Tests for Flame Propagation of Textiles and Films*, which applies to plastic films used for decorative or other purposes inside buildings. To comply with this standard, you must protect displays using any of these plastic films.

We strongly recommend that you take one or both of the following measures to protect all large displays, especially if the material is displayed in a public area:

- Fully enclose the materials in a light box or an illuminator.
- Frame and laminate the materials to a non-combustible mounting board, wall, glass, or 1/4-inch or thicker polycarbonate, e.g., LEXAN, support.

Other standards covering the burning characteristics of these products may apply to markets outside the U.S. Check with the appropriate local agency. Do not use these materials as backdrop displays in theaters.

For more information, see CIS-37, *Combustion of KODAK Films, Resin-Coated Photographic Papers, and Print and Display Materials*.

SCANNER TOOLS

The KODAK Q-60 Color Input Targets are available on KODAK EKTACHROME Professional Film in both 35 mm and 4 x 5 inch formats and on KODAK EKTACOLOR Paper. Developed primarily for use by prepress houses in the printing industry, this target can also be used by professional photographers, desktop publishers, and in the emerging hybrid imaging area.

The target is designed for use in the commercial and desktop arenas as a comparative control tool to help customers calibrate their input product to the final output. This target maps the gamut of color space that KODAK EKTACHROME Film and EKTACOLOR Paper can reproduce.

When used properly, customers will be able to compare their output—whether it is separations for the printed page and four-color printing or second generation originals from a film recorder—to the original. This will help customers optimize the capabilities of their system for color reproduction of an extreme range of color gamut.

Scanner color characterization targets produced in accordance with ANSI IT8.7/1 (transmission) and IT8.7/2 (reflection) Standards (or ISO 12641) are available from Kodak.

The KODAK PROFESSIONAL Q-60 Color Input Target/Q-60R2 is manufactured on KODAK PROFESSIONAL ENDURA Paper, and is likewise identified by a watermark with a single grey dot under PAPER. This target can be used with both the newer ENDURA Papers and older papers. The older Q-60R1 target, which has the same two-dot watermark as the older papers, can be used with the newer papers.

PRINTER CONTROL TOOLS

The following tools are manufactured by Kodak for optimization of printer balance and slope controls of KODAK PROFESSIONAL PORTRA Films printed on KODAK PROFESSIONAL Paper.

Product	Features / Description	CAT No.
KODAK PROFESSIONAL PORTRA Printer Control Negative Set / Size 135	Includes one each: very under, under, normal, over, and very over on a single strip of film	179 8511
KODAK PROFESSIONAL PORTRA Printer Control Negative Normal / Size 120	Size 120 Film	846 0958
KODAK PROFESSIONAL PORTRA Printer Control Negative Very Under / Size 120	Size 120 Film	107 1398
KODAK PROFESSIONAL PORTRA Printer Control Negative Under / Size 120	Size 120 Film	841 1902
KODAK PROFESSIONAL PORTRA Printer Control Negative Over / Size 120	Size 120 Film	177 1302
KODAK PROFESSIONAL PORTRA Printer Control Negative Very Over / Size 120	Size 120 Film	144 5741

The following tools are manufactured by Kodak for optimization of printer balance and slope controls of KODAK PROFESSIONAL PORTRA 400BW Film printed on KODAK PROFESSIONAL Paper.

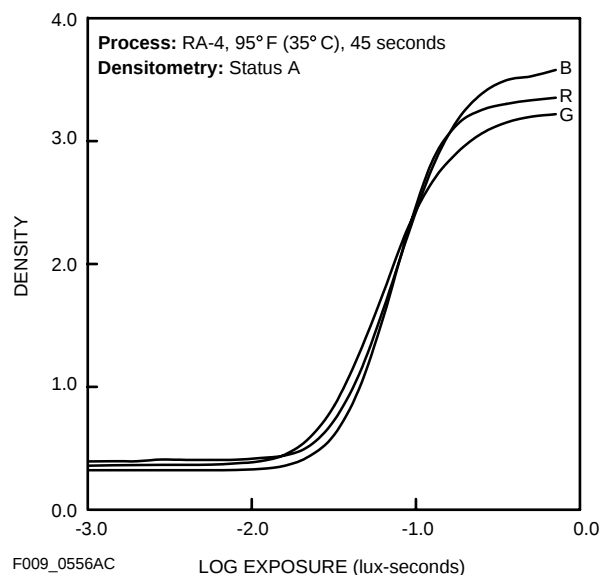
Product	Features / Description	CAT No.
KODAK PROFESSIONAL PORTRA 400BW Printer Control Negative Set / Size 135	This set includes one each: very under, under, normal, over, and very over negatives on a single strip of 35 mm film	156 8286
KODAK PROFESSIONAL PORTRA 400BW Printer Control Negative Set / Size 120 Five Negative Set	This set includes one each: very under, under, normal, over, and very over negatives on a single strip of size 120 film	114 4419

The following tool is manufactured by Kodak for optimization of printer balance and slope controls of KODAK PROFESSIONAL T400 CN Film printed on KODAK PROFESSIONAL Paper.

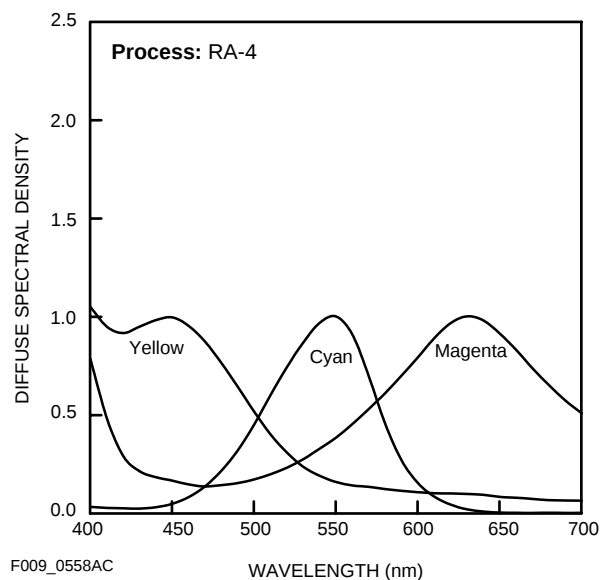
Product	Features / Description	CAT No.
KODAK T-MAX T400 CN Printer Balancing Kit / Size 135, Size 120	Includes size 135 and size 120 negatives for printer balance and slope control	865 3552

CURVES

Characteristic Curves

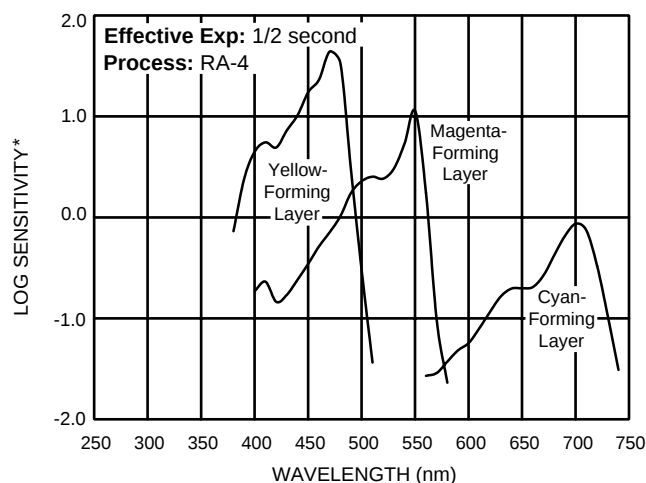


Spectral-Dye-Density Curves



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Spectral-Sensitivity Curves



*Sensitivity = reciprocal of exposure (erg/cm^2) required to produce specified density

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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.

MORE INFORMATION

Kodak has many publications to assist you with information on Kodak products, equipment, and materials.

The following publications are available from dealers who sell Kodak products, or you can contact Kodak in your country for more information.

E-30	<i>Storage and Care of KODAK Photographic Materials—Before and After Processing</i>
E-70	<i>Retouching Prints on KODAK EKTACOLOR and EKTACHROME Papers</i>
E-71	<i>Retouching Color Negatives</i>
E-176	<i>Post-Processing Treatment of Color Prints—Effects on Image Stability</i>
J-39	<i>Tray, Drum, and Rotary-Tube Processing with KODAK EKTACOLOR RA Chemicals</i>
K-4	<i>How Safe is Your Safelight?</i>
Z-130	<i>Using KODAK EKTACOLOR RA Chemicals</i>

For the latest version of technical support publications for KODAK PROFESSIONAL Products, visit Kodak on-line at:
<http://www.kodak.com/go/professional>

If you have questions about KODAK PROFESSIONAL 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)

Note: The Kodak materials described in this publication for use with KODAK PROFESSIONAL ENDURA Day/Night Display Material are available from dealers who supply KODAK PROFESSIONAL Products. You can use other materials, but you may not obtain similar results.



EASTMAN KODAK COMPANY

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