

Kodak Professional



KODAK PROFESSIONAL EKTACHROME Duplicating Film EDUPE is a low-contrast color reversal duplicating film designed for making high-quality duplicates from originals on KODAK EKTACHROME or KODACHROME Films. It features excellent color reproduction, extremely fine grain, and very high sharpness.

Although its primary application is producing duplicate slides, you can also use this film for making copy slides of high-contrast color reflection prints.

FEATURES	BENEFITS
<ul style="list-style-type: none"> Optimized spectral sensitivity and tone scale 	<ul style="list-style-type: none"> Versatile performance Exceptional tone and color reproduction from a variety of original film types
<ul style="list-style-type: none"> Extended tone scale latitude 	<ul style="list-style-type: none"> Increased highlight and shadow detail Faithful reproduction of original tone scale Richer blacks Cleaner whites
<ul style="list-style-type: none"> Finest grain available in a color reversal duplicating film 	<ul style="list-style-type: none"> Outstanding reproduction of detailed images—even with enlargement The perfect match for today's finer-grained films
<ul style="list-style-type: none"> Excellent latent-image keeping 	<ul style="list-style-type: none"> No color or contrast shifts within a roll, or from the start to the end of the day
<ul style="list-style-type: none"> Superb reciprocity characteristics 	<ul style="list-style-type: none"> No tone scale compromise with exposures from 10 seconds to 1/100 second Flexibility to handle long exposures for dodge-and-burn or short exposures to maximize productivity
<ul style="list-style-type: none"> Robust processing performance 	<ul style="list-style-type: none"> Consistency from run to run and day to day
<ul style="list-style-type: none"> Common emulsion technology 	<ul style="list-style-type: none"> Same great results from both sheet and roll formats
<ul style="list-style-type: none"> Same rich color dyes as KODAK PROFESSIONAL EKTACHROME Films E100S, E100SW, E100VS, and E200 	<ul style="list-style-type: none"> Scanning compatibility with other popular KODAK EKTACHROME Films

SIZES AVAILABLE

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

Rolls	Code / Spec No.	Acetate Base	CAT No.
135-36	EDUPE	5-mil (0.13 mm)	134 2641
35 mm x 100 ft	EDUPE/SP663		195 2837
35 mm x 400 ft	EDUPE/SP663		114 7461
35 mm x 1000 ft	EDUPE/SP663		197 5358
46 mm x 100 ft	EDUPE/SP446		122 1985
61.5 mm x 100 ft	EDUPE/SP816		102 3035
70 mm x 100 ft*	EDUPE / SP481*		813 7523
120	EDUPE		139 5268

*Perforated on both edges.

Sheets	Size	Film Code	Acetate Base	CAT No.
10 50	4 x 5 in.	EDUPE	8.2-mil (0.21 mm)	802 4531 890 6943
10 50	8 x 10 in.	EDUPE		133 1941 163 8444

STORAGE AND HANDLING

Load and unload film in subdued light.

Store unexposed film in a refrigerator at 13°C (55°F) or lower in the original sealed package. To avoid moisture condensation on film that has been refrigerated, allow the film to warm up to room temperature before opening the package. Process film as soon as possible after exposure.

Protect processed slides and transparencies from strong light, and store them in a cool, dry place. For more information, see KODAK Publication No. E-30, *Storage and Care of KODAK Photographic Materials—Before and After Processing*.

DARKROOM RECOMMENDATIONS

Do not use a safelight. Handle unprocessed film in total darkness.

EXPOSURE GUIDELINES

You can expose this film with enlargers, optical printers, contact-printing equipment, or cameras. A diffuse optical system offers the least difficulty with dust and scratches.

Certain factors in the darkroom will influence the quality of your results. You can optimize your results by taking these steps:

- Make sure the darkroom is lighttight. Check for light leaks around doors and vents, and mask them if necessary.
- Paint the walls, ceiling, and other prominent surfaces flat black. Minimize or eliminate other reflective materials and digital displays.
- Avoid fluorescent tubes in the darkroom—they emit a weak illumination just after being turned off.
- Install a dark slide in any drawers used to store unprocessed film. Verify that it is lighttight by placing an unexposed sheet in the drawer, partially covered by an opaque material. Close the drawer, and leave the room lights on for four hours. If, after processing the film, you see a density difference or a line corresponding to the opaque material, the drawer is not lighttight.

Enlargers

With either tungsten or pulsed-xenon illumination, set the illumination level at the exposure plane to one footcandle (10.8 lux). Use a light integrator to measure pulsed-xenon illumination. With either illumination, measure without correction filters in the light beam. Enlargers must have a heat-absorbing glass, and an ultraviolet-absorbing filter (such as KODAK WRATTEN Gelatin Filter No. 2B or a KODAK Acetate Filter / Color Printing CP2B).

Start with the filter pack printed on the film carton. Then add any necessary filters listed in the table under “Filter Recommendations.”

Note: Very short exposure times may not be repeatable. Consult the timer manufacturer for exposure limitations. If your exposure is too short for your timer, add neutral density filtration.



Caution

Consult the manufacturer of pulsed-xenon lamps for ventilation recommendations and information on ultraviolet radiation.

Optical Printers

If your equipment holds filters between the light source and the original transparency, use KODAK Color Printing Filters (Acetate) for color-balance adjustments. Use KODAK WRATTEN Gelatin Filter / Color Compensating if you must place the filters between the lens and the duplicating film. Also use a heat-absorbing glass, an ultraviolet-absorbing filter (such as KODAK WRATTEN Gelatin Filter No. 2B or a KODAK Acetate Filter / Color Printing CP2B).

Start with the filter pack printed on the film carton. Then add any necessary filters listed in the table under “Filter Recommendations.”

Note: When duplicating mounted slides, adjust the printer to a 1.03X magnification. While some cropping will occur, this magnification ensures that none of the slide mount will be included in the duplicate. To verify correct lens magnification, first project the original slide, and measure the distance between two widely separated points on the projected image. Then project the duplicate slide, and measure the distance between the same two points. Divide the distance measured on the duplicate by the distance measured on the original to determine the lens magnification.

Contact-Printing Equipment

Use an enlarger as the light source for contact printing original transparencies onto the duplicating film. Use clear, scratch-free glass of good optical quality, and keep all surfaces clean to minimize problems with dust. The original transparency must be in complete contact with the glass during the exposure for sharp images. Also, the emulsion side of the original transparency should be in contact with the emulsion side of the duplicating film. Duplicate transparencies made by contact printing will have slightly higher contrast than those made by using an optical system.

35 mm Cameras

You can make duplicate slides with a single-lens reflex camera and a suitable slide-duplicating attachment.

Tungsten (3200 K) Illumination. As a starting point, set the camera ISO or ASA speed indicator to the exposure index printed on the film box. Set the shutter speed at 1 second.

Standard Illuminator (5000 K). As a starting point, set the camera speed indicator to the exposure index printed on the film carton. Set the shutter speed at 1/8 second.

Electronic Flash. Make a trial exposure series with the camera shutter set at its flash synchronization speed and the flash unit set on *Manual*.

Start with the filter pack printed on the film carton. Then add any necessary filters listed in the table under "Filter Recommendations."

For maximum sharpness, place the filters between the original transparency and the light source.

Make an exposure series in 1/3-stop increments to determine the best exposure for your film and equipment. If the lowest film speed setting on your camera is 25, set the speed indicator at 25 and adjust the aperture as follows.

Exposure Index Provided with the Film	Increase the Lens Aperture by
12	1 stop
6	2 stops
3	3 stops

Distinguishing Originals on KODACHROME and KODAK EKTACHROME Films

To help you identify the type of original being duplicated, here is a brief summary of Kodak films and their processes:

KODACHROME Films: All KODACHROME Films have a "relief image," that is, the image appears to be dimensional or "raised" on the emulsion side.

KODACHROME Film originals typically require CC10C more filtration than KODAK EKTACHROME Film originals.

KODAK EKTACHROME Films: EKTACHROME Films do not have a raised or "relief" image on the emulsion side; both sides are smooth.

Filter Recommendations

When using tungsten illumination, start with the basic filter pack printed on the film box. The table below shows the additional filtration needed when you use this film with other light sources. In all cases, use these filters in addition to the filtration printed on the box and a KODAK WRATTEN Gelatin Filter No. 2B.

The following filter recommendations are for KODAK PROFESSIONAL WRATTEN Gelatin Filters / Color Compensating. If you use dichroic filters, you may have to make some adjustments.

Pulsed Xenon	Electronic Flash	5000 K Illuminator
Filtration for EKTACHROME Films		
85B	10M + 60Y	30R
Filtration for KODACHROME Films		
85B + 10C	50Y	20R

Flash exposure is based on electronic flash (5500 K) with appropriate color-conversion, color-balancing, and ultraviolet filters. If the electronic flash source is higher or lower in color temperature than 5500 K, increase the filtration as follows.

- 6000 K to 5500 K: add KODAK WRATTEN Gelatin Filter / Light Balancing No. 81
- 5000 K to 5500 K: add KODAK PROFESSIONAL Gelatin Filter / Light Balancing No. 82

KODAK WRATTEN Gelatin Filters and KODAK Acetate Filters are now distributed by Tiffen Co. L.L.C. In the U.S. call 800-368-6257 or view their website at www.tiffen.com.

EXPOSURE

Make a series of exposures in 1/3-stop increments, starting with the filtration provided.

Standard 1/3-stop Exposure-Index ratings:

4, 5, 6, 8, 10, 12, 16, 20, 25, 32, 40

Note: Roll format film labels include a starting point Exposure Index.

Reciprocity Characteristics

Typical exposure times are 1 second for tungsten illumination, 1/1000 second (or shorter) for electronic flash, and 10 seconds for pulsed-xenon illumination. You are not, however, limited to these exposures. EDUPE Film has excellent reciprocity characteristics. You can shorten times to increase productivity or lengthen them as needed to dodge and burn difficult originals.

Adjusting Density

If your initial exposure series is too high in density (underexposed), increase the exposure and make a new exposure series. If the whole series is too low in density (overexposed), decrease the exposure and make a new series. When you increase or decrease exposure, try to adjust the aperture rather than the exposure time (see “Adjustments for Emulsion-Number Changes”).

Adjusting Color Balance

Judge the color balance of duplicate transparencies made for projection by viewing the projected images. You can also view transparencies on a standard illuminator (5000 K). The standard illuminator provides the correct light intensity and spectral distribution characteristics for critical analysis of color transparencies. See ANSI Standard PH2.30–1989, *Viewing Conditions—Photographic Prints, Transparencies, and Photomechanical Reproductions*, for the specifications of a standard illuminator (5000 K).

When you view a duplicate transparency, you may find that you want to change the color balance. To adjust the filter pack, subtract a filter of the same color as the overall hue, or add a filter that is complementary to the overall hue. Use the information in the table below to determine the filter adjustment.

If Color Balance Is Too—	Subtract These Filters	OR	Add These Filters
Yellow	Yellow		Magenta + Cyan
Magenta	Magenta		Cyan + Yellow
Cyan	Cyan		Magenta + Yellow
Blue	Magenta + Cyan		Yellow
Green	Cyan + Yellow		Magenta
Red	Magenta + Yellow		Cyan

If you use filters between the original transparency and the duplicating film, keep the number of filters in the filter pack to a minimum. Using more than three CC filters will result in a significant loss in sharpness. If the filter pack contains all three subtractive colors (neutral density), remove the lowest-value filter and reduce the other two by the same value as follows:

Filter Pack	40C	40M	20Y
Subtract neutral density	-20C	-20M	-20Y
Adjusted filter pack	20C	20M	

You can further reduce 20C + 20M to CC20B.

When you change the filter pack, you must adjust the exposure to compensate for differences in filter density and in the number of filter surfaces. Otherwise, the density of the new duplicate will differ from the density of the previous duplicate.

The table below gives filter factors for adjusting exposure. The filter factors take into account the effects of filter surfaces.

Filter	Change Exposure By	Filter	Change Exposure By
05Y	None	05R	1/3 stop
10Y	None	10R	1/3 stop
20Y	None	20R	1/3 stop
05M	1/3 stop	05G	None
10M	1/3 stop	10G	1/3 stop
20M	1/2 stop	20G	1/2 stop
05C	None	05B	None
10C	1/3 stop	10B	1/3 stop
20C	1/3 stop	20B	1/2 stop

Adjustments for Emulsion-Number Changes

When you change to a new film emulsion, you may have to change the exposure and filter pack. You will find the recommended filtration for each emulsion on the film carton.

To calculate the filtration for a new emulsion, start with the filter pack you are currently using. Then subtract the *recommended* filter pack for the old emulsion from the filter pack you are using. This will give you the difference between the actual filter pack and the recommended pack. Finally, add the recommended filter pack for the new emulsion to obtain your new filter pack.

Current filter pack	50C	40Y
Subtract recommended pack for old emulsion	-30C	-25Y
Difference	20C	15Y
Add recommended pack for new emulsion	+20C	+40Y
new filter pack	40C	55Y

If you make significant changes to the exposure time to compensate for filter-pack adjustments, you may have to make additional changes in filtration. If possible, adjust the aperture rather than the exposure time.

Be sure to follow the storage and processing recommendations so that your adjusted filter pack will remain valid.

Copying Reflection Originals

You can use KODAK PROFESSIONAL EKTACHROME Duplicating Film EDUPE to copy color prints or other reflection copy such as paintings and drawings. If you use incandescent illumination (3000 to 3200 K), start with the filter-pack data packaged with the film, and then adjust filtration as required.

With low-contrast originals such as watercolors and pastels, you can obtain higher contrast in the duplicate by using a camera-original film such as KODAK EKTACHROME 64T Professional Film or KODAK EKTACHROME 100 Professional Film.

PROCESSING

Process EDUPE Film in KODAK Chemicals, Process E-6.

As always, process control is important. KODAK Publication Z-119, Using KODAK Chemicals, Process E-6, or the KODAK Q-LAB Process Monitoring Service manual are sources for good quality-control procedures.

RETOUCHING

Use KODAK E-6 Transparency Retouching Dyes. You can chemically retouch sheets on both the base and the emulsion side. Retouch only the emulsion side of the roll formats.

For information on retouching equipment, supplies, and techniques, see KODAK Publication No. E-68, *Retouching Transparencies on KODAK EKTACHROME Film*.

PRINTING TRANSPARENCIES

You can reproduce images made on EDUPE Film by using a variety of Kodak materials.

Duplicate Color Transparencies

For direct printing, use—

KODAK PROFESSIONAL EKTACHROME
Duplicating Film EDUPE

KODAK EKTACHROME RADIANCE III Overhead
Material

Or make internegatives on KODAK Commercial
Internegative Film, and print them on—

KODAK VERICOLOR Print Film

KODAK VERICOLOR Slide Film

KODAK PROFESSIONAL DURATRANS Display
Material

KODAK PROFESSIONAL DURACLEAR Display
Material

Color Prints

For direct printing, use—

KODAK EKTACHROME RADIANCE III Papers

KODAK EKTACHROME RADIANCE III Select
Material

Or make internegatives on KODAK Commercial
Internegative Film, and print them on—

KODAK PROFESSIONAL PORTRA, SUPRA, and
ULTRA III Papers

KODAK PROFESSIONAL DURAFLEX Print Material

KODAK PROFESSIONAL Color Metallic Paper

Digital Files

You can scan your image to a file and print digitally to—

KODAK PROFESSIONAL Digital III Color Paper

KODAK PROFESSIONAL DURATRANS Plus Digital
Display Material

KODAK PROFESSIONAL DURACLEAR Plus Digital
Display Material

KODAK PROFESSIONAL DURAFLEX Digital Print
Material

SCANNING TRANSPARENCIES

For Graphic Arts Applications

The KODAK EKTACHROME Film family is characterized by sets of image dyes that perform very similarly when scanned. The scanner operator can set up one basic tone scale and color-correction channel for all EKTACHROME Films, and then optimize the tone scale and gray balance for the requirements of individual images.

Use the KODAK Color Input Target / Q-60E1 (4 x 5-inch transparency) or Q-60E3 (35 mm slide) to establish the setup for KODAK EKTACHROME Films on all scanners. These targets are manufactured to ANSI standards and represent the dye sets of all EKTACHROME Films.

For Photo CD Applications

Use the Universal E-6 Film Term to scan all KODAK EKTACHROME Films for KODAK Photo CD Imaging Workstation applications.

For Output to a Photo CD Player: Using the Universal E-6 Film Term should result in an image that closely matches your transparency in density, tone scale, and overall color balance when viewed on a player.

For Output to Devices Other than Photo CD Players: The YCC data that results from using the Universal E-6 Film Term is capable of producing a high-quality duplicate of your transparency in terms of density, tone scale, and color reproduction. The quality of your final reproduced image also depends on the capabilities of your output device, the viewing environment, and the procedure that is used.

IMAGE STRUCTURE

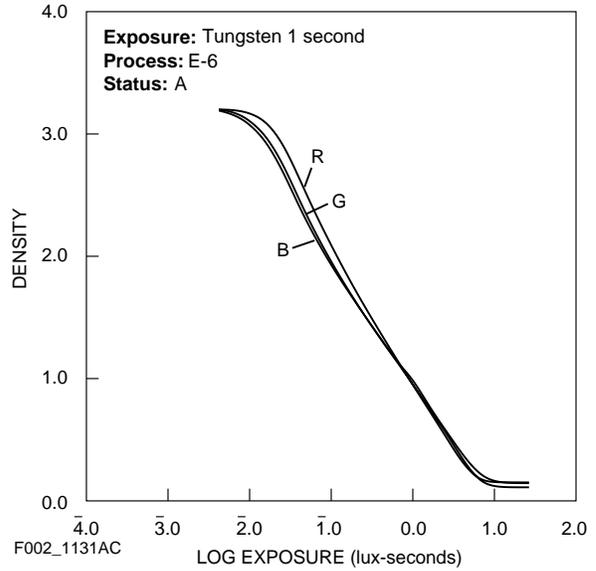
The image structure classifications given here apply only to KODAK PROFESSIONAL EKTACHROME Duplicating Film EDUPE. However, image structure depends on the combination of the duplicating film, the original transparencies being duplicated, and the equipment being used.

Diffuse rms Granularity* 8.7 (extremely fine)

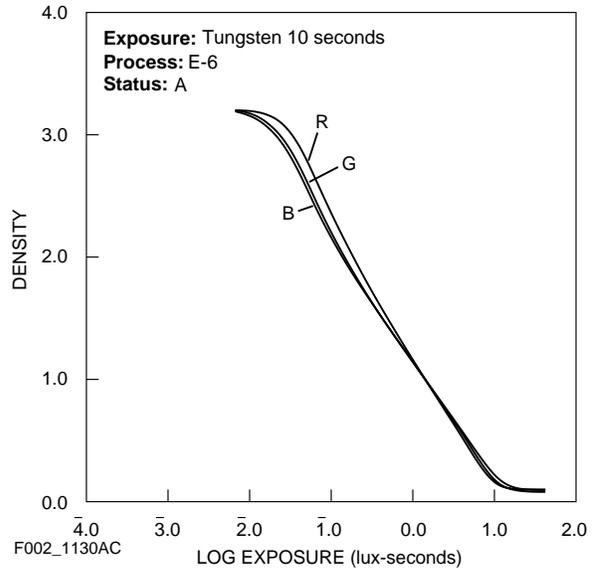
*Read on a gross diffuse visual density of 1.0, using a 48-micrometre aperture, 12X magnification.

CURVES

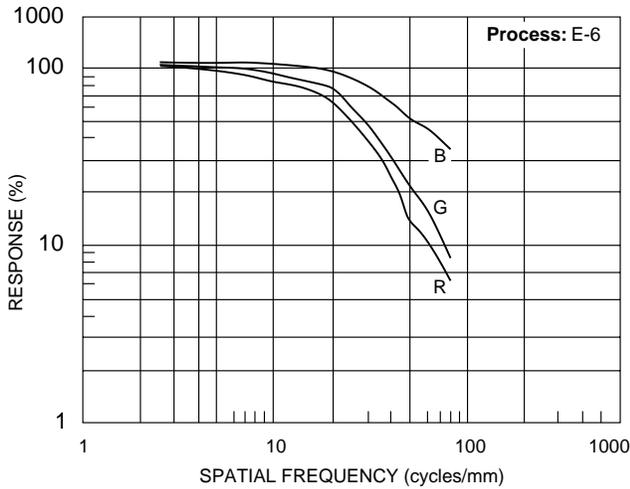
Characteristic Curves, Roll Formats



Characteristic Curves, Sheet Formats

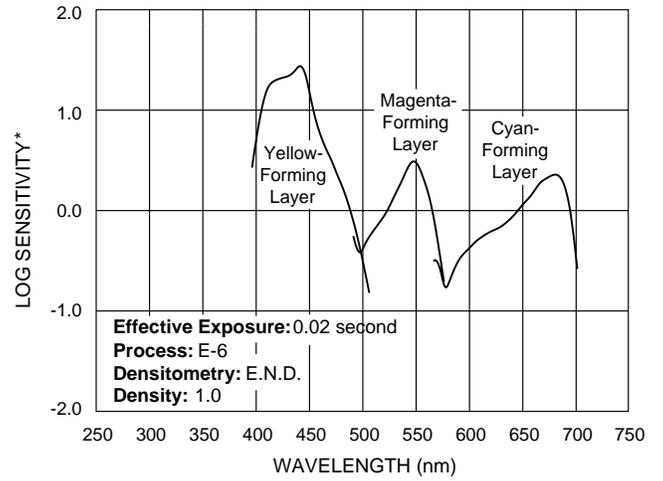


Modulation-Transfer Curves



F002_1129AC

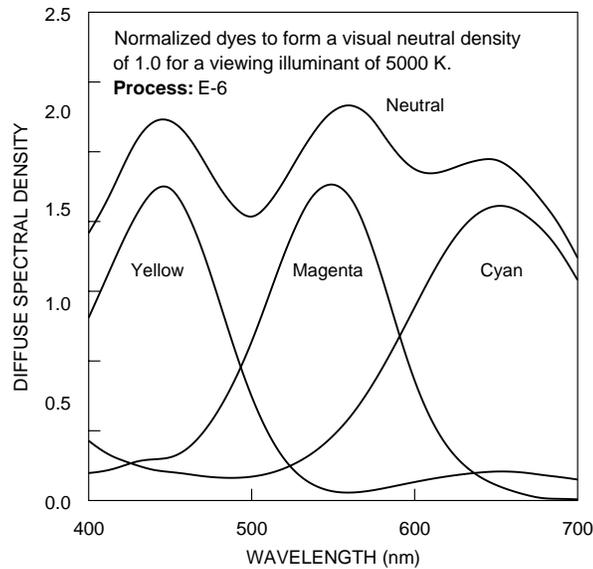
Spectral-Sensitivity Curves



*Sensitivity = reciprocal of exposure (erg/cm²) required to produce specified density

F002_1128AC

Spectral-Dye-Density Curves



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.

KODAK PROFESSIONAL EKTACHROME Duplicating Film EDUPE

MORE INFORMATION

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

Additional information is available on the Kodak website and through the U.S.A. / Canada faxback system.

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

- E-8 *KODAK EKTACHROME 64 Professional Film*
- E-27 *KODAK EKTACHROME 100 Professional Film*
- E-28 *KODAK PROFESSIONAL EKTACHROME Film E200*

- E-30 *Storage and Care of KODAK Photographic Materials—Before and After Processing*
- E103RF *KODAK PROFESSIONAL Color Reversal Films*
- E-113 *KODAK EKTACHROME 100 Plus Professional Film*
- E-130 *KODAK EKTACHROME 64T Professional Film*
- E-144 *KODAK EKTACHROME 160T Professional Film*
- E-145 *KODAK EKTACHROME 320T Professional Film*
- E-147 *KODAK EKTACHROME 1600 Professional Film*
- E-161 *KODAK EKTACHROME 400X Professional Film*
- E-163 *KODAK PROFESSIONAL EKTACHROME Film E100VS*

- E-164 *KODAK PROFESSIONAL EKTACHROME Films E100S and E100SW*

- Z-119 *Using KODAK Chemicals, Process E-6*

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 EKTACHROME Duplicating Film EDUPE are available from dealers who supply KODAK PROFESSIONAL Products. You can use other materials, but you may not obtain similar results.



EASTMAN KODAK COMPANY

Kodak Professional
Imaging Solutions