KODAK ROYAL Digital Paper

Kodak

KODAK ROYAL Digital Paper is an exceptional state-of-the-art, silver-halide paper for making direct digital prints from digital files, as well as optical prints from color negatives. This paper delivers bold, saturated colors, state-of-the-art image stability, and is optimized to work well in both digital and optical imaging systems. It replaces KODAK ROYAL Generations, KODAK EKTACOLOR ROYAL Plus, KODAK EKTACOLOR ROYAL IX AP, and KODAK EKTACOLOR ROYAL X Papers.

ROYAL Digital Paper is easily identified by its thicker support, which provides durability in handling, and by its distinctive gold "KODAK ROYAL Paper" watermark.

This paper is available in rolls in F (glossy) and N (matt) surfaces. It is designed for processing in KODAK EKTACOLOR RA, KODAK EKTACOLOR PRIME, and KODAK EKTACOLOR PRIME LORR Chemicals for Process RA-4 or KODAK EKTACOLOR SM Chemicals for Process RA-2SM.

FEATURES	BENEFITS
• Optimized for digital printing	• Exceptional detail and crisp, clean text • Robust calibration
• Excellent flesh tone reproduction	• Natural-looking skin tones
• Enhanced tone scale	• Excellent flesh to neutral; warm highlights
• Saturated colors	• Rich, bright, compelling colors • Vibrant greens, blues, and reds
• Enhanced flesh-tone reproduction	• Exceptionally natural-looking skin tones
• Easy to view raw stock color	• Straightforward printer setup and focus
• State-of-the-art image stability	• Bold, bright colors that last a lifetime before noticeable fading in typical home display • Over 200 years before noticeable fading in the most common home storage conditions, with double the stability of any other non-Kodak silver halide paper
• Technology optimized for KODAK Print Films	• The best possible prints from KODAK Films • Versatility to provide great results with other manufacturers' negative films
• Robust process performance	• Resistant to abrasion marks during processing • Minimum waste • Reduced process sensitivity to leuco cyan dye in the bleach-fix (<pH 6.2)

STORAGE AND HANDLING

For optimum results, store unexposed paper at 13°C (55°F) or lower in the original package. You can store unexposed paper at 24°C (75°F) for up to 6 months and still achieve high-quality results. High temperatures or high humidity may produce unwanted changes.

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

Handle paper carefully by the edges to avoid creases and fingerprints.

Minimum Warm-Up Time (Hours) at Ambient Temperature of 70°F (21°C)			
Size	From a Storage Temperature of		
	-18°C (0°F)	2°C (35°F)	13°C (55°F)
Rolls: cm x m (in. x ft)			
8.9 cm x 78 (3½ x 256)	5	4	3
8.9 cm x 156 (3½ x 511)	8	6	4
8.9 cm x 221 (3½ x 725)	10	8	6
10.2 cm x 78 (4 x 256)	6	4	3
10.2 cm x 156 (4 x 511)	8	6	4
10.2 cm x 221 (4 x 725)	10	8	6
12.7 cm x 78 (5 x 256)	6	4	3
12.7 cm x 156 (5 x 511)	8	6	4
12.7 cm x 221 (5 x 725)	10	8	6
15.2 cm x 78 (6 x 256)	6	5	3
15.2 cm x 156 (6 x 511)	8	6	4
20.3 cm x 78 (8 x 256) 25.4 cm x 78 (10 x 256)	7	5	4
27.9 cm x 27 (11 x 90)* 27.9 cm x 78 (11 x 256) 30.5 cm x 78 (12 x 256)	8	6	4

* Designed for the KODAK CREATE-A-PRINT 35 mm Enlargement Center.

DARKROOM RECOMMENDATIONS

With the exception of the sizes designed for KODAK CREATE-A-PRINT 35 mm Enlargement Centers that minilab operators can load in room light, handle this paper in *total darkness*. Be sure that your darkroom is light tight. Eliminate any stray light from timers, LEDs, etc. KODAK ROYAL Digital Paper is sufficiently sensitive to photographic safelights that sensitometric shifts may occur before D-min (fog) changes are seen.

Note: Using a safelight *will* affect your results. *If absolutely necessary,* you can use a safelight equipped with a KODAK 13 Safelight Filter (amber) with a 7½-watt bulb. Keep the safelight at least 4 feet (1.2 meters) from the paper. Keep safelight exposure as short as possible. Run tests to determine whether safelight use gives acceptable results for your application. For information on safelight testing, see KODAK Publication No. K- 4, *How Safe is Your Safelight?*

EXPOSURE

You can expose this paper in automatic printers, such as KODAK CREATE-A-PRINT 35 mm Enlargement Centers, KODAK Minilab Systems, KODAK 312 Color Printers, KODAK I.LAB Digital High-Speed Printers, AGFA High-Speed Printers, GRETAG High-Speed Printers, GRETAG Minilabs and Microlabs, NORITSU Minilabs and Microlabs, FUJI FRONTIER and other FUJI Minilabs, KONICA Minilabs, PHOTO-ME Minilabs, and more.

Note: Printer and balance slope changes may be necessary. Check production after final balance. You may want to make a color preference adjustment.

If you are using AGFA MSP or MSC printers, visit www.kodak.com/go/colorpapers or contact your Kodak representative to obtain Schwarzschild coefficients. Agfa's current recommendation is that the Schwarzchild coefficients are the same for KODAK ROYAL Digital Paper as for previous ROYAL Papers.

Because voltage changes affect the light output and color quality, use a voltage regulator. Use a tungsten-halogen lamp to expose the paper. Do not use a fluorescent lamp. If the printer has no means of removing infrared radiation, use a heat-absorbing glass.

Keep negatives and the optical system of your equipment clean. Mask negatives to eliminate stray light.

To control the color balance, use dichroic filters, KODAK Color Printing Filters (CP), or KODAK Color Compensating Filters (CC) placed between the lamp and the negative. You can also use CC filters between the lens and the paper if they are clean and unscratched. Use as few CC filters between the lens and the paper as possible—preferably not more than three. If you use cyan filtration, use filters with the suffix "-2," such as CP10C-2.

Start with a filter pack of 40M + 40Y for the white-light method. Adjust filtration as necessary.

Printer Control Negative Sets

Use the appropriate KODAK Printer Balancing Kit to determine aims for KODAK Color Negative Films or to cross over from another type of color paper to KODAK ROYAL Digital Paper.

LATENT-IMAGE KEEPING

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

PROCESSING

Use KODAK EKTACOLOR Chemicals for Process RA-4 or KODAK EKTACOLOR SM Chemicals for Process RA-2SM. For FUJI FRONTIER Processors, use KODAK EKTACOLOR Processing Cartridge 111 and KODAK Rinse Tablets. Use KODAK Control Strips, Process RA-4 to monitor your process.

For more information on processing chemicals, see www.kodak.com/go/photochemicals.

Use a maximum drying temperature of 96°C (205°F).

VIEWING

Evaluate prints under light of the same color and brightness that you will use to view the final prints. For an average condition, use a light source with a color temperature of 5000 ± 1000 K, a Color Rendering Index (CRI) of 85 to 100 (an index of 90 or higher is desirable), and an illuminance up to 500 lux. Fluorescent lamps such as a cool white deluxe lamp (made by several manufacturers) meet these conditions You can also use a mixture of fluorescent and incandescent lamps. For each pair of 40-watt cool white deluxe lamps, use a 75-watt frosted tungsten bulb.

PRINT FINISHING

Dust Spotting

Use KODAK Liquid Retouching Colors to correct dust spots on prints made with this paper. To apply dyes, follow this procedure:

1. If necessary, clean the surface of the print by buffing it with a tuft of cotton before you start retouching. Be careful not to scratch the surface. Protect the print from fingerprints and perspiration by wearing cotton gloves (e.g., KODAK Cotton Gloves).

2. Transfer a small amount of the dye(s) you need to a palette.

3. If necessary, add a touch of neutral dye to the puddle of pure colored dye. The neutral dye will reduce the brilliance of the pure colors by adding density. For good control, keep the dilutions weak by adding a little distilled water. This allows you to build up the dye gradually on the print. It is easier to add dye gradually than to remove it if you apply too much.

Note: If the liquid dyes on your palette dry out, you can add water to dilute them again.

4. Pick up a small amount of dye with your brush, and stroke the brush on newsprint or a paper towel to blot it *thoroughly*. Too much moisture can cause opalescence, or a cloudy look, on the print. Rotate the tip on the newsprint to form a good point. Do not use your tongue or lips to form a tip.

5. Retouch the print with light strokes of the brush; be sure to keep the dye within the area of the spot. Avoid spilling over into the surrounding area. Any overlapping will result in a dark ring around the spotted area.

6. If you apply too much color, blot it quickly with newsprint or you will have too much density in the spot. If too much dye penetrates the emulsion, you can remove it with a 5-percent clear ammonia-water solution. (You can make a 5-percent solution by mixing 5 parts of 28-percent liquid ammonium hydroxide with 23 parts water.) Apply the solution with a tuft of cotton, rubbing it with a circular motion. Be sure to apply it only to the area where you want to remove the dye. Then swab the area with clean water-dampened cotton. Repeat if necessary with a fresh tuft of cotton. Be sure to remove all of the ammonia. Allow the area to dry thoroughly before you resume retouching. For best results, remove unwanted dye quickly.

STORAGE AND DISPLAY OF PRINTS

ROYAL Digital Paper has been formulated to provide improved dye stability and print longevity for prints displayed under typical home lighting conditions (i.e., 120 lux for 12 hours a day) and typical home dark storage conditions (i.e., 20 to 23°C [68 to 73.4°F] and 50% relative humidity). Product modifications have provided an improvement in the fade neutrality when compared with previous papers.

Despite the improvements in print longevity and fade neutrality, photographic dyes, like all dyes, can change with time and exposure to sunlight, ultraviolet radiation, excessive heat, and high humidity. To help prevent changes in photographic dyes, follow these guidelines:

- Illuminate prints with tungsten light whenever possible.
- Display prints in the lowest light level consistent with your viewing needs.
- If a print is exposed to direct or indirect sunlight or fluorescent light, use an ultraviolet-absorbing filter (such as glass) between the light source and the print.
- For prints displayed behind glass, maintain a slight separation between the prints and the glass.
- Keep the temperature and humidity as low as possible.
- Use album materials described in KODAK Publication No. E-30, *Storage and Care of KODAK Photographic Materials—Before and After Processing.*

Mounting/Laminating

Prints can be mounted using a contact type adhesive or cement for cold mounting. In addition, prints can be mounted or laminated using pressure sensitive materials with a roller mounting or laminating system.

If the prints are to be displayed behind glass, maintain a slight separation between the print and the glass.

Mounting or laminating prints at high temperatures is not recommended.
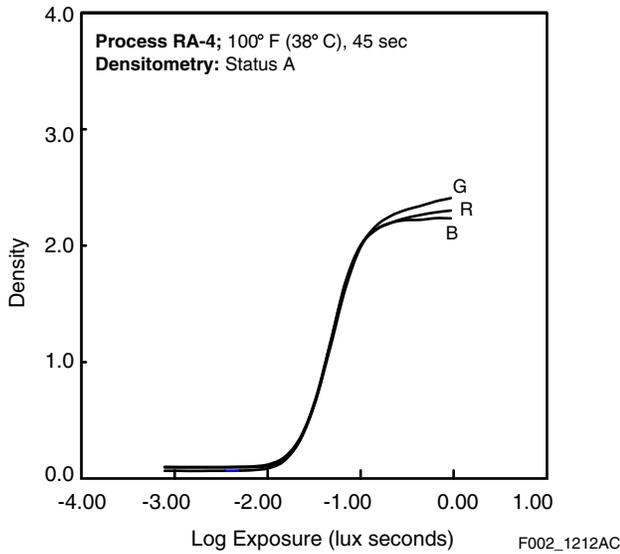
SIZES AVAILABLE

KODAK ROYAL Digital Color Paper is available in roll sizes. These sizes and catalog numbers may differ from country to country. See your Kodak representative or dealer who supplies KODAK Products.
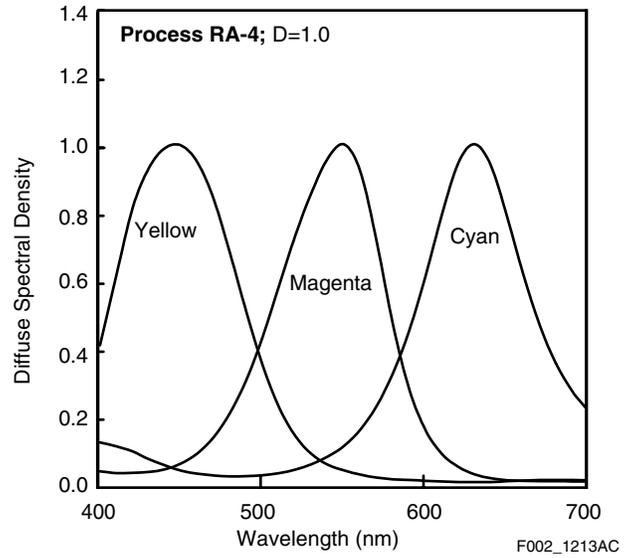
Roll Width	Roll Length		
	78 m (256 ft)	156 m (511 ft)	221 m (725 ft)
8.9 cm (3.5 in.)	✔	✔	✔
10.2 cm (4 in.)	✔	✔	✔
12.1 cm (4.75 in.)		✔	
12.7 cm (5 in.)	✔	✔	✔
15.2 cm (6 in.)	✔	✔	
20.3 cm (8 in.)	✔		
25.4 cm (10 in.)	✔		
27.9 cm (11 in.)	✔		
30.5 cm (12 in.)	✔		

CURVES

Characteristic Curves

Process RA-4; 100° F (38° C), 45 sec
Densitometry: Status A

Density vs Log Exposure (lux seconds)

F002_1212AC

Spectral Dye Density Curves

Process RA-4; D=1.0

Diffuse Spectral Density vs Wavelength (nm)

Yellow, Magenta, Cyan

F002_1213AC

Spectral Sensitivity Curves

Process: RA-4

LOG SENSITIVITY* vs WAVELENGTH (nm)

Yellow-Forming Layer, Magenta-Forming Layer, Cyan-Forming Layer

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

F002_1049AC
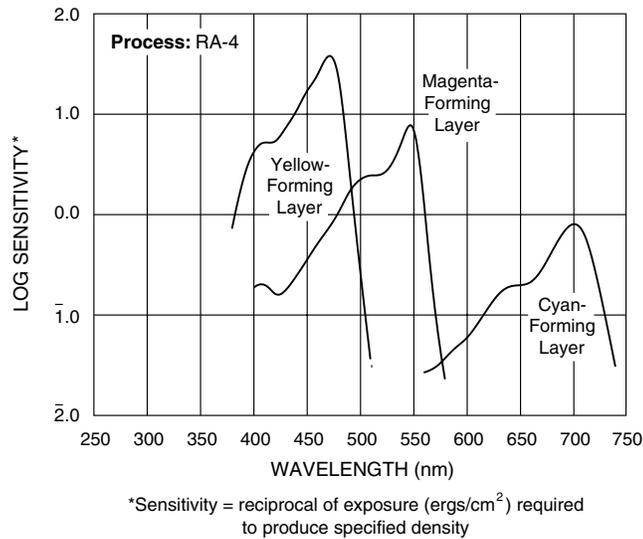
NOTICE: The sensitometric curves and data in this publication represent product tested under the conditions of exposure and processing specified. They are representative of production coatings, and therefore do not apply directly to a particular box or roll of photographic material. They do not represent 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 Papers and Chemicals. Visit www.kodak.com/go/colorpapers or www.kodak.com/go/photochemicals.

For the latest version of technical support publications for KODAK Products, visit Kodak on-line at: **http://www.kodak.com**
If you have questions about KODAK Products, call Kodak. In the U.S.A.: 1-800-242-2424, 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 ROYAL Digital Color Paper are available from dealers who supply KODAK Products to photofinishers. You can use other materials, but you may not obtain similar results.