

FUJICHROME PROVIA 1600 Professional [RSP]

1 FEATURES AND USES

FUJICHROME PROVIA 1600 Professional [RSP] is an ultra-high speed daylight-type color reversal film designed for push-processing. It is optimized for effective speeds of EI 1600 and EI 3200 with Process CR-56P and E-6P.

Highly suited for low light photography, this film is appropriate to indoor and nighttime sports as well as night-fall illuminated and available light photography.

PROVIA 1600 has excellent properties for making color transparency originals for photomechanical reproduction and photographic duplication as well as projection originals. It also produces high quality direct printing on FUJICHROME PROFESSIONAL PAPER.

Features	Results
<ul style="list-style-type: none"> • Improved Granularity and Sharpness 	<ul style="list-style-type: none"> • Lower loss in granularity, sharpness and maximum density with push-processing • Fine image reproduction at ultra-high speeds
<ul style="list-style-type: none"> • Excellent Suitability for Artificial Light 	<ul style="list-style-type: none"> • Fine color reproduction of nighttime exposures at stadiums and other indoor sports arenas since color balance shifts are sharply reduced
<ul style="list-style-type: none"> • Wide Push-Processing Latitude 	<ul style="list-style-type: none"> • Excellent results in EI* 1600 or 3200 push-processing using Process CR-56P** or E-6P** • Can be used at EI 800 or 4800 if necessary

* EI is the acronym for Exposure Index and exposure meter ISO designation dials should be adjusted to this value.

** Push Processes based on the standard FUJI CR-56 or E-6 processing chemicals.

2 FILM SIZES, EMULSION NUMBER, BASE MATERIAL AND THICKNESS

Sizes	Emulsion Number
Rolls • 135 36-exp.	#411~

Base Material Cellulose Triacetate

Base Thickness 127 μm

3 EXPOSURE INDEX AND PROCESSING REQUIREMENTS

For best results, the use of an exposure meter is recommended. The speeds and recommended processing times indicated below are to be used with ISO-compatible exposure meters.

	Daylight	Tungsten Lamps (3200K)	CR-56P/E-6P Push Process Code	Recommended First Developer Times (minutes)
Daylight	not required	LBB-12** (or No. 80A***)		
Exposure Index (EI)	800/30°	250/25°*	P-1	9
	1600/33°	500/28°*	P-2	12
	3200/36°	1000/31°*	P-3	15
	4800/38°	1600/33°*	P-4	16.5

* Indicates the effective speed resulting from designated filter use.

** Fuji Light Balancing Filter

*** Kodak Filter

This film is designed to yield best results when exposed at EI 1600 or 3200 speeds and processed in "Fuji Push Process CR-56P" or E-6P. Exposure at EI 800 and EI 4800 is also possible. However, since maximum density, color balance, gradation and other film performance parameters may differ with P-1, P-2, P-3, P-4 processing it is recommended that test exposures be made and the results evaluated. Three different speeds are indicated on the cartridge. Be sure to mark the speed at which exposures were made.

Notes on Processing Specifications

Of the three exposure indices indicated on the film cartridge, be sure to mark the one which was used during camera exposure and request the respective processing. For P-4 push-processing, write "P-4/16 min. 30 sec" on the cartridge.

- If no such marking is provided the film will be processed at EI 1600/P-2.
- If the film is cut or otherwise modified, quality cannot be guaranteed and there will be cases where processing will not be possible.

4 EXPOSURE GUIDE AND EXPOSURE UNDER VARIOUS LIGHT CONDITIONS

Use a meter for exposure determination. If not available refer to the following table.

EI 1600

Light Conditions	Bright Sunlight	Hazy Sunlight	Cloudy Bright	Cloudy Day or Open Shade
Lens Aperture	f/22	f/16		f/11
Exposure Time (sec.)	1/1000		1/1500	

- The foregoing settings are for 2 hours after sunrise and 2 hours before sunset.
- Provide lens opening 1/2 stop smaller during the summer and 1/2 stop larger during the winter.
- Excessively bright (or dark) or backlighted subjects may require plus or minus 1 stop lens opening adjustments.

EI 1600

Indoor and Night Scenes	Daytime Indoor Scenes (on a Clear Day)	Indoor Scenes (Fluorescent Lamps)	Stage Scenes	Evening and Nighttime game Scenes	Night Scenes
Lens Aperture	f/4 - 5.6				
Exposure Time (sec.)	1/125	1/60	1/125	1/60	

NOTE Since light intensities for indoor or night scenes vary widely from location to location, the data above should be used only as a guide.

Daylight

Under daylight conditions color balancing filters are not necessary, but the following exposure conditions may require the indicated filters.

Subject Conditions	Filter	Exposure Correction
Fair weather open shade and shaded landscapes.	UV Filter (Fuji SC-40 or 41 or No. 2B*)	None
Bright distant scenes, snow landscapes, seaside scenes, aerial scenes and open landscapes.		
Close-ups of plants and subjects having bright colors.		

Excessively high or low subject color temperatures may require the following filter additions and exposure corrections.

Subject Conditions	Filter	Exposure Correction
High Color Temperature: Cloudy weather landscapes or portraits and clear weather open shade.	LBA-2** (No. 81A)*	+1/3 stop***
Low Color Temperature: Morning and evening twilight scenes and portraits.	LBB-2** or LBB-4** (No. 82A or No. 82C)*	+1/3 to +2/3 stop***

- * Kodak Filters
- ** Fuji Light Balancing Filters
- *** "+" = Lens opening

Electronic Flash

- Since electronic flash characteristics are similar to daylight, no filters are required. Effective light output and color balance will differ with equipment type, age and other factors, requiring thereby initial exposure tests.
- Adjust lens openings for electronic flash according to following formula.

$$\text{Lens Aperture (f-number)} = \frac{\text{ISO 1600 Electronic Flash Guide Number}}{\text{Electronic Flash-to-Subject Distance (meters or feet)}}$$

- Set the film speed at ISO 1600. Since the amount of light reflected onto the subject from surrounding surfaces will differ with the conditions, refer to flash unit instructions.

Photo-Reflector Lamps (Daylight Photoflood Lamps)

- Daylight photoflood lamps tend to result in under-exposure, so it is sometimes essential to increase exposure light output beyond that indicated by an exposure meter.
- Color balance and light output will differ with lamp configuration, use duration and applied voltage. It is essential that exposure conditions be determined in relation to the particular lighting equipment employed.

Fluorescent Lamps

- Color balance corrections should be made using the filter combinations suggested below because effective light intensity and color balance varies with lamp make and age.
- For exacting work, test exposures are recommended.

(Exposure Time: 1/15 second)

Fluorescent Lamp Type	White (W)	Daylight (D)	Cool White (CW)	Warm White (W.W)
Color Compensating Filters*	30M + 10B	40R	20M + 10R	LBB-8 + 5M (No. 80C + 5M)
Exposure Corrections**	+1 stop	+1 stop	+1 stop	+1½ stops

* Fuji Color Compensating Filters (or Kodak CC Filters) recommended.

** Exposure correction values include filter exposure factors. These values are added to unfiltered exposure meter readings. "+" = Lens opening.

- NOTES**
- Use 1/30th or slower shutter speeds.
 - For shutter speeds longer than 4 seconds, exposure adjustments will be necessary to compensate for reciprocity.

Tungsten Lamps

- A Fuji Light Balancing Filters LBB-12 (or Kodak Filter No. 80A) is recommended with photoflood lamps. A 1 2/3 stop larger lens opening is also recommended.
- With household tungsten Lamps, a Fuji Light Balancing Filter LBB-2 (or Kodak Filter No. 82A) will compensate for inherent color temperatures lower than photoflood lamps. A 2 stop larger lens opening is recommended.

Mixed Light Sources

Under mixed light conditions, derive the basic filter configuration for the main light source.

5 LONG EXPOSURE COMPENSATION

No exposure or color balance compensation is required for exposures within a 1/10000 to 1 second shutter speed range. However for exposures of 4 second or longer, reciprocity-related color balance and exposure compensations are required.

EI 1600

Exposure Time (sec.)	1/10000 to 1	4	16	32
Color Compensating Filters	None	7.5R	10M + 5R	
Exposure Corrections*		+1/2 stop	+2/3 stop	

* Exposure correction values include filter exposure factors. These values are added to unfiltered exposure meter readings. "+" = Lens opening.

6 EXPOSURE PRECAUTIONS

For artificial light sources such as electronic flash, photoflood lamps, fluorescent lamps, tungsten lamps, mercury lamps and the like, effective light output and color temperatures will vary with the type, the applied voltage and the age of the equipment. Also, light intensity or color temperature differences may be caused by variations in auxiliary lighting equipment such as reflectors and diffusers.

7 FILM HANDLING

- Expose film before the expiration date indicated on the film package and process promptly after exposure.
- When loading and unloading roll film avoid direct sunlight. If there is no shade, turning one's back toward the sun will shade the film.
- Camera-loaded film should be exposed and processed promptly.
- Under certain conditions the X-ray equipment used to inspect carry-on baggage at airport terminals will adversely affect photographic film (cause fogging). The adverse effects of this are increased with the strength of the X-rays, the speed of the film, and the cumulative number of inspection exposures. Since this film retains an ultra-high speed and is especially sensitive to X-rays and other radiation, it is essential that at each inspection the film be removed from the baggage and that airport security personnel be asked to inspect the film manually.
- Film fogging may occur in hospitals, factories, laboratories and other locations using X-rays and other radiation sources.

8

FILM STORAGE

Unprocessed Film Storage

- Storing exposed or unexposed, unprocessing film under high temperature and humidity conditions will cause adverse speed, color balance and physical property changes. Store film under the following conditions.
 - * Refrigerated Storage: Below 15°C (59°F)
 - * Extended Term Storage: Below 0°C (32°F)
- New building materials, newly manufactured furniture, paints and bonding agents may produce noxious vapors. Do not store film, loaded camera or film holders near these substances.
- When refrigerated film is removed for use, allow it to reach room temperatures before opening (at least one hour). Opening while temperatures are still low may cause moisture condensation.

Processed Film Storage

Light, high temperatures and humidities cause color changes in processed films. Therefore, place such films in mounts or sleeves and store in dark, dry, cool and well ventilated locations under the following conditions.

- * General Storage Conditions: Below 25°C (77°F) at 30 to 60% RH
- * Extended Storage Conditions: Below 10°C (50°F) at 30 to 50% RH

NOTE As with all color dyes, those used in this film will discolor or fade with time.

9

VIEWING LIGHT SOURCES

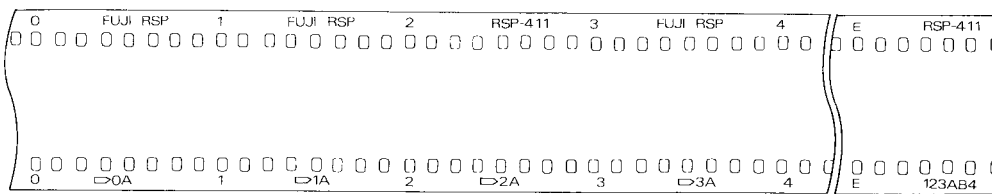
A color viewer with an ISO adjusted light source should be used for checking original and duplicate films because the characteristics and brightness levels of the viewer substantially affect discernment accuracy.

* The ISO standard (ISO/DP3664-2) specifies an illuminated viewer surface with a color temperature derived from a CIE illuminant D50 (D: Daylight) with a reciprocal color temperature of 5000K, an average brightness of 1400cd/m² ± 300cd/m², a brightness uniformity of more than 75%, a light diffusion level of more than 90% and an average color rendition assessment value of more than Ra90. Transparency viewers should meet these standards.

10 PROCESSED FILM EDGE MARKINGS

<Rolls>

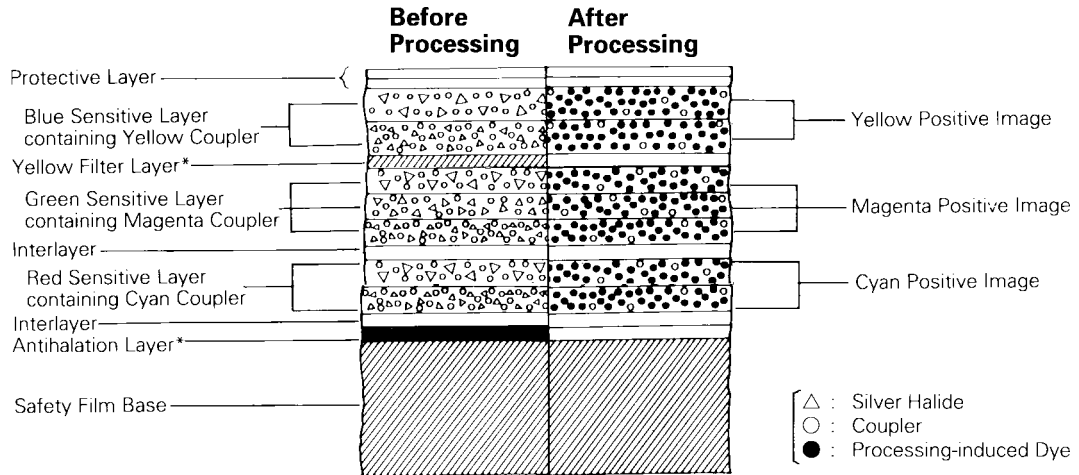
- 135 Size



These designations are repeated along the film edge.

11

FILM STRUCTURE



* These layers become colorless and transparent after processing.

12 DIFFUSE RMS GRANULARITY VALUE

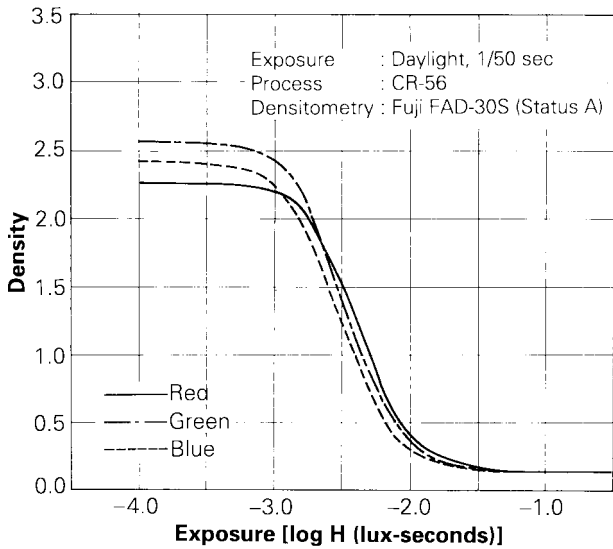
EI 800 **22**, EI 1600 **25**, EI 3200 **30**
 Micro-Densitometer Measurement Aperture: 48μm in diameter
 Sample Density: 1.0 above minimum density

13 RESOLVING POWER

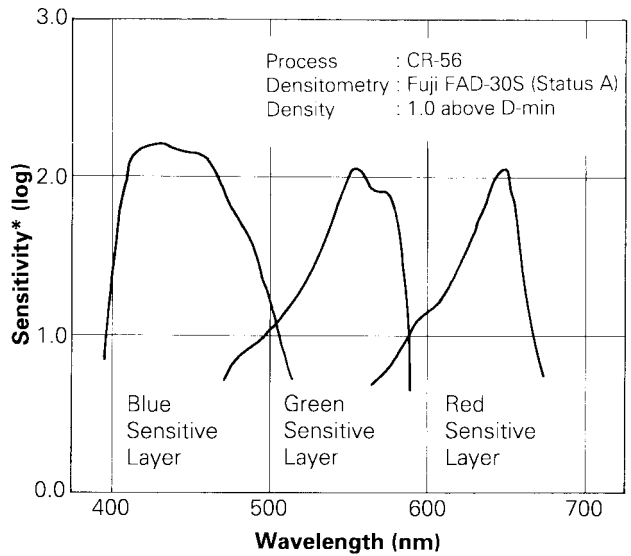
- Chart Contrast 1.6 : 1
 - EI 800 **40** lines/mm
 - EI 1600 **40** lines/mm
 - EI 3200 **32** lines/mm

- Chart Contrast 1000 : 1
 - EI 800 **100** lines/mm
 - EI 1600 **100** lines/mm
 - EI 3200 **71** lines/mm

14 CHARACTERISTIC CURVES

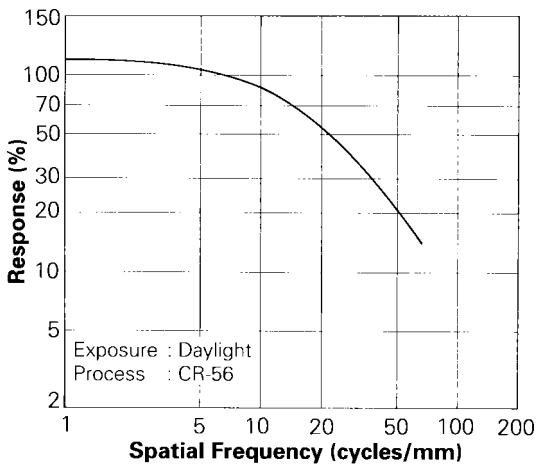


15 SPECTRAL SENSITIVITY CURVES

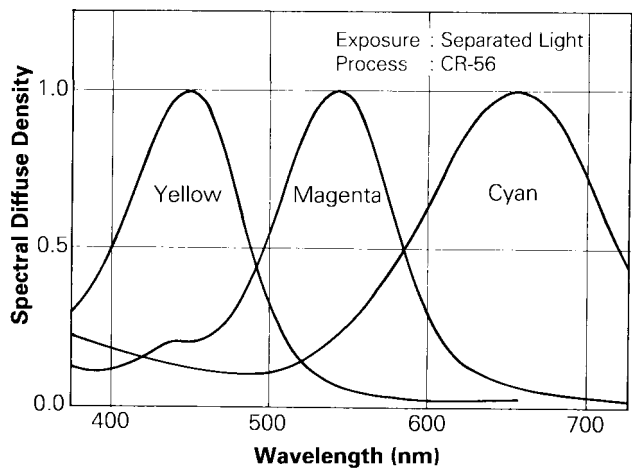


* Sensitivity equals the reciprocal of the exposure (ergs/cm²) required to produce a specified density.

16 MTF CURVE



17 SPECTRAL DYE DENSITY CURVES



NOTICE The data herein published were derived from materials taken from general production runs. However, as Fujifilm is constantly upgrading the quality of its products, changes in specifications may occur without notice.