

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 No. 2C* or No. 2B* (SC-40 or SC-41)**	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
<u>High Color Temperature:</u> Cloudy weather landscapes or portraits and clear weather open shade.	No. 81A* (LBA-2)***	+1/3 stop ****
<u>Low Color Temperature:</u> Morning and evening twilight scenes and portraits.	No. 82A* or No. 82C* (LBB-2 or LBB-4)***	+1/3 to +2/3 stop ****

- * Kodak Filters
- ** Fuji Sharp-Cut Filter
- *** Fuji Light Balancing Filter
- **** "+" = 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 initial exposure tests.
- Adjust lens openings for electronic flash according to following formula.

$$\text{Lens Aperture (f-number)} = \frac{\text{ISO 100 Electronic Flash Guide Number}}{\text{Electronic Flash-to-Subject Distance (meters)}}$$

- Set the film speed at ISO 100. 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, duration of use 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: 1/4 second)

Fluorescent Lamp Type	White (W)	Daylight (D)	Cool White (CW)	Warm White (WW)
Color Compensating Filters*	40M+10B	40R+10M	40M+5R	No. 80C + 25M (LBB - 8 + 25M)
Exposure Corrections**	+1 2/3 stops	+1 2/3 stops	+1 2/3 stops	+2 stops

- * Kodak Color Compensating Filters (or Fuji CC Filters) recommended.
- ** Exposure correction values include filter exposure factors. These values are added to unfiltered exposure meter reading. "+" = 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 Kodak Filter No. 80A (or Fuji Light Balancing Filter LBB-12) is recommended with photoflood lamps. A 1 2/3 stop large lens opening is also recommended.
- With household tungsten lamps, a Kodak Filter No. 82A (or Fuji Light Balancing Filter LBB-2) will compensate for inherent color temperatures lower than photoflood lamps. A 2 stop larger lens opening is recommended.

Mixed Light Sources

Under mixed light source 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 1/4000 to 1 second shutter speed range. However for exposures of 4 seconds or longer, reciprocity-related color balance and exposure compensations are required.

Exposure Time (sec.)	1/4000 to 1	4	8	16	32	64
Color Compensating Filters	None	5M	7.5M	10M	12.5M	Not recommended
Exposure Corrections*		+1/3	+1/2	+2/3	+1	

* 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.
- Handle sheet film in total darkness and do not touch emulsion surfaces. (The use of a safelight will cause fogging.)
- Camera-loaded film should be exposed and processed immediately.
- 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. Therefore, it is recommended that at each inspection the film be removed from the baggage and air-

port 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

- Storing exposed or unexposed film under high temperature and humidity conditions will cause adverse speed, color balance and physical property changes. Store film under the following conditions.
 - Short-to-medium term Storage: Below 15°C (59°F) (Refrigerator)
 - Long-term Storage: Below 0°C (32°F) (Freezer)
- Building supplies, newly manufactured furniture, paints and bonding agents may produce noxious gases. Do not store film, lighttight boxes with film, loaded cameras or film holders under these conditions.
- Before use, allow films to stand at room-temperature; over 3 hours for refrigerated film, and over 6 hours for frozen film. Further, long windings such as 100 feet will require more time. Opening the container while film is cold may cause harmful condensation.

Processed Film

Light, high temperature and humidity 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.

- Medium-term Storage: Below 25°C (77°F) at 30 to 60% RH
- Long-term Storage: Below 10°C (50°F) at 30 to 50% RH

9. PROCESSING

Process in standard E-6, CR-56 or equivalent chemicals.

10. VIEWING LIGHT SOURCES

Use a standard viewer. Visual responses will differ with light source quality and brightness. Therefore, employ a viewer which meets the ISO/ANSI standards.

* 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 tempera

ture of 5000K, an average brightness of $1400\text{cd/m}^2 \pm 300\text{cd/m}^2$, 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.

11. PRINTS AND DUPLICATES

Processed transparencies can be made into prints on FUJICHROME PAPER TYPE 35 or FUJICOLOR INTERNEGATIVE FILM IT-N. Duplicates can be made on FUJICHROME DUPLICATING FILM CDU TYPE II.

12. RETOUCHING

Use commercially available retouching dyes and bleaching chemicals.

13. SHEET FILM CODE NOTCHING

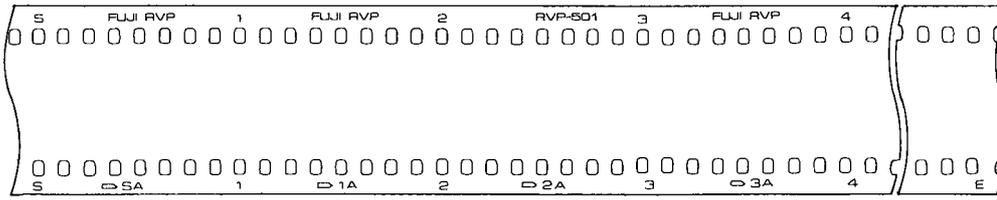
A notch code to identify this emulsion type is located in the upper right-hand corner when the emulsion surface is facing toward you.



14. PROCESSED FILM EDGE MARKINGS*

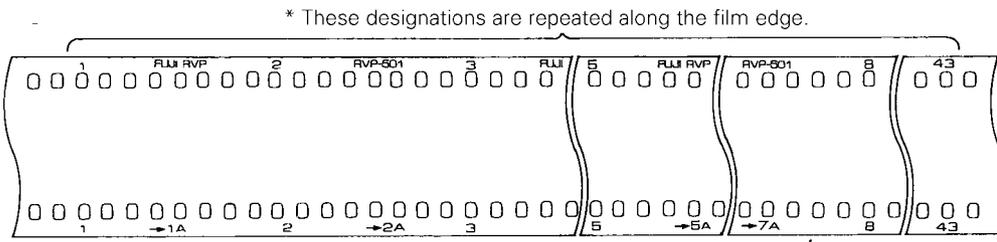
<Rolls>

- 135 Size



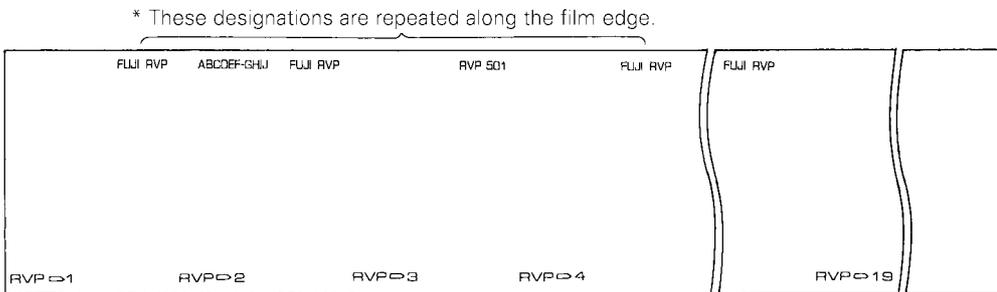
* These designations are repeated along the film edge.

- 35 mm x 30.5 m (100ft)



* These designations are repeated along the film edge.

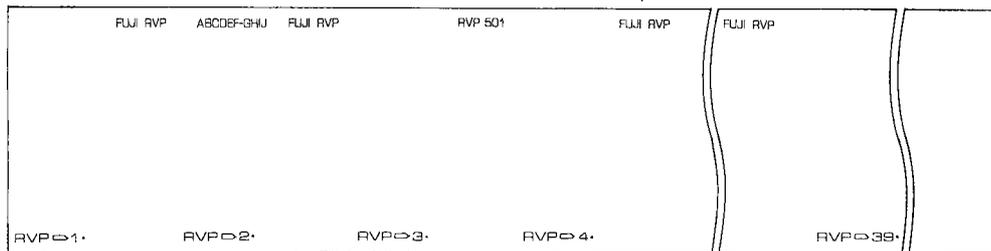
- 120 Size



* These designations are repeated along the film edge.

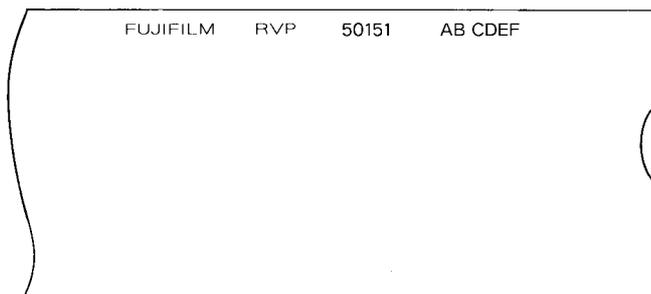
- 220 Size

* These designations are repeated along the film edge.

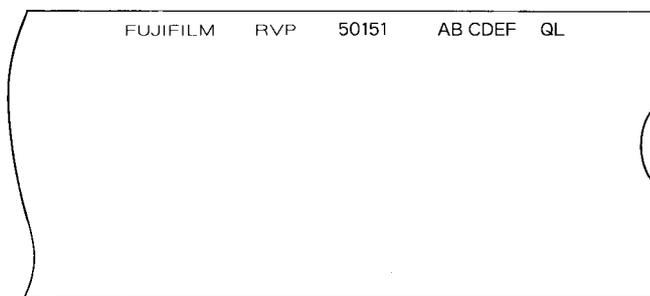


<Sheets>

- Sheet Size

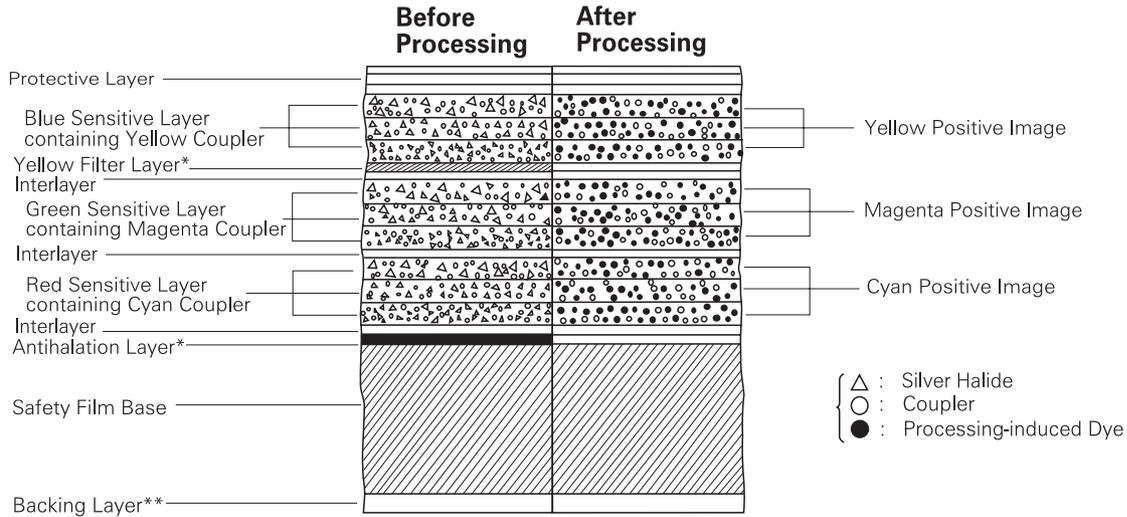


- QuickLoad Type



* The emulsion is on the opposite side. (Base side facing you)

15. FILM STRUCTURE



* These layers become colorless and transparent after processing.
 ** The backing layer is colorless and transparent both before and after processing, but it is not provided with 135 size film.

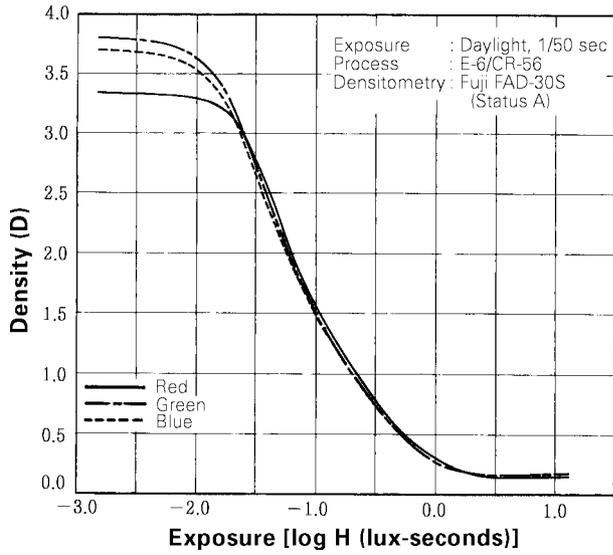
16. DIFFUSE RMS GRANULARITY VALUE 9

Micro-Densitometer Measurement Aperture: 48 μm in diameter.
 Sample Density: 1.0 above minimum density.

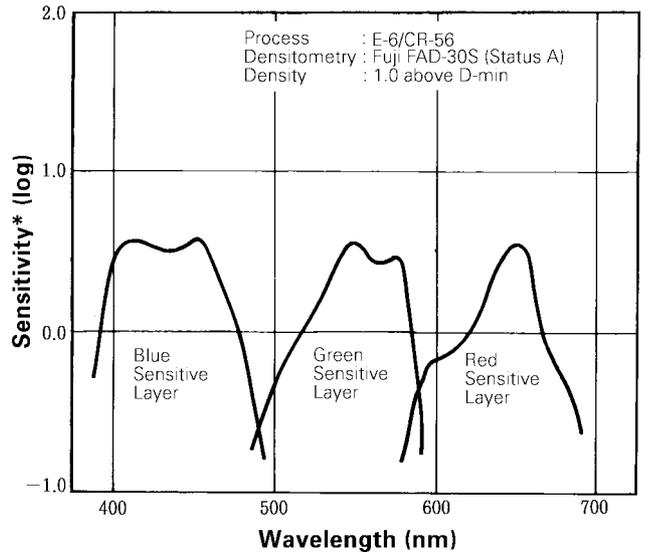
17. RESOLVING POWER

Chart Contrast 1.6 : 1 **80** lines/mm
 Chart Contrast 1000 : 1 **160** lines/mm

18. CHARACTERISTIC CURVES

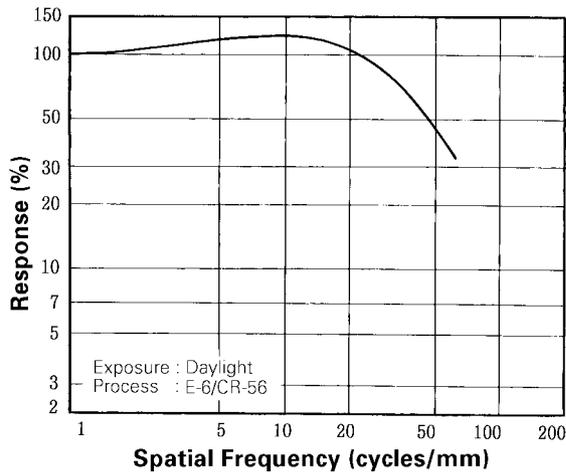


19. SPECTRAL SENSITIVITY CURVES

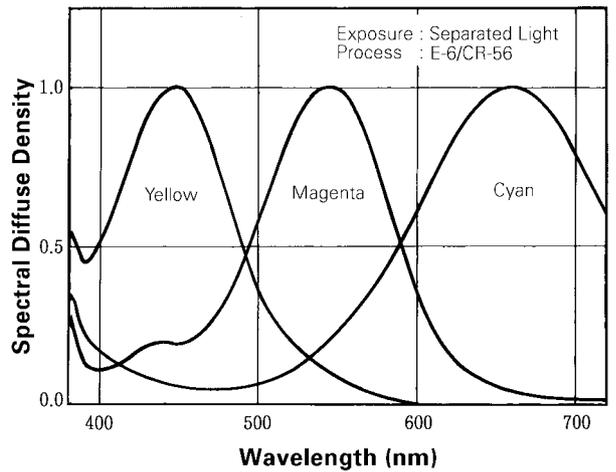


* Sensitivity equals the reciprocal of the exposure (ergs/cm²) required to produce a specified density.

20. MTF CURVE



21. SPECTRAL DYE DENSITY CURVES



NOTICE The sensitometric curves and other data herein published were derived from particular materials taken from general production runs. As such they do not represent in exact duplication the characteristics of every lot produced nor a standard for FUJIFILM products. Further, FUJIFILM is in a constant process of upgrading quality which may result in data changes.

