

PRODUCT INFORMATION BULLETIN

COLOR NEGATIVE FILMS

FUJICOLOR C200

(E)

1. FEATURES AND USES

FUJICOLOR C200 is a daylight-type ISO 200 color negative film that incorporates the newly developed New Super Uniform Fine Grain Technology to achieve high image quality when printed on FUJICOLOR papers.

Features

- Excellent Grain Quality** Fine grain for a high-speed film, providing no loss of image quality even in large-size enlargements
- Wide Exposure Latitude** Stable results can be expected under a variety of photographic conditions
- Excellent Skin Color Reproduction** Smooth, beautiful and naturally depicted skin tones
- Excellent Sharpness** Extremely sharp depiction of all aspects of the subject, from overall form to textural details

It requires no color-compensating filters when used under daylight conditions or with an electronic flash.

2. SPEED

Light Source	Speed	Filter
Daylight	ISO 200/24°	None
Tungsten Lamps (3200K)	ISO 50/18*	Wratten No.80A (or LBB-12**)

* Indicates the effective speed resulting from designated filter use.

** Fuji Light Balancing Filter

3. FILM SIZES, PRODUCTION NUMBER, BASE MATERIAL AND THICKNESS

Size and Package Configuration		Production Number
Roll	135 ... 36-exp	C74 and above

	Base Material	Base Thickness
Roll	Cellulose Triacetate	122µm (135)

4. EXPOSURE GUIDE

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

Daylight Exposure Guide Table

Light Conditions	Seashore or Snow Scenes under Bright Sun	Bright Sunlight	Hazy Sunlight	Cloudy Bright	Cloudy Day or Open Shade
Lens Aperture	f/16	f/16	f/11	f/8	f/5.6
Shutter Speed (sec.)	1/500	1/250			

- NOTES
- The foregoing settings are for 2 hours after sunrise and 2 hours before sunset.
 - For close-up shooting against light, open up the lens 1 or 2 aperture stops.

Low Light Exposure Guide Table

Light Conditions	Fine Weather Daytime Indoor Scenes	Nighttime Indoor Scenes (under Fluorescent Light)	Evening Scenes	Night Scenes
Lens Aperture	f/2.8 to 4	f/2 to 2.8	f/2.8 to 4	f/2 to 2.8
Shutter Speed (sec.)	1/30			

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

5. EXPOSURE UNDER VARIOUS LIGHT CONDITIONS

Daylight

Even when exposed under morning or evening twilight conditions or when color temperatures are low, no special filter use is needed as color balancing can be done during printing.

Electronic Flash

- Electronic flash produces light similar to daylight, so filters are not needed. However, the possibility of undesirable effects on color balance, due to various factors (the type of flash used and amount of time used, etc.) should be taken into consideration. Test exposures are recommended.
- If shutter speeds slower than 1/60 second are used, light from non-flash sources, such as room lighting, may cause color imbalances. Make test exposures.
- The use of a flash meter is advisable, but the following formula can also be used to obtain satisfactory lens opening.

$$\text{Aperture (f-number)} = \frac{\text{Lens Electronic Flash Guide Number (at ISO 200)}}{\text{Electronic Flash-to-Subject Distance (meters)}}$$

- When using an auto flash unit, the ISO film speed setting should be set to 200. Since the amount of light on the subject may vary according to amount of light reflected from surrounding surfaces and other factors, follow the instructions provided with the flash unit.

Daylight Photoflood/Photo-Reflector Lamps

- Daylight-type photoflood or photo-reflector lamp output may be lower than that indicated by the exposure meter. It is recommended to compensate for the difference by increasing the exposure time (by lowering the shutter speed) or by increasing the lens opening. Whenever possible, test exposures are recommended.
- Other factors that should be considered when determining the exposure settings are lamp configuration, length of time used and line voltage, as they may affect lamp output and color balance.

Fluorescent Lamps

Photographing under fluorescent lighting may result in a greenish tint. However, this phenomenon is corrected during printing, thus achieving optimal finishing quality. For this reason, additional use of correction filters is not required. A slow shutter speed of less than 1/30 second is recommended.

Tungsten Lamps

When using 3200K tungsten lighting, use a Wratten filter

No. 80A (Fuji LBB-12* filter) and increase the lens opening by +2 stops. In the case of cameras with TTL metering, there is no need for additional exposure compensation.

* Fuji Light Balancing Filter

6. LONG EXPOSURE COMPENSATION

No exposure or color balance compensation is required for exposures within a 1/4000 to 2 second shutter speed range. However, for exposures of 4 seconds or longer, provide the compensations indicated below.

Exposure Time (sec.)	1/4000 to 2	4	16	64
Exposure Corrections*	Unnecessary	+ 1/3	+ 2/3	+ 1

* A "+" followed by a number indicates the required increase in lens opening.

Except for special effects, the normal intensity ratio for main-to-fill subject lighting should remain within 1:4 limits.

7. EXPOSURE PRECAUTIONS

When using an accessory such as a reflector umbrella, reflector or diffuser to control light intensity or diffuse the light, make sure that no change has occurred in the color or composition of the accessory's materials or reflective surface, and that the color of the light has not been altered by the material.

8. UNPROCESSED FILM HANDLING / STORAGE**HANDLING**

- Expose film before the expiration date indicated on the film package and process as soon as possible after exposure.
- Roll film should be loaded and unloaded quickly and away from direct sunlight.
- Film loaded in cameras should be exposed and processed promptly.
- X-ray inspection machines used to inspect checked-in baggage at airports can cause fogging of film. Put both exposed and unexposed film into carry-on baggage (preferably in a transparent plastic bag or a netbag that allows the film to be seen). Because of the increasing number of airports using strong X-ray machines for carry-on baggage, it is recommended that you remove film from your carry-on baggage and request a visual (manual) inspection of your film.
- Film fogging may occur near X-ray equipment used in hospitals, factories, laboratories and other places where radiation is used. Always keep film away from sources of radiation.

STORAGE

Storing exposed or unexposed film under hot and humid conditions may adversely affect the speed, color balance and physical properties of the film. Although it is best to store film at a low temperature, for practical purposes, film should be stored as follows:

Short-term Storage	Store at 15°C or below
Long-term Storage	Store at 0°C or below

- New building materials, newly manufactured furniture, paints and bonding agents may produce gases which could affect photographic film. Do not store film, lightproof boxes containing film or cameras or film holders loaded with film near these materials.
- Film should be sealed in plastic bags* prior to cold storage. When taken out of cold storage, film should be allowed to reach room temperature before opening by letting it stand over 3 hours (for refrigerated film) or over 6 hours (for frozen film). Opening film while it is still cold may cause condensation to form on the film surface, causing color changes or the emulsion to become more susceptible to scratches.

* Polyester, polystyrene, polyethylene, polypropylene, etc.

9. PROCESSING

This film is intended for processing by Fujifilm Processes CN-16, CN-16Q, CN-16FA, CN-16L, CN-16S or Process C-41.

9-1 Replenishment Rate

The following table shows the replenishment rates for each type of Fujifilm Processes.

CN-16Q		CN-16FA	
Processing Solution	Replenishment Rate*	Processing Solution	Replenishment Rate*
NQ1-R	43	N1-R	22
NQ2-R	20	N2-R	5
NQ3-R	30	N3-R	16
NQS	30	NS	34
NQ4-R	20	N4-R	20

CN-16L		CN-16S	
Processing Solution	Replenishment Rate*	Processing Solution	Replenishment Rate*
N1-R	20	N1-R	15
N2-R	5	N2-R	5
N3-R	8	N3-R	7.5
NS	17	N4-R	30
N4-R	15		

* Replenishment Rate.....Replenisher volume (mL) per single roll (135/24 exp.)

9-2 Photographic and Processing Characteristics

Almost the same as those for the current SUPERIA 200.

10. PRINTER CONDITIONS

This film can be printed on the same printer setup with results similar to SUPERIA 200.

11. CONTROL STRIPS

Use FUJICOLOR NEGATIVE FILM CONTROL STRIPS to manage processing performance.

12. PROCESSED FILM HANDLING AND STORAGE

Since the purpose of film is to provide a long-term record of memorable events, as much effort as possible has been made to use materials that exhibit the least amount of change over time, but the effects of light, heat, atmospheric oxygen, contaminant gases, humidity and mold cannot be completely avoided. It is possible, however, to minimize change in the photographic image or base material by maintaining appropriate storage conditions, such as those used by museums and art galleries. Temperature and humidity control is the most important key to minimizing the change that occurs in film. Films stored in the dark under the following conditions may be expected to show almost no change over time.

Storage Period with Almost No Change	Temperature	Relative Humidity
More than 20 years	Below 10°C	30%-50%
10-20 years	Below 25°C	30%-50%

(1) Color negative film should be inserted into sleeves for storage. Furthermore, it is recommended that film, as well as prints, be placed into non-airtight* containers made of paper, plastic**, or metal designed for the storage of photographs.

* To prevent film base (especially TAC base) decomposition, it is essential that the container or case be allowed to air out during one dry day each year.

** Polyester, polystyrene, polyethylene, polypropylene, etc.

(2) Processed film should be stored at a place as far away as possible from high temperatures, direct sunlight and other strong light and direct illumination. The following conditions are not desirable for the storage of film and should be avoided in the case of long-term storage:

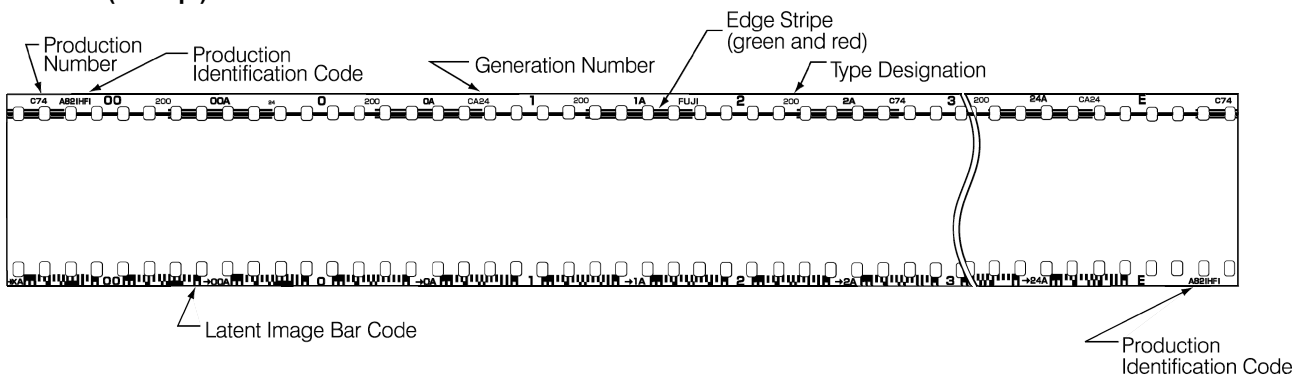
- Storage in a closet lying against a wall that is exposed to cold, outside air (where condensation may form).
- Storage in an attic or on top of a closet or cabinet near the ceiling (where high temperatures may form).

13. PROCESSED FILM EDGE MARKINGS AND FIGURES

Edge Markings

Item	
• Edge Stripe	One green solid line and two red broken line on one side
• Type Designation	200
• Generation Number	CA24
• Latent Image Bar Code	39-1
• FUJIFILM Identification Code	
Negative Carrier	
: 135B	0872
: 135C/D/J/K/S	2162

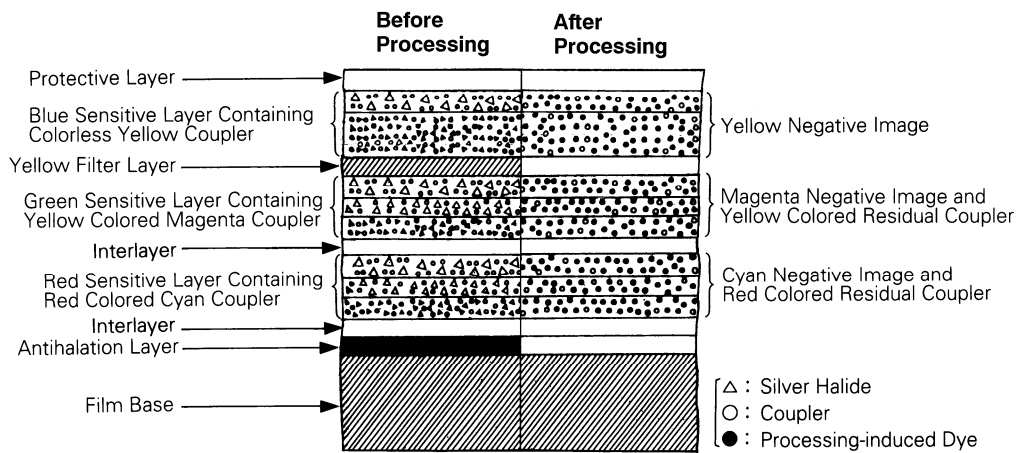
135 Size (36 Exp.)



14. TECHNOLOGIES INCORPORATED IN FUJICOLOR C200

- New Super Uniform Fine Grain Technology
 Fujifilm's Super Uniform Fine Grain Technology Incorporates flat hexagonal grains with a large surface area that retains a sufficient volume of photosensitive pigment. Photons generated when light is absorbed are accumulated in the periphery of the grain and then efficiently concentrated to form the latent image. The result is a dramatic reduction in grain size with no loss in sensitivity, ensuring stunning prints and enlargements with barely perceptible grain.

15. FILM STRUCTURE



16. DIFFUSE RMS GRANULARITY VALUE

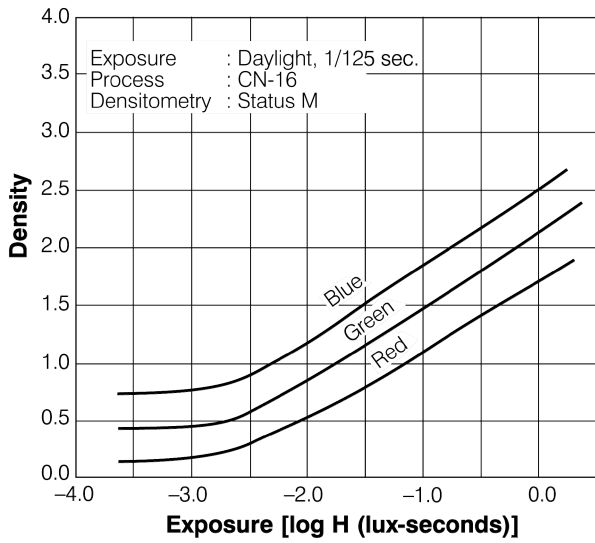
Diffuse RMS Granularity Value: 4*
 Micro-densitometer Measurement Aperture:
 48 μm in diameter Sample
 Density: 1.0 above minimum density

* Based on Fujifilm measurements. Due to difference in measurement conditions, comparison with color reversal film is not possible.

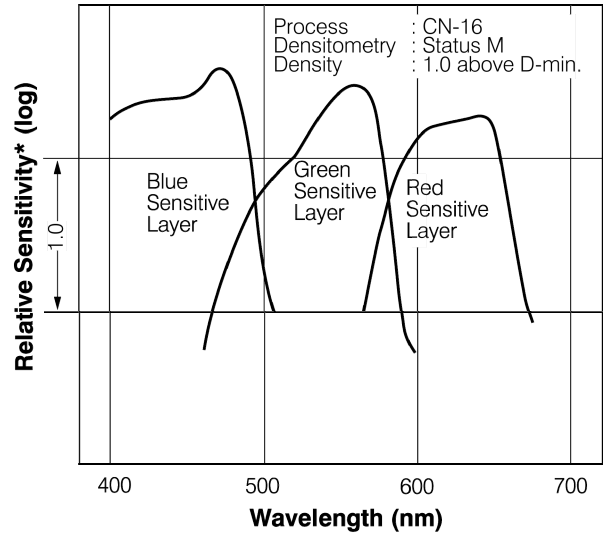
17. RESOLVING POWER

Test-Object Contrast: 1.6:1 **50** lines/mm
 Test-Object Contrast: 1000:1 **125** lines/mm

18. CHARACTERISTIC CURVES

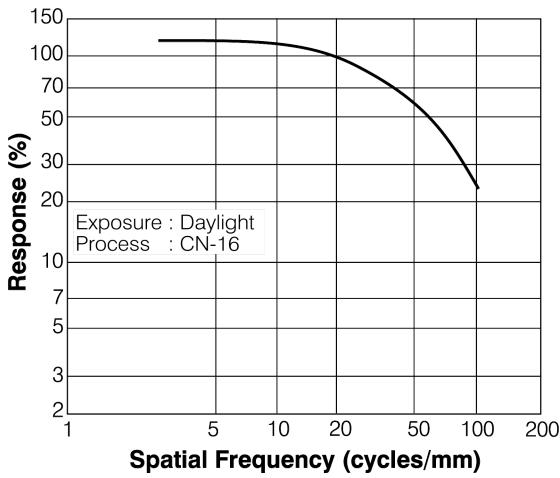


19. SPECTRAL SENSITIVITY CURVES

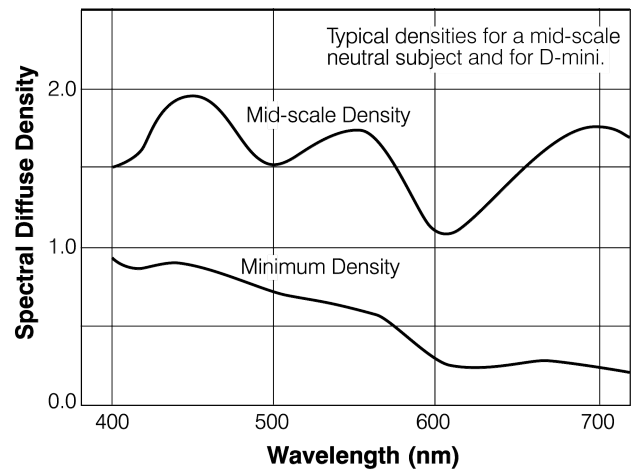


* Sensitivity equals the reciprocal of the exposure (J/cm²) required to produce a specified density.

20. MTF CURVE



21. SPECTRAL DYE DENSITY CURVES



NOTICE The data herein published were derived from materials taken from general production runs. However, changes in specifications may occur without prior notice.