FUJIFILM
AF3-121E
PRODUCT INFORMATION BULLETIN
COLOR NEGATIVE FILMS

NEW FUJICOLOR PORTRAIT FILM NPH 400 PROFESSIONAL [NPH] (Daylight)

1. FEATURES AND USES

FUJICOLOR PORTRAIT FILM NPH 400 PROFESSIONAL [NPH] is a new-generation professional daylight color negative film incorporating Fujifilm's proprietary fourth color-sensitive layer in addition to the conventional three RGB-sensitive layers. With its extremely useful high-speed ISO 400 rating, NPH provides faithful reproduction of neutral grays with sharply improved fidelity over a wide exposure range from under- to over-exposures. It produces superb skin tones with smoothly continuous gradation from the highlights to the shadows, and gives an excellent three-dimensional feeling in such details as fabrics and other textures. By incorporating the most advanced technologies, NPH is able to meet a wide range of photographic needs, from portrait and wedding photography to commercial and fashion work.

Features	Results
• **High speed of ISO 400**	• Higher effective film speed and finer grain
• **Wide Exposure Latitude**	• Faithful reproduction of neutral grays over a wide exposure range from underexposure to overexposure
• **Superb Skin Tone Reproduction**	• Superb skin-tone and hue reproduction with continuously smooth gradation from the highlights to the shadows without any washout
• **Excellent Three-dimensional Appearance**	• Clearer colors in the highlights and appropriately controlled color saturation in the shadows to allow rendering of subjects with a feeling of three-dimensional realism
• **Faithful Color Reproduction**	• Faithful color reproduction of scenes under a wide variety of lighting

2. SIZES, BASE & EMULSION NUMBER

Sizes*	Base Thickness	Base Material	Emulsion Number
135 ····· 36-exp. ····· 36-exp. (5-roll packs)	122 μm	Cellulose Triacetate	101 –
120 120 (5-roll packs)	98 μm		
220 (5-roll packs)			

* Some sizes are not available in certain markets.

3. EXPOSURE

- The following tables provide recommendations which will yield the best results when a series of bracketed exposures are not made. The film speed shown is the effective speed when a filter is used.

Light Condition	Film Speed	Filter
Daylight or Electronic Flash	ISO 400/27°	None
Tungsten (3200K)	ISO 100/21°*	Wratten No.80A (or LBB-12**)

* Indicates the effective speed resulting from designated filter use.
** Fuji Light Balancing Filter

- **Exposure Determination without an Exposure Meter**
  The recommendations in the table below should be used two hours after sunrise and two hours before sunset.

Daylight Exposure Guide

Light Conditions	Seashore or Snow Scenes under Bright Sun	Bright Sunlight	Hazy Sunlight	Cloudy	Cloudy Day or Open Shade
Lens Aperture	f/22	f/16	f/11	f/8	f/5.6

NOTES
- Exposure time 1/500 sec.
- The use of an exposure meter is highly recommended in cloudy weather or in open shade as light conditions continually change.
- Back lit and close up subject exposures should be increased by one to two stops.
- A Wratten No. 1A UV absorbing filter is recommended for snow, mountain, or distant landscape scenes.

Low Light Exposure Guide

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.)	1/60	1/30	1/60	1/30

4. EXPOSURE UNDER VARIOUS LIGHTING SOURCES

Since this film is designed as a daylight type, there is no need for filtering when the subject is exposed under natural daylight conditions. Even when exposed under early morning and evening twilight conditions, filtering is generally not necessary as when printed, these exposures will produce excellent results.

Electronic Flash

- Since electronic flash characteristics are similar to daylight, no filters are required. Effective light output and color balance will differ with the equipment type, age, color temperature and other factors. This will require making initial tests.
- With shutter speeds slower than 1/60 of a second, the influence of non-flash light sources such as modeling lamps and room illumination may cause undesirable color balance shifts. Test exposures are recommended.
- Adjust the lens opening for electronic flash according to the following formula;

$$\text{Lens Aparture} = \frac{\text{ISO 400 Electronic Flash Guide Number}}{\text{Electronic Flash-to-Subject Distance (in Meters)}}$$

- The film speed should be set at the ISO setting currently being used for ISO 400 rated film.
- Since the amount of light reflected onto the subject from surrounding surfaces will differ with conditions, refer to the instructions for the flash unit.

Fluorescent Lamps and High-Intensity Discharge Lamps

Because this film has the fourth color-sensitive layer, there is no need to use color compensating filters for normal use. If normal color balance on this negative film is required, then use color compensating filters. Fluorescent and H/D lamps are subject to color and brightness variations during alternating-current cycles. To avoid this variability under these lighting conditions, expose NPH at speeds longer than 1/30 sec. Test exposures are always recommended for determining the appropriate filtration and exposure.

Lamp Type	Fluorescent				High-intensity Discharge	
	Daylight (D)	Cool White (C.W)	White (W)	Warm White (W.W)	Deluxe White Mercury	Clear Mercury
Color Compensating Filters*	10M+10Y	—	10C	30C+30M	10C	40M+40Y
Exposure Corrections**	+1	+ 2/3	+ 2/3	+1	+ 2/3	+2

* Wratten CC Filters (or Fuji Color Compensating Filters)

** Exposure correction values include filter exposure factors. These values are added to unfiltered exposure meter readings. A "+" followed by a number indicates the required increase in lens opening.

If the fluorescent lamp type is unknown, use a 30M cc filter and a +1 stop exposure correction. This will provide acceptable results under most conditions.

Tungsten Lamps

A Wratten filter No.80A (or Fuji Light Balancing Filter LBB-12) is recommended along with a 2 lens stop increase, when using 3200 K tungsten lighting. In the case of cameras with TTL metering, there is no need for additional exposure compensation.

5. LONG AND SHORT EXPOSURES

No exposure or color balance compensation is required when exposure time is within a 1/4000 to 1 second. However for exposures of 4 seconds or longer, exposure compensations are required.

Exposure Time (sec.)	1/4000 to 1	4	16
Color Compensating Filter	None	None	None
Exposure Corrections (Lens Opening)	None	+ 1/2 stop	+ 1 stop

(Exposure time longer than 16 seconds is not recommended.)

6. EXPOSURE PRECAUTIONS

With artificial light, such as electronic flash, photoflood, fluorescent, tungsten, mercury vapor, etc., the color temperature may be affected by such factors as brand, age of equipment and line voltage. Reflectors and diffusers can also influence color temperature.

7. FILM HANDLING

To insure quality results, NPH like all professional films requires proper handling prior to and after exposure.

- Unprocessed film should be kept away from X-rays used to inspect checked-in baggage, etc. at airport terminals. Strong X-rays can cause fogging of unprocessed film. It is recommended such film be placed in your carry-on baggage whenever possible. (Consult with airport personnel for details.)
- Allow sufficient time for refrigerated films to reach room temperature before using.
- Load and unload films in subdued light.
- Do not subject unexposed or exposed film to high temperatures and humidity.
- Process promptly after exposure.
- Do not use a safelight. Handle unprocessed film in total darkness.

8. FILM STORAGE

Unprocessed Film

Unexposed film should be stored at 10°C (50°F) or below in factory sealed packaging.

Processed Film

Processed film should be placed in protective envelopes and stored in a cool, dark, and dry location.

- Recommended Storage Conditions
  Temperature: Below 25°C (77°F)
  Humidity: 30% to 60% RH
- Extended Duration Conditions
  Temperature: Below 10°C (50°F)
  Humidity: 30% to 50% RH

NOTE Even though this film reaches new highs in long term dye stability, as with all color dyes, those used in this film will fade with time.

9. PROCESSING

This film is designed for standard C-41 processing chemicals. Equivalent chemicals such as CN-16 should also produce the expected results.

10. NEGATIVE EXPOSURE EVALUATION

NPH exposure results can be accurately predicted by using an electronic densitometer equipped with Status M filters. An 18% gray card, receiving the same illumination as the subject, when read through the RED filter should render density readings between 0.70 and 0.90 (for exposures under recommended lighting and with optimal film processing).

11. VIDEO ANALYZING

A separate channel set up is recommended for the analyzer. Excellent results are attainable on the Kodak PVAC*, Bremson CVIS** and other analyzers. Starting values and Setup and Balancing manuals are available. Please contact your local Sales or Technical Representative for these items.

* PVAC is a registered trademark of the Eastman Kodak Company.
** CVIS is a registered trademark of Bremson Data Systems.

12. PRINTING

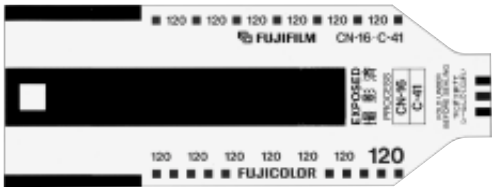
Color prints can be made by contact printing or enlarging on FUJICOLOR and other professional printing materials.

13. RETOUCHING

Conventional retouching techniques will work well with this film.

14. PACKAGING

* Packaging formats may vary in different markets.

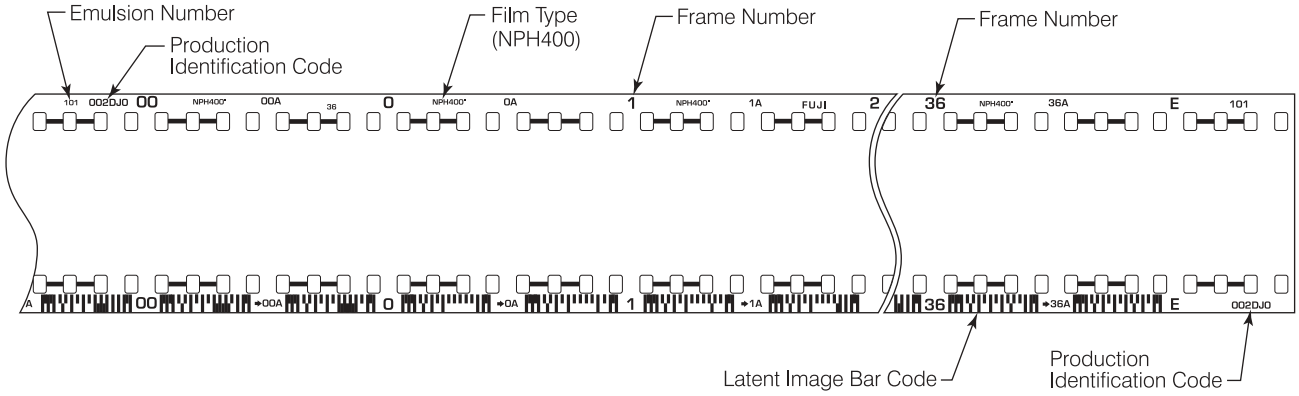
Size	Item	Contents
135	Film Box	
	Cartridge	
120	Film Box	
	Backing Paper	<Before Exposure>  <After Exposure> 
	Seal	
	Envelope	

Size	Item	Contents
220	Film Box	
	Backing Paper	<Before Exposure>  <After Exposure> 
	Seal	
	Envelope	
120, 220	Easy End-seal	(1) Seal  Condition of seal after exposure of roll Pull tab: Condition of seal before attachment (2)Sample of roll with seal attached  (3)Sample of box indication (NPH 400) 

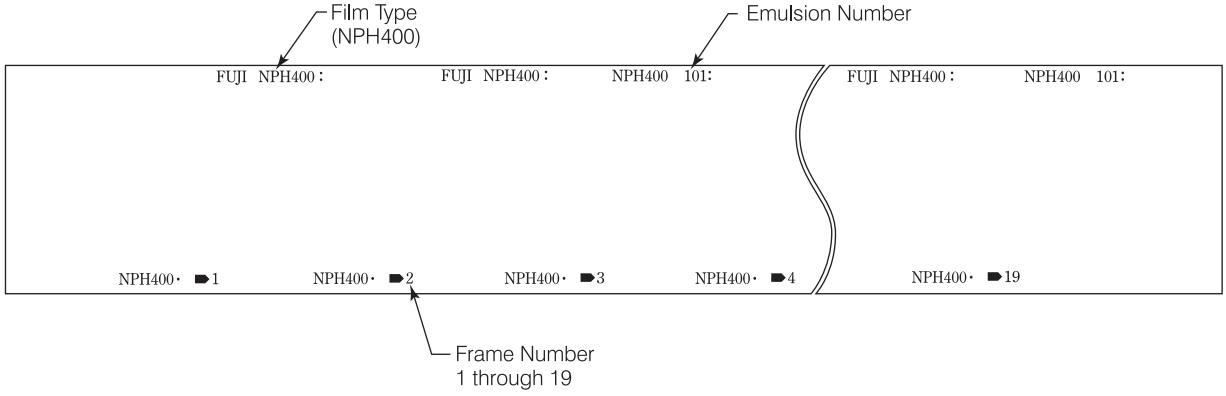
15. IDENTIFYING FILM

It may be necessary to segregate NPH from other color negatives when utilizing many different analyzers and printers. The following markings identify NPH films.

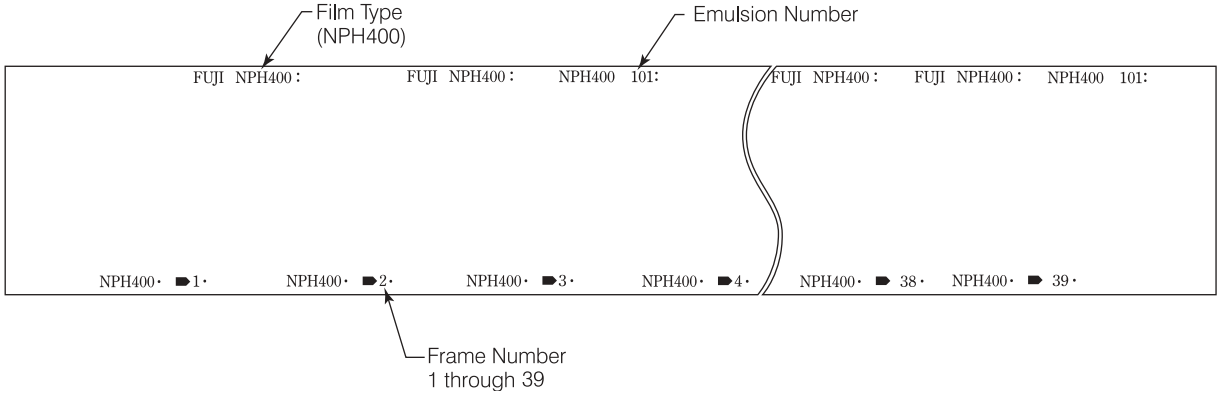
• 135 Size



• 120 Size



• 220 Size



16. TECHNOLOGIES INCORPORATED IN NPH

16-1 4th Color Layer Technology with Enhanced Optimization of Spectral Characteristics

This film incorporates a fourth color-sensitive layer in addition to the conventional three RGB-sensitive layers in order to reproduce colors as they are perceived by the human eye. The optimized spectral characteristics of this film enable the rendition of natural colors even for photographs taken under fluorescent lights or mixed light sources. With the ability to reproduce more natural-looking shadows, this film is capable of producing a three-dimensional look with an effectiveness not found in previous films.

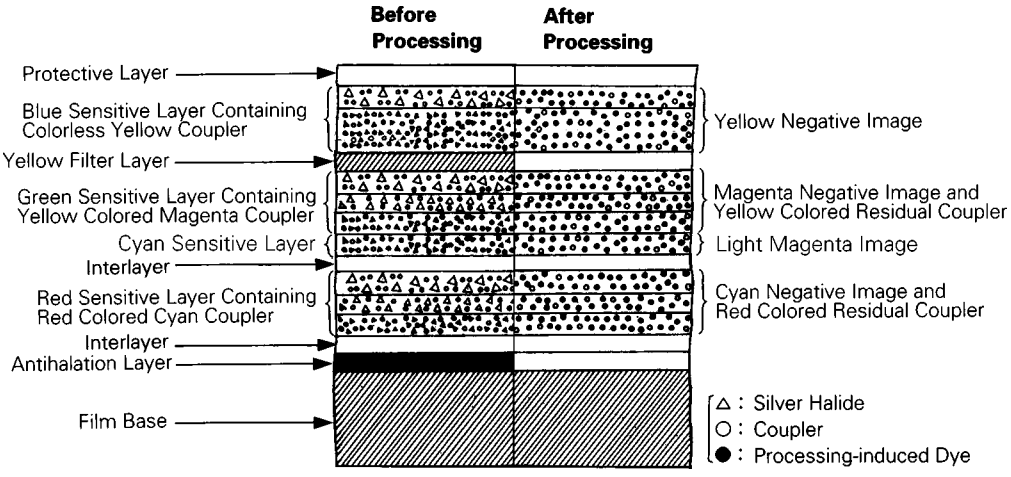
16-2 New Optimized Interlayer Effect Technology

The control provided by the new optimized interlayer effect technology incorporated in this film makes possible faithful color reproduction, superbly natural skin tones, and highly consistent gradation that is smoothly continuous from the highlights to the shadows whatever the situation.

16-3 Fine ∑ (Sigma) Technology

Fine ∑ (Sigma) Technology provides a new thin, flat grain structure that effectively increases the overall surface area of the small-volume silver halide crystals. This has enabled the adsorption of a greater amount of sensitizing dyes in proportion to the increase in the surface area of the silver halide crystals, resulting in the efficient absorption of a larger amount of light. This technology thereby provides a higher-than-ever effective speed, improved graininess, and smoother textual reproduction of skin and other elements.

17. FILM STRUCTURE



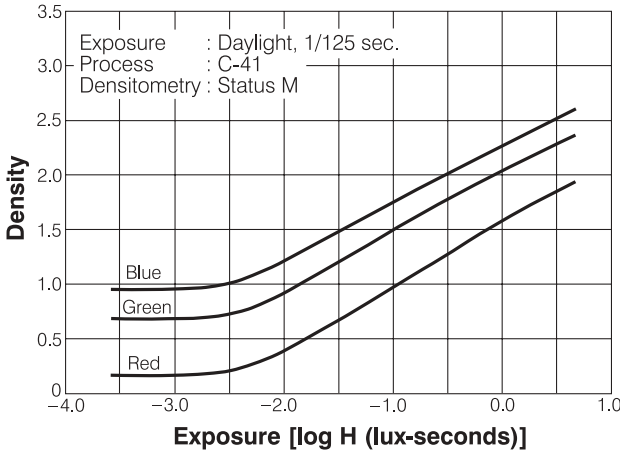
18. DIFFUSE RMS GRANULARITY 4

Micro-densitometer Measurement Aperture: 48μm in diameter.
Magnification: 12 X.
Measured Sample Density (NETA): 1.0.

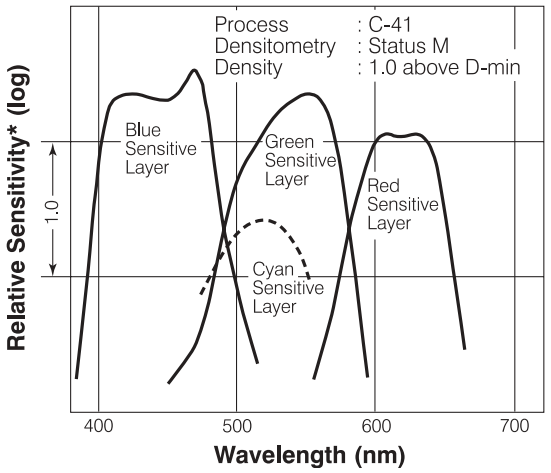
19. RESOLVING POWER

Test Object Contrast 1.6:1 ..... **50** lines per mm
Test Object Contrast 1000:1 ..... **125** lines per mm

20. CHARACTERISTIC CURVES

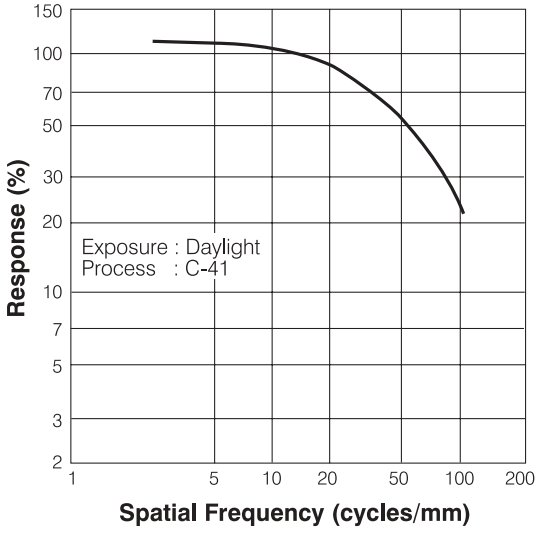


21. SPECTRAL SENSITIVITY CURVES

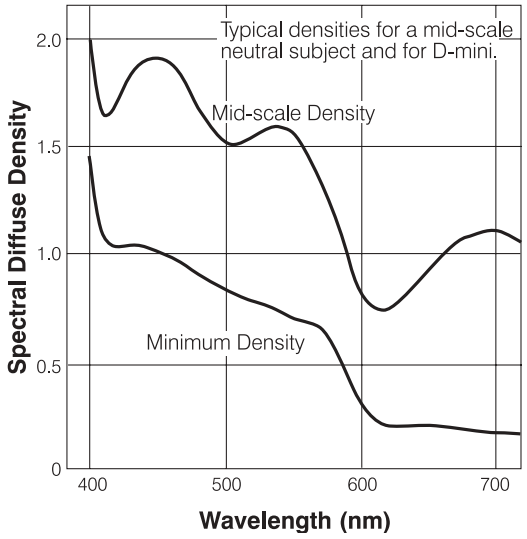


* Sensitivity equals the reciprocal of exposure (J/cm²) required to produce a specified density.

22. MTF CURVE



23. 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 prior notice.

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