

AGFA AVIPHOT COLOR N400 PE1

Panchromatic Negative Colour Film

AGFA Aviphot Color N400 PE1 is a panchromatic negative colour film, designed for aerial photography from low to medium altitudes. This film gives excellent definition and low granularity combined with a high level of sensitivity.

Thickness of the polyester base: 100µm.

Total film thickness: 125µm.

■ Applications

The film is designed for aerial photography with a variety of different cameras. In normal atmospheric conditions it permits shooting images from 15,000 ft (approximately 4,500 m). Processing is done with AGFAcolor Process AP 70 or the equivalent C41. AGFA Aviphot Color N400 can be copied onto Agfa's CN colour paper or Agfa's negative colour copying films AGFAvitone CP 94 and AGFAvitone CP 70.

The film is designed for use with most military cameras and all currently available cartographic cameras.

■ Characteristics

Using the latest colour film technology, AGFA Aviphot Color N400 offers outstanding characteristics:

- Minimum granularity, high definition and high speed.
- Excellent image quality. AGFA Aviphot Color N400 is made up of thin layers of colour, giving it its high resolution characteristics.
- Perfectly balanced colour saturation for low and medium altitude flying.
- Pure, faithful colours: colour contamination is avoided by the triple masking technique (an orange mask appears on the film during development).
- Wide exposure latitude limits the need for repeat flights.
- No Schwarzschild effect for shutter speeds ranging from 1/1,000 up to 1 second.

■ Photographic Information

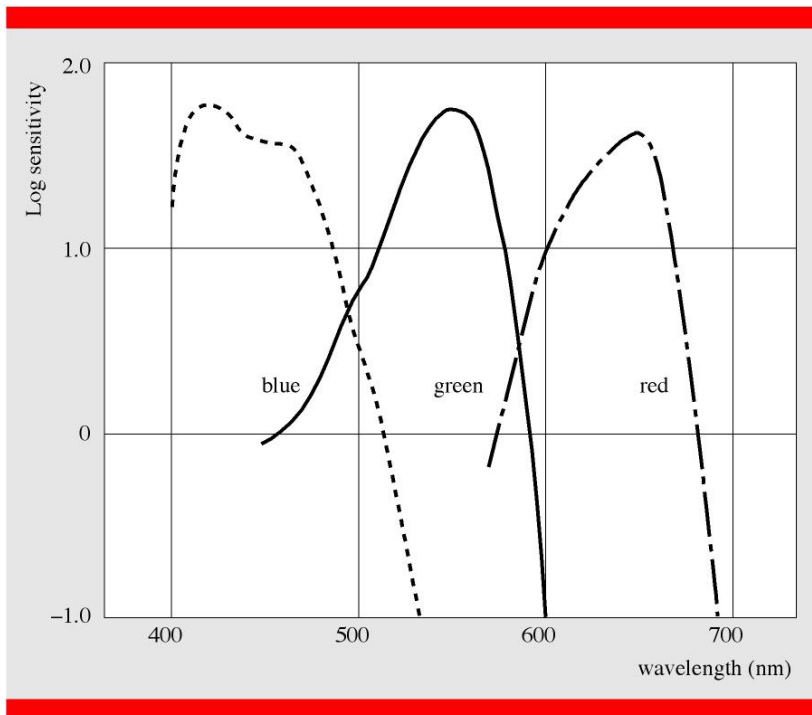
Speed

ISO 400/27, ASA 400, DIN 27 for processing in AGFAcolor Process AP 70 at 37.8 °C/100 °F during 3 min 17 s.

ISO 640/29, ASA 640, DIN 29 for processing in AGFAcolor Process AP 70 at 37.8 °C/100 °F during 5 min 20 s.

Example: 1/500, f=5.0 at 2,500 ft, 15° with 400 setting at Zeiss RMK Top 15.

Spectral Sensitivity

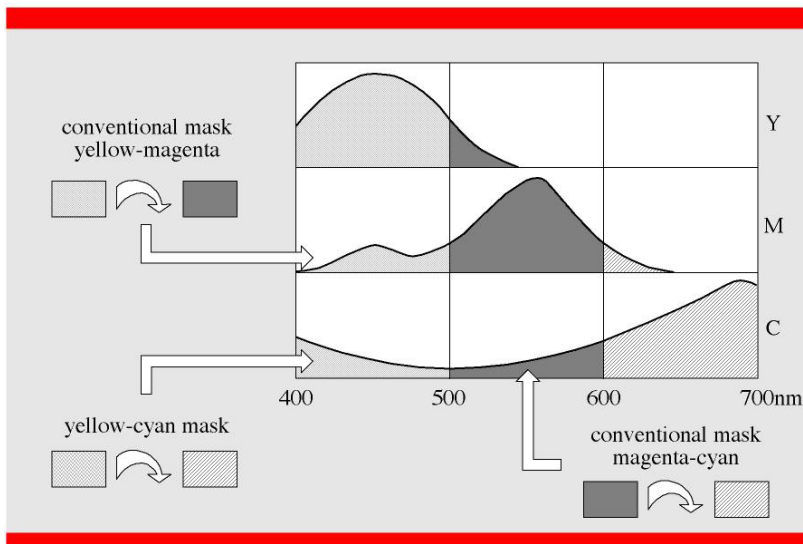


The curve refers to a density 1.0 above base fog. Sensitivity is reciprocal to the exposure expressed in mJ/m^2 , required to produce that particular density.

Colour Rendering

The colour rendering of :Aviphot Color N400 is set at a colour temperature of 5500 K. The masking technology compensates for any unwanted development of colour dyes. This accounts for the extremely faithful and pure rendering of each object's colour components.

Triple Masking for Controlling the Colour Rendering



The purity of the colours is optimised for aerial photography at low to medium altitudes. If desired, the colour saturation and timbre can be influenced by development. Strongly saturated colours will emerge on the paper print at slight underexposure, combined with over-development in AP 70 chemistry.

Example:

- Object:
 - Neutral grey: diffused reflection density = 1.
 - Red: visual reflection density = 0.61.
 - Green: visual reflection density = 0.83
 - Blue: visual reflection density = 1.22.
- Processing: AP 70.
- Printing:
 - Agfa's CN 312 paper, processed in AP 94 chemistry.
 - Print density = 1 for neutral grey
 - Colour shade on the print = neutral for neutral grey.

Exposure N400	Development AP 70	Reflection density onto CN 312	Filter correction for blow-up	Exposure time for printing
400 ASA	3 min 17 s	red: 0.68 green: 0.54 blue: 0.89	47 - 25 - 0	f = 11 / 5.5"
640 ASA	5 min 20 s	red: 0.74 green: 0.71 blue: 1.03	65 - 40 - 0	f = 11 / 12"

Granularity

The minute, flat silver grains are distributed very evenly throughout the emulsions, and they account for the uniform distribution of dyes in this high speed film. Due to its fine grain :Aviphot Color N400 minimises the loss of sharpness, even with very large blow-ups.

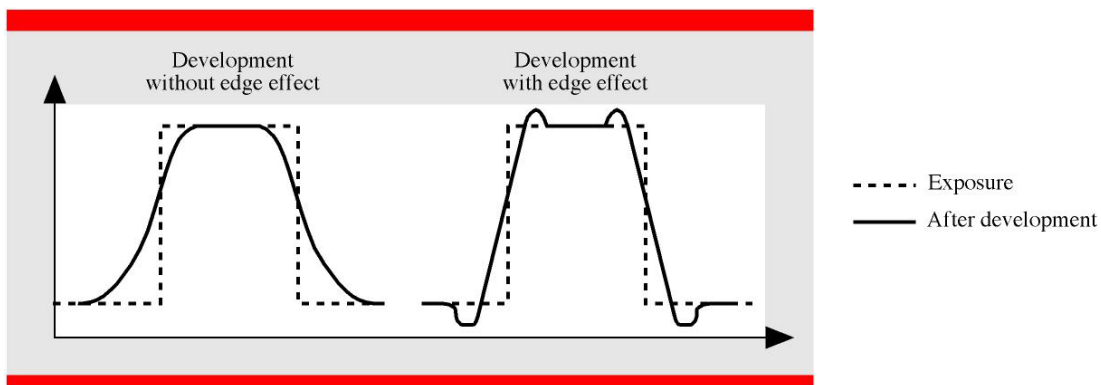
RMS Granularity

The RMS granularity measured at a diffused visual density of 1.0 with 48µm spot size equals RMS (x 1000) = 8.

Sharpness

The impression of sharpness is based on granularity and edge definition. In view of the low level of granularity, and the sharp edge effect offered by this film, :Aviphot Color N400 will yield extremely sharp photographic images. This is an important benefit for cartographers, facilitating the task of determining measuring points in an image.

Due to the use of the DIR technology (Developer Inhibitor Release) inhibitors in the emulsion are active during development, to achieve better differentiation of densities within one colour. The visual effect results in clear-cut marking and enhanced sharpness.



TOC (Target Object Contrast)

Measured according to ANSI PH 2.33-1980:

TOC 1000:1 = 130 lp/mm or 260 dots/mm.

TOC 1.6:1 = 55 lp/mm or 110 dots/mm.

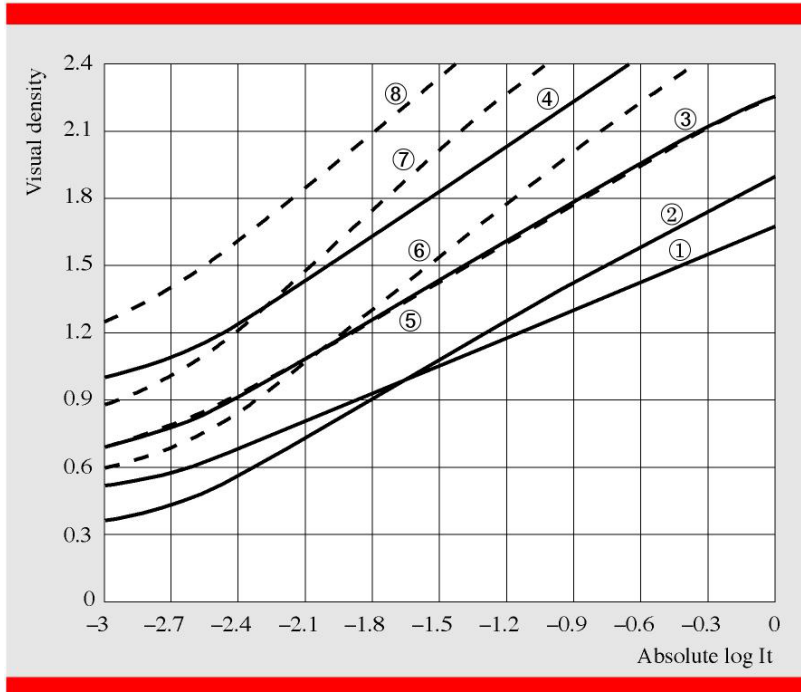
These resolution values are not affected by the processing conditions in AP 70.

Colour Density Curves

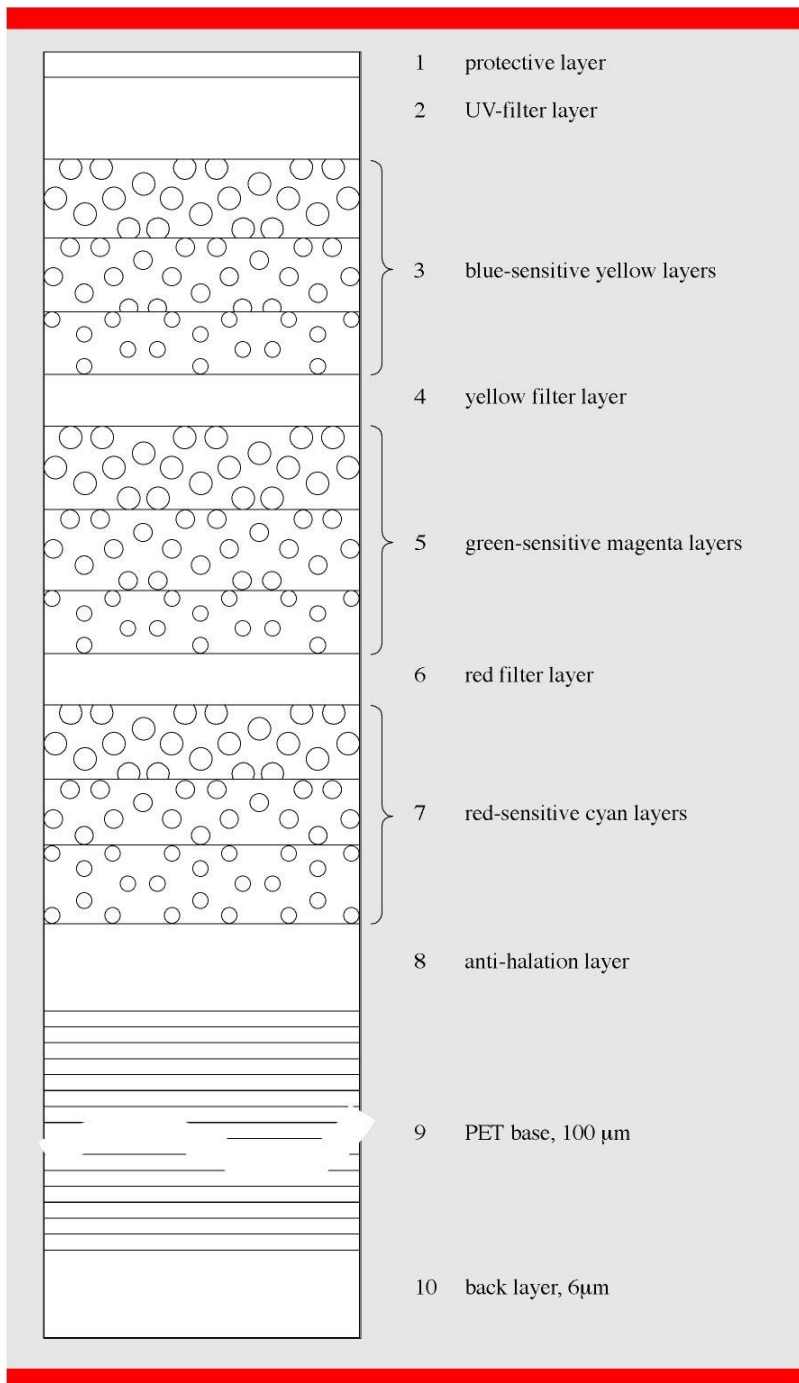
Exposure: daylight 1/1000 s.

Processing: AP 70 at 37.8 °C/100 °F.

Visual density



■ Film structure



Total film thickness: 100μm PET + 19μm colour layers + 6μm back layer = 125μm.

■ Production Guidelines

Film handling

Wear cotton gloves, both before and after processing the film.

Darkroom Lighting

The film must be handled in total darkness.

Exposure

Recommended speed setting: 400 up to 640 ASA.

Filters are not required, as the emulsions are sensitised to daylight. :Aviphot Color N400 is manufactured within strict tolerances, and the spectral deviations are minimal.

Always make a series of test images representative of the exposure, flying altitude and atmospheric conditions, which will determine the optimum processing conditions.

Processing

:Aviphot Color N400 is preferably processed in a processor with :Agfacolor Process AP 70 (or the equivalent C 41).

If you do not have your own aerial processor, specialised photo labs can offer a solution. They generally have a lot of experience in processing :Aviphot Color film. Don't forget to inform the flight crew about the quality of the final result, so they can take it into account on their next sortie.

Archiving

:Aviphot Color N400 can be archived for a very long time, if the material has been processed in a professional way and according to the instructions. Dark fading (loss of a certain colour dye) is normally due to inadequate washing and/or stabilising during processing. Light fading (exposure to light) hastens the deterioration of the colour dyes. If the films are to be stored for the maximum duration - i.e. centuries - we recommend keeping them stored in a dark room, at a relative humidity ranging from 40% to 60% and at a temperature of maximum 24 °C/75 °F. Protect the film from effects caused by harmful gases (formaldehyde-, turpentine - and vapour, hydrogen sulphide or ammonia).

■ Shelf Life

Unexposed :Aviphot Color N400 films should be stored in a cool and dry place, in their original packaging at a temperature below 13 °C/55 °F. The photographic characteristics can be kept stable in freezers (at temperatures below -10 °C/+14 °F) for an extended period of time. After it has been taken out of the freezer, the film needs to adapt to the ambient temperature for some 12 hours, before the original packaging can be opened. If that is neglected, the air humidity on the film may start condensing. After the original packaging has been opened, the film must not be exposed to high temperatures or high air humidity. It should also be kept clear from harmful gases.

Exposed films are best processed immediately afterwards. The latent image may start fading, especially when influenced by less favourable weather conditions (heat, high air humidity) possibly causing a shift in the colour balance.

■ Dimensional stability of :Aviphot Color N400

Temporary dimensional changes

- Thermal coefficient of linear expansion (-20 °C to +50 °C)
0.0018 % per °C of change
- Humidity coefficient of linear expansion (30% RH to 60% RH)
0.0024 % per % RH of change

Permanent dimensional changes

- Dimensional change due to processing
+0.0015 %, pre- to post-processing

■ Assortment

:Aviphot Color N400 PE1 – standard sizes*

Size		Spool/Winding/Perforation	Order code
70 mm x 30.5 m	2.3/4" x 100 ft	AE246 – EI – P	EHKD6
126 mm x 30.5 m	5" x 100 ft	AE365 – EI – NP	EHKE8
240 mm x 76 m	9.7/16" x 249 ft	AH897 – EI – NP	EAWUW
240 mm x 135 m	9.7/16" x 443 ft	AM897 – EI – NP	37XDQ

* For all other sizes, please contact your local Agfa representative.

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