

AVIPHOT COLOR X400 PE1

Panchromatic Negative Colour Film

Aviphot Color X-400 PE1 is a panchromatic negative maskless colour film with high colour saturation, designed for aerial photography from low to medium altitudes. It is also suitable for industrial applications requiring a high speed film whereby images are scanned from the film. This film gives excellent definition and lower granularity than a masked film with the same photographic speed.

Thickness of the polyester base: 100µm.

Total film thickness: 137µm.

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. Aviphot Color X400 can be copied onto Agfa's Rapitone C1-C2 aerial colour paper or onto Agfa's negative colour copying films Avitone CP 94 and Avitone CP 70. The film is designed for use with most military cameras and all currently available cartographic cameras.

The absence of a mask allows for an improved signal/noise ratio and hence a more grain-free digital image after the scanning. This is particularly of interest to avoiding noise in highlight areas.

The Aviphot Color X400 maskless film can be used for a range of industrial applications for ground photography, security cameras or traffic control cameras.

Characteristics

Using Agfa's latest colour film "Generation 2000" technology, Aviphot Color X400 offers outstanding characteristics:

- Panchromatic sensitivity up to 650 nm.
- Minimum granularity, high definition and high speed.
- Thin layer technology brings higher sharpness by containing the light decay and supporting the "edge" effect.
- Excellent image quality: Aviphot Color X400 is built using multilayer technology and uses high inter-imaging effect for best image colour saturation.
- Wide exposure latitude limits the need for repeat flights.
- Outspoken anti-static characteristics, before and after film processing.
- Back layer designed for best reduction of Newton rings.
- Durable Top coat and back layer to protect the film against scratches
- No Schwarzschild effect for shutter speeds ranging from 1/1,000 up to 1 second.

■ Photographic Information

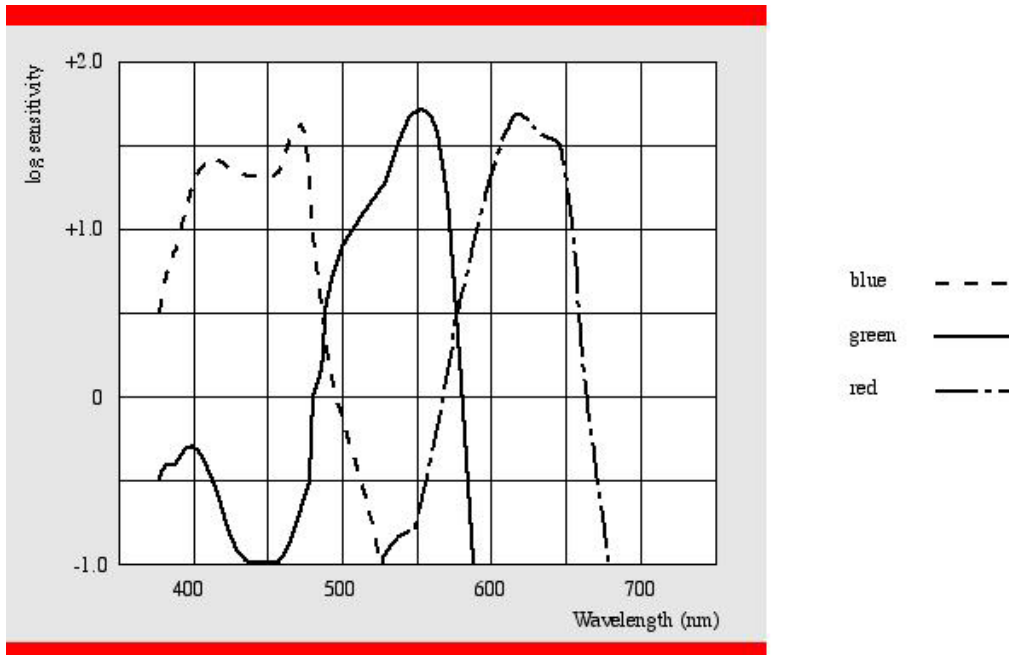
Speed

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

ISO 640/29, ASA 640, DIN 29 for processing in Agfacolor Process AP 70 at 37.8 °C/100 °F for 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 X400 is set at a colour temperature of 5500 K (Daylight). The absence of a colour mask makes the colour rendering less saturated when compared to masked films. The loss of saturation is being compensated in the X400 using embedded chemical processes.

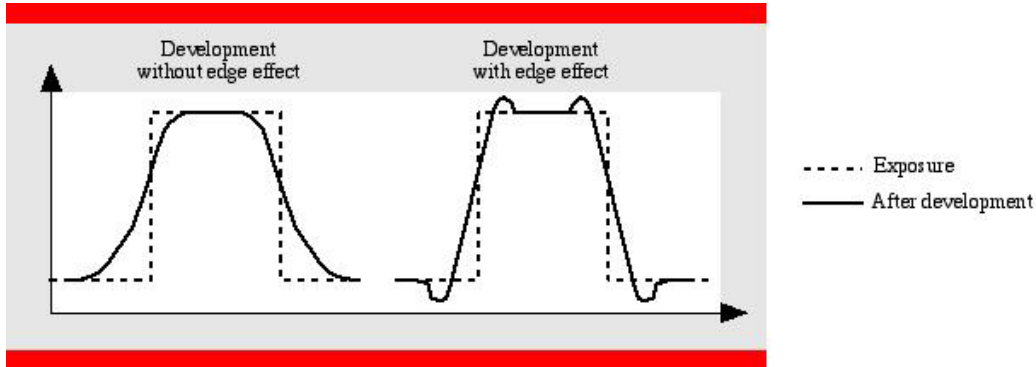
RMS Granularity

The RMS granularity measured in the magenta dye layer at a diffused visual density of 1.0 with $48\mu\text{m}$ spot size equals $\text{RMS} (\times 1000) = 7$. The magenta dye layer contributes for the largest amount in the perceived graininess.

Sharpness

The impression of image detail content is based on granularity, edge definition and overall radiometric quality. In view of the low level of granularity, and the sharp edge effect offered by this film, :Aviphot Color X400 will yield extremely detailed 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.

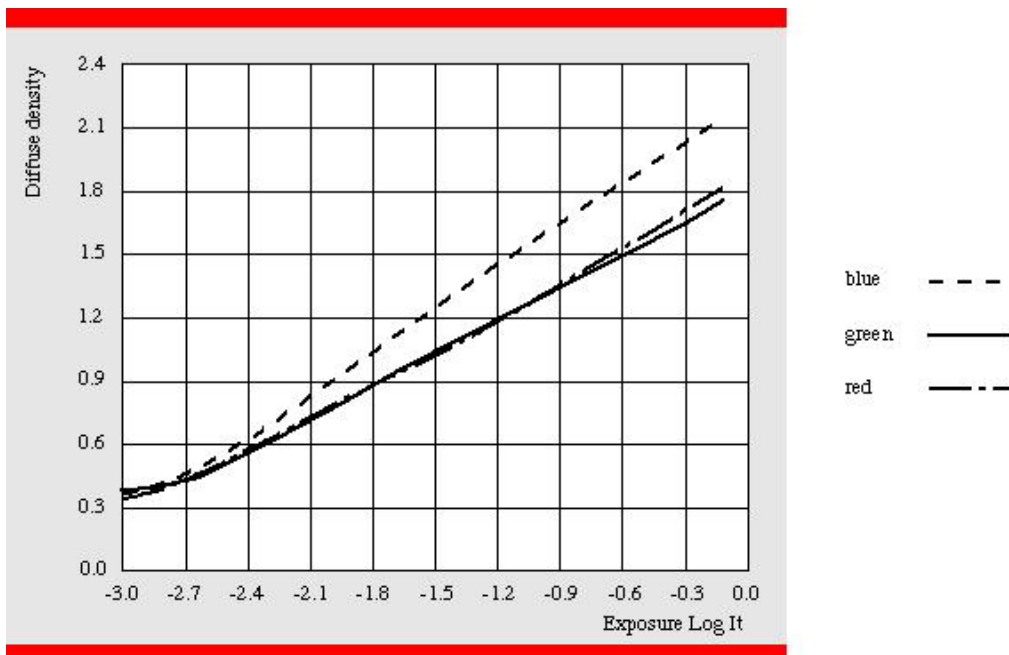
TOC 1.6:1 = 55 lp/mm or 110 dots/mm

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.

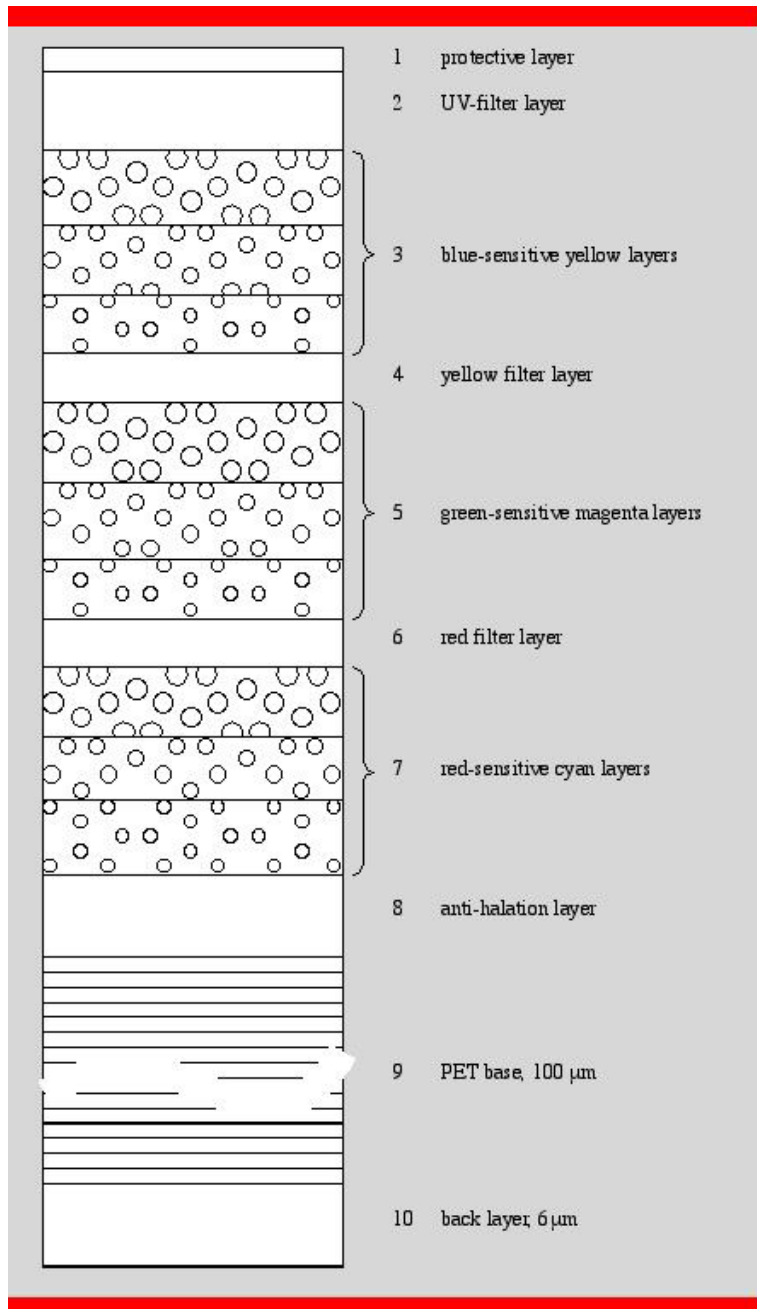


Exposure: daylight 1/1000 s.

Processing: AP 70 at 37.8 °C/100 °F.

■ Film structure

Total film thickness: 100µm PET + 31µm colour layers + 6µm back layer = 137µm.



■ 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. In slightly hazy conditions it is advised to use a 420 nm haze cut filter to improve the image contrast. :Aviphot Color X400 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 X400 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.

■ Archival

:Aviphot Color X400 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 X400 films should be stored in a cool and dry place, in their original packaging at a temperature below 10 °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

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: +0.0016 %, pre- to post-processing

■ Assortment

:Aviphot Color X400 PE1 – standard sizes*

Size		Spool/Winding/Perforation	Order code
240 mm x 76 m	9.7/16" x 249 ft	AH897 – EI – NP	EPKY3
240 mm x 135 m	9.7/16" x 443 ft	AM897 – EI – NP	EPKX1

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

Subject to modifications without prior notice.

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