

:AVIPHOT COLOR X100 PE1

Colour negative film without colour mask

:Aviphot Color X100 PE1 is a colour negative film without colour mask. It is suitable for technical, industrial and aerial photography. Processed in AP 70 (or C-41) chemistry, the film shows a very adaptable image contrast with impressive sharpness and extremely low granularity. Well saturated colours can be obtained.

Thickness of the dimensionally stable polyester base: 0.10 mm (0.004").

Total film thickness: 0.127 mm (0.005").

■ Applications

- This film can be used in Industrial Recording systems, such as equipment used for the plotting of graphs in control and monitoring devices by way of illuminated deflection sources.
- It can also be used in stereo image recording devices, either airborne or in ground based facilities for subsequent production of three dimensional plans, maps, etc.
- :Aviphot Color X100 PE1 is used for aerial photography with a variety of cameras. Excellent images can be obtained from levels as low as 1500 ft up to high altitudes of 25,000 ft to 30,000 ft.
- Due to its extremely fine grain and high sharpness the film is very suitable for cartographic image acquisition and interpretation. Highest quality enlargements can easily be made.
- This film facilitates electronic image scanning. Because there is no colour mask, the usual orange colour does not have to be removed from the image colour. Even in absence of a colour mask, clean and saturated colours are reproduced.
- The absence of a colour mask allows faster production with contacting, printing onto black-and-white and colour paper, and scanning. It also facilitates focusing.
- :Aviphot Color X100 PE1 can be copied onto Agfa CN colour paper or on the Agfa negative colour copying films :Avitone CP 94 and :Avitone CP 70.

■ Characteristics

Using the latest colour film technology, :Aviphot X100 offers outstanding characteristics:

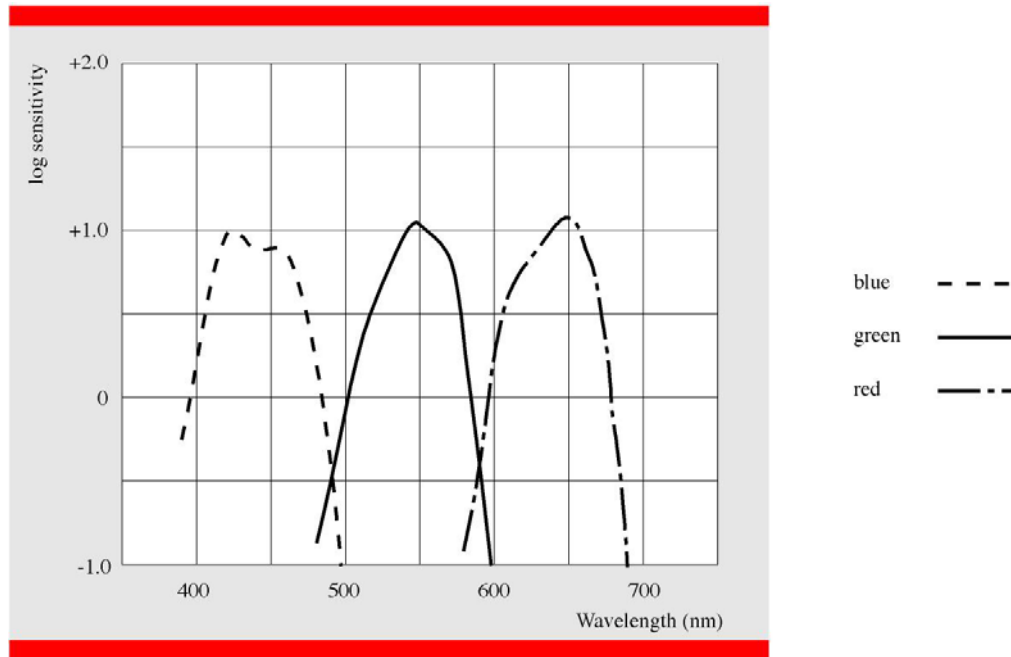
- Very high definition and very low granularity; a slight increase in grain is obtained when the film is pushed to its limit.
- Push processing by increasing either the developing time or the developer temperature will dramatically boost the image contrast. You can obtain smooth shadow areas with large-scale flights and low sun angles as well as high contrast images with small-scale applications.
- The excellent image quality is obtained due to the Agfa SEM (Surface Enhanced Multistructured) crystal technology and stacked multiple sensitised layers for each colour.
- The wide exposure latitude limits the need for repeat flights.
- There is no reciprocity failure for shutter speed ranging from 1/1000 up to 1 second.

■ Photographic information

Speed

- ISO 100/21, ASA 100, DIN 21 for processing in :Agfacolor Process AP 70 at 37.8°C/100°F for 3 min 15 s developing time.
- ISO 160/23, ASA 160, DIN 23 for processing in :Agfacolor Process AP 70 at 37.8°C/100°F for 5 min 20 s developing time.

Spectral sensitivity



The curves refer to a density of 1.0 above base fog. Sensitivity is reciprocal to the exposure (mJ/m^2) required to produce that particular density.

Colour rendering

The colour rendering of :Aviphot Color X100 is set for a colour temperature of 5500K. In absence of a colour mask, a very high activity of the inter-image effects amongst the dye layers ensures colour purity. During processing, this chemical activity amplifies the edge sharpness and reduces the granularity.

Granularity

The combination of the Agfa SEM crystal technology with the inter-image effect among the dye layers and the highly concentrated DIR (Developer Inhibitor Release) couplers throughout the film results in a substantial reduction of granularity. Levels remain very low when the film is processed at 37.8°C for less than 4 minutes.

Measured at a diffused visual density of 1.0 (48 μm aperture) RMS granularity value is 6 when the film is processed for 3 min 17 s.

Sharpness

The DIR technology makes the inhibitors in the emulsion active during the development in order to achieve better differentiation of densities within each colour. Visually, this results in clean cut edges and enhanced sharpness, independent of the processing time.

TOC (Target Object Contrast)

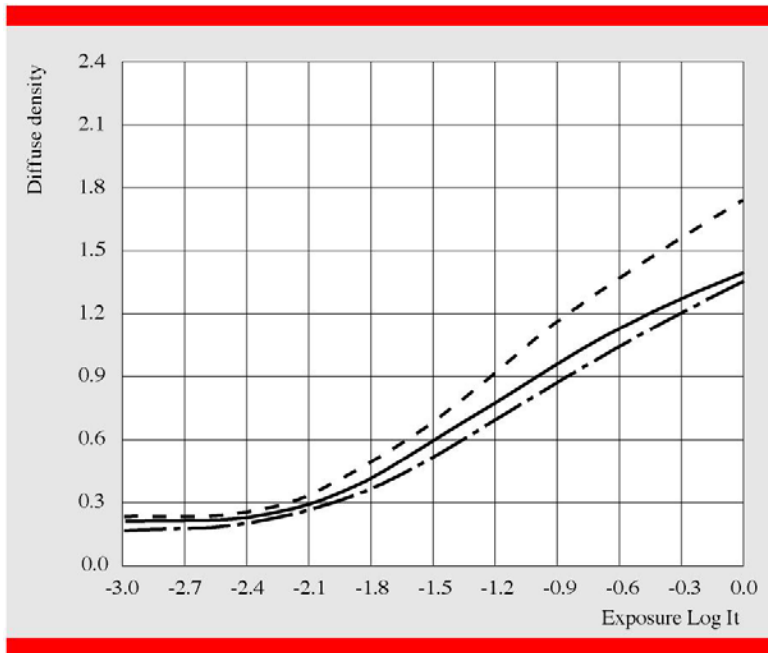
Measured according to ANSI PH 2.33-1980.

TOC 1000:1 = 150 lp/mm or 300 dots/mm.

TOC 1.6:1 = 80 lp/mm or 160 dots/mm.

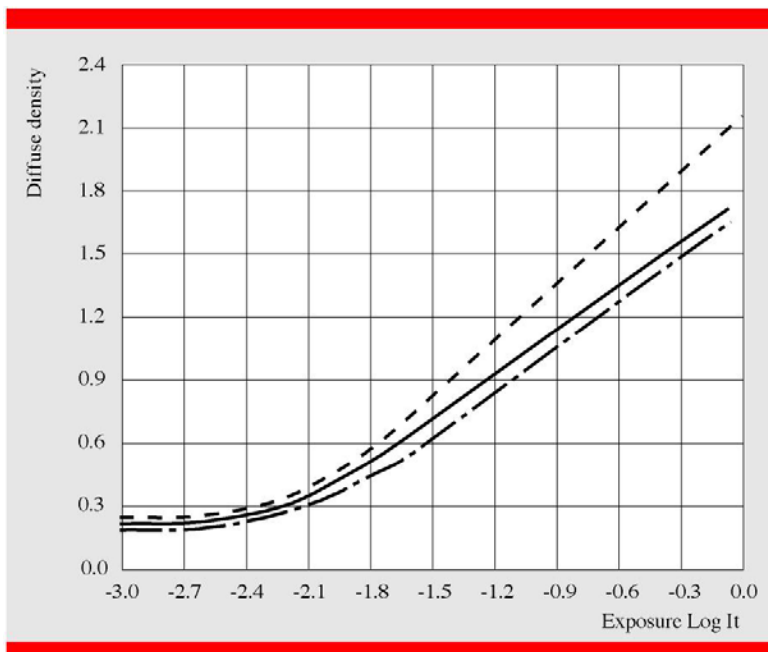
These values are not affected by processing conditions in AP 70.

Colour density curves



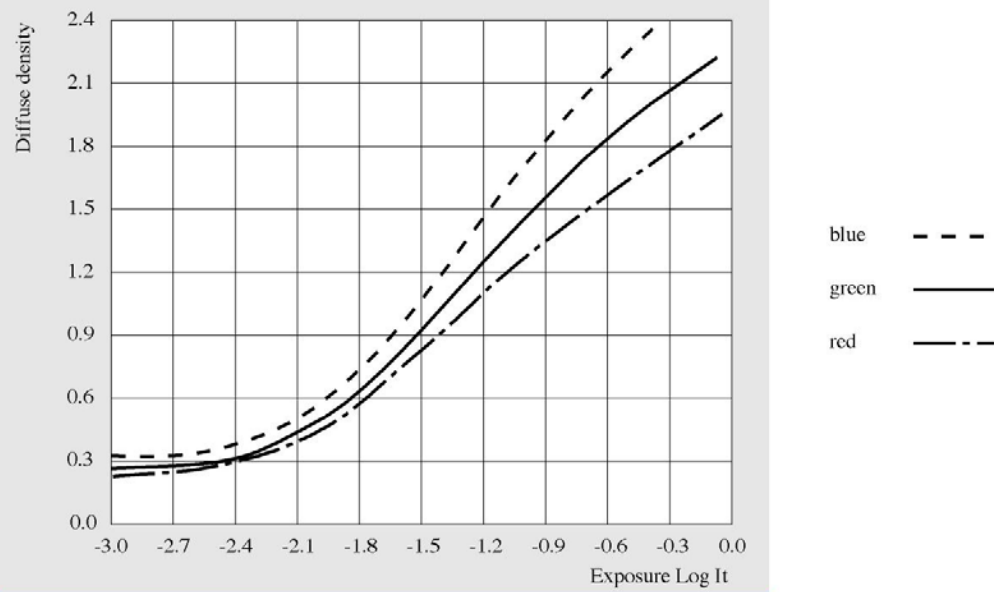
Exposure daylight 1/1000 s

Processing in AP 70 at 37.8°C/100°F for 3 min 15 s.



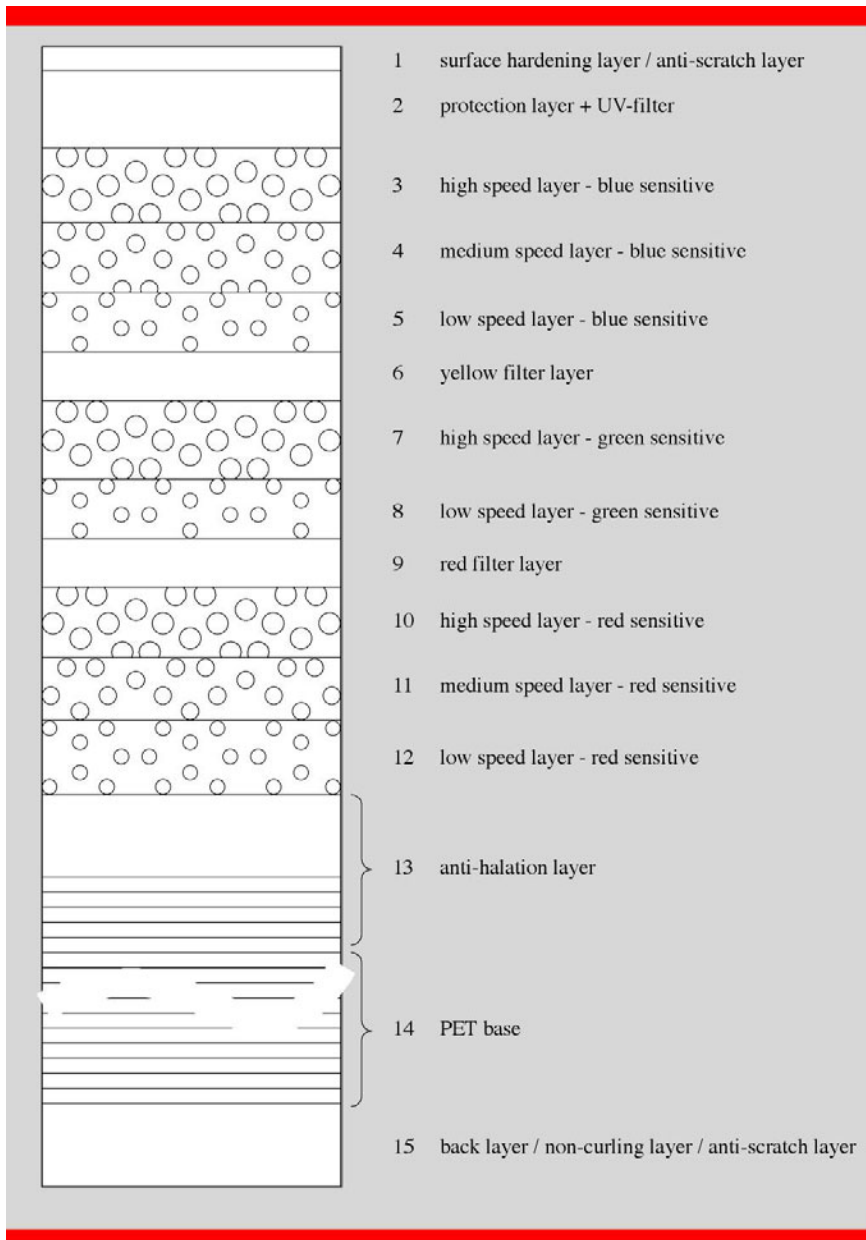
Exposure daylight 1/1000 s

Processing in AP 70 at 37.8°C/100°F for 4 min



Exposure daylight 1/1000 s
Processing in AP 70 at 37.8°C/100°F for 5 min 20 s.

■ Film structure



Layers 1 - 13: 22 μm

PET base (14): 100 μm

Back layer (15): 6 μm

■ Production guidelines

Film handling

Wear cotton gloves before and after processing the film.

Darkroom lighting

The film must be handled in total darkness.

Exposure

Recommended speed setting: from 125 to 160 ASA.

Filters are not required because the emulsions are sensitive to daylight. :Aviphot Color X100 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 in order to determine the optimum processing conditions.

Processing

:Aviphot Color X100 is preferably processed in a processor with :Agfacolor Process AP 70 (or the equivalent C-41) chemistry.

If you don't have your own aerial processor, specialised photo-labs can offer a solution: in general they have a lot of experience in processing :Aviphot Color films. Don't forget to inform the flight crew about the required quality of the final result, enabling them to keep that into account on their next sortie.

Yellow streaks after processing

These yellow streaks are caused by a certain type of bleach solutions, containing ferric ammonium propylene diamine tetra-acetic acid or FePDTA. These types of bleaches require regular checking of the pH value and the concentration in the tank solution, which must vary within the tolerances specified by the bleach manufacturer.

Too low a concentration of the bleach and/or too high a pH value can cause yellow streaks. Usually the replenishment rate is too low, sometimes caused by adding insufficient concentrate during bleach recycling. The pH value should be at the lowest tolerance limit and may have to be decreased by adding acetic acid.

An adequate circulation of the solution in the bleach tank is necessary to avoid the formation of a high pH value where the film enters the tank (may be caused by carry-over of developer into the bleach tank).

For processing :Aviphot colour film, Agfa supplies the following bleaches which do not contain FePDTA:

- 70 BL-R (BL replenisher)
- 70 BL-J (BL rejuvenator)

Below are the pH values and the specific gravity (status 08/2001) for 2 types of bleaches:

Process solution	Tolerances pH value at 25°C/77°F			Specific gravity at 25°C/77°F		
	Fresh tank	Seasoned tank	Replenisher	Fresh tank	Seasoned tank	Replenisher
:Agfacolor 70 BL	6.0	5.8 – 6.0	5.8 – 6.0	1.135 – 1.141	1.128 – 1.200	1.152 – 1.205
Kodak Flexicolor Bleach III (PePDTA)	4.5 – 5.0	4.5 – 5.0	4.25 – 4.75	1.030 - 1.040	1.030 – 1.060	1.030 – 1.040

Processing :Aviphot Color X100 in AN-6 chemistry

Working with AN-6 configured processors using the processing times and temperatures recommended by Kodak may result in a high base fog level around 0.45 up to 0.48 and a base colour which is not neutral. The base density can be changed a little by using push and pull processing, but then the base colour also changes.

Solutions may be as follows:

- Using AN-6 chemistry at 38°C for 4 minutes developing time you can obtain a base density close to what can be expected with :Agfacolor AP70 with a neutral appearance?
- Using :Agfacolor AP70 developer with AP72 bleach (designed for shorter bleach times) at the normal times and temperatures for AP72 the results were very close to standard AP70 processing. Important: when using AP72 bleach, the stop bath should be used in the AN-6 configured processor to avoid problems with the pH and stains appearing on the film.
- It is also possible to use AP72 fixer for short fix times.

Since it was difficult to make old Versamat machines suitable for running standard C-41 chemistry, Kodak created a special set of chemistry called AN-6. Old colour Versamat processors built to work with AN-6 chemistry have 3 developer tanks, 1 stop tank, 1 bleach tank and 1 fix tank plus a number of wash tanks. To use :Agfacolor AP70 chemistry in this type of machine, the configuration can be changed to 3 developer tanks, 4 bleach tanks, 1 wash and 4 fix tanks, followed by a final wash and a final rinse tank. Because the AN-6 and AN-5 configured processors are equipped with 16 tanks, they can be converted into an AP70-friendly machine using a bit of creative plumbing.

■ **Archival**

If processed in a professional way and according to the instructions, :Aviphot Color X100 can be archived for a very long time. Dark fading (loss of density of colour dye without exposure to light) is due to inadequate washing and/or stabilizing after processing. Light fading (colour dye density drop due to exposure to light) hastens the deterioration of colour dyes. If the films are to be stored for the maximum duration (i.e. for centuries), we recommend keeping them in a dark room, at a relative humidity from 40% to 60% and at a temperature of maximum 24°C/75°F. Protect the film from harmful gases (formaldehyde, turpentine and vapour, hydrogen sulphide or ammonia). It is advised to archive films on the original spool and in the original plastic boxes. These items are sold separately as items for archival.

■ **Shelf life**

Unexposed :Aviphot Color X100 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 opening the original packaging. If the film is not acclimatised, ambient humidity may condense on the film. Once the original packaging is open, the film must be kept away from high temperature sources, high air humidity and harmful gases.

Films are preferably processed immediately after exposure. The latent image may start fading, especially in 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 1% RH.

Permanent dimensional changes

Dimensional change due to processing: +0.014%, from pre- to post-processing.

■ Assortment

:Aviphot Color X100 - Standard sizes*

Size		Spool/Winding/Perforation	Order code
70 mm x 30.5 m	2.3/4" x 100 ft	CSP5 – EI – P	EELTH
126 mm x 30.5 m	5" x 100 ft	AE365 – EI – NP	EELSF
240 mm x 76 m	9.7/16" x 249 ft	AH897 – EI – NP	EELWO
240 mm x 135 m	9.7/16" x 443 ft	AM897 – EI – NP	EELXQ

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

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