

CMS 20 II PRO & ADOTECH IV

High-resolution black and white film up to 20 ASA and special developer

The CMS 20 II PRO is an orthopanchromatic and ultra-high resolution film based on silver halide material. The „AHU“ halo protection layer between the emulsion and the base guarantees the sharpness of the image. Because of the tiny technologically produced silver grains, this film is the highest resolution, sharpest fine-grain film in the world. However it is also one of the hardest and less sensitive emulsions of its kind.

The spectral sensitization of the CMS 20 II PRO differs slightly from that of other low-sensitivity films. In the production, special emphasis was placed on good tone separation. The CMS 20 II PRO excellently differentiates between blue and red. Its sensitivity spectrum ranges from 400 nm to just below 650 nm.

The film is based on a completely clear carrier and the antihalation layer dissolves completely during development. This makes it possible to process the film as a B&W slide film. In the reversal

process, however, tests must still be performed to determine the actual sensitivity. The ADOTECH IV developer was designed to control the contrast of the emulsion and achieve perfect half-tones at an exposure value of up to 14 f-stop.

CMS 20 PRO II

Film type: Silver halide film with antihalation layer between emulsion and base material for highest sharpness.

Film speed in normal up to high image contrast: ISO 12/12 °

Film speed at reduced to normal image contrast: ISO 20/14 °

The exposure requires an adjusted processing and therefore must be consistent throughout the film.

Spectral Sensitivity: Orthopanchromatic.

Grain-Size: RMS at density 1,0 und a focal opening of $25\mu = 14$. Other films are measured at 45μ because they



cannot resolve as much as CMS 20. Therefore this value is theoretical. The film exceeds the possible image transfer of an optical system at a focal opening of 45μ . CMS 20 is the highest resolution material known on earth.

Reciprocity failure: 1 Sec. + 1/2 F-Stop, 10 Sec. + 1 F-Stop, 1/1000 Sec. + 1/2 F-Stop.

Resolution: At a contrast ratio of 1000: 1 = 800 Lp / mm.

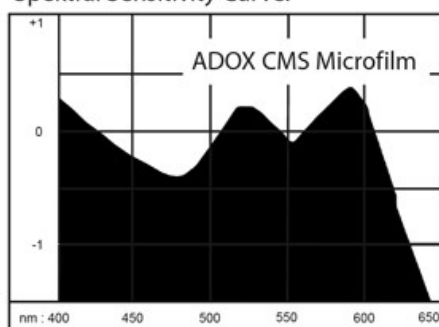
Base 35mm/120: Clear PET 100 micron.

Base sheet film: Clear PET 130 micron.

EXPOSURE INSTRUCTIONS

1) Because of the characteristics of the clear base, light can penetrate through the film lash along the perforation into the 35mm cartridge and affect the first images. Therefore, the film should be stored in a black film container before and after being exposed. Load the film in subdued light.

Spektral Sensitivity Curve:



2) The CMS 20 PRO II has a thinner emulsion layer compared to normal B&W-films. To make sure that there is enough depth of field, we recommend to stop-down at least one or two apertures to compensate for any wandering of the emulsion layer out of the optimal focal level.

3) The camera must allow the manual adjustment of the film speed. If there is no setting other than 25 ASA, use the exposure compensation.

ADOTECH IV

ADOTECH IV is the new special developer for the pictorial development of the high-resolution CMS 20 PRO II and thus the successor to the previous ADOTECH III. The CMS 20 PRO II film delivered until 2011 can be processed either in ADOTECH III or ADOTECH IV. The dilution, temperature and development instructions can be found on the bottle label.

PRODUCT HISTORY

2005: First batch of ADOTECH developer for CMS 20 35mm film (without suffix „I“ or „II“).

2012: ADOTECH II (50ml glass bottle with addition „II“) for CMS 20 Type II 35 mm film, 120 and sheet films.

2013: ADOTECH II in 100ml PET bottle to protect the developer from re-crystallization. Attention: the 100ml version is a lighter concentrate compared to the 50ml. The concentrate quantity must therefore be doubled.

2016: ADOTECH III in 100ml PE-HD bottle with additional gas diffusion barrier.

TECHNICAL DATA

Content: 100 ml.

Dilution: 1 + 14 to make 1500 ml working solution.

Capacity: A 250ml or 300ml working solution is enough to develop a 35mm film. The diluted solution should not be used a second time.
With a 500 ml or 600 ml working solution you can develop two 35mm films or two medium format films. In this case the films can be developed simultaneously (two films on one spiral) or one after another. If the films are processed one after the other, no extra development time is required. However, the second development should take place within the next two hours.

Sensitivity: With this new developer, it is possible to achieve any sensitivity between ISO 3/6 ° and ISO 25/15 °. Up to ISO 25/15 ° good tonal values can be achieved without the lights getting too steep. The specified sensitivities correspond at ISO 3/6 ° to the ISO norm or the zone system. Even at ISO 6/9 °, there is a good approximation to the ISO norm or to the zone system, although the values for zone 2 and zone 3 are somewhat lower.
Higher sensitivities are push-sensitivities according to the following definition: Skin tones (in the zone system IV) must have an equivalent density to that which

is present at nominal sensitivity, e.g a density of approximately 0.9.
In case of high image contrast, we recommend not to use the sensitivity of ISO 25/15 °. At lower image contrast, however, exposing at this maximum sensitivity can be very useful to achieve incredibly high-detailed results.

Tonal rendering: The gray tone rendering in the lights has been significantly improved compared to the ADOTECH I. Now the CMS 20 PRO II reaches approximately the same curve as a normal black and white film. In particular, the shadow detail has been significantly improved. In addition, the usable sensitivity range has been slightly extended.

Shelf life: Since ADOTECH III, shelf life restrictions have been eliminated. ADOTECH IV now lasts like a normal developer and no longer needs to be filled with water after partial usage. In addition, it has a significantly improved stability against streaks on larger homogeneous gray areas. This typical problem of the high-resolution process can now be considered mostly eliminated. Please note that, unlike working solutions, the concentrate should not be stored in the refrigerator (risk of precipitation). Concentrates should not be stored below approx. 11 ° C to 13 ° C.

WHY IS ADOTECH IV SPECIAL?

CMS 20 PRO II and ADOTECH IV are to be considered a closed imaging system. The CMS 20 PRO II is not a „regular“ film designed to produce halftones (greyscales) in any reducing

agent. The ultrahigh resolution of this imaging system is the result of the monodisperse ultrafinegrain emulsion of this film and the special developing technique used in ADOTECH IV. This is the reason why you should not develop CMS 20 in just any other developer. If you use a generic developer, the results will be high in contrast, unpredictable and poor. Please understand that for the above reasons we cannot give any

technical support for other developers but ADOTECH.

DEVELOPING CMS 20 PRO II WITH ADOTECH IV

The different sensitivities are achieved by adjusting the development temperature, the agitation rhythm and the development time. The values apply equally to 35mm and 120 film.

ISO	Dilution	Temperature*	Time (minutes)	Agitation (first 30 sec. constant)	Contrast
3/6°	1+14	20° C	7,5	1x every min.	Normal (N)
6/9°	1+14	20° C	10,5-11	1x every min.	Normal (N)
10/11°	1+14	22° C	10,5	1x every min.	Normal (N)
12/12°	1+14	23° C	10	1x every min.	Normal (N)
20/14°	1+14	24° C	11	1x every 2min	Normal (N)
25/15°	1+14	26° C	11	1x every 2min	Slightly higher (N+0,5)

* All temperature values represent the temperature of the working solution. It is not necessary to keep this temperature constant (e.g. in a warm water bath) during the development. On the contrary, doing this would damage the results. It is only necessary to ensure that the development takes place in a room with a normal room temperature

between 20 ° C and 21 ° C.
If the development takes place at higher room temperatures, the development time must be reduced accordingly. It should be noted that the higher the room temperature is and the higher the working solution temperature is, the more the development time has to be reduced.

PROCESSING GUIDELINES

Quality: When exposed at low sensitivity, the grain is slightly finer, while the resolution and the dynamic range slightly higher. Sharpness and detail contrast of the image are slightly better at higher sensitivities.

Mixing: The mixing of the working solution should be made with distilled water. Using a slightly harder water might affect the quality and contrast of the image.

Pre-wash: There is no need for pre-washing the film. Pre-washing will lead to an increased contrast.

Agitation: First half minute ongoing, then once every minute 1 tilt. Tilt the tank gently and try to imitate a rotation with your hand sideways. If you have troubles with inhomogenities (especially around the perforation holes of the 35mm film), agitate more slowly and more steadily. People tend to agitate differently. If you notice too high contrast, decrease the development time slightly. If you find the contrast is too low, increase the development time slightly. Try to keep your agitation constant.

Intermediate-wash: After the development, *do not* stop by using water. We recommend using either an acidic stop bath or directly fix the film with an acidic fixer after the development.

Fixing and inal rinse: The fixing time is only 30 to 60 seconds in any rapid fixer due to the small silver grains.

The final rinse should be shortened to 5 minutes for complete archival stability.

Wetting-agent bath and drying: The wetting agent bath should not be as concentrated as for conventional films. The wetting agent bath should happen outside the developing tank, preferably in a clean tray. After processing, make sure to rinse your reels well. Clean your tanks thoroughly to wash out any fixer traces. Ideally use a separate tank just for ADOTECH IV.

After the wetting agent bath, gently wipe the film with soft kitchen paper. The kitchen paper used should be white and without colored drawings. This method absorbs excess water and accelerates the drying process.

Shelf life of the working solution: Diluted ADOTECH IV can last up to 14 days when stored in fully filled bottles. This shelf life can be extended by storing the working solution in the fridge.

