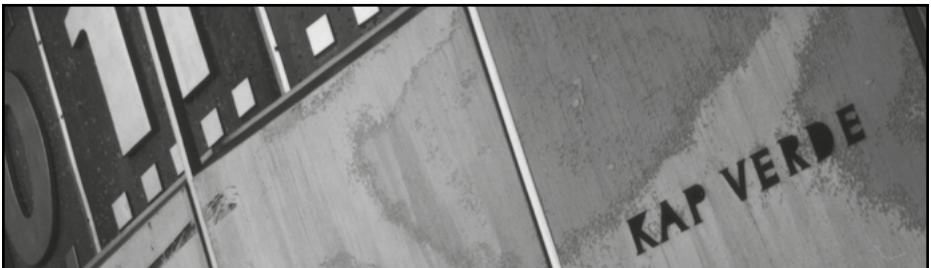
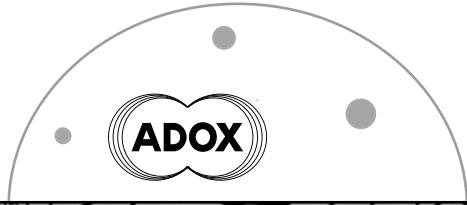


# ADOX CMS 20 Ultrahigh-Resolution-Film

Up to 20 ASA achievable when developing to greyscales • Up to 800 lp / mm resolution

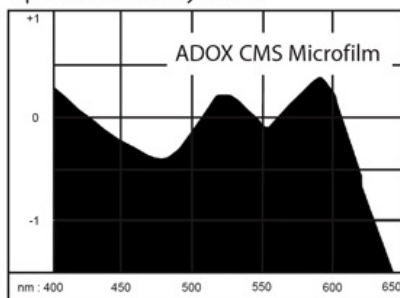


## ADOX CMS 20 and ADOTECH II

The spectral sensitivity of ADOX CMS 20 differs only slightly from that of other slow speed films. When designing the emulsion special care was taken to achieve a superior tonal differentiation.

CMS differs very good between red and blue. His sensitivity ranges from 400nm just until 650 nm. He is thus an orthopanchromatically sensitized film. ADOX CMS 20 is a monodisperse, ultrahigh resolving document-film. In order to make this material usable for pictorial photography ADOX developed the ADOTECH II chemistry system which leads to superior results. Comparing ADOTECH II with ADOTECH I the characteristic curve of the films was straightened which results especially to an improved highlight differentiation.

Spektrale Empfindlichkeitsverteilung:  
Spektral Sensitivity Curve:



### Technical Data ADOX CMS 20

#### Type:

Silver halide recording material with an anti-halation layer inbetween emulsion and filmbase yielding highest sharpness and resolving power. Light cannot diffuse within the base layer.

Filmspeed for normal contrast situations: ISO 16/12°.

Filmspeed for reduced contrast situations: ISO 20/14°

Exposure to 20 ISO requires a dedicated development and such has to be held the same over the entire film length

Spectral sensitivity: Orthopanchromatic.

#### Grain-Size:

RMS at density 1,0 und a focal opening of  $25\mu = 14$ .

Other films are measured at  $45\mu$  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  $45\mu$ . CMS 20 is the finest grain and highest resolution recording material known on earth.

#### Reziprocity failure:

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

#### Resolution:

Resolution in high contrast 1000 : 1 = 800 Lp/mm (line pairs/mm).

(Do not confuse with lines/mm)

**Note:** Because of the clear Polyester base of the film light may penetrate through the cartridge mouth and spoil the first images. Please always keep the film in the black light tight containers before loading. Load the film in subdued light quickly.

Because of the thin emulsion the film pops more easy out of focus.

The best way to work around this is to stop down at least one stop. If you stop down more than 2 stops your lenses resolution will be reduced. The best is to use high quality fast fixed focal length lenses (e.g. Leitz Summicron Asph. 1:2/35mm).

Stopped down to 5,6 such a lens yields highest resolution.

You have to use a camera with the possibility of manual filmspeed settings. There is no DX code assigned to 16 or 20 ASA!

If you cannot set other speeds than 25 ASA check if you can override the exposure by 1/3rd f-stops (this is usually possible). 20 ASA equals 1/3rd stop less than 25 and 16 ASA equals 2/3rds of a stop down.

### Processing of ADOX CMS 20 in ADOX ADOTECH II Developer PET bottle 100ml conc.\*

\*(If you own a small glass bottle containing 50ml of ADOTECH II produced earlier than September 2013 the amount of concentrate has to be divided by two e.g. instead of 33 ml take only 16,5ml and fill to 500 ml)

### Processing of 6 rollfilms 120 or 6 35mm films in 500 ml of working solution (Jobo Tank)

- Film 1 and 2: pour 33 ml of ADOTECH in your beaker and fill to 500 ml with 20° or 24° C warm water  
-Refill the ADOTECH bottle with water to 100ml.-
- Film 3 and 4: pour 50 ml of ADOTECH in your beaker and fill to 500 ml with 20° or 24° C warm water  
-Refill the ADOTECH bottle with water to 100ml.-
- Film 5 and 6: pour 100 ml of ADOTECH in your beaker and fill to 500 ml with 20° or 24° C warm water  
-Refill the ADOTECH bottle with water to 100ml.-

After each development fill up the ADOTECH bottle with water to 100ml. This way ADOTECH stays fresh for one year even though you have opened the bottle already.

With each 500 ml of working solution 2 rollfilms 120 can be processed.

We recommend developing the films one after the other instead of spooling two films in one reel.

Increase the developing time with each second film by 10 to 15%.

### Processing of 6 rollfilms 120 or 6 35mm films in 600 ml of working solution (Various Tanks)

If your tank uses more than 500ml per film you can mix 600ml from 33 ml of concentrate (resp. from 50 or 100 for film 3/4 or 5/6) and extend the developing time from 10 minutes to 13 minutes!

### Processing of 6 35mm films in 250 ml of working solution (Jobo Tank 1501)

- Film 1: pour 16,5 ml of ADOTECH in your beaker and fill to 250 ml with 20° or 24° C warm water  
-Refill the ADOTECH bottle with water to 100ml.-
- Film 2: pour 20 ml of ADOTECH in your beaker and fill to 250 ml with 20° or 24° C warm water  
-Refill the ADOTECH bottle with water to 100ml.-
- Film 3: pour 25 ml of ADOTECH in your beaker and fill to 250 ml with 20° or 24° C warm water  
-Refill the ADOTECH bottle with water to 100ml.-
- Film 4: pour 33 ml of ADOTECH in your beaker and fill to 250 ml with 20° or 24° C warm water  
-Refill the ADOTECH bottle with water to 100ml.-
- Film 5: pour 50 ml of ADOTECH in your beaker and fill to 250 ml with 20° or 24° C warm water  
-Refill the ADOTECH bottle with water to 100ml.-
- Film 6: pour 100 ml of ADOTECH in your beaker and fill to 250 ml with 20° or 24° C warm water

After each development fill up the little glass ADOTECH bottle with water to 100ml. This way ADOTECH stays fresh for one year even though you have opened the bottle already.

### Processing of 6 35mm films in 300 ml of working solution (Other tanks)

If your tank uses more than 250ml per film you can mix 300ml from 16,5 ml of concentrate (resp. from 20 or 25.. for film 2,3,4..) and extend the developing time from 10 minutes to 13 minutes!

### Developing of 25 sheetfilms 4x5" in 1500 ml of Working solution

Pour 100 ml of new ADOTECH in your beaker and fill to 1500 ml with 20° or 24° C warm water. We recommend tray development with gentle but constant agitation in order to prevent inhomogenities in larger grey areas. In 500ml of working solution up to 8 sheets can be developed. If you use a Tank please agitate slowly but steadily. With sheetfilms you might have to use constant agitation other than what we recommend further down for 35mm. Always develop only one sheet at a time! After 12 sheets increase the developing time by 10%.

- In 250 or 300 ml of working solution **one film** can be developed. In 500 or 600 ml of working solution two films can be developed. After use the working solution shall be discarded.
- The working solution can be kept for 1-2 days under protective gas or in fully filled glass bottles (sheetfilm multi use).
- Developing time: Times vary for the different versions of this developer and should be taken from the instructions on the bottle. The latest version needs **10 minutes** if diluted to either 250ml or 500ml and **13 Minutes** in the **higher dilutions** to 300ml or 600ml **at 20°C for 20 ASA**.
- Agitation: First half minute ongoing than once every minute. Tilt the tank gently or move it on a flat table in the shape of an 8. If you have trouble with inhomogenities agitate more slowly and more steadily. There is no need for pre-watering the film. Pre-watering will lead to an increased contrast. People tend to agitate differently. If you notice too high a 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.
- After the development you **MUST** use an acidic stop bath before fixing. Do **NOT** use plain water.
- Fixing: Because of the small, fine grains ADOX CMS 20 needs only 30 to 60 seconds of fixing in

regularly diluted fixers at 20°C. If you overfix the film your highlights (in the negative) will burn out.

- Washing: Can be shortened to 5 Minutes. ADOTECH II yields very high tolerance against density irregularities in large homogenous grey areas which are common for microfilms. In order to keep this protection we recommend developing only one film at a time in a tank. Clean your tanks thoroughly before use to wash out all fixer. Ideally use a separate tank just for ADOTECH.



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*Thoroughly clean your tanks after each use. We recommend a separate clean tank just for the Adotech procedure. Do not only rinse your tank. Clean it with a brush or a sponge thoroughly after washing and wipe it dry with a paper towel before developing a new film.*

### Characteristics of ADOX ADOTECH II developer

- Very good film speed utilisation
- Enhanced edge sharpness and resolution
- Very good detail contrast
- Remarkable exposure latitude. Capable of equalizing high object contrast and better resolution in the highlights.
- Enhanced highlight and shadow differentiation without negative affect on the midtones.
- Very good  $d_{max}$ .
- Very fine grain
- Suppresses artefacts in large homogenous grey areas
- Easy to use (can be used in tanks also used for other developers)
- Remarkably long shelf life for a technical developer

**Important notice:** CMS 20 and ADOTECH are to be considered a closed imaging system. CMS 20 is not a „regular“ film designed to produce halftones (greyscales) in any reducing agent. The ultrahigh resolution of this imaging system is based on the monodisperse ultrafinegrain emulsion of this film and the special developing technique used in ADOTECH II. This is the reason why you cannot develop CMS 20 in any other developer.

The inventors of ADOTECH II dedicated half a human's lifespan to formulate this very special developer.

If you use a generic developer the film will get black but 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 II.

### Complaints

In case of a complaint we always need unexposed and exposed material to be sent back (if possible in the original packaging). In any case we need the full emulsion number. Defective material will be replaced by with new material of the same amount and kind. Any consequential damages are excluded. Silver halides (processed film) are being affected by other chemicals and may change in colour over time. There can be no guarantee given that processed materials will never change as there are too many factors (one of them being the way the film has been treated in processing) affecting the material.

Latest revision of this datasheet: Oktober 16th 2014.