

Retro 100 **TONAL**

Traditional orthopan chromatic black-and-white film
- new production -

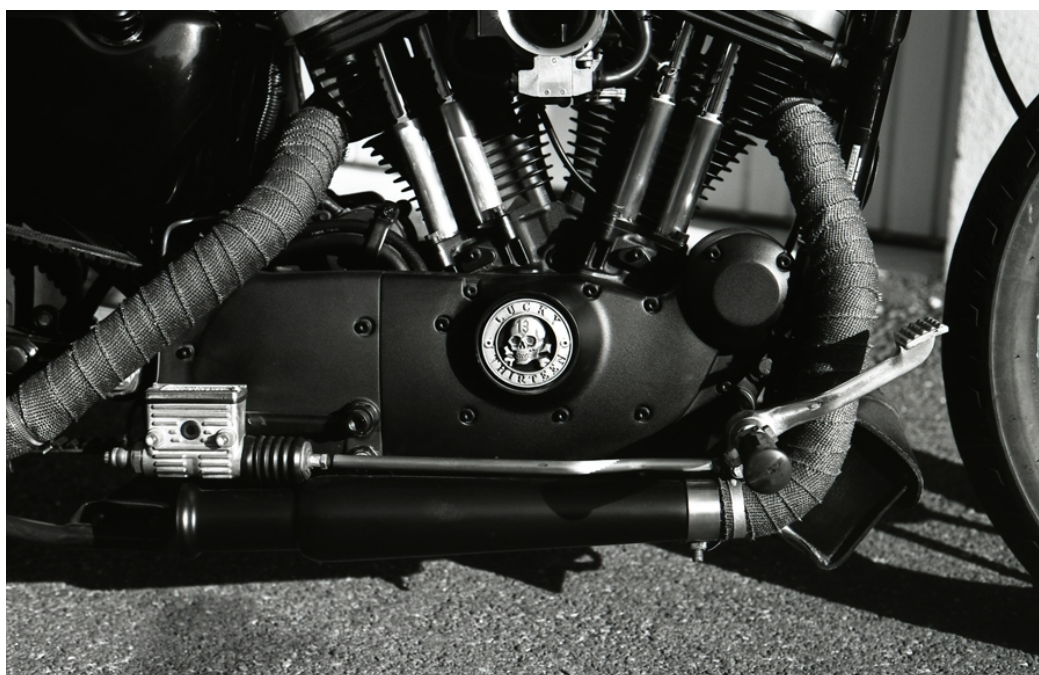


Photo: © Georges Gardano

Worldwide unique black-and-white film

1 Key features

- His key features make the Retro 100 TONAL the top choice for portrait photography among films available at the moment
- Unsurpassed sharpness and grain
- As easy to process as panchromatic films in world leading standard developers (D76)
- Usable as slide film with stunning maximal density in the Agfa Scala processing (3,30 – 3,45 max.D in different developing processes)
- Smoother gradation characteristics than Agfa Scala which gives prints and projections very beautiful tonal values
- Resolving capacity of 260 Lp/mm by contrast 1:1000
- 100 Lp/mm higher resolving capacity than top panchromatic films with same sensibility (high standard films feature a 120 to 150 Lp/mm resolving capacity)
- Base material features:
 - robust, dimensionally stable, archive stable
 - clear synthetic ideal for scanning

2 Features and uses

The Retro 100 TONAL is a medium speed black and white negative film with orthopan chromatic sensitization, excellent tonal gradation, highest resolution, fine grain and excellent sharpness. Decades ago this film was included in the Agfa product line as portrait film.

Unlike other pure ortho chromatic films the Retro 100 TONAL differences between red and black. These feature make it an excellent choice for a wide range of photographic applications, including architectural subjects, landscape, portraits and so one. The film can be processed with all black and white developer and offers a very high standard regarding archival features.

His crystal clear base material opens the possibility to use it as a slide film to be developed in the Agfa Scala process.

3 Film sizes, base material and thickness

Film size	Base material and thickness
135/36, 135/30.5 m and 120	Real synthetic film base 100 µm thickness
Sheet films: 10,2x12,7cm (4x5") 20,3x25,4cm (8x10")	Real synthetic film base 175 µm thickness

4 Important handling notes

Films with a synthetic film base has to be loaded in the camera and unloaded in subdued light. Before and after exposition always store the films in the black light-tight rollfilm-container. Not following these advices can cause light infiltration through the base material to the exposed pictures. Please take care in handling the 120 size films in keeping the film-roll tight with two fingers after breaking the unexposed adhesive label to avoid that the film is rolling to spring off. The same procedure should be followed after taking the roll film out of the camera. The exposed film should be kept compellingly again in the black light-tight rollfilm-container.

5 Technical data

Sensitivity

orthopan chromatic, ca. 380 nm to 610 nm

Sensibility

depending on the developer

- daylight: ISO 100/21° to ISO 200/24°

- artificial light: ISO 50/18° to ISO 100/21°

Base Material

Real synthetic film base for LE500 storage (highest level of archive stability)

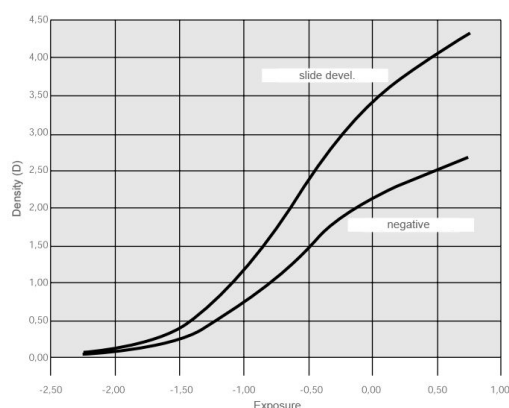
Resolving Capacity

260 Lp/mm by contrast 1:1000 compared to the Rollei Retro 100 (APX 100) with 150 Lp/mm

Processing

in absolute darkness or by indirect dark red labor light

6 Exposure curve



7 Exposure guide

Under daylight (5400K) the film has a sensibility of ISO 100/21° (ISO 200/24° in some developer with higher sensibility gain like ILFORD MICROPHEN). Because of the low sensibility for long-wave (red) light it is recommended to assume that the sensibility is reduced of one stop, when taking pictures with artificial light or when the sun is low (sunset), comparing to the effective sensibility with daylight.

If you don't use a exposure meter you can use the following nominal values. In this case it is recommended to do serial exposures beginning one stop under the metered value until one stop over.

Situation	Time, aperture
Sunshine in high mountains	1/125, f22
Beach or snow landscape in bright sunshine	1/125, f22
Bright sunshine (sunny 16 rule)	1/125, f16
Sunshine and high fog	1/125, f11
Cloudy, sunshine	1/125, f5.6
Covered, shadow	1/125, f5.6

8 Filter factors

With cameras with TTL exposure measurement when measured through the filter generally a correction is not needed. By measurement with a light exposure the measured values have to be multiplied with the indicated factor or rather the lens aperture has to be opened about the indicated number of steps.

Filter	Extend the shutter speed by the factor of	Open the lens aperture of
Yellow (#8)	1.5 to 2	½ to 1
Dark yellow (#15)	2 to 3	1 to 1½
Greenish yellow(#11)	3 to 4	1½ to 2
Orange (#21)	3 to 4	1½ to 2

Because of the reduced red sensibility of the Retro 100 TONAL red filter are not recommended.

The values are for pictures taken under daylight. Artificial light contains a greater part of red then daylight. Accordant it is reduced slightly less by yellow and orange filter. A reduction of the extension factor for the shutter speed about 0.2 to 0.5 or respectively the lens aperture of 1/3 to ½ is recommended in these cases.

9 Reciprocity characteristics

The reciprocity-law, which says that the light exposure remains the same when the lens aperture is closed of one stop and the shutter speed is duplicated, normally is only valid if the shutter speed is not too short or too long, normally between ½ s and 1/1000 s. With a too long shutter speed the reciprocity error or Schwarzschild-Effect appears. As an example: if the light meter shows a shutter speed of 4 s, it should be assumed that the shutter speed will be between 8 s and 10 s. The following correction values can be helpful.

Measured time (sec.)	Effective exposure time (sec.)
1	1 to 2
2	3 to 4
4	8
8	24
15	60
30	180

By important pictures a picture should be taken with the chosen lens aperture and the corrected shutter speed, one picture with a +1 stop comparing to the first picture and one more with a -1 stop comparing to the first picture. Taking a serial of pictures with different lens apertures has the advantage, that you don't have to calculate for every picture the corrected shutter speed.

The reciprocity error causes a higher contrast, because a smaller extension factor counts for the lights as for the shadows. Films with longtime light exposure usually profit from a compensating developing, for example with the Rollei RHS High Speed.

10 Presoaking

The Retro 100 TONAL has a crystal clear base material and a water soluble anti halation backing. To eliminate this coat and to ameliorate sensibility gain and uniformity of the development it is recommended to presoak the film during 30s in tap water without agitating to much (agitation every 2.5 or 3 s). The temperature of the water should be the same as planned for the developing process. Advice: by eliminating the water soluble anti halation backing the washing water will be dark blue when poured out. This discoloration is normal. It is sufficient to presoak one time as described above. It is not necessary to wash until the discoloration is disappeared.

11 Processing in labs

Those photographer who do not develop the Retro 100 TONAL themselves can bring films which are exposed with nominal sensibility to every normal photographic laboratory. If the films are overexposed or underexposed it is recommended to access to the special skills of professional laboratories. Please inform the lab about the exposition so that they can chose the correct processing time to compensate. The developer used in laboratories are in most case fine grain developer. This developer are the best choice to gain optimal results. Preferably no hot drying. Cold drying is recommended. For roll films the use of special wetting agent which are optimized for polyester films, like Rollei RWA Wetting Agent, is recommended.

12 Processing and development times

The following developing times are supposed to be a reference for personal optimizations. They are designed for a gamma value of 0.65. It can be necessary to change the values according to your personal necessity.

The developer has an influence to the sensibility. Variations of the sensibility of ISO 100/21° are noted.

Note 1: because of the fresh emulsion it is recommended during the years 2010 and 2011 to add some drops of Rollei RBM 5 Black Magic Additiv (RBM54).

Note 2: high silver content emulsions like Rollei Ortho 25 or Retro 100 TONAL are very sensitive to metal ions contained in the tap water. Therefore it is recommended to use distilled or demineralised water.

Developing time table

The recommended developing times are valid only with the recommended presoaking and a agitation of 1 time every 30s at 20°C (exceptions noted).

Developer	Developing time (min.)
Rollei RLC Low Contrast 1+4	8
ECOPRINT universal 1+12	5
Rollei RHS 1+7	5
Rollei RHS 1+9	6
Rollei RLS 1+4	14 (24°C) (ISO 50/18°)
Champion Promicrol 1+14	10
Champion Promicrol 1+9	6.5
Ilford ID 11 Stock	7
Ilford Ilfotec HC 1+15	5
Ilford Microphen Stock	7 (ISO 200/24°)
Ilford Perceptol Stock	9 (ISO 50/18°)
Kodak D-76 Stock	7
Kodak HC-110 Dil. B	5
Kodak T-Max 1+4	6
Kodak Xtol 1+2	16
Moersch MZB	Bath A: 10 Bath B: 7½ (24°C) (ISO 64/19°)
Tetenal Ultrafin 1+10	7 (agitate every 3 s)
Tetenal Ultrafin 1+20	9 (agitate every 3s)
Rodinal (R 09 One Shot) 1+50	13

13 Temperature and processing time

To achieve constant results it is recommended to process at the same temperature every time, usually 20°C. Should it be necessary to process at an other temperature it is recommended to use the following corrections.

18°C	19°C	20°C	21°C	22°C	24°C
5	4 ½	4	3 ½	3 ¼	2 ½
5 ½	5	4 ½	4	3 ¾	3
6	5 ½	5	4 ½	4	3 ¼
6 ½	6	5 ½	5	4 ½	3 ½
7 ¼	6 ½	6	5 ½	5	4
8	7 ¼	6 ½	6	5	4 ½
8 ¾	7 ¾	7	6 ½	5 ¾	5
9 ¼	8 ¼	7 ½	6 ¾	6	5 ¼
9 ¾	8 ¾	8	7 ¼	6 ½	5 ½
10 ½	9 ½	8 ½	7 ¾	7	6
11 ¼	10	9	8	7	6 ¼
11 ¾	10 ½	9 ½	8 ½	7 ¾	6 ¾
12 ½	11 ¼	10	9	8	7
13	11 ¾	10 ½	9 ½	8 ½	7 ¼
13 ¾	12 ¼	11	10	9	7 ½
14 ¼	12 ¾	11 ½	10 ½	9	8
14 ¾	13 ¼	12	10 ¾	9 ¾	8 ¼
15 ¼	13 ¾	12 ½	11 ¼	10	8 ¾
16	14 ½	13	11 ¾	10 ½	9

14 Stop bath

The stop bath has the function of neutralize alkali on the film which reduces the efficiency of the fixing. By processing films the utilization of a stop bath between developer (alkali) and fixing (acidic) is not absolutely necessary. If a stop bath is used the following recommendations are valid.

Stop bath	Stop time (min.)
Rollei RCS Citrin Stop 1 + 19	1

If no acid stop bath is used it is recommended to water the film two time for 30s at a temperature of 20°C by agitating constantly. So the carryover of developer remains to the fixing bath can be prevented.

15 Fixing

Rollei RXA Fix Acid 1+7 (a modern high-performance fixing bath with a ammonium thiosulfate basic) or a similar product is recommended for fixing.

It is recommended to determine the fixing time through a test with an undeveloped film piece. To do this you hold the film piece in the fixing bath and you record the time that it takes to become absolutely clear. The required fixing time is three times the recorded time.

If the fixing bath is used several times, this time becomes longer with the number of processed films. When the recorded time has reached twice the time of a new bath, the bath should be discarded.

The best fixing is gained with the two-bath-method. For this two fixing baths are prepared and stored in two different containers. The film is fixed in the first bath for half of the fixing time. The first bath is canted back in the container and the film is fixed for the same time in the second bath. If the clearing test shows that the first bath is exhausted, it is thrown away and substituted by the second bath. The second bath is replaced by a new bath. So the capacity of the fixing bath is well used and the films are well fixed. If no clearing test is done it is recommended to fix the film for 3 minutes by 20°C. (in a new fix bath).

16 Washing

The washing with running water is only recommended if a constant temperature of 20°C is assured. By normal house connection this can't be normally assured. So it is more secure to use a cascade washing method with water at a temperature of 20°C. The following cycle is recommended:

- Fill the tank with 20°C water, agitate 5 times, allow to stand for 5 min
- Change of water, agitate 10 times, allow to stand for 5 min
- Change of water, agitate 20 times, allow to stand for 5 min
- Throw away the water, wetting agent bath

17 Wetting agent

As final bath a wetting agent bath, prepared with deionized or distilled water is recommended to prevent dry spot cause by hard water or static charging of the film. A static charging brings the film to pull in dust.

Recommended is Rollei RWA Wetting Agent for one minute without agitation.

Wetting agent should not be overdosed. It is only possible to use it more then one time if several films are processed one after the other. Foam don't passes good off the film. For this reason it is recommended to add carefully the water to the wetting agent to prevent the creation of foam. It can be helpful to prepare the wetting agent at the same time as the developer. So possibly foam can decompose during the time the film is processed.

18 Drying

It is not recommended to wipe the film, because of the danger to grate the film. After the wetting agent bath as much water as possible should be removed from the film through shaking when the film is still in the reel. Then you take the film out of the reel and hang it up in a dust arm place for several hours. To obtain a better flatness, the end of the film should be weighted.

As an explication: The often used base material of cellulose triacetate tends to contract and to decompose when stored under bad conditions. The Image Permanence Institute has proved that after only five years severe damages can appear when the negative is stored warm and humid. This danger does not exist with polyester base material. Polyester (specially PET) is high grade persistent adverse environmental influences and mechanical more stable than cellulose triacetate. Polyester base material tends to maintain the curvature they have received during fabrication, if they are not forced to flatness during the drying. Roll films on polyester base material should be hanged with weights under tension during several hours. While using normal weights (up to multiple kilos) a cracking of the film has not to be expected. The film has to be hanged up firmly but clips which perforate the film should not be used as

the holes can pull out.

When the film is dried in a drying cabinet the heating should be turned off.

The use of a drying cabinet is not recommended as it tends to blow dust on the film and this will cause damages on the surface.

19 Travel with films

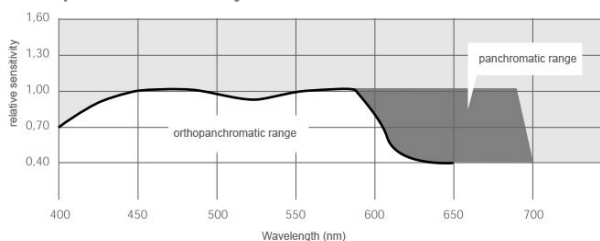
Retro 100 TONAL films are specially resistant to storage conditions. Generally a dry and not too warm storage is recommended for light sensitive material.

20 X-Ray controls at airports

There shouldn't be any problem with the control of cabin luggage if the machines at the airports are branded as 'film safe' also when the films are irradiate more then one time (up to 5 times).

Problems can occur when the films are transported in the luggage, as this luggage is irradiate with higher dosed radiation. For this reason it is recommended to transport the films in the cabin luggage.

21 Spectral sensitivity curve



22 Scanning of negatives

The Retro 100 TONAL is absolutely qualified for scanning with film scanners and flatbed scanners because of his transparent base material.

23 Notes

In this section are gathered important and useful advices directly from the test field.

- Because the film is very fresh and the ortho sensitizer tends to calcium dots in the emulsion, it's recommended to use the developer and wetting

agent with distilled or demineralised water.

- Because of the orthopan chromatic sensitizer you should be aware that deep greens will cause a loss of sensibility of about 1/3 stop.

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Notice

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