

1.) Rinsing

You **must not rinse** after developing. You may either use an acidic stop bath or fix immediately after developing.

2.) Development dynamics

Due to different development dynamics, high resolution techniques are invariably more sensitive to schlieren and other artefacts than conventional development techniques. **That is why you are strongly advised to use a tank of optimal size when you develop roll films: if you need 500 ml WS, do NOT use a tank larger than 500 ml. If you use Jobo tanks for example, never use Multitank 1540 (which is made for 1 litre of WS). You would have to use Unitank 1520 (which is made for 500 ml of WS).** The same goes for other makes. **When developing 35 mm films, be careful not to pour too heavily; pour moderately. Heavy pouring may result in inadvertent density variations at the sprocket holes!** Also, you should process only **one 35 mm film per tank and development.** Two 35 mm films per tank at most.

3.) Wetting agent and drying

The wetting agent should not be as concentrated as is standard with conventional films. **Also, we recommend to use the wetting agent outside the development tank and to rinse the spiral thoroughly after that. Dried residues of the wetting agent might froth up and cause air bubbles possibly resulting in faulty development.** After using the wetting agent we recommend that 35 mm films be wiped carefully with kitchen roll with no colour prints on (use the soft side). This way, surplus water and possible residual dirt are soaked up very well, which speeds up the drying process.

4.) Shelf life

a) Concentrates

The developer components **Part A1 and Part A2** are very durable due to their low pH-value; just like any other developer, however, they are subject to oxidation. In order to utilise the high shelf life, concentrates should be poured into clean (brown) glass bottles – full to the brim if possible – and stored in the fridge after first opening the original bottle. You should use a variety of glass bottles with different volumes (e.g. 250 ml, 150 ml, 100 ml and 50 ml) for this. You can re-use these after rinsing for the same purpose. In case you cannot fill the bottle to the brim, we recommend the supplementary use of protective gas.

If you leave the opened developer in the original bottle, the use of protective gas is hardly useful, because the original bottle is made of non-gas-tight synthetic material, so that the protective gas would be gradually replaced by air, which would shorten the shelf life!

Part B does not contain any developer substances and is, thus, not subject to oxidation. Thus, **Part B** has a virtually unlimited shelf life and can be kept in the original bottle.

b) Working solutions

In contrast to the concentrates, the working solutions have a relatively short shelf life (max. a few days in brimful bottles). **Therefore you should not prepare more working solution than required and use it soon after preparation.** Never re-use a working solution!

Exception: for the development of a roll film 500 ml working solution are needed; this amount of WS is sufficient for two films. **You may thus use one and the same WS for a second film immediately after the development of the first.**

5.) Analogue-Digital-Interface (A/D-Interface)

High-performance scanners can be used to create picture files that allow of prints in absolutely outstanding quality. Such digitally created prints, however, do not match the quality of photochemically created prints. This is because the resolution of even the best high-performance scanners on the market does not even come close to the resolving power of high resolution document copy films.

DATA SHEET

Inversion Development



Speed Photography
+
Ultrahigh Resolution

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SPUR MODULAR UR NEW

SPUR MODULAR UR New– Parts A, Part B, – a new modular developer system for high resolution document copy films.

SPUR MODULAR UR allows of the perfect match between emulsion and developer so that superior results are achieved with any document copy film such as SPUR DSX/Agfa Copex Rapid, SPUR Orthopan UR/ADOX CMS 20 and Rollei ATP 1.1.

Different Parts A are needed for the respective emulsions. Part A1 is needed for SPUR DSX/Agfa Copex Rapid; Part A2 is needed for SPUR Orthopan UR/Adox CMS 20 and for Rollei ATP 1.1. Part B is the same with all emulsions.

The Parts A1 and B are needed for the absolutely schlieren-free development of the SPUR DSX/Agfa Copex Rapid roll film; Part C is no longer needed! The film speed reduction of the roll films that has been necessary up to now is no longer needed, either!

The properties of our previous document copy film developers (sharpness, fineness of grain, resolving power, exposure latitude, tonal values, speed utilisation) are retained by **SPUR MODULAR UR New** or, indeed, surpassed.

Specifications of SPUR DSX:

Film type: silver halides with A.H.U (Anti-Halation-Undercoating)

Emulsion thickness: 5 μ

Spectral sensitivity: orthopanchromatic

Filter factors: yellow + 0.5 to f/number, orange + 1 to 1.5 f/numbers, red + 4 f/numbers, green + 1 to 1.5 f/numbers

Graininess: RMS-graininess at density 1.0 and aperture size of 48 μ = 9. **Resolution:** The resolving power attains 600 LP/mm at a contrast ratio of 1,000 : 1

Reciprocity: 1 sec + 1/2 f/number, 10 sec + 1 f/number, 1/10,000 sec + 1/3 f/number

Specifications of SPUR Orthopan UR:

Film type: silver halides with A.H.U (Anti-Halation-Undercoating)

Spectral sensitivity: orthopanchromatic

Graininess: RMS-graininess at density 1.0 and aperture size of $25 \mu = 14..$ A comparison with SPUR DSX based on the meter reading is not possible since the graininess of this film was gauged at a different aperture size (48μ). The graininess of the **Orthopan UR** is much finer than that of the DSX film.

Resolution: The resolution is 800 LP/mm at a contrast ratio of 1,000 : 1.

Reciprocity: 1 sec + 1/2 f/number, 10 sec + 1 f/number, 1/1,000 sec + 1/2 f/number

Shooting: Please note that:

1) Due to the properties of the film base, flare may penetrate the cartridge along the perforation from the tip end of the film (only with 35 mm films). This may spoil the first shots. In order to avoid this, the film should be kept in an opaque film can and **must not** be exposed to light before or after exposure. Make sure that the film is not exposed to bright light when loading the camera; choose a dim environment.

2) Compared to conventional black-and-white films, high resolution document copy films have a lower emulsion thickness. Therefore you should stop down once or twice in order to make sure there is sufficient depth of focus so as to compensate for a possible drifting-off of the emulsion from the optimum focal plane. In order to fully utilise the high resolving power of the film, you should **not stop down more than is necessary!** (Naturally, this is also dependent on the desired effect.) For this reason you should use high-speed lenses.

3) The camera must allow of a manual adjustment of the film speed.

Film processing:

Please note the following as a basic principle:

Due to the new type of schlieren-free development the gradation control can no longer be exercised through development times only; it has to be exercised through dilution and inversion tact in addition. Thus, a different dilution for condenser and diffuser contrast is required when preparing the working solution! Development times that are longer than suggested are not advisable, as longer development times cause silver precipitation that may deposit on the emulsion layer!

1) SPUR DSX / AGFA Copex Rapid, 35 mm miniature film

Condenser:

Film Speed: ISO 40/17° to ISO 50/18°

Preparation of 250 ml WS: 50 ml Part A1 + 20 ml Part B, use water to bring to 250 ml

NO PRE-WASHING!

Development time at 20° C: 5.5 to 6 minutes

Inversion tact: steadily during the first **30** seconds, then once every **60** seconds

Fixing time: 60 seconds **Final wash:** 5 minutes

Diffuser:

Film Speed: ISO 40/17° to ISO 50/18°

Preparation of 250 ml WS: 50 ml Part A1 + 10 ml Part B, use water to bring to 250 ml

NO PRE-WASHING!

Development time at 20° C: 13 minutes

Inversion tact: steadily during the first **30** seconds, then once every **60** seconds

Fixing time: 60 seconds **Final wash:** 5 minutes

Mixing Systems:

Film Speed: ISO 40/17° to ISO 50/18°

Preparation of 250 ml WS: 50 ml Part A1 + 15 ml Part B, use water to bring to 250 ml

NO PRE-WASHING!

Development time at 20° C: 10 to 11 minutes

Inversion tact: steadily during the first **30** seconds, then once every **60** seconds

Fixing time: 60 seconds **Final wash:** 5 minutes

2) SPUR DSX / AGFA Copex Rapid 120 roll film

Condenser:

Film speed: ISO 50/18°

Preparation of 500 ml WS: 50 ml Part A1 + 50 ml Part B, use water to bring to 500 ml.

NO PRE-WASHING! Development time at 20° C: 5 minutes

Inversion tact: steadily during the first **30** seconds, then once every **30** seconds

Fixing time: 60 seconds **Final wash:** 5 minutes

Diffuser:

Film speed: ISO 50/18°

Preparation of 500 ml WS: 125 ml Part A1 + 25 ml Part B, use water to bring to 500 ml.

NO PRE-WASHING! Development time at 20° C: 9 minutes

Inversion tact: steadily during the first **60** seconds, then once every **30** seconds

Fixing time: 60 seconds **Final wash:** 5 minutes

Mixing Systems:

Film speed: ISO 50/18°

Preparation of 500 ml WS: 70 ml Part A1 + 35 ml Part B, use water to bring to 500 ml.

NO PRE-WASHING! Development time at 20° C: 7 minutes

Inversion tact: steadily during the first **30** seconds, then once every **30** seconds

Fixing time: 60 seconds **Final wash:** 5 minutes

3.) SPUR Orthopan UR / ADOX CMS 20, 35 mm miniature film

Film speed: ISO 10/11° to ISO 12/12°

Preparation of 250 ml WS:

Condenser: 20 ml Part A2 + 10 ml Part B, use water to bring to 250 ml.

Diffuser: 25 ml Part A2 + 10 ml Part B, use water to bring to 250 ml.

NO PRE-WASHING! Development time at 20° C: 6.5 minutes

Inversion tact: steadily during the first **30** seconds, then once every **30** seconds

Fixing time: 60 seconds **Final wash:** 5 minutes

4.) Rollei ATP 1.1, 35 mm miniature film

Not tested yet, data will be provided soon!

Further processing notes:

250 ml working solution suffice for the development of 35 mm films, 500 ml for roll films. 500 ml WS will do for the development of two roll films in succession or for two roll films at the same time if developed on a spiral. **In regions with hard water the WS has to be prepared with deionised water! Rotary development is not recommended because of a loss of speed of up to 1 f/number!**