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## Data Sheet for the SPUR Ultraspeed Vario Development System

The **SPUR Ultraspeed Vario** development system is an advanced push and pull processing technique that allows for exposure and development of films with virtually any speed.

Absolutely new about this development system is that a broad variety of contrasting is available at a chosen speed. This holds true for the push band, and – to a minor extent – for the pull band of development. At a speed of ISO 25/15° the AGFAPHOTO APX 100 New, for example, offers full contrasting ranging from “normal” (N) to “extremely soft” (N – 4). Contrast can be controlled by variation of the dilution and variation of the development times of the first and second development, respectively. The respective parameters are given in the development table.

Conventional push and pull developers use variation of speed for contrast control; that is, the higher the chosen speed, the higher the contrast; and the lower the speed, the lower the contrast.

That is why a low speed (e.g. for an improved fineness of grain) is of no use with a low subject contrast, since the consequently low contrast would make for very poor negatives. When pushing, a high subject contrast has always been detrimental and has always led to utterly insufficient tonal values – up to now.

All these limitations are removed by the new **SPUR Ultraspeed Vario** technique. Compared to other developers of this kind, definition, contrast of detail and graininess are much better, too.

The **SPUR Ultraspeed Vario** development system is a two-bath developer consisting of two different developers. These are:

1. The Ultraspeed Vario first developer
2. The Ultraspeed Vario second developer

Both pull processing and push processing require a two-bath development. This is true for both developers. As a basic principle, you pour for the first 30 seconds permanently during the first development. For the rest of the development time the development tank is not agitated (stand development!).

An intermediate wash is not to be applied. After tipping out the first developer, the second developer has to be filled in immediately!

During the second development, agitate for the first 30 seconds permanently. When pulling, you then pour once per minute during the whole of the given development time. When pushing and developing to the nominal speed rate (box speed), pour twice every minute.

Before the first development you may pre-wash with warm water (20°C / 68° F). This, however, is not necessary. With very high pushing speed values, and especially in some emulsions, there may be residue (silver sludge), which may however easily be removed before drying (use your fingers).

**Explanatory notes on the stated speeds:**

The speed values have been recorded at the foot of the characteristic curve. Thus, the recorded values are absolutely reliable - even in the extreme push band -, as the values refer to the shadow details of the subject independent of contrast.

Moreover, all speed values – without exception – have been recorded according to the calibration of the exposure meter by metering on Zone 5 (middle grey of 18 % reflectance). When metering on the shadows in a poor lighting situation (e.g. theatre photography) when pushing, an extra speed reserve of 2 f-stops is yielded when metering on Zone 3 (dark tonal values with medium shadow detail). Example: When using an automatic exposure control a film speed of ISO 6400/39° can thus be used instead of ISO 1600/33°. If – dependent on the subject – shadow details can be neglected, a further f-stop is yielded.

**For beginners:** All exposure meters are calibrated on middle grey (in the Zone System: Zone 5). When shadows are metered, the exposure meter indicates an overexposure, since it “thinks” the metered shadow section is middle grey. The photographer must correct this mistake by underexposing (based on the metered value) – otherwise the shadows will be rendered much too light. If, however, the lights are metered, the exposure meter will indicate an underexposure, since it “thinks” the lights are middle grey. In this case, the photographer must overexpose (based on the metered value), or else white house walls, for example, will be rendered grey. (Of course, this rule may be flouted successfully, for example, when Low Key or High Key techniques are used).

Since very high film speeds are only needed with poor illumination and subjects with a high portion of shadows (e.g. theatre photography or in dim environments), metering on the shadows is the convention in such cases, which yields a speed reserve as stated above. Thus, a higher film speed can be chosen when using an automatic exposure control. **This, however, is not the real film speed**, but a necessary correction that is owed to the particular circumstances of illumination.

**Caution:** A comparison of the speed values for the **SPUR Ultraspeed Vario** given in our exposure table with other values as can be found on **Digitaltruth or in some other data sheets** is not possible, **since these values are wrong**. Please relate to comparisons we have made:

An example: The **alleged speed of ISO 6400/39°** that – according to **Digitaltruth** – can be gained with the Kodak Tri X 400 with Ilford Ilfotec DD-X at a dilution of 1 + 4 and 25 minutes development time or with the same film with Kodak HC 110, Dilution B, 26 minutes development time is – **according to our criteria – a real speed of ISO 800/30°**. Using the **SPUR Ultraspeed Vario**, a speed of **ISO 1600/33°** is yielded – that is **a full f-stop more!** **Compared to the stated Digitaltruth value this would be ISO 12800/42° (a utopian value that cannot be gained with any film and developer)!**

The exposure corrections that have to be made because of the light situation seem to be included in the calculation of these widely spread false speed values. This is not only dubious, but also false, as these values yield an absolute underexposure when metered correctly on middle grey.

We can claim to the best of our knowledge that **the SPUR Ultraspeed Vario technique produces the highest film speeds ever**. The values we give are absolutely reliable and may thus look less impressive against the exorbitant values given on Digitaltruth or in some other data sheets. **Users may see for themselves by making their own comparisons (diaphragm ranges)!**

## Development Chart SPUR Ultraspeed Vario

Contrast was determined using a densitometer on the respective developed film direct and roughly corresponds with diffusor contrast. The contrast data includes the shift of zones brought about by exposure for speeds deviating from box speed.

Temperature indications other than 20° C refer to filling temperature. At normal room temperature it is not necessary to take any extra steps to keep constant that temperature of 20° C.

Dilutions apply to both the primary and the secondary developers. Both developers must be diluted according to the instructions in the chart.

Manufacturer Film	Temp. ° C	Film Speed ISO	Dilution	Developing time min		Contrast
				First	Second	
<b>ADOX</b>	-----	-----	-----	-----		-----
CHS 100 II	20°	25/15°	1 + 49	3	5	Very extremely low (N - 6)
CHS 100 II	20°	25/15°	1 + 35	2,5	3	Extremely low (N - 4)
CHS 100 II	20°	25/15°	1 + 40	4	3	Very low (N - 3)
CHS 100 II	20°	25/15°	1 + 44	4,5	5	Low (N - 2)
CHS 100 II	20°	25/15°	1 + 49	5	5	Low (N - 2)
CHS 100 II	20°	50/18°	1 + 35	3,5	3	Low (N - 2)
CHS 100 II	20°	50/18°	1 + 27	2	3	Moderately low (N - 1)
CHS 100 II	20°	50/18°	1 + 35	4	4	Normal (N)
CHS 100 II	20°	64/19°	1 + 24	2	3,5	Moderately low (N - 1)
CHS 100 II	20°	100/21°	1 + 20	2	5	Normal (N)
CHS 100 II	20°	200/24°	1 + 14	2,5	5,5	slightly increased (N+0,5)
CHS 100 II	20°	320/26°	1 + 11	3	15	Moderately high (N + 1)
CHS 100 II	20°	400/27°	1 + 9	5	15	High (N + 1,5)
CHS 100 II	24°	500/28°	1 + 9	5	19	High (N + 2)
Silvermax	20°	50/18°	1 + 20	2	4,5	Moderately low (N - 1)
Silvermax	20°	100/21°	1 + 20	4	5	slightly increased (N+0,5)
Silvermax	20°	200/24°	1 + 14	4	10	Moderately high (N + 1)
Silvermax	20°	320/26°	1 + 11	5	15	Moderately high (N + 1)
Silvermax	22°	400/27°	1 + 9	5	15	Moderately high (N + 1)
Silvermax	24°	500/28°	1 + 7	5	19	Moderately high (N + 1)

Manufacturer Film	Temp. ° C	Film Speed ISO	Dilution	Developing time min		Contrast
				First	Second	
<b>AGFAPHOTO</b>	-----	-----	-----	-----		-----
APX 100 New	20°	12/12°	1 + 49	3,5	3,5	Extremely low (N - 4)
APX 100 New	20°	12/12°	1 + 49	4,5	2,5	Very low (N - 3)
APX 100 New	20°	12/12°	1 + 49	4	3,5	Low (N - 1,5)
APX 100 New	20°	12/12°	1 + 49	5	3	Moderately low (N - 1)
APX 100 New	20°	25/15°	1 + 49	3	5	Extremely low (N - 4)
APX 100 New	20°	25/15°	1 + 35	2	2,5	Very low (N - 3)
APX 100 New	20°	25/15°	1 + 35	2,5	2,5	Low (N - 2)
APX 100 New	20°	25/15°	1 + 40	4	2,5	Low (N - 1,5)
APX 100 New	20°	25/15°	1 + 35	2,5	3	Moderately low (N - 1)
APX 100 New	20°	25/15°	1 + 30	2,5	2	Moderately low (N - 1)
APX 100 New	20°	25/15°	1 + 35	3	2,5	Slightly low (N - 0,5)
APX 100 New	20°	25/15°	1 + 24	2	2	Normal (N)
APX 100 New	20°	50/18°	1 + 24	2	2,5	Moderately low (N - 1)
APX 100 New	20°	50/18°	1 + 40	4	4	Slightly low (N - 0,5)
APX 100 New	20°	50/18°	1 + 24	2	3,5	Normal (N)
APX 100 New	20°	50/18°	1 + 40	5	5	slightly increased (N+0,5)
APX 100 New	20°	50/18°	1 + 35	4	4	Moderately high (N + 1)
APX 100 New	20°	100/21°	1 + 20	2,5	2,5	Normal (N)
APX 100 New	20°	100/21°	1 + 20	2	4	Normal (N)
APX 100 New	20°	100/21°	1 + 20	2	5,5	Moderately high (N + 1)
APX 100 New	20°	200/24°	1 + 14	2,5	5	Moderately high (N + 1)
APX 100 New	20°	200/24°	1 + 14	2,5	7	High (N + 1,5)
APX 100 New	20°	400/27°	1 + 11	3	15	Moderately high (N + 1)
APX 100 New	20°	400/27°	1 + 11	5	15	High (N + 1,5)
APX 100 New	24°	640/29°	1 + 11	5	19	High (N + 1,5)

APX 400 New	20°	400/27°	1 + 24	2,5	10	Slightly low (N - 0,5)
APX 400 New	20°	800/27°	1 + 14	4	14	Moderately high (N + 1)
APX 400 New	20°	1000/28°	1 + 11	5	17	Moderately high (N + 1)
APX 400 New	24°	1250/30°	1 + 11	5	19	Normal (N)

Manufacturer Film	Temp. ° C	Film Speed ISO	Dilution	Developing time min		Contrast
				First	Second	
<b>Ilford</b>	-----	-----	-----	-----		-----
FP4+	20°	10/11°	1 + 49	4,5	2,5	Extremely low (N - 4)
FP4+	20°	12/12°	1 + 44	3,5	3,5	Very low (N - 3)
FP4+	20°	16/13°	1 + 49	4	4	Low (N - 1,5)
FP4+	20°	16/13°	1 + 49	5	3,5	Moderately low (N - 1)
FP4+	20°	25/15°	1 + 35	2	2,5	Very extremely low (N - 5)
FP4+	20°	25/15°	1 + 35	2	3,5	Very low (N - 3)
FP4+	20°	25/15°	1 + 35	2,5	3	Low (N - 2)
FP4+	20°	25/15°	1 + 27	2	2	Low (N - 1,5)
FP4+	20°	25/15°	1 + 40	4	2,5	Moderately low (N - 1)
FP4+	20°	25/15°	1 + 35	3	3	Slightly low (N - 0,5)
FP4+	20°	50/18°	1 + 27	2	3	Moderately low (N - 1)
FP4+	20°	50/18°	1 + 24	2	3,5	Normal (N)
FP4+	20°	50/18°	1 + 35	4	4	slightly increased (N+0,5)
FP4+	20°	125/22°	1 + 20	2	5	Normal (N)
FP4+	20°	125/22°	1 + 20	2,5	4,5	slightly increased (N+0,5)
FP4+	20°	125/22°	1 + 20	2	6,5	Moderately high (N + 1)
FP4+	20°	200/24°	1 + 14	2,5	5,5	Moderately high (N + 1)
FP4+	20°	320/26°	1 + 11	3	15	High (N + 1,5)
FP4+	20°	400/27°	1 + 11	5	15	High (N + 2)
FP4+	24°	640/29°	1 + 11	5	19	High (N + 2)

HP5+	20°	100/21°	1 + 44	3	3	Extremely low (N - 4)
HP5+	20°	160/23°	1 + 49	4	4	Very low (N - 3)
HP5+	20°	200/24°	1 + 49	4	6	Low (N - 2)
HP5+	20°	320/26°	1 + 40	5	5	Moderately low (N - 1)
HP5+	20°	400/27°	1 + 30	3	8,5	Normal (N)
HP5+	20°	500/28°	1 + 24	2,5	10	slightly increased (N+0,5)
HP5+	20°	800/30°	1 + 20	4	14	Moderately high (N + 1)
HP5+	22°	1000/31°	1 + 14	5	15	High (N + 1,5)
HP5+	24°	1250/32°	1 + 14	5	19	Moderately high (N + 1)

Manufacturer Film	Temp. ° C	Film Speed ISO	Dilution	Developing time min		Contrast
				First	Second	
Ilford	-----	-----	-----	-----		-----
Delta 100	20°	32/16°	1 + 49	3	5	Very extremely low (N - 5)
Delta 100	20°	32/16°	1 + 49	4	4	Extremely low (N - 4)
Delta 100	20°	50/18°	1 + 49	5	5	Very low (N - 3)
Delta 100	20°	50/18°	1 + 40	4	4	Low (N - 2)
Delta 100	20°	64/19°	1 + 24	2	4,5	Slightly low (N - 0,5)
Delta 100	20°	64/19°	1 + 35	4	5	Normal (N)
Delta 100	20°	100/21°	1 + 20	2,5	5	Normal (N)
Delta 100	20°	200/24°	1 + 14	3,5	7	Moderately high (N + 1)
Delta 100	22°	400/27°	1 + 11	4,5	17	High (N + 1,5)
Delta 100	24°	500/28°	1 + 11	5	20	High (N + 1,5)

Delta 400	20°	400/27°	1 + 24	2,5	9	Moderately low (N - 1)
Delta 400	20°	400/27°	1 + 24	3	11	Normal (N)
Delta 400	20°	640/29°	1 + 20	4	14	slightly increased (N+0,5)
Delta 400	20°	800/30°	1 + 14	4,5	17	High (N + 1,5)
Delta 400	22°	1000/31°	1 + 11	5	19	High (N + 1,5)
Delta 400	22°	1250/32°	1 + 9	5	22	Moderately high (N + 1)

Delta 3200	20°	1000/31°	1 + 14	5	15	Moderately high (N + 1)
Delta 3200	20°	1600/33°	1 + 9	5	19	Normal (N)

**The inversion tact of Delta 3200 during the second development always is:  
First 30 seconds permanently, twice every minute thereafter!**

Manufacturer Film	Temp. ° C	Film Speed ISO	Dilution	Developing time min		Contrast
				First	Second	
<b>Kentmere</b>	-----	-----	-----	-----		-----
Kentmere 400	20°	400/27°	1 + 24	2,5	10	Slightly low (N - 0,5)
Kentmere 400	20°	800/27°	1 + 14	4	14	Moderately high (N + 1)
Kentmere 400	20°	1000/28°	1 + 11	5	17	Moderately high (N + 1)
Kentmere 400	24°	1250/30°	1 + 11	5	19	Normal (N)

Manufacturer Film	Temp. ° C	Film Speed ISO	Dilution	Developing time min		Contrast
				First	Second	
<b>Kodak</b>	-----	-----	-----	-----		-----
Tri X 400	20°	100/21°	1 + 40	2	4	Very extremely low (N- 5)
Tri X 400	20°	100/21°	1 + 49	4	5	Extremely low (N - 4)
Tri X 400	20°	100/21°	1 + 40	5	2	Very low ( N - 3,5)
Tri X 400	20°	100/21°	1 + 44	5	5	Low ( N - 2,5)
Tri X 400	20°	200/24°	1 + 30	2	4,5	Very low (N - 3)
Tri X 400	20°	200/24°	1 + 35	3,5	4,5	Low (N - 2)
Tri X 400	20°	200/24°	1 + 40	5	5	Low (N - 1,5)
Tri X 400	20°	250/25°	1 + 35	3	6	Low (N - 2)
Tri X 400	20°	250/25°	1 + 49	4	11	Low (N - 1,5)
Tri X 400	20°	250/25°	1 + 49	5	10	Moderately low (N - 1)
Tri X 400	20°	320/26°	1 + 49	3	12	Very low (N - 3)
Tri X 400	20°	320/26°	1 + 30	2	8	Moderately low (N - 1)
Tri X 400	20°	400/27°	1 + 24	2	9,5	Normal (N)
Tri X 400	20°	640/29°	1 + 20	3	12,5	Moderately high (N + 1)
Tri X 400	20°	800/30°	1 + 14	2,5	15	High (N + 1,5)
Tri X 400	20°	1000/31°	1 + 14	3,5	19	High (N + 1,5)
Tri X 400	20°	1250/32°	1 + 11	4,5	15	Moderately high (N + 1)
Tri X 400	22°	1600/33°	1 + 9	5	19	High (N + 1,5)

Manufacturer Film	Temp. ° C	Film Speed ISO	Dilution	Developing time min		Contrast
				First	Second	
<b>Kodak</b>	-----	-----	-----	-----		-----
Tmax 100	20°	25/15°	1 + 40	5	7,5	Extremely low (N - 4)
Tmax 100	20°	25/15°	1 + 35	5	4,5	Very low (N - 3)
Tmax 100	20°	25/15°	1 + 35	5	5	Low (N - 2)
Tmax 100	20°	25/15°	1 + 35	5	6	Moderately low (N - 1)
Tmax 100	20°	50/18°	1 + 44	5	11	Very extremely low (N- 6 )
Tmax 100	20°	50/18°	1 + 24	2,5	4	Extremely low (N - 4)
Tmax 100	20°	50/18°	1 + 24	2,5	5	Very low (N - 3)
Tmax 100	20°	50/18°	1 + 24	2,5	6	Low (N - 2)
Tmax 100	20°	50/18°	1 + 24	3	5	Moderately low (N - 1)
Tmax 100	20°	50/18°	1 + 27	4	5	Moderately low (N - 1)
Tmax 100	20°	50/18°	1 + 30	5	6,5	Slightly low (N - 0,5)
Tmax 100	20°	50/18°	1 + 27	4,5	5	Normal (N)
Tmax 100	20°	50/18°	1 + 27	5	5	Moderately high (N + 1)
Tmax 100	20°	100/21°	1 + 20	2,5	5,5	Normal (N)
Tmax 100	20°	200/24°	1 + 14	3	6	Moderately high (N + 1)
Tmax 100	20°	320/26°	1 + 11	5	17	High (N + 2)

Tmax 400	20°	250/25°	1 + 49	5	10	Low (N - 2)
Tmax 400	20°	320/26°	1 + 30	2	8	Moderately low (N - 1)
Tmax 400	20°	400/27°	1 + 24	2	9	Normal (N)
Tmax 400	20°	640/29°	1 + 20	2	10	slightly increased (N+0,5)
Tmax 400	20°	800/30°	1 + 20	3	12,5	Moderately high (N + 1)
Tmax 400	20°	1000/31°	1 + 14	4	17	High (N + 1,5)



Manufacturer Film	Temp. ° C	Film Speed ISO	Dilution	Developing time min First	Second	Contrast
<b>Rollei</b>	-----	-----	-----	-----		-----
RPX 100	20°	25/15°	1 + 49	4	2,5	Very extremely low (N - 5)
RPX 100	20°	25/15°	1 + 49	4	3	Extremely low (N - 4)
RPX 100	20°	32/16°	1 + 44	3	4	Extremely low (N - 4)
RPX 100	20°	40/17°	1 + 49	4	3,5	Extremely low (N - 4)
RPX 100	20°	40/17°	1 + 49	3,5	4,5	Very low (N - 3)
RPX 100	20°	50/18°	1 + 44	3,5	4,5	Low (N - 2,5)
RPX 100	20°	50/18°	1 + 40	3	5	Low (N - 2)
RPX 100	20°	50/18°	1 + 40	4	4	Moderately low (N - 1)
RPX 100	20°	80/20°	1 + 44	5	5	Moderately low (N - 1)
RPX 100	20°	80/20°	1 + 35	4	4	Slightly low (N - 0,5)
RPX 100	20°	100/21°	1 + 20	2	5	Normal (N)
RPX 100	20°	200/24°	1 + 14	2,5	7	slightly increased (N+0,5)
RPX 100	20°	320/26°	1 + 14	5	13	High (N + 1,5)
RPX 100	22°	400/27°	1 + 11	5	19	Moderately high (N + 1)

RPX 400	20°	100/21°	1 + 44	4	4	Very extremely low (N- 5)
RPX 400	20°	160/23°	1 + 49	2,5	10	Very extremely low (N- 5)
RPX 400	20°	200/24°	1 + 35	3	5	Very extremely low (N- 5)
RPX 400	20°	200/24°	1 + 44	4	9	Very low (N - 3)
RPX 400	20°	250/25°	1 + 35	3	7	Very low (N - 3)
RPX 400	20°	320/26°	1 + 49	5	11	Very low (N - 3)
RPX 400	20°	400/27°	1 + 24	2	10	Moderately low (N - 1)
RPX 400	20°	400/27°	1 + 24	2,5	12	Slightly low (N - 0,5)
RPX 400	20°	400/27°	1 + 20	2,5	13	Normal (N)
RPX 400	20°	640/29°	1 + 20	5	15	Normal (N)
RPX 400	22°	800/30°	1 + 14	4	17	Normal (N)
RPX 400	22°	1000/31°	1 + 11	5	19	Normal (N)