

## NEOPAN 400 Professional

### 1. FEATURES AND USES

NEOPAN 400 Professional is a high speed, black-and-white negative film with an ISO speed of 400. The incorporated silver halide particles have been rendered much finer than before while light absorption efficiency has also been greatly increased.

- Development efficiency has been improved so that push processing capabilities are increased and satisfactory results obtained even with ever shorter development times.
- In spite of its high speed this film yields quality prints featuring fine grain, high sharpness, and fine texture.
- Despite its high speed, this film is highly resistant to static marks. Further, it also features adequate in-camera transport smoothness and flexibility.

Due to the above improvements, this film is effective not only for general applications, but is especially suited to such special applications as low light level or action freezing photography, news photography, and a variety of other professional uses.

### 2. FILM SIZES, BASE MATERIAL AND THICKNESS

<b>135</b>	24- and 36-exp.	Gray-tinted Cellulose Triacetate	0.122 mm thickness
<b>35 mm</b>	30.5 m (100 ft), darkroom loading type		
<b>120</b>	12-exp. (6 x 6 cm)		

### 3. SPEED

ISO 400/27°

### 4. COLOR SENSITIVITY

Panchromatic

### 5. EXPOSURE GUIDE

To obtain the best photographic results, correct exposure is indispensable, and for correct exposures the use of an exposure meter is recommended. If an exposure meter is not available, as a guide use the exposures suggested in the tables below.

### Exposure Guide Tables

(1) Standard Exposure at ISO 400

Light Conditions	Seashore or Snow Scenes under Bright Sun	Bright Sunlight	Fine Weather Daylight Scenes	Cloudy Bright	Cloudy Day or Open Shade
<b>Lens Aperture</b>	f/22	f/16	f/16	f/11	f/8
<b>Shutter Speed (sec.)</b>	1/500		1/250		

(2) High-speed Exposure at EI 1600\*

Light Conditions	Night-time Indoor Scenes	Evening Scenes	Night Scenes	Stage Scenes		Indoor Sports Scenes	Night Game Scenes
				Normally Illuminated	Highly Illuminated		
<b>Lens Aperture</b>	f/2.8 to 4	f/4 to 5.6	f/2.8 to 4	f/4	f/8	f/2.8 to 5.6	f/4 to 5.6
<b>Shutter Speed (sec.)</b>	1/60	1/125	1/60	1/125		1/250	

- EI (Exposure Index) is the exposure determination designator and the camera or exposure meter ISO speed should be set to this value.

### Flash Exposures

When electronic flash exposures are to be made, use the shutter speeds designated for the particular camera involved. The lens aperture for electronic flash exposure is determined from the particular flash unit guide number, using the formula given below.

$$\text{Lens Aperture (f-number)} = \frac{\text{Guide Number (ISO 400)}}{\text{Flash-to-Subject Distance (meters or feet)}}$$

When an automatic electronic flash unit is employed, it should be set at an ISO speed of 400. Electronic flash is, in the same manner as flashbulb photography, dependent on the reflectivity of the surroundings. Observe the electronic flash unit instructions.

### Filter Recommendations

When a filter is to be used, multiply the normal exposure by a proper filter factor using the table below as a guide.

Filter	Fuji Filter*	SC-39 (UV)	SC-48 (yellow)	SC-56 (orange)	SC-60 (red)
		Kodak Filter	No. 1A	No. 8	No. 21
<b>Filter Factor</b>	Daylight	1.0	2.0	4.0	8.0
	Tungsten	1.0	1.5	3.0	6.0

**6. SAFELIGHT**

The film should be handled in total darkness. If a safelight is required, a Fuji Safelight Filter SLG4\* (dark green) or Kodak No. 3 Filter with a 15 watt bulb may be used at a distance not less than 1 meter (3.3 feet).

In such cases, use the safelight durations that are short as possible and towards the end of the development period.

**NOTE** \* Fuji Filters and chemicals are available in some countries.

**7. PROCESSING****(1) Development**

Processing times and temperatures for development are shown below. To prevent the appearance of development marks and assure uniform finish, agitate the developer continuously for the first minute and for five seconds every minute thereafter.

- **Development Conditions (Small Tank Processing)**

Agitation: Agitate continuously for the first minute and for five seconds every minute thereafter.

[135 size] Unit: minutes

Developer	Temp. EI	18°C	20°C	22°C	24°C	26°C
		(64°F)	(68°F)	(72°F)	(75°F)	(79°F)
SPD [Super Prodol]*	400	5	4 1/4	3 1/2	3	NR
	800	7 3/4	5 3/4	4 3/4	4	3 1/2
	1600	11	9	7 1/2	6 1/4	5 1/4
	3200	NR	16	12 1/2	10	8
SPD(1:1)*	400	8 1/4	7	6	5	4 1/4
Fujidol E	400	8 1/2	7	5 3/4	4 3/4	4

[120 size]

SPD [Super Prodol]*	400	5	4 1/4	3 1/2	3	NR
	800	7 3/4	5 3/4	4 3/4	4	3 1/2
	1600	11	9	7 1/2	6 1/4	5 1/4
SPD(1:1)*	400	8 1/2	7	5 3/4	4 3/4	4
Fujidol E	400	8 1/2	7	5 3/4	4 3/4	4

NR: Not Recommended

**NOTE** • Fuji chemicals are available in some countries.

(Non-Fuji Film Developer Processing)  
[135 size]

Unit: minutes

Developer	Temp. EI	18°C	20°C	22°C	24°C	26°C
		(64°F)	(68°F)	(72°F)	(75°F)	(79°F)
D-76	250	8	6 1/2	5 1/4	4 1/4	3 1/2
	400	9 1/4	7 1/2	6 1/4	5	4 1/4
	800	10 3/4	8 3/4	7 1/4	5 3/4	4 3/4
	1600	16 1/2	13 1/2	11	9 1/4	7 3/4
D-76(1:1)	400	10 3/4	9 1/2	8 1/2	7 1/2	6 1/2
	800	15	13	11	9 3/4	8 1/2
Microdol-X	200	9 1/2	8 1/2	7 3/4	7	6 1/4
	400	11 1/4	10	9	8	7
HC-110 (Dil.B)	400	6	5	4 1/4	3 1/2	3
	800	8 1/2	7 1/4	6	5	4 1/4
	1600	14 1/2	12	10	8 1/4	7
T-MAX Developer	400	7	6	5	4 1/2	3 3/4
	800	8 3/4	7 1/2	6 1/2	5 1/4	4 3/4
	1600	11 1/4	10	9	8	7
T-MAX RS Developer	400	6 1/2	5 1/2	4 1/2	3 3/4	3 1/4
	800	7 3/4	6 1/2	5 1/2	4 3/4	4
	1600	11	9 1/2	8	7	6
Xtol	400	7 1/2	6 1/4	5 1/4	4 1/4	3 1/2
	800	10 1/2	8 3/4	7	5 3/4	4 3/4
	1600	15 1/2	12 1/2	10 1/2	8 3/4	7 1/4
Microphen	400	5	4 1/4	3 1/2	3	NR
	800	7	5 3/4	5	4 1/4	3 1/2
	1600	10	8 1/2	7 1/4	6 1/4	5 1/4
	3200	19	16	13 3/4	11 3/4	10
ID-11	400	8	7	6 1/4	5 1/2	5
	800	9 1/2	8 1/2	7 1/2	6 3/4	6 1/4
	1600	14	12 1/2	11	9 3/4	8 3/4
ILFOTEC LC 29 (1:19)	400	6 3/4	5 1/2	4 1/2	3 3/4	3 1/4
	800	9 1/2	8	6 3/4	5 3/4	4 3/4
Acufine	400	3 3/4	3 1/4	NR	NR	NR
	800	5 1/2	4 1/2	3 3/4	3 1/4	NR
	1600	8 1/4	7	6	5	4 1/4

NR: Not Recommended

[120 size]

Unit: minutes

Developer	Temp. EI	18°C	20°C	22°C	24°C	26°C
		(64°F)	(68°F)	(72°F)	(75°F)	(79°F)
D-76	250	7 <sup>3</sup> / <sub>4</sub>	6 <sup>1</sup> / <sub>2</sub>	5 <sup>1</sup> / <sub>2</sub>	4 <sup>1</sup> / <sub>2</sub>	3 <sup>3</sup> / <sub>4</sub>
	400	9 <sup>1</sup> / <sub>4</sub>	7 <sup>1</sup> / <sub>2</sub>	6 <sup>1</sup> / <sub>4</sub>	5 <sup>1</sup> / <sub>4</sub>	4 <sup>1</sup> / <sub>2</sub>
	800	11 <sup>1</sup> / <sub>2</sub>	9 <sup>1</sup> / <sub>2</sub>	7 <sup>3</sup> / <sub>4</sub>	6 <sup>1</sup> / <sub>2</sub>	5 <sup>1</sup> / <sub>2</sub>
	1600	16 <sup>1</sup> / <sub>2</sub>	13 <sup>1</sup> / <sub>2</sub>	11 <sup>1</sup> / <sub>2</sub>	9 <sup>1</sup> / <sub>2</sub>	8
D-76(1:1)	400	11 <sup>1</sup> / <sub>2</sub>	9 <sup>3</sup> / <sub>4</sub>	8 <sup>1</sup> / <sub>4</sub>	7	6
	800	16	13 <sup>1</sup> / <sub>2</sub>	11 <sup>1</sup> / <sub>2</sub>	9 <sup>3</sup> / <sub>4</sub>	8 <sup>1</sup> / <sub>2</sub>
Microdol-X	200	10	8 <sup>1</sup> / <sub>2</sub>	7 <sup>1</sup> / <sub>4</sub>	6	5 <sup>1</sup> / <sub>4</sub>
	400	12	10	8 <sup>1</sup> / <sub>2</sub>	7	6
HC-110 (Dil.B)	400	6 <sup>1</sup> / <sub>4</sub>	5 <sup>1</sup> / <sub>4</sub>	4 <sup>1</sup> / <sub>2</sub>	3 <sup>3</sup> / <sub>4</sub>	3 <sup>1</sup> / <sub>4</sub>
	800	9	7 <sup>1</sup> / <sub>2</sub>	6 <sup>1</sup> / <sub>4</sub>	5 <sup>1</sup> / <sub>4</sub>	4 <sup>1</sup> / <sub>2</sub>
	1600	14 <sup>1</sup> / <sub>2</sub>	12	10	8 <sup>1</sup> / <sub>2</sub>	7 <sup>1</sup> / <sub>4</sub>
T-MAX Developer	400	6 <sup>3</sup> / <sub>4</sub>	6	5 <sup>1</sup> / <sub>4</sub>	4 <sup>3</sup> / <sub>4</sub>	4 <sup>1</sup> / <sub>4</sub>
	800	8 <sup>1</sup> / <sub>2</sub>	7 <sup>1</sup> / <sub>2</sub>	6 <sup>1</sup> / <sub>2</sub>	5 <sup>3</sup> / <sub>4</sub>	5 <sup>1</sup> / <sub>4</sub>
	1600	11 <sup>1</sup> / <sub>2</sub>	10	8 <sup>3</sup> / <sub>4</sub>	7 <sup>3</sup> / <sub>4</sub>	7
T-MAX RS Developer	400	6 <sup>1</sup> / <sub>2</sub>	5 <sup>1</sup> / <sub>2</sub>	4 <sup>3</sup> / <sub>4</sub>	4	3 <sup>1</sup> / <sub>2</sub>
	800	8 <sup>1</sup> / <sub>4</sub>	7	6	5 <sup>1</sup> / <sub>4</sub>	4 <sup>1</sup> / <sub>2</sub>
	1600	11 <sup>1</sup> / <sub>2</sub>	10	8 <sup>1</sup> / <sub>2</sub>	7 <sup>1</sup> / <sub>2</sub>	6 <sup>1</sup> / <sub>2</sub>
Xtol	400	7 <sup>1</sup> / <sub>2</sub>	6 <sup>1</sup> / <sub>4</sub>	5 <sup>1</sup> / <sub>4</sub>	4 <sup>1</sup> / <sub>4</sub>	3 <sup>1</sup> / <sub>2</sub>
	800	10 <sup>1</sup> / <sub>2</sub>	8 <sup>3</sup> / <sub>4</sub>	7	5 <sup>3</sup> / <sub>4</sub>	4 <sup>3</sup> / <sub>4</sub>
Microphen	400	5	4 <sup>1</sup> / <sub>4</sub>	3 <sup>1</sup> / <sub>2</sub>	3	NR
	800	7	5 <sup>3</sup> / <sub>4</sub>	5	4 <sup>1</sup> / <sub>4</sub>	3 <sup>1</sup> / <sub>2</sub>
	1600	10	8 <sup>1</sup> / <sub>2</sub>	7 <sup>1</sup> / <sub>4</sub>	6 <sup>1</sup> / <sub>4</sub>	5 <sup>1</sup> / <sub>4</sub>
ID-11	400	8	7	6 <sup>1</sup> / <sub>4</sub>	5 <sup>1</sup> / <sub>2</sub>	5
	800	9 <sup>1</sup> / <sub>2</sub>	8 <sup>1</sup> / <sub>2</sub>	7 <sup>1</sup> / <sub>2</sub>	6 <sup>3</sup> / <sub>4</sub>	6 <sup>1</sup> / <sub>4</sub>
	1600	13 <sup>1</sup> / <sub>2</sub>	12	10 <sup>3</sup> / <sub>4</sub>	9 <sup>1</sup> / <sub>2</sub>	8 <sup>1</sup> / <sub>2</sub>
ILFOTEC LC 29 (1:19)	400	6 <sup>3</sup> / <sub>4</sub>	5 <sup>1</sup> / <sub>2</sub>	4 <sup>1</sup> / <sub>2</sub>	3 <sup>3</sup> / <sub>4</sub>	3 <sup>1</sup> / <sub>4</sub>
	800	9 <sup>1</sup> / <sub>2</sub>	8	6 <sup>3</sup> / <sub>4</sub>	5 <sup>3</sup> / <sub>4</sub>	4 <sup>3</sup> / <sub>4</sub>
Acufine	400	4	3 <sup>1</sup> / <sub>4</sub>	NR	NR	NR
	800	6	4 <sup>3</sup> / <sub>4</sub>	4	3 <sup>1</sup> / <sub>4</sub>	NR
	1600	8 <sup>1</sup> / <sub>4</sub>	7	6	5	4 <sup>1</sup> / <sub>4</sub>

NR: Not Recommended

- NOTE**
- The (1:1) parenthetical expression contained in the above table indicates the amount of water dilution in terms of 1 part water to one part developer. Those locations where there are no such parenthetical expressions indicate processing in the developer stock solution without dilution.
  - To prevent development marks and ensure uniform finish, agitate the developer continuously for the first minute and for five seconds every minute thereafter. This note must be applied especially in the case of developing time less than 5 minutes.

### • Processing Capacities and Times (Small Tank Development)

[135 size]

Unit: minutes

Developer	Processing Capacity: 135 – 36 exp. films									
	1	2	3	4	5	6	7	8	9	10
SPD [Super Prodol] (1 lit.)	4 <sup>1</sup> / <sub>4</sub>	4 <sup>1</sup> / <sub>4</sub>	4 <sup>1</sup> / <sub>4</sub>	4 <sup>1</sup> / <sub>4</sub>	4 <sup>1</sup> / <sub>2</sub>	4 <sup>1</sup> / <sub>2</sub>	4 <sup>3</sup> / <sub>4</sub>	4 <sup>3</sup> / <sub>4</sub>	5	5
D-76 (1 lit.)	7 <sup>1</sup> / <sub>2</sub>	7 <sup>1</sup> / <sub>2</sub>	7 <sup>1</sup> / <sub>2</sub>	7 <sup>1</sup> / <sub>2</sub>	8	8	8	8 <sup>1</sup> / <sub>2</sub>	8 <sup>1</sup> / <sub>2</sub>	8 <sup>1</sup> / <sub>2</sub>

[120 size]

Unit: minutes

Developer	Processing Capacity: 120 films									
	1	2	3	4	5	6	7	8	9	10
SPD* [Super Prodol] (1 lit.)	4 <sup>1</sup> / <sub>4</sub>	4 <sup>1</sup> / <sub>4</sub>	4 <sup>1</sup> / <sub>4</sub>	4 <sup>1</sup> / <sub>2</sub>	4 <sup>1</sup> / <sub>2</sub>	4 <sup>3</sup> / <sub>4</sub>	4 <sup>3</sup> / <sub>4</sub>	5	5	5 <sup>1</sup> / <sub>2</sub>
D-76 (1 lit.)	7 <sup>1</sup> / <sub>2</sub>	7 <sup>1</sup> / <sub>2</sub>	7 <sup>1</sup> / <sub>2</sub>	8	8	8 <sup>1</sup> / <sub>2</sub>	8 <sup>1</sup> / <sub>2</sub>	9	9	9 <sup>1</sup> / <sub>2</sub>

### • Deep Tank Development Conditions (Development Temperatures and Times)

When deep tanks are used, development times should be extended by 5 to 10%, compared to those used with small tanks.

#### (2) Stop Bath

For the stop bath a 1.5% acetic acid solution is recommended. Immerse the film in the bath at 15 to 25°C (59 to 77°F) for 20 to 30 seconds while agitating.

#### (3) Fixing

This film is fully fixed in the standard short fixing times associated with most black and white films. There is no need to give extended fixing.

Fujifix\* or Super Fujifix\* is recommended for fixing. The recommended fixing times at 15 to 25°C (59 to 77°F) are shown below. The required fixing time is twice the time it takes for the film become clear. In order to avoid the lack of fixing uniformity and to prevent film staining, agitate the fixing solution continuously for the first 30 seconds.

Fixer	Type	Fixing Time (min.)
Fujifix	Acid hardening fixer corresponding to F-8	10
Super Fujifix	Acid hardening rapid fixer	3 to 5

**NOTE** • Fuji chemicals are available in some countries.

**(4) Washing**

Wash the film in running water for 20 to 30 minutes. To reduce the washing time, the use of Fuji QW\* (quick washing agent) or Kodak hypo clearing solution is recommended. When using Fuji QW or hypo clearing solution, prewash the film for about 30 seconds, immerse it in Fuji QW or hypo clearing solution for 1 to 2 minutes, and wash it in running water for 5 minutes. The required wash water temperature is 15 to 25°C (59 to 77°F).

**(5) Drying**

After washing, wipe both sides of the film with a sponge or chamois cloth, immerse it in a 1-to-200 solution of Fuji Drivel\* or a diluted solution of Kodak PHOTO-FLO for 30 seconds and hang the film up for uniform drying. In case of air drying, hang the film in a well-ventilated, dust free location.

**8. PROCESSING IN AUTOMATIC PROCESSORS**

• **Processing Conditions for Hanger-transport Type Processors**

The processing conditions with developers such as SPD\* and D-76, are the same as those essential to Fuji Neopan SS and Tri-X film with similar results being obtained.

① **Processing Example for the Kodak Versamat Processor**

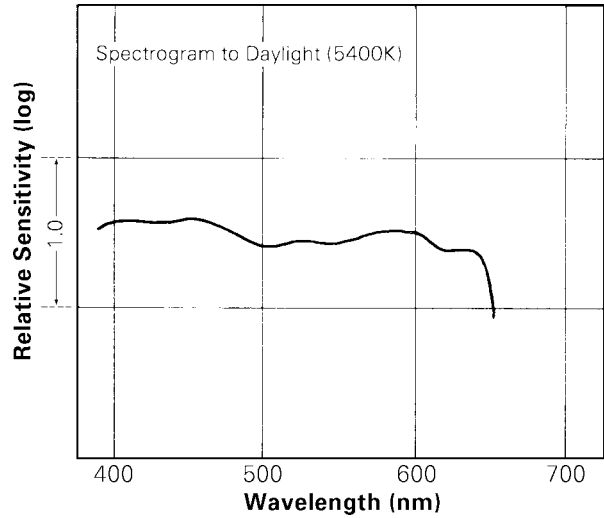
Processor Type	Developer	Temperature	Processing Speed (ft./min.)		
			Standard (Equivalent to ISO 400)	x2 Push Process (Equivalent to EI 800)	x4 Push Process (Equivalent to EI 1600)
5AN	HPD**	26.5°C (80°F)	4	3	2
411			4	3	2
11C			8	6	4

**NOTE** \* Fuji chemicals are available in some countries.  
 \*\* Corresponding to the Kodak Duraflo RT developer.

② **Processing Example for the FP260 (FC) Processor**

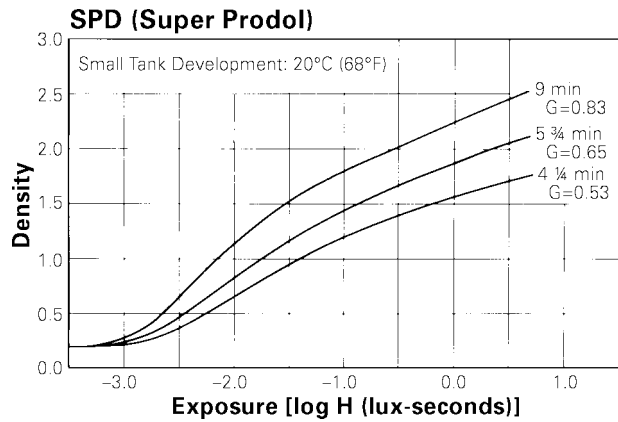
Developer	Temperature	Development Time (min.)		
		EI 400	EI 800	EI 1600
SPD [Super Prodol]	30°C (86°F)	60	90	120

**9. SPECTRAL SENSITIVITY CURVE**

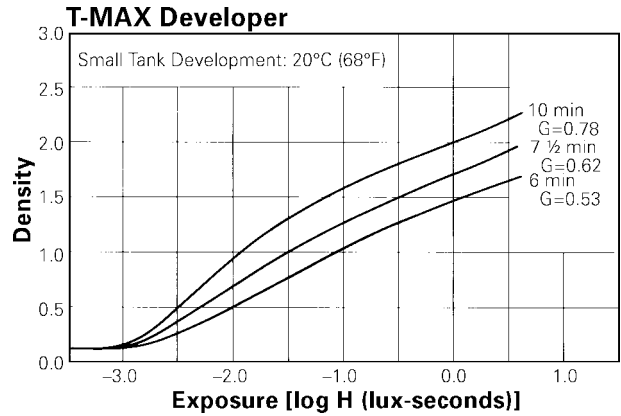
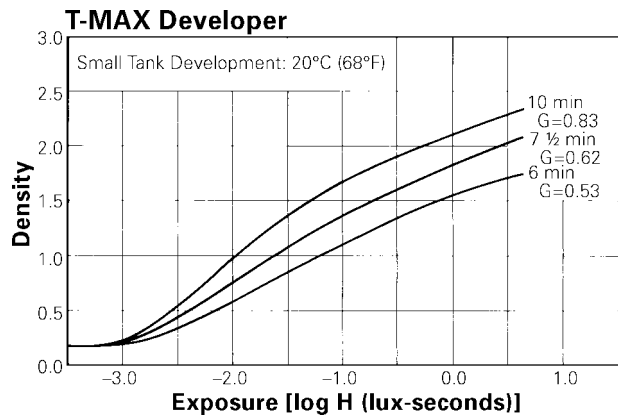
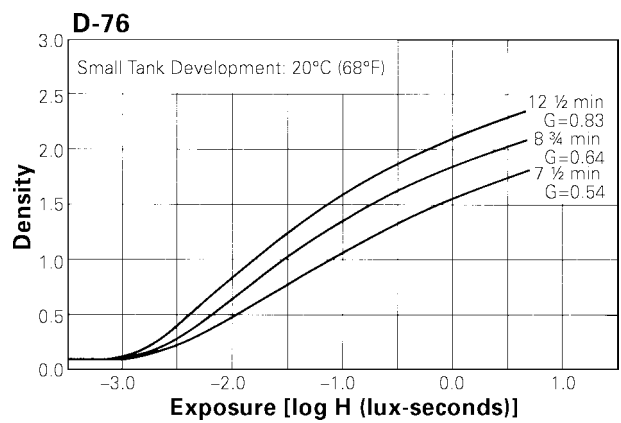
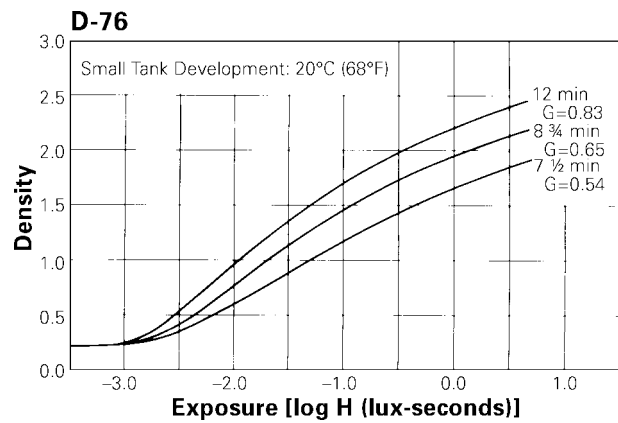
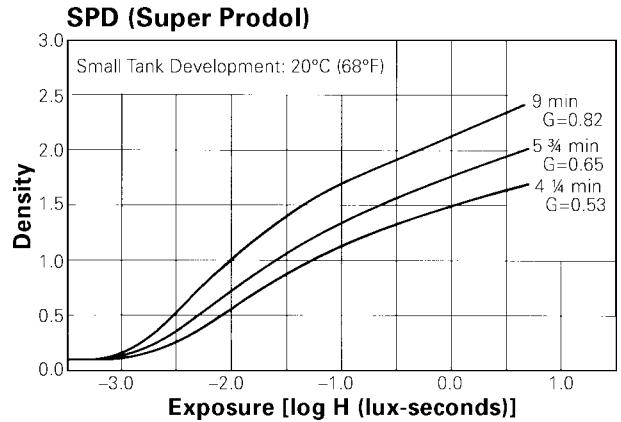


**10. CHARACTERISTIC CURVES**

[135 size]

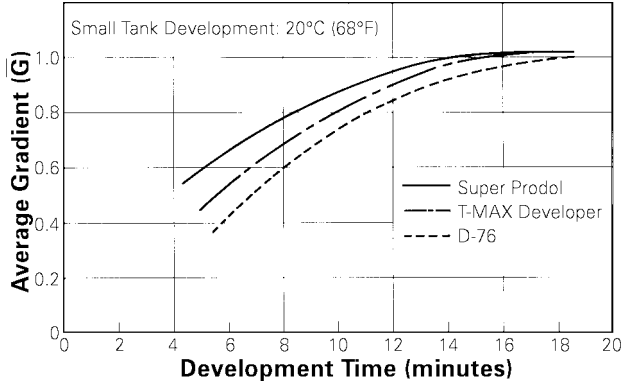


[120 size]

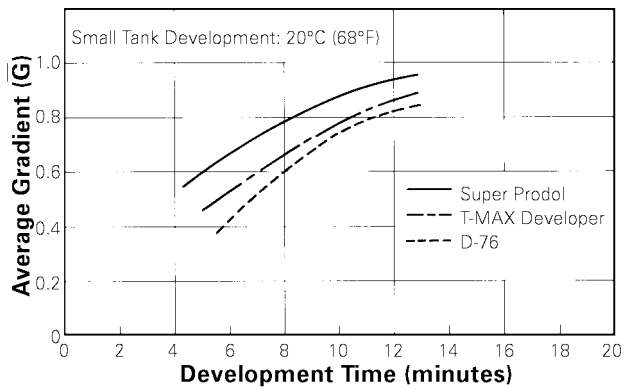


**11. TIME-G<sub>̄</sub> CURVES**

[135 size]



[120 size]



**NOTICE** The data herein published were derived from materials taken from general production runs. However, as Fujifilm is constantly upgrading the quality of its products, changes in specifications may occur without notice.