

3. BLACK-AND-WHITE FILMS

3-1. FILMS FOR BLACK-AND-WHITE PHOTOGRAPHY

Black-and-white negative films are used for the production of black-and-white prints. These films can be processed in the many conventional black-and-white negative film developers presently available. By using different developer type and development condition (time and/or temperature) combinations, the film speed, contrast and granularity can be varied to a considerable extent.

NEOPAN Professional films are marketed by the Fuji Photo Film Company.

BLACK-AND-WHITE NEGATIVE FILMS

Film Name	Film Speed		Color Sensitivity	Film Sizes	Features and Uses
	Daylight	Tungsten			
NEOPAN 100 ACROS	ISO 100/21°	ISO 100/21°	Panchromatic	135 (36-exp.) 120,	<ul style="list-style-type: none"> • Medium speed, super fine grain, black-and-white negative film featuring Super Fine-Σ Grain Technology. • Suited to all normal indoor and outdoor photography as well as long exposure applications. • Provides outstanding sharpness, rich gradation, wide exposure latitude and excellent reciprocity characteristics.
NEOPAN 400 Professional	ISO 400/27°	ISO 400/27°	Panchromatic	135 (24-and 36-exp.) 135 (36-exp. 20-roll packs) 35mm 30.5m (100ft) 120, 120 (5-roll packs)	<ul style="list-style-type: none"> • Professional-quality, high-speed, fine-grain black-and-white negative film. • Suited to rapid-action subjects, telephotography, available-light photography, long-distance flash situations, and pull-/ push-processing to exposure indices between EI 200 and EI 3200. • Provides enhanced sharpness and excellent tonal gradation.
NEOPAN 1600 Professional	EI 1600/33° Multi-speed Film	EI1600/33° Multi-speed Film	Panchromatic	135 (24-and 36-exp.) 135 (36-exp. 20-roll packs) 35mm 30.5m (100ft)	<ul style="list-style-type: none"> • Professional-quality, very-high-speed black-and-white negative film. • Suited to available-light photography such as in night games and stage productions, while allowing pull-/ push-processing to exposure indices between EI 400 and EI 3200. • Provides enhanced sharpness and rich gradation.

3-2. PROCESSING BLACK-AND-WHITE FILMS

Suggested development times for NEOPAN 100 ACROS, NEOPAN 400 Professional and NEOPAN 1600 Professional films are indicated below.

NEOPAN 100 ACROS [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)
Microdol-X	100	13½	11½	9¾	8¼	7
D-76	100	8½	7¼	6¼	5¼	4½
	200	12	10	8½	7	6
D-76 (1:1)*	100	13	10½	8¾	7¼	6¼
T-MAX Developer	100	6½	5½	4¾	4	3½
	200	9½	8	6½	5½	4¾
T-MAX RS Developer	100	6¼	5¼	4½	3¾	3¼
X tol	100	9½	8	6¾	5½	4¾
HC-110 (Dil.B)	80	5½	4½	3¾	3¼	NR
ID-11	100	8	6¾	5¾	4¾	4
Perceptol	100	15½	12½	10	8	6½

NR: Not recommended

*Normally, developer stock solution does not require diluting. However, in this case above *(1:1), one part water is to be added to one part developer.

Development Conditions

Developing Tank : Small tank

Agitation : Continuous agitation for the first minute and for 5 seconds every minute thereafter.

NEOPAN 100 ACROS [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)
Microdol-X	100	13½	11½	9¾	8¼	7
D-76	100	8½	7¼	6¼	5¼	4½
	200	12	10	8½	7	6
D-76 (1:1)*	100	13	10½	8¾	7¼	6¼
T-MAX Developer	100	6½	5½	4¾	4	3½
	200	9½	8	6½	5½	4¾
T-MAX RS Developer	100	6¼	5¼	4½	3¾	3¼
X tol	100	9½	8	6¾	5½	4¾
HC-110 (Dil.B)	80	5½	4½	3¾	3¼	NR
ID-11	100	8	6¾	5¾	4¾	4
Perceptol	100	15½	12½	10	8	6½

NR: Not recommended

*Normally, developer stock solution does not require diluting. However, in this case one part water is to be added to one part developer.

Development Conditions

Developing Tank : Small tank

Agitation : Continuous agitation for the first minute and for 5 seconds every minute thereafter.

NEOPAN 400 Professional [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	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
	320	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
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
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

*Normally, developer stock solution does not require diluting. However, in this case one part water is to be added to one part developer.

NOTE To prevent development marks and assure uniform finish, agitate the developer continuously for the first minute and for five seconds every minute thereafter. This applies especially when the development time is shorter than 5 minutes.

NEOPAN 400 Professional [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 3/4	6 1/2	5 1/2	4 1/2	3 3/4
	400	9 1/4	7 1/2	6 1/4	5 1/4	4 1/2
	800	11 1/2	9 1/2	7 3/4	6 1/2	5 1/2
	1600	16 1/2	13 1/2	11 1/2	9 1/2	8
D-76 (1:1)*	400	11 1/2	9 3/4	8 1/4	7	6
	800	16	13 1/2	11 1/2	9 3/4	8 1/2
Microdol-X	200	10	8 1/2	7 1/4	6	5 1/4
	320	12	10	8 1/2	7	6
HC-110 (Dil. B)	400	6 1/4	5 1/4	4 1/2	3 3/4	3 1/4
	800	9	7 1/2	6 1/4	5 1/4	4 1/2
	1600	14 1/2	12	10	8 1/2	7 1/4
T-MAX Developer	400	6 3/4	6	5 1/4	4 3/4	4 1/4
	800	8 1/2	7 1/2	6 1/2	5 3/4	5 1/4
	1600	11 1/2	10	8 3/4	7 3/4	7
T-MAX RS Developer	400	6 1/2	5 1/2	4 3/4	4	3 1/2
	800	8 1/4	7	6	5 1/4	4 1/2
	1600	11 1/2	10	8 1/2	7 1/2	6 1/2
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
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	13 1/2	12	10 3/4	9 1/2	8 1/2
Acufine	400	4	3 1/4	NR	NR	NR
	800	6	4 3/4	4	3 1/4	NR
	1600	8 1/4	7	6	5	4 1/4

NR: Not recommended

*Normally, developer stock solution does not require diluting. However, in this case one part water is to be added to one part developer.

Development Conditions

Processing Tank : Small tank

Agitation : Continuous agitation for the first minute and for 5 seconds every minute thereafter.

NEOPAN 1600 Professional

Unit: minutes

Developer	EI	Temp.				
		18°C (64°F)	20°C (68°F)	22°C (72°F)	24°C (75°F)	26°C (79°F)
D-76	400	4 3/4	4	3 1/4	NR	NR
	800	6	5	4 1/4	3 1/2	NR
	1600	9	7 1/2	6	5	4
	3200	NR	15	12	10	8
D-76 (1:1)*	400	6 1/2	5 1/2	4 3/4	4	3 1/2
	800	8	7	6	5	4 1/4
	1600	11	9	7 1/2	6 1/2	5 1/2
D-76 (1:3)*	800	13	11 1/2	10	9	8
	1600	17	15 1/4	13 1/2	12	10 1/2
Microdol-X	400	8	6 1/2	5 1/4	4 1/4	3 1/2
	800	10	8 1/4	6 3/4	5 1/2	4 1/2
	1600	13	10 1/2	8 1/2	7	5 3/4
HC-110 (Dil. B)	800	5 1/2	4 3/4	4	3 1/2	NR
	1600	8 1/4	7	5 3/4	5	4 1/4
T-MAX Developer	1600	5 1/2	4 1/2	4	3 1/2	3
	3200	12	10	8 1/2	7 1/2	6 3/4
T-MAX RS Developer	1600	5 3/4	5	4 1/2	3 3/4	3 1/4
	3200	10 1/2	9 1/2	8 1/2	7 3/4	7
Microphen	1600	4	3 1/4	NR	NR	NR
	3200	7	5 3/4	4 3/4	4	3 1/4
ID-11	800	5 1/4	4 1/2	3 3/4	3 1/4	NR
	1600	8	6 1/2	5 1/2	4 1/2	3 3/4
ACU-1 (1:5)*	1600	7	5 3/4	4 3/4	4	3 1/4

NR: Not recommended

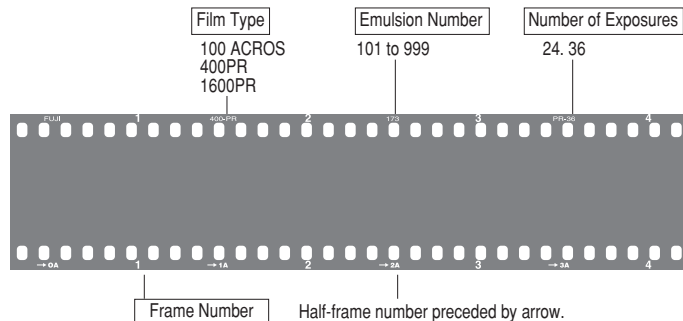
*Normally, developer stock solution does not require diluting. However in, one (1:1), three (1:3) or five (1:5) parts water are to be added to one part developer, respectively.

3-3. FILM IDENTIFICATION EDGE MARKINGS

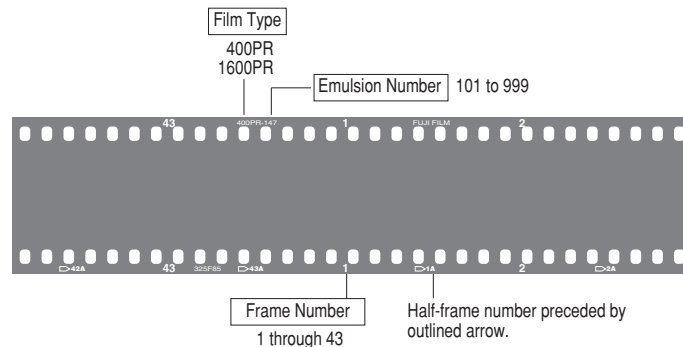
NEOPAN film types are distinguishable by the edge markings indicated below.

NEOPAN Films

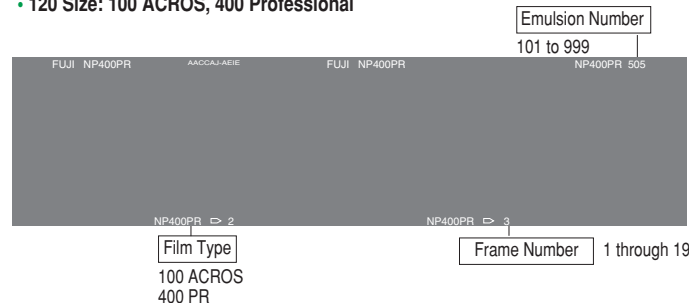
- 135 Size: 100 ACROS, 400 Professional, 1600 Professional



- 35mm Size: 400 Professional, 1600 Professional



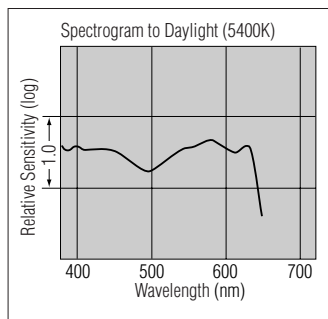
- 120 Size: 100 ACROS, 400 Professional



3-4. TECHNICAL DATA

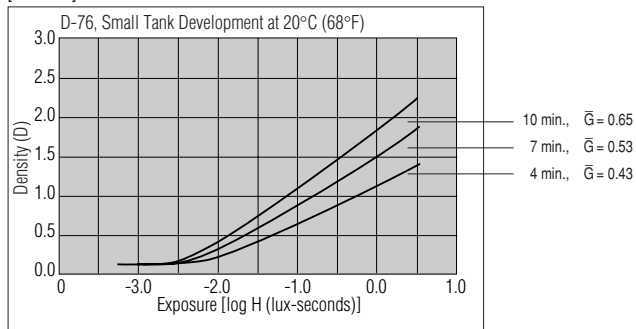
NEOPAN 100 ACROS ISO 100/21°

• SPECTRAL SENSITIVITY CURVE

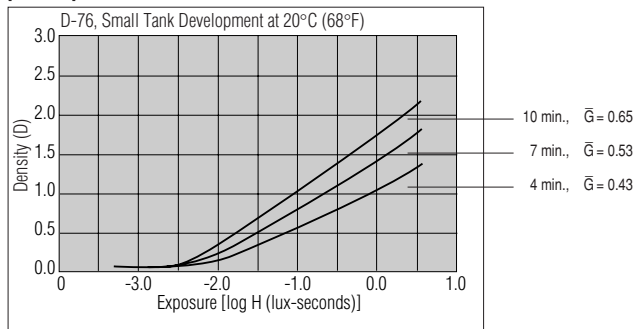


• CHARACTERISTIC CURVES

[135 Size]

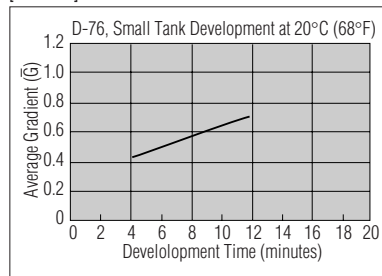


[120 Size]

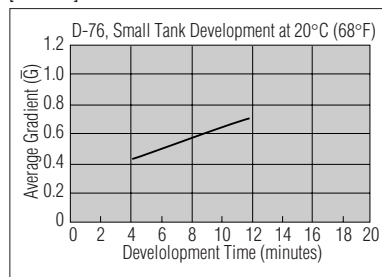


• TIME-G CURVE

[135 Size]

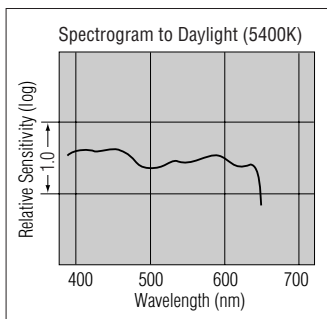


[120 Size]



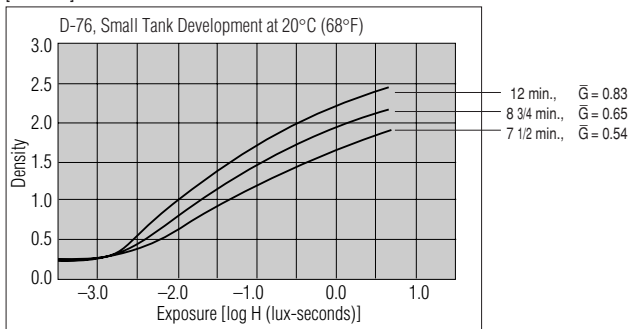
NEOPAN 400 Professional ISO 400/27°

• **SPECTRAL SENSITIVITY CURVE**

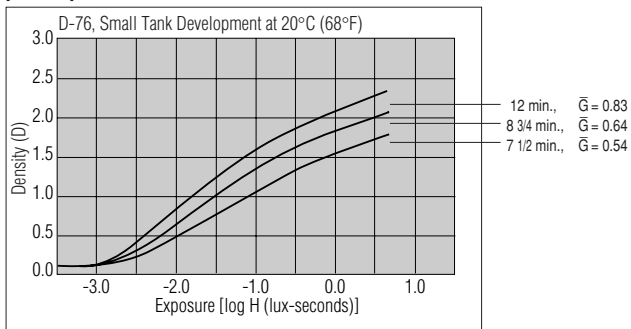


• **CHARACTERISTIC CURVES**

[135 Size]

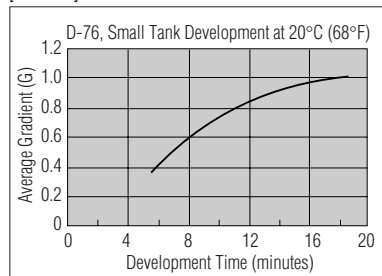


[120 Size]

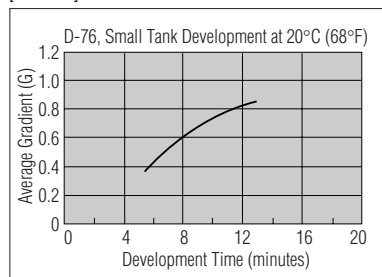


• **TIME- \bar{G} CURVE**

[135 Size]

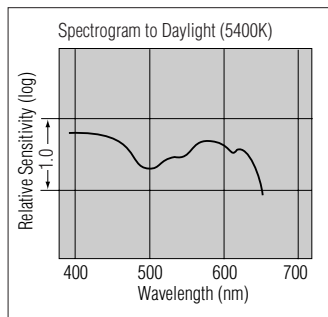


[120 Size]

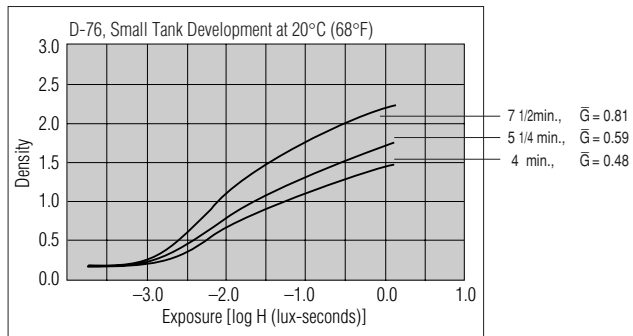


NEOPAN 1600 Professional EI 1600/33°

• **SPECTRAL SENSITIVITY CURVE**



• **CHARACTERISTIC CURVES**



• **TIME- \bar{G} CURVE**

