Kodak TAKE PICTURES. FURTHER.™

TECHNICAL DATA
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Processing Kodak black-and-white films and papers

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Following are starting-point recommendations for processing Kodak black-and-white films with Kodak ch For best results, you should make tests to determine the best development time for your application.

Note: Development times shorter than 5 minutes may produce unsatisfactory uniformity.

Small Tank Film Processing, Intermittent Agitation for Tanks That Can Be Inverted

ROLL FILMS							
Kodak film	Film code	Development time (minutes)				Comments	Refe publ
		20°C (68°F)			24°C (75° F)		
		Kodak Xtol developer	Kodak D-76 developer	Kodak HC-110 developer (Dilution B)	Kodak T-Max developer (1:4)		
T-Max 100 professional	TMX	6 ¾	9	7	6 ½	Also Kodak T-Max developer (1:7) for 10 minutes or (1:9) for 14 minutes, at 24°C (75°F)	
						Also T-Max	

T-Max 400 professional		TMY	6 ½	8	6	6	developer (1:7) for 10 minutes or (1:9) for 15 minutes, at 24°C (75°F)
T-Max P3200 professional	EI 400	TMZ	7 ½	10 ½	7 ½	6	--
	EI 800		8 ¼	11	8	6 ½	Also T-Max developer (1:7) for 12 ½ minutes and (1:9) for 17 minutes, at 24°C (75°F)
	EI 1600		9 ¼	11 ½	9	7	--
	EI 3200		11	15	11 ½	9 ½	--
	EI 6400		12 ½	17 ½	14	11	--
	EI 12,500		15 ¼	--	--	12	--
	EI 25,000		18 ½	--	--	14	--
Plus-X pan		PX	5 ¼	5 ½	5	5	Also Kodak developer D-76 (1:1) for 7 minutes, at 20°C (68°F)
Plus-X pan professional		PXP	5 ½	5 ½	5	5	Also Kodak developer D-76 (1:1) for 7 minutes, at 20°C (68°F)
Tri-X pan		TX	(135) 6 ¾ (120) 6 ¼	8	7 ½	5 ½	Also Kodak developer DK-50 (1:1) for 6 minutes, at 20°C (68° F)
Tri-X pan professional		TXP	6 ¼	8	5 ½	6 ½	Also Kodak developer DK-50 (1:1) for 8 minutes, at 20°C (68° F)

Verichrome pan	VP	6	7	5	4	Also Kodak developer D-76 (1:1) for 9 minutes, at 20°C (68°F)	I

Tray Processing

SHEET FILMS							
Kodak film	**Film code**	**Development time (minutes)**				**Comments**	**Ref pub**
		20°C (68°F)			**24°C (75°F)**		
		Kodak Xtol developer	**Kodak D-76 developer**	**Kodak HC-110 developer (Dilution B)**	**Kodak T-max RS developer and replenisher (1:4)**		
T-Max 100 professional	TMX	7 ¼	7	7 ½	8	--	F
T-Max 400 professional	TMY	7 ¼	7	7 ½	6	--	
Plus-X pan professional	PXT	6 ¼	6	5	5	Also developer DK-50 (1:1) for 4 ½ minutes and developer D-76 (1:1) for 7 minutes, at 20°C (68°F)	I
Tri-X pan professional	TXT	6 ½	5 ½	5 ½	NR	Also developer DK-50 (1:1) for 5 minutes, at 20°C (68° F)	I
Ektapan	EKP	7 ¼	10	6	3	--	F

NOTE: These are starting-point recommendations for processing Kodak black-and-white films with Kod chemicals. For best results, you should make tests to determine the best development time for your applica

Development times shorter than 5 minutes may produce unsatisfactory uniformity.

Small-Tank Processing, Intermittent Agitation

SPECIALTY FILMS									
Kodak film	Development time (minutes)								Ref pub
	20°C (68°F)					21°C (70°F)			
						Kodak Xtol developer			
	Kodak D-76 developer for CI 0.70	Kodak HC-110 developer (dil B) for CI 0.80	Kodak developer D-19 for CI 1.65	Kodak Technidol liquid developer (EI 25)	Kodak Xtol developer CI 0.65	(1:3) for CI 0.60 EI 6	(1:4) for CI 0.60 EI 8	(1:5) for CI 0.60 EI 10	
High speed Infrared (rolls)	8 ½	5	6	--	6 ¾	--	--	--	F
Technical pan (135)	--	--	--	9	--	9	12	15[1] 16[2]	P
Technical pan (sheets)	--	--	--	8	--	--	--	--	

[1]Using 16 fluidounces of developer per roll

[2]Using 8 fluidounces of developer per roll

Final Steps in Processing Black-and-White Film

Step/Solution	Time (min:sec)	Temperature	Comments
Rinse/stop bath	0:30		Agitate continuously. Rinse with a stop bath such as: • Kodak indicator stop bath (1:63) • Kodak Ektaflo stop bath (1:31)
Fix	2:00 to 4:00[1] with a liquid-concentrate (L) fixer **-OR-** 5:00 to 10:00[1] with a powder (P) fixer		Agitate continuously for the first 30 seconds and at 30-second intervals after that with a hardening fixer s • Kodak rapid fixer (L) • Kodafix solution (L) • Kodak Polymax fixer (L) • Kodak fixer (P) Fix for twice as long as it takes the film to clear (lose milky appearance). See instructions for the specific fi **IMPORTANT**: With Kodak T-Max professional fi fixer will be exhausted more rapidly than with other fi

	(F) fixer	18 to 24°C (65 to 75°F)	fixer will be exhausted more rapidly than with other fi negatives show a magenta (pink) stain after fixing, fix be near exhaustion, or fixing time is too short. If the s pronounced and irregular, refix the film in fresh fixer.
Rinse	0:30		Rinse the film in the tank under running water.
Wash aid	1:00 to 2:00		Treat with Kodak hypo clearing agent. Agitate contin for the first 30 seconds and then at 30-second interv
Wash	5:00		Run the wash water at least fast enough to provide a complete change of water in the container in 5 minut rapid washing in a small tank, fill the tank to overflow with fresh water and then dump it all out. Repeat this 10 times.
Final rinse/wetting agent	0:30		To minimize drying marks, treat the film with Kodak Flo solution after washing. Provide gentle agitation fo seconds of the total time.
Dry	--		Hang the film to dry film in a dust-free place. You ma the surfaces carefully with a Kodak photo chamois o viscose sponge to remove excess liquid. Store dry ne in sleeves or envelopes away from dust and extreme temperature and humidity.

[1]Times are approximate. Refer to the film or developer instructions.

Processing Your Kodak Black-and-White Papers
Tray Processing Recommendations

Kodak Paper	Base tint	Kodak developer or developer and replenisher	Dilution	Times at 20°C (68° F) with continuous agitation	Range (minutes)	Refer publi
Resin-Coated Base Papers						
Polycontrast III RC	White	Polymax T, Dektol, Ektonol	1:9 1:2 1:3	1:00 1:00 1:30	0:45 to 2:00 0:45 to 2:00 1:00 to 3:00	G-
Polymax II RC	White	Polymax T, Dektol, Ektonol	1:9 1:2 1:3	1:00 1:00 1:30	0:45 to 2:00 0:45 to 2:00 1:00 to 3:00	G-
Kodabrome II RC	White	Polymax T, Dektol, Ektonol	1:9 1:2 1:1	1:00 1:00 1:30	0:45 to 2:00 0:45 to 2:00 0:45 to 3:00	G-
P-Max art RC	White	Polymax T, Dektol, Ektonol	1:9 1:2 1:1	1:00 1:00 1:30	0:45 to 2:00 0:45 to 2:00 0:45 to 3:00	G-
Panalure Select RC	White	Polymax T, Dektol, Ektonol	1:9 1:2 1:1	1:00 1:00 1:30	0:45 to 2:00 0:45 to 2:00 0:45 to 3:00	G-
Fiber-Base Papers						
Ektamatic SC	White	Dektol	1:2	1:00	0:45 to 2:00	G-

Polymax fine-art[1]	White (F, N)	Polymax T	1:9	2:00 to 3:00	1:00 to 3:00	G-
	Warm (C)	DEKTOL	1:2			
Azo[2]	White	Polymax T, Dektol, Ektaflo Type 2, Ektonol, Selectol-Soft	1:9 1:2 1:9 1:1 1:1	1:00 1:00 2:00 2:00 2:00	0:45 to 2:00 0:45 to 2:00 1:30 to 4:00 1:30 to 4:00 1:30 to 4:00	G-

[1]Kodak Polymax fiber paper, wingle weight, has been renamed Kodak Poymax fine-art paper.

[2]For use with a contact printer, not an enlarger.

Final Steps in Tray Processing Your Black-and-White Papers

RESIN-COATED (RC) PAPERS			
Step/Solution	**Time (min:sec)**	**Temperature**	**Comments**
Stop bath	0:10	18 to 24°C (65 to 75°F)	Such as-- • Kodak Ektaflo stop bath (1:31) • Kodak indicator stop bath (1:63) Agitate continuously.
Fixer (single bath)	2:00 (for single bath)		Such as-- • Kodak Polymax T fixer (1:7) • Kodak fixer (working strength; see instructions) • Kodafix solution (1:7) • Kodak rapid fixer (solution A and B; paper strength; see instructions) Agitate continuously for the first 15 to 30 seconds, and occasionally after that.
Fixer (two bath)	0:45 to 1:00 (for two-bath fixing)		With two-bath fixing, drain prints for 5 seconds between b
Wash	4:00	10 to 30°C (50 to 86°F)	Use a Kodak automatic tray siphon for efficient tray washi addition, agitate continuously. Run water fast enough to cha completely in the tray several times in 4 minutes.
Dry	--	--	Remove excess water from prints with lintless blotters, or a viscose sponge or squeegee. Air-dry in a clean, dust-free p or use an infrared or hot air dryer.

Note: Keep wet times of RC prints to 10 minutes or less to avoid edge penetration by solutions.

FIBER-BASE PAPERS			
Step/Solution	**Time (min:sec)**	**Temperature**	**Comments**
Stop bath	0:15	18 to 24°C (65 to 75°F)	Such as-- • Kodak Ektaflo stop bath (1:31) • Kodak indicator stop bath (1:63) Use an acid stop bath to protect the effectiveness and the life of the fixer.
Fixer (two or single bath)	2:30 to 5:00[1] for two-bath fixing 5:00 to 10:00[1] for single-bath fixing		Agitate continuously for the first 15 to 30 seconds, ther occasionally after that. If you use two fixing baths, fix prints for 5 minutes in ea bath. Drain prints for 5 seconds between baths. Do not fix prints for more than 10 minutes since the fixe penetrate the paper fibers and be difficult to wash out. Non-hardening fixer (for general printing and for toning as-- • Kodak rapid fixer, solution A (do not use solution B) Hardening fixers (for general printing and for mechaniz processing) such as-- • Kodak Polymax T fixer (1:7) • Kodak fixer (working strength; see instructions) • Kodafix solution (1:7) • Kodak rapid fixer (solution A and B; paper strength; instructions) NOTE: Using a hardening fixer makes toning less effici For the same amount of toning time, you may see less toning effect.
Wash without a washing aid **-OR-** **Rinse** + **Wash in a wash aid** + **Running water wash**	60:00 1:00 2:00--SW 3:00--DW 10:00--SW 20:00--DW	10 to 30°C (50 to 86°F)	Use a Kodak automatic tray sipon for efficient tray was Use water running fast enough to change the water in th completely 10 to 12 times in 60 minutes. For time and water conservation, you can use these ste substitute for the 60-minute wash. Use running water with continuous agitation. Use Kodak hypo clearing agent (working strength). Ag continuously for the first 15 to 30 seconds, then occasic after that. Run the water fast enough to change it completely ever minutes.
			Remove excess water from prints with lintless blotters,

Dry	--	--	viscose sponge or squeegee. Air-dry in a clean, dust-fr place, or use fiber-base print dryer.

[1]Times vary depending on the paper and the fixer. Refer to the product's instructions.