# KODAK PROFESSIONAL T-MAX Developers

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TECHNICAL DATA / **CHEMICALS**

**December 2017 • J-86**

KODAK PROFESSIONAL T-MAX Developer is a moderately active, liquid black-and-white film developer that offers enhanced shadow detail in normally processed and push-processed films. The same description applies to KODAK PROFESSIONAL T-MAX RS Developer and Replenisher except that it is a black-and-white film developer and replenisher. Like T-MAX Developer, T-MAX RS Developer and Replenishler produces higher image quality (enhanced shadow detail) than current push-processing developers when you process film normally or push it one, two, or three stops.

You can use T-MAX Developer to process **roll sizes** of KODAK PROFESSIONAL T-MAX Films and most other black-and-white continuous-tone films. Do not use this developer to process sheet film. You can use T-MAX RS Developer and Replenisher to process all roll and sheet sizes of KODAK PROFESSIONAL T-MAX Films, as well as most other black-and-white continuous-tone films.

T-MAX Developer is intended for use in unreplenished systems. For replenished systems, use T-MAX RS Developer and Replenisher. T-MAX RS Developer and Replenisher is a hydroquinone-based, two-part developer specially formulated for replenished systems, but you can also use it in unreplenished systems.

T-MAX Developer is available as a one-part concentrate in sizes to make one gallon and five gallons of working solution. You can easily mix smaller volumes by mixing one part of the concentrate with four parts water. T-MAX RS Developer and Replenisher is available in convenient sizes to make one gallon and ten gallons of solution; use this solution as a working-tank solution or a replenisher. The ten-gallon size consists of two separate units, each to make five gallons of solution.

## *KODAK PROFESSIONAL T-MAX* RS DEVELOPER AND REPLENISHER

| FEATURES | BENEFITS |
|---|---|
| • Mixed solution used as a working-tank solution or a replenisher | • No need for a separate replenisher solution<br>• No starter concentrate required |
| • Designed for processing sheets and rolls | • No need for separate developers |
| • Liquid concentrates | • Easy mixing |
| • Buffered solution | • Less affected by differences in water supplies |
| • Ideal for large tanks and replenished systems | • Excellent process uniformity |
| • Good shadow detail | • Good tone reproduction |
| • Excellent storage characteristics for concentrate and working solution | • Long solution life |
| • Works well with normally exposed film as well as pushed film | • One developer for normal and push processing |

## REPLENISHMENT

Add 1½ fluid ounces (45 mL) of solution for each 135-36 or 120 roll or 8 x 10-inch sheet (or equivalent) processed. Stir or recirculate the solution thoroughly after each addition of replenisher solution.

**Note:** Do not use KODAK T-MAX RS Developer and Replenisher to replenish KODAK T- MAX Developer.

## PROCESS CONTROL

Use KODAK Black-and-White Film Process Control Strips (CAT 180 2990) to monitor the developer activity of T-MAX 1RS Developer and Replenisher. For more information about using Black-and-White Film Process Control Strips, see the instructions packaged with the strips.

## STORAGE

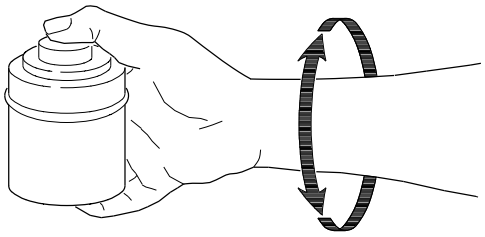
You can store working-strength solution in a full, tightly closed bottle for six months, in a half-filled bottle for two months, or in a covered tank for one month. You can store the concentrate for up to two years.

## PROCESSING

The development times in the following tables are starting point recommendations. They are intended to produce a contrast index of 0.60 for KODAK PROFESSIONAL T-MAX 400 Film and 0.56 for the other films. These development times should produce negatives with a contrast suitable for printing with a diffusion enlarger. To adjust contrast for printing with a condenser enlarger, reduce the development time by 20 to 30 percent.

## MANUAL PROCESSING

### Small-Tank Processing (8- or 16-ounce tank)—Rolls



Agitate once every 30 seconds. Drop the loaded film reel into the developer and attach the top to the tank. Firmly tap the tank on the top of the work surface to dislodge any air bubbles. Provide initial agitation of 5 to 7 inversion cycles in 5 seconds, i.e. extend your arm and vigorously twist your wrist 180 degrees as shown below.

Then repeat this agitation procedure at 30-second intervals for the rest of the development time.

| KODAK T-MAX RS Developer and Replenisher | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| KODAK Film | Speed Rating | Development Time (Minutes) | | | | | | |
| | EI | 18°C (65°F) | 20°C (68°F) | 21°C (70°F) | 22°C (72°F) | 24°C (75°F) | 27°C (80°F) | 29°C (85°F) |
| T-MAX 100 Professional | 100/200 | NR | 8 | 7 | 7 | **6** | — | — |
| | 400 | — | 12 | 11 | 10 | **9** | — | — |
| | 800 | — | NR | NR | NR | **11 1/2** | — | — |
| PROFESSIONAL T-MAX 100 | 100/200 | NR | 8 | 7 1/2 | 7 | **6 1/4** | — | — |
| | 400 | — | 12 1/4 | — | — | **10** | — | — |
| | 800 | — | — | — | — | **11 3/4** | — | — |
| T-MAX 400 Professional and PROFESSIONAL T-MAX 400 | 400/800 | NR | 7 | 6 | 6 | **5** | — | — |
| | 1600 | — | 10 | 9 | 8 | **7** | — | — |
| | 3200 | — | 13 | 12 | 11 | **9 1/2** | — | — |
| T-MAX P3200 Professional | 400* | — | 8 | 7 | 6 1/2 | 6 | 5 1/2 | 5 |
| | 800 | — | 9 | 8 1/2 | 7 1/2 | 6 1/2 | 6 | 5 1/2 |
| | 1600 | — | 10 1/2 | 9 1/2 | 8 1/2 | 7 1/2 | 7 | 6 |
| | 3200 | — | 13 | 12 | 11 | 10 | 9 | 8 |
| | 6400 | — | 15 | 14 | 13 | 11 | 10 | 9 |
| | 12,500* | — | 18 | 16 | 14 | 12 | 11 | 10 |
| | 25,000* | — | NR | NR | 16 | 14 | 13 | 11 |
| PROFESSIONAL T-MAX P3200 | 400* | — | 9 | 8 1/2 | 7 1/2 | 7 | 6 1/2 | 5 1/2 |
| | 800 | — | 10 1/2 | 9 1/2 | 9 | 8 1/2 | 7 1/2 | 6 1/2 |
| | 1600 | — | 12 | 11 | 10 | 9 1/2 | 8 1/2 | 7 |
| | 3200 | — | 14 1/2 | 13 | 12 | 11 1/2 | 10 | 8 1/2 |
| | 6400 | — | 16 1/2 | 15 | 13 1/2 | 13 | 11 1/2 | 10 |
| | 12,500* | — | 18 1/2 | 17 | 15 1/2 | 14 1/2 | 13 | 11 |
| | 25,000* | — | NR | NR | 17 | 16 1/2 | 14 1/2 | 12 1/2 |
| PLUS-X Pan | 125/250 | 6 1/2 | **5 1/2** | 4 1/2† | 4† | 3 1/2† | — | — |
| PLUS-X Pan Professional | 500 | NR | 9 | 8 1/2 | 7 1/2 | **6 1/2** | — | — |
| PROFESSIONAL PLUS-X 125 | 125/250 | 5 | 4 1/4† | 4† | 3 1/2† | **3†** | — | — |
| | 500 | — | 7 1/4 | 6 1/2 | 6 | **5** | — | — |
| TRI-X Pan | 400/800 | 7 | 6 | 5 1/2 | 5 1/2 | **5** | — | — |
| | 1600 | — | 9 1/2 | 9 | 8 1/2 | **8** | — | — |
| | 3200 | — | 12 | 11 1/2 | 11 1/2 | **11** | — | — |
| TRI-X Pan Professional | 320 | **5** | 4† | 3 1/2† | 3 1/2† | 3† | — | — |
| PROFESSIONAL TRI-X 400 Film / 400TX | 400/800 | 4 3/4† | 4 1/2† | 4 1/4† | 4† | 3 1/2† | — | — |
| | 1600 | 8 1/2 | 7 3/4 | 7 1/4 | 6 3/4 | 6 | — | — |
| | 3200 | — | 9 1/2 | 9 | 8 1/4 | 7 1/2 | — | — |
| PROFESSIONAL TRI-X 320 Film / 320TXP | 320 | 4 1/2† | 4† | 3 1/2† | 3 1/4† | 2 3/4† | — | — |
| VERICHROME Pan | 125 | — | **4†** | 4† | 3 1/2† | 3 1/2† | — | — |

*Make tests to determine if results at these ratings are acceptable for your needs.
†Development times shorter than 5 minutes may produce unsatisfactory uniformity.

NR = Not recommended
**Note:** The development times in **bold type** are suggested starting points

## MANUAL PROCESSING

### Large-Tank Processing (1/2 to 3 1/2 -gallon tank)—Rolls

**Agitating Rolls in a Large Tank:** Agitate continuously for the first 15 to 30 seconds by raising and lowering the basket, rack, or spindle 1 cm (1/2 inch). Do not agitate the basket, rack, or spindle for the remainder of the first minute. Then agitate once per minute by lifting the basket, rack, or spindle out of the developer, tilting it approximately 30 degrees, draining it for 5 to 10 seconds, and reimmersing it. Alternate the direction of tilting the basket, rack, or spindle.

**Agitating Sheet Film in a Large Tank:** Separate the sheets by at least 1 cm (1/2 inch). Use a hanger loaded with an 8 x 10-inch sheet of acetate or scrap film to avoid uneven development or scratching of the larger sheets. (This unevenness is caused by turbulence around the central frame of the multiple-film hanger during agitation.)

To agitate a sheet of film or a batch of sheet films in hangers in a tank, start the timer. Lower the hangers as a unit carefully into the developer. Tap the hangers sharply against the rim of the tank two or three times to dislodge air bubbles from the surface of the film. (Air bubbles can interfere with development and produce low-density circles on the film.) Do not agitate the hangers for the remainder of the first minute. Lift all the hangers out of the solution and tilt them almost 90 degrees to the left. Reimmerse the hangers, lift them out again, and then tilt them almost 90 degrees to the right. Do this as quickly and smoothly as possible—in about 5 to 7 seconds. After you reimmerse the hangers, check their spacing. Repeat this agitation cycle once every minute during the development time.

**Note:** When you process films larger than 5 x 7 inches, be careful not to lift them from the solution so quickly that the films are pulled from the hangers.

| KODAK PROFESSIONAL T-MAX RS Developer and Replenisher | | | | | |
|---|---|---|---|---|---|
| **KODAK Film** | **Speed Rating** | **Development Time (Minutes)** | | | |
| | **EI** | **20°C (68°F)** | **21°C (70°F)** | **22°C (72°F)** | **24°C (75°F)** |
| T-MAX 100 Professional | 100/200 | 10 | 9 | 8 | **7 1/2** |
| | 400 | NR | NR | NR | **11 1/2** |
| PROFESSIONAL T-MAX 100 | 100/200 | 8 3/4 | 8 1/4 | 7 3/4 | **7** |
| | 400 | — | — | — | **11 1/4** |
| T-MAX 400 Professional and PROFESSIONAL T-MAX 400 | 400/800 | 8 1/2 | 8 | 7 1/2 | **7** |
| | 1600 | 12 | 11 | 10 | **9** |
| | 3200 | NR | NR | NR | **12** |
| T-MAX 3200 Professional | 400* | 10 1/2 | 9 1/2 | 8 1/2 | 7 1/2 |
| | 800 | 11 1/2 | 10 | 9 | 8 |
| | 1600 | 13 1/2 | 11 1/2 | 10 1/2 | 9 1/2 |
| | 3200 | 17 | 14 1/2 | 13 | 12 |
| | 6400 | NR | 18 | 16 | 14 |
| | 12,500* | NR | NR | 18 | 17 |
| PROFESSIONAL T-MAX P3200 | 400* | 10 | 9 1/2 | 8 1/2 | 8 |
| | 800 | 12 | 10 1/2 | 10 | 9 1/2 |
| | 1600 | 13 1/2 | 12 1/2 | 11 1/2 | 10 1/2 |
| | 3200 | 16 1/2 | 14 1/2 | 13 1/2 | 13 |
| | 6400 | NR | 17 | 15 | 14 1/2 |
| | 12,500* | NR | NR | 17 1/2 | 16 1/2 |
| PLUS-X Pan | 125/250 | 8 | 7 | 6 | **5 1/2** |
| PLUS-X Pan Professional | 500 | NR | NR | NR | **8** |
| PROFESSIONAL PLUS-X 125 | 125/250 | 4 3/4 | 4 1/2 | 4 | **3 1/2** |
| | 500 | NR | NR | NR | **5 3/4** |
| TRI-X Pan | 400/800 | 10 | 8 1/2 | 7 1/2 | **6 1/2** |
| | 1600 | 14 | 12 1/2 | 10 1/2 | **9** |
| | 3200 | NR | NR | NR | **13 1/2** |
| TRI-X Pan Professional | 320 | 6 | 5 1/2 | 5 1/2 | **5** |
| PROFESSIONAL TRI-X 400 Film / 400TX | 400/800 | 5 | 4 3/4 | 4 1/2 | 4 |
| | 1600 | 8 3/4 | 8 | 7 1/2 | 7 |
| PROFESSIONAL TRI-X 320 Film / 320TXP | 320 | 4 1/2 | 4 1/4 | 3 3/4 | 3 1/4 |
| VERICHROME Pan | 125 | **5 1/2** | 5 | 5 | 4† |

*Make tests to determine if results at these ratings are acceptable for your needs.
†Development times shorter than 5 minutes may produce unsatisfactory uniformity.

NR = Not recommended
**Note:** The development times in **bold type** are suggested starting points

## MANUAL PROCESSING

### Large-Tank Processing (1/2 to 3 1/2-gallon tank)—Sheets

| KODAK PROFESSIONAL T-MAX RS Developer and Replenisher | | | | | |
|---|---|---|---|---|---|
| KODAK Film | Speed Rating | Development Time (Minutes) | | | |
| | EI | 20°C (68°F) | 21°C (70°F) | 22°C (72°F) | 24°C (75°F) |
| T-MAX 100 Professional | 100/200 | 12 | 11 | 9 1/2 | **8** |
| PROFESSIONAL T-MAX 100 | 100/200 | 8 3/4 | 8 1/4 | 7 3/4 | **7** |
| T-MAX 400 Professional and PROFESSIONAL T-MAX 400 | 400/800 | 10 | 8 | 7 1/2 | **6** |
| PLUS-X Pan Professional | 125 | 9 | 8 | 7 1/2 | **7** |
| TRI-X Pan Professional | 320 | **5** | 4 1/2[1] | 4 1/2[1] | 4[1] |
| PROFESSIONAL TRI-X 320 Film / 320TXP | 320/640 | 3 1/2 | 3 1/4 | NR | NR |
| EKTAPAN | 100 | **5** | 4[1] | 3 1/2[1] | 3[1] |

[1].Development times shorter than 5 minutes may produce unsatisfactory uniformity.

NR = Not recommended
**Note:** The development times in **bold type** are suggested starting points.

### Tray Processing—Sheets

Provide continuous agitation; rotate the sheets 90 degrees as you interleave them.

| KODAK PROFESSIONAL T-MAX RS Developer and Replenisher | | | | | |
|---|---|---|---|---|---|
| KODAK PROFESSIONAL Film | Speed Rating | Development Time (Minutes) | | | |
| | EI | 20°C (68°F) | 21°C (70°F) | 22°C (72°F) | 24°C (75°F) |
| T-MAX 100 Professional | 100/200 | 11 | 10 | 9 | **8** |
| PROFESSIONAL T-MAX 100 | 100/200 | 7 1/4 | 6 3/4 | 6 1/4 | **5 3/4** |
| T-MAX 400 Professional and PROFESSIONAL T-MAX 400 | 400/800 | 8 | 7 1/2 | 7 | **6** |
| PLUS-X Pan Professional | 125 | 9 | 7 1/2 | 6 1/2 | **5** |
| TRI-X Pan Professional | 320 | **5** | 4 | NR | NR |
| PROFESSIONAL TRI-X 320 Film / 320TXP | 320/640 | 2 3/4 | 2 1/2 | NR | NR |
| EKTAPAN | 100 | **5** | 4 | 4 | 3 |

NR = Not recommended
**Note:** The development times in **bold type** are suggested starting points.

## ROTARY-TUBE PROCESSING

### Rotary-Tube Processing—Rolls and Sheets

Follow the agitation recommendations for your processor.

| KODAK T-MAX RS Developer and Replenisher | | | | | | | |
|---|---|---|---|---|---|---|---|
| KODAK Roll Film | Speed Rating | Development Time (Minutes) | | | | | |
| | EI | 20°C (68°F) | 21°C (70°F) | 22°C (72°F) | 24°C (75°F) | 27°C (80°F) | 29°C (85°F) |
| T-MAX 100 Professional | 100/200 | 7 | 6 1/2 | 6 | **5** | — | — |
| | 400 | 12 | 11 | 10 | **8** | — | — |
| | 800 | NR | NR | 14 1/2 | **12** | — | — |
| PROFESSIONAL T-MAX 100 | 100/200 | 7 3/4 | 7 1/4 | 6 3/4 | **6 1/4** | — | — |
| | 400 | 12 1/4 | 11 1/2 | 10 3/4 | **10** | — | — |
| | 800 | NR | NR | 12 3/4 | **11 3/4** | — | — |
| T-MAX 400 Professional and PROFESSIONAL T-MAX 400 | 400/800 | 6 1/2 | 6 | 5 1/2 | **5 1/2** | — | — |
| | 1600 | 10 | 9 | 8 1/2 | **8** | — | — |
| | 3200 | 14 | 13 | 12 1/2 | **12** | — | — |
| T-MAX P3200 Professional | 400[1] | 9 | 8 | 7 1/2 | 7 | 6 1/2 | 4 1/2 |
| | 800 | 10 | 9 | 8 | 7 1/2 | 7 | 5 |
| | 1600 | 12 | 11 | 10 | 9 1/2 | 9 | 5 1/2 |
| | 3200 | 15 | 13 | 11 1/2 | 10 1/2 | 9 1/2 | 7 |
| | 6400 | 16 | 14 | 12 1/2 | 11 1/2 | 10 | 8 |
| | 12,500[1] | NR | 15 | 14 | 13 | 11 1/2 | 9 1/2 |
| | 25,000[1] | NR | 16 | 15 | 14 | 12 1/2 | 11 |
| PROFESSIONAL T-MAX P3200 | 400[1] | 9 | 8 1/2 | 7 1/2 | 7 | 6 1/2 | 5 1/2 |
| | 800 | 10 1/2 | 9 1/2 | 9 | 8 1/2 | 7 1/2 | 6 1/2 |
| | 1600 | 12 | 11 | 10 | 9 1/2 | 8 1/2 | 7 |
| | 3200 | 14 1/2 | 13 | 12 | 11 1/2 | 10 | 8 1/2 |
| | 6400 | 16 1/2 | 15 | 13 1/2 | 13 | 11 1/2 | 10 |
| | 12,500[1] | 18 1/2 | 17 | 15 1/2 | 14 1/2 | 13 | 11 |
| | 25,000[1] | NR | NR | 17 | 16 1/2 | 14 1/2 | 12 1/2 |
| PLUS-X Pan | 125/250 | 4 1/2 | 4 1/2 | 4 | 4 | — | — |
| PLUS-X Pan Professional | 500 | 9 | 8 | 7 1/2 | **7** | — | — |
| PROFESSIONAL PLUS-X 125 | 125/250 | 4 1/4 | 4 | 3 1/2 | **3** | — | — |
| | 500 | 7 1/4 | 6 1/2 | 6 | **5** | — | — |
| TRI-X Pan | 400/800 | 6 | 5 1/2 | 5 | **4** | — | — |
| | 1600 | 10 | 9 | 8 | **7** | — | — |
| | 3200 | 12 | 11 | 10 | **9** | — | — |
| TRI-X Pan Professional | 320 | **3 1/2** | 3 | 2 1/2 | 2 | — | — |
| PROFESSIONAL TRI-X 400 Film / 400TX | 400/800 | 4 1/2 | 4 1/4 | 4 | 3 1/2 | — | — |
| | 1600 | 7 3/4 | 7 1/4 | 6 3/4 | 6 | — | — |
| | 3200 | 9 1/2 | 9 | 8 1/4 | 7 1/2 | — | — |
| PROFESSIONAL TRI-X 320 Film / 320TXP | 320 | 4 | 3 1/2 | 3 1/4 | 2 3/4 | — | — |

[1] Make tests to determine if results at these ratings are acceptable for your needs.

NR = Not recommended

**Note:** The development times in **bold type** are suggested starting points.

| KODAK T-MAX RS Developer and Replenisher | | | | | |
|---|---|---|---|---|---|
| KODAK Sheet Film | Speed Rating | Development Time (Minutes) | | | |
| | EI | 20°C (68°F) | 21°C (70°F) | 22°C (72°F) | 24°C (75°F) |
| T-MAX 100 Professional | 100/200 | 7 | 6 1/2 | 6 | **5** |
| | 400 | 12 | 11 | 10 | **8** |
| | 800 | NR | NR | 14 1/2 | **12** |
| PROFESSIONAL T-MAX 100 | 100/200 | 7 3/4 | 7 1/4 | 6 3/4 | **6 1/4** |
| | 400 | 12 1/4 | 11 1/2 | 10 3/4 | **10** |
| | 800 | NR | NR | NR | **11 3/4** |
| T-MAX 400 Professional and PROFESSIONAL T-MAX 400 | 400/800 | 6 1/2 | 6 | 5 1/2 | **5 1/2** |
| | 1600 | 10 | 9 | 8 1/2 | **8** |
| | 3200 | 14 | 13 | 12 1/2 | **12** |
| PLUS-X Pan Professional | 125/250 | 6 1/2 | 5 1/2 | **5** | 4 1/2 |
| | 500 | 10 1/2 | 10 | 9 | **8** |
| PROFESSIONAL TRI-X 320 Film / 320TXP | 320 | 2 1/2 | 2 1/4 | NR | NR |

NR = Not recommended

**Note:** The development times in **bold type** are suggested starting points.

## MACHINE PROCESSING

### Large-Tank Rack-and-Tank Processing—Rolls and Sheets

The development times for these processors are based on a machine speed that transfers the film every 2 minutes. The times given below are starting-point recommendations. Make tests to determine the best development time for your application.

| Large-Tank Rack-and-Tank Processing—Rolls | | |
|---|---|---|
| **KODAK T-MAX RS Developer and Replenisher** | | |
| **KODAK Film** | **Speed Rating** | **Development Time (Minutes)[1]** |
| | EI | 22°C (72°F) |
| T-MAX 100 Professional | 100/200 | 6 to 8 |
| | 400 | 8 to 10 |
| PROFESSIONAL T-MAX 100 | 100/200 | 6 to 8 |
| | 400 | 8 to 10 |
| T-MAX 400 Professional and PROFESSIONAL T-MAX 400 | 400/800 | 6 to 8 |
| | 1600 | 8 to 10 |
| T-MAX 3200 Professional | 400[2]/800 | 6 to 8 |
| | 1600 | 8 to 10 |
| | 3200 | 10 to 12 |
| | 6400 | 12 to 14 |
| | 12,500[2] | 14 to 16 |
| PROFESSIONAL T-MAX P3200 | 400[2]/800 | 6 to 8 |
| | 1600 | 8 to 10 |
| | 3200 | 6 to 8 |
| | 6400 | 8 to 10 |
| | 12,500[2] | 10 to 12 |
| PLUS-X Pan | 125/250 | 4 to 6 |
| PLUS-X Pan Professional | 500 | 6 to 8 |
| PROFESSIONAL PLUS-X 125 | 125/250 | 3½ to 6 |
| TRI-X Pan | 400/800 | 6 to 8 |
| | 1600 | 8 to 10 |
| TRI-X Pan Professional | 320 | 6 to 8 |
| PROFESSIONAL TRI-X 400 Film / 400TX | 400/800 | 4 to 6 |
| PROFESSIONAL TRI-X 320 Film / 320TXP | 320/640 | 4 to 6 |
| VERICHROME Pan | 125 | 6 to 8 |

**[1] Development time depends on agitation and tank size.**

[2] Make tests to determine if results at these ratings are acceptable for your needs.

| Large-Tank Rack-and-Tank Processing—Sheets | | |
|---|---|---|
| **KODAK T-MAX RS Developer and Replenisher** | | |
| **KODAK Film** | **Speed Rating** | **Development Time (Minutes)[1]** |
| | EI | 22°C (72°F) |
| T-MAX 100 Professional | 100/200 | 6 to 8 |
| PROFESSIONAL T-MAX 100 | 100/200 | 6 to 8 |
| T-MAX 400 Professional and PROFESSIONAL T-MAX 400 | 400/800 | 6 to 8 |
| PLUS-X Pan Professional | 125 | 6 to 8 |
| TRI-X Pan Professional | 320 | 4 to 6 |
| PROFESSIONAL TRI-X 320 Film / 320TXP | 320/640 | 4 to 6 |
| EKTAPAN | 100 | 4 to 6 |
| Professional Copy / 4125 | 12 to 25 | 4 to 6 |

**[1] Development time depends on agitation and tank size.**

**Note:** Do not use T-MAX RS Developer and Replenisher in roller-transport processors. We recommend that you use KODAK DURAFLO RT Developer Starter, KODAK DURAFLO RT Developer Replenisher, and KODAK Rapid Fixer in roller-transport processors.

## KODAK PROFESSIONAL T-MAX DEVELOPER

| FEATURES | BENEFITS |
|---|---|
| • Liquid concentrates | • Easy mixing |
| • Concentrate mix ratio 1:4 | • Mix any amount you need |
| • Buffered solution | • Less affected by differences in water supplies |
| • Good shadow detail | • Good tone reproduction |
| • Ideal for small tanks and rotary-tube processors | • Excellent process uniformity |
| • Large capacity | • Process up to 48 rolls of film per gallon |
| • Excellent storage characteristics for concentrate and working solution | • Long solution life |
| • Works well with normally exposed film as well as pushed film | • One developer for normal and push processing |

## CAPACITY

The capacity of this developer with normal processing is approximately 48 rolls of 135-36 or 120 film per gallon (or equivalent), with time compensation. The capacity is lower when you use the developer for push processing.

**Note:** Do not use T-MAX RS Developer and Replenisher to replenish T-MAX Developer.

### Time Compensation

To process the maximum number of rolls of film per gallon of T-MAX Developer, use time compensation according to the table below. Discard the developer after you process 48 rolls of film.

If you use this developer for push processing, discard it after processing one batch of film. The capacity of the solution will be lower, and it should not be reused.

| **Time Compensation** | | |
|---|---|---|
| **KODAK PROFESSIONAL T-MAX Developer** | | |
| **Film Size** | **Number of Rolls (per Gallon)** | Development-Time Increase[1] |
| 136-36 or 120 | 1 to 16 | Use normal development time |
| | 17 to 32 | Normal development time + 1 minute |
| | 33 to 48 | Normal development time + 2 minutes |

**1. At the primary recommended time and temperature.**

## STORAGE

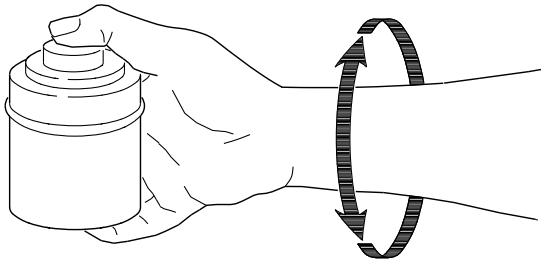
You can store working-strength solution in a full, tightly closed bottle for six months, in half-filled bottle for two months, or in a covered tank for one month. You can store the concentrate for up to two years.

## PROCESSING

The development times in the following tables are starting-point recommendations. They are intended to produce a contrast index of 0.60 for T-MAX 400 Film and 0.56 for the other films. These development times should produce negatives with a contrast suitable for printing with a diffusion enlarger. To adjust contrast for printing with a condenser enlarger, reduce the development time by 20 to 30 percent.

## MANUAL PROCESSING

### Small-Tank Processing (8- or 16-ounce tank)—Rolls



Agitate once every 30 seconds. Drop the loaded film reel into the developer and attach the top to the tank. Firmly tap the tank on the top of the work surface to dislodge any air bubbles. Provide initial agitation of 5 to 7 inversion cycles in 5 seconds, i.e. extend your arm and vigorously twist your wrist 180 degrees as shown below.

Then repeat this agitation procedure at 30-second intervals for the rest of the development time.

| KODAK PROFESSIONAL T-MAX Developer | | | | | | | |
|---|---|---|---|---|---|---|---|
| KODAK Film | Speed Rating | Development Time (Minutes) | | | | | |
| | EI | 20°C (68°F) | 21°C (70°F) | 22°C (72°F) | 24°C (75°F) | 27°C (80°F) | 29°C (85°F) |
| T-MAX 100 Professional | 100/200 | 8 | 7½ | 7 | **6½** | — | — |
| | 400 | 12 | 11 | 10 | **9** | — | — |
| | 800 | NR | NR | NR | **10½** | — | — |
| PROFESSIONAL T-MAX 100 | 100/200 | 7½ | 7 | 6½ | **6 ¼** | — | — |
| | 400 | 12¼ | — | — | **10** | — | — |
| | 800 | — | — | — | **11¾** | — | — |
| T-MAX 400 Professional and PROFESSIONAL T-MAX 400 | 400/800 | 7 | 6 ½ | 6½ | **6** | — | — |
| | 1600 | 10 | 9 | 8 | **8** | — | — |
| | 3200 | NR | NR | NR | **9½** | — | — |
| T-MAX 3200 Professional | 400* | 7½ | 7 | 6½ | 6 | 5 | 4† |
| | 800 | 8 | 7½ | 7 | 6½ | 5½ | 4½† |
| | 1600 | 8½ | 8 | 7½ | 7 | 6 | 5 |
| | 3200 | 11½ | 11 | 10½ | 9½ | 8 | 6½ |
| | 6400 | 14 | 13 | 12 | 11 | 9 ½ | 8 |
| | 12,500* | 16 | 15½ | 14½ | 12 ½ | 10½ | 9 |
| | 25,000* | NR | 17½ | 16 | 14 | 12 | 10 |
| PROFESSIONAL T-MAX P3200 | 400 | 8½ | 8 | 7½ | 6½ | 5½ | 4½† |
| | 800 | 9½ | 9 | 8½ | 7½ | 6½ | 5½ |
| | 1600 | 10½ | 10 | 9 | 8 | 7 | 6 |
| | 3200 | 12 | 11½ | 10½ | 9½ | 8 | 6½ |
| | 6400 | 13½ | 13 | 12 | 11 | 9 | 7½ |
| | 12,500 | 15½ | 14½ | 13½ | 12 | 10 | 8½ |
| | 25,000 | NR | 16 | 15 | 13½ | 11½ | 9½ |
| PLUS-X Pan | 125/250 | 5½ | 5½ | 5 | **5** | — | — |
| PLUS-X Pan Professional | 500 | NR | NR | NR | **9** | — | — |
| PROFESSIONAL PLUS-X 125 | 125/250 | 5¾ | 5¼ | 4¾† | **4¼†** | — | — |
| | 500 | NR | NR | NR | **6 ¼** | — | — |
| TRI-X Pan | 400/800 | 6 | 6 | 5½ | **5 ½** | — | — |
| | 1600 | 10 | 9½ | 9 | **8 ½** | — | — |
| | 3200 | NR | NR | NR | **11** | — | — |
| TRI-X Pan Professional | 320 | 8 | 7½ | 7 | **6½** | — | — |
| PROFESSIONAL TRI-X 400 Film / 400TX | 400/800 | 6 | 5 ¾ | 5 ½ | 4¾† | — | — |
| | 1600 | 8 ¾ | 8 ¼ | 7 ¾ | 7 | — | — |
| | 3200 | NR | NR | NR | 8 ¼ | — | — |
| PROFESSIONAL TRI-X 320 Film / 320TXP | 320 | 7 ¼ | 6 ¾ | 6 ¼ | 5 ¼ | — | — |
| VERICHROME Pan | 125 | **6** | 5 ½ | 5 | 4† | — | — |

*Make tests to determine if results at these ratings are acceptable for your needs.
†Development times shorter than 5 minutes may produce unsatisfactory uniformity.

NR = Not recommended
**Note:** The development times in **bold type** are suggested starting points

## ROTARY-TUBE PROCESSING

### Rotary-Tube Processing—Rolls

Follow the agitation recommendations for your processor.

| KODAK PROFESSIONAL T-MAX Developer | | | | | | | |
|---|---|---|---|---|---|---|---|
| KODAK Film | Speed Rating | Development Time (Minutes) | | | | | |
| | EI | 20°C (68°F) | 21°C (70°F) | 22°C (72°F) | 24°C (75°F) | 27°C (80°F) | 29°C (85°F) |
| T-MAX 100 Professional | 100/200 | 6 1/2 | 6 1/2 | 6 | **5 1/2** | — | — |
| | 400 | 10 1/2 | 10 | 9 | **9** | — | — |
| | 800 | NR | NR | 14 | **12 1/2** | — | — |
| PROFESSIONAL T-MAX 100 | 100/200 | 7 3/4 | 7 1/4 | 6 3/4 | **6 1/4** | — | — |
| | 400 | 12 1/4 | 11 1/2 | 10 3/4 | **10** | — | — |
| | 800 | NR | NR | 12 3/4 | **11 3/4** | — | — |
| T-MAX 400 Professional and PROFESSIONAL T-MAX 400 | 400/800 | 6 1/2 | 6 1/2 | 6 | **5 1/2** | — | — |
| | 1600 | 8 1/2 | 8 | 7 1/2 | **7** | — | — |
| | 3200 | 11 | 10 1/2 | 10 | **9 1/2** | — | — |
| T-MAX 3200 Professional | 400[1] | 6 1/2 | 6 | 5 1/2 | 4 1/2 | 3 1/2 | 3 |
| | 800 | 7 1/2 | 6 1/2 | 6 | 5 | 4 | 3 1/2 |
| | 1600 | 8 | 7 | 6 1/2 | 5 1/2 | 4 1/2 | 4 |
| | 3200 | 11 | 9 1/2 | 8 1/2 | 7 1/2 | 6 | 5 1/2 |
| | 6400 | 13 | 11 1/2 | 10 1/2 | 9 | 7 1/2 | 6 1/2 |
| | 12,500[1] | 14 1/2 | 13 | 12 | 10 1/2 | 9 | 8 |
| | 25,000[1] | NR | 15 | 14 | 12 | 11 | 10 |
| PROFESSIONAL T-MAX P3200 | 400* | 8 1/2 | 8 | 7 1/2 | 6 1/2 | 5 1/2 | 4 1/2 |
| | 800 | 9 1/2 | 9 | 8 1/2 | 7 1/2 | 6 1/2 | 5 1/2 |
| | 1600 | 10 1/2 | 10 | 9 | 8 | 7 | 6 |
| | 3200 | 12 | 11 1/2 | 10 1/2 | 9 1/2 | 8 | 6 1/2 |
| | 6400 | 13 1/2 | 13 | 12 | 11 | 9 | 7 1/2 |
| | 12,500* | 15 1/2 | 14 1/2 | 13 1/2 | 12 | 10 | 8 1/2 |
| | 25,000* | NR | 16 | 15 | 13 1/2 | 11 1/2 | 9 1/2 |
| PLUS-X Pan | 125/250 | 5 1/2 | 5 | 4 1/2 | **3 1/2** | — | — |
| PLUS-X Pan Professional | 500 | 9 | 8 | 7 | **6** | — | — |
| PROFESSIONAL PLUS-X 125 | 125/250 | 5 3/4 | 5 1/4 | 4 3/4 | **4 1/4** | — | — |
| | 500 | 8 3/4 | 8 | 7 1/4 | **6 1/4** | — | — |
| TRI-X Pan | 400/800 | 6 | 5 1/2 | 5 | **4 1/2** | — | — |
| | 1600 | 9 | 8 | 7 1/2 | **6 1/2** | — | — |
| | 3200 | 12 | 11 | 10 | **9** | — | — |
| TRI-X Pan Professional | 320 | 8 | 7 1/2 | 7 1/2 | **6** | — | — |
| PROFESSIONAL TRI-X 400 Film / 400TX | 400/800 | 6 | 5 3/4 | 5 1/2 | 4 3/4 | — | — |
| | 1600 | 8 3/4 | 8 1/4 | 7 3/4 | 7 | — | — |
| | 3200 | NR | NR | NR | 8 1/4 | — | — |
| PROFESSIONAL TRI-X 320 Film / 320TXP | 320 | 7 1/4 | 6 3/4 | 6 1/4 | 5 1/4 | — | — |

[1] Make tests to determine if results at these ratings are acceptable for your needs.

NR = Not recommended

**Note:** The development times in **bold type** are suggested starting points.

## QUICK REFERENCE TO PROCESSING FILMS

### Before Processing

- Make sure all hangers and reels are clean and dry before loading film.
- Handle unprocessed panchromatic film in total darkness.
- Make sure all solution temperatures are close to the temperature of the developer (within ?1.7°C [?3°F]). The temperature recommendation for most developers is 20°C (68°F); for KODAK PROFESSIONAL T-MAX Developer, it is 24°C (75°F).

| Step | Time | Agitation and Notes |
|---|---|---|
| **1.Developer** | See development tables | **Small tank** (closed, cylindrical container that holds a single stack of spiral reels)—First tap the tank against the sink or counter to dislodge air bubbles that cling to the film. Then agitate at a rate of about 4 inversion cycles (down, up) every 30 seconds (5 cycles in 5 seconds for T-MAX Films). Each inversion cycle should take about 1 second. If you cannot invert the tank without spilling the developer, slide it back and forth in about a 10-inch arc for the same length of time.<br>**Large tank** (open, rectangular container usually used for sheet film)—First, tap the hangers against the top of the tank to dislodge air bubbles. Then lift, tilt, and drain the hangers over the tank 2 times at 1-minute intervals. Tilt the hangers to the right and then to the left to get even development. |
| **2.Stop Bath** | 30 seconds | Agitate continuously. |
| **3.Fixer** | Fix for twice as long as it takes the film to clear (lose its milky appearance); usually 2 to 4 minutes in liquid-concentrate fixers, 5 to 10 minutes in powder fixers | With a small tank, agitate continuously for the first 30 seconds and at 30-second intervals after that. For a large tank, use 1-minute intervals. |
| **4.Rinse** | 30 seconds | Agitate continuously for the first 30 seconds and then at 30-second intervals. |
| **5.Hypo Clearing Agent** | 1 to 2 minutes | Rinse the film in the tank under running water. |
| **6.Wash** | 5 minutes | Run the wash water fast enough to provide a complete change of water in the container in 5 minutes. For rapid washing in a small tank, fill the tank to overflowing with fresh water and then dump it all out. Repeat this cycle 10 times. |
| **7.Wetting Agent** | 30 seconds | Provide gentle agitation for 5 seconds of the total time. To reduce drying scum, mix KODAK PHOTO-FLO Solution with distilled water in areas that have hard water. |
| **8.Dry** | As necessary | Hang film in a clean, dust-free place. |
| **After Processing** | Wash and dry all the equipment that came in contact with chemical solutions. | When thoroughly dry, store negatives in sleeves or envelopes away from dust and extreme temperature and humidly. For more information, see Storage and Care of KODAK Photographic Materials—Before and After Processing, Kodak Alaris Publication No. E-30. |

## SIZES AVAILABLE

Sizes and CAT numbers may differ from country to country. See your dealer who supplies KODAK PROFESSIONAL Products.

| **KODAK PROFESSIONAL T-MAX RS Developer and Replenisher** | **CAT No.** |
|---|---|
| To make 1 gallon | 844 6163 |
| To make 10 gallons (2 units to make 5 gallons each) | 825 4237 |

| **KODAK PROFESSIONAL T-MAX Developer** | **CAT No.** |
|---|---|
| To make 1 gallon | 140 2767 |
| To make 5 gallons | 159 9844 |

| **KODAK Black-and-White Film Process Control Strips** | **CAT No.** |
|---|---|
| Box of 50 strips | 180 2990 |

## MORE INFORMATION

Kodak Alaris has many publications to assist you with information on Kodak Alaris products, equipment, and materials.

The following publications are available from dealers who sell Kodak Alaris products, or you can, visit: www.kodakalaris.com/go/professional

| | |
|---|---|
| E-103CF | *Chemicals for KODAK PROFESSIONAL Black-and-White Films (Matrix)* |
| F-7 | *KODAK VERICHROME Pan Film* |
| F-8 | *KODAK PLUS-X Pan and KODAK PLUS-X Pan Professional Films* |
| F-9 | *KODAK TRI-X Pan and KODAK TRI-X Pan Professional Films* |
| F-10 | *KODAK EKTAPAN Film* |
| F-16 | *KODAK Professional Copy Film* |
| F-32 | *KODAK T-MAX Professional Films* |
| F-4016 | *KODAK PROFESSIONAL T-MAX Films* |
| F-4017 | *KODAK PROFESSIONAL TRI-X 320 Film / 320TXP* |
| F-4018 | *KODAK PROFESSIONAL PLUS-X 125 Film* |
| J-87 | *KODAK T-MAX 100 Direct Positive Film Developing Outfit* |

The following book is available from photo-specialty dealers who sell Kodak Alaris products:

| | |
|---|---|
| R-20 | *KODAK Black-and-White DATAGUIDE* |

**Note:** The Kodak Alaris materials described in this publication for use with KODAK PROFESSIONAL T-MAX Developers are available from dealers who supply KODAK PROFESSIONAL Products. You can use other materials, but you may not obtain similar results.



KODAK PROFESSIONAL T-MAX Developers
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