	UNDILUTED	1 to 1	1 to 3
Prof. T-Max P3200	14	--	--
Pan F	5	6	9
FP-4	5.5	8.5	12
HP-5(El 200)	6	10	13
Agfa 25	4.3	6	9
Agfa 100	4.5	8.5	12
Agfa 400	7.5	12	18

For reference, the following table shows the times recommended by Ilford for their films in D-76 or ID-11+, all at normal speed, with the Ilford-specified Gradient (similar to Contrast Index) of 0.55. You will notice that these times are quite different from those used by Johnson:

	UNDILUTED	1+1	1+3
Pan F	6	8.5	14
FP-4	6.5	9	15
HP-5	7.5	12	21

Note that as Johnson uses the 1+3 dilution, this is for very high contrast scenes, with slight overexposure. The 1+3 dilution produces higher grain but also higher sharpness than lesser dilutions. Those who wish to use it for more normal scenes should extend these times by a couple of minutes. Johnson uses D-76 undiluted for best gradation of normal and low contrast scenes, and diluted D-76 for better sharpness and the ability to bridge high contrast scenes.

PHOTOGRAPHERS' FORMULARY INC.

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Catalog numbers 01-0270 1 liter
01-0271 4 liters
01-0272 8 liters

PHOTOGRAPHERS' FORMULARY

FORMULARY TD-16 FILM DEVELOPER

These directions cover three kits.

GENERAL DESCRIPTION

Formulary TD-16 has been formulated to duplicate the working characteristics of Kodak® D-76 precisely. D-76 is probably the most popular black and white developer in the world. It offers perhaps the optimum balance of speed, fine grain, high sharpness, and good gradation. However, there are two important ways in which TD-16 differs from D-76 as published and manufactured today.

1. It has been known since 1929, when Kodak scientists did much work on this problem that precisely repeatable, consistent results were impossible to obtain with D-76.The problem is that the pH of D-76 can rise considerably, and when it does, contrast is greatly increased, and it becomes impossible to time the developer accurately. This effect occurs most obviously when D-76 is stored as a stock solution. The maximum rise in contrast (one that would necessitate printing on paper at least two grades softer than normal) occurs after 50 days of storage. However, variability in the performance of D-76 can occur even when it is used fresh, because different mixing techniques introduce different amounts of air into the developer, and this affects the pH appreciably too. Therefore we have taken the opportunity to work out a proprietary modification of D-76 that maintains all of its desirable working characteristics over a period of six months. We must note here that ideally, all developers should be used fresh. TD-16 will also perform consistently when fresh, even when vigorous mixing techniques are used.
2. Critical photographers have noticed that there is a slight difference between the image quality of D-76 as mixed up from the published formula, and D-76 as supplied in a single powder package from Kodak® It is generally conceded that the image quality of D-76 mixed from scratch is superior. The reason is that packaged D-76 contains special stabilizing and sequestering agents to allow it to dissolve well as a single powder and perform well even in areas with very poor water supplies. We have opted for superior image quality, and therefore have not added any superfluous stabilizing or sequestering chemicals to TD-16. But because we have done this, TD-16 must be sold in two packages

2. Also, those who live in an area with a poor water supply (especially hard water areas high in calcium salts) may have to use de-mineralized or distilled water. We realize this is an inconvenience, but hope photographers will consider the rewards of improved image quality to be worth the trouble.

CHEMICAL SAFETY

All chemicals are dangerous and must be treated with respect. Please read the Chemical warnings on each package.

Some individuals become sensitized (develop allergic symptoms or rashes) when using certain chemicals. If this should occur, discontinue use and consult a physician.

The user assumes all risks upon accepting these chemicals. IF FOR ANY REASON YOU DO NOT WISH TO ASSUME ALL RISKS, PLEASE RETURN THE CHEMICALS FOR A FULL REFUND.

Please consult with local sewer and water authorities regarding disposal of darkroom chemicals in your area.

STORAGE

After mixing, the stock solution will last up to six months if kept in a bottle filled to the top with a good tight cap. However, for the best results, all photographic solutions should be used as soon after mixing as possible. If the developer is to be used diluted, be sure to dilute just before using, and discard the working solution after one use.

CAPACITY

D-76 is most often used diluted 1+1. It is very important, if consistent results are to be obtained, to develop only two rolls of 35 mm per liter of the diluted solution. When the developer is diluted even to 1+3, only one roll per liter should be developed. It is possible, at the 1+3 dilution to develop two rolls per liter, but the results will not be consistent, and there is the possibility that a speed loss will occur. Another point is that, when the developer is diluted, it becomes very sensitive to the pH of the water supply used, so that under these conditions, distilled water should be used to obtain completely reliable results. If TD-16 is used undiluted, it is possible to reuse it, although this is not recommended. A maximum of 8 rolls per liter can be developed. Increase time about 5% for each roll developed. Consistent quality will only be obtained when the developer is first used. A better approach for those who wish to reuse the undiluted developer, is to use a replenisher. This is available as TD-16R. This is an acceptable procedure, but we wish to emphasize that optimum results can never be obtained when the-developer is re-used as there is always at least some compromise in image quality, and a slight speed loss is inevitable as bromide from used film builds up. Kodak® replenisher formula D-76R should not be used with TD-16, because it is not consistent for either long or short-term use.

HOW TO MIX TD-16

Mixing. is very simple. Place 750 ml of water for the one-liter kit, or 3000 ml for the four-liter kit, or 6000 ml for the eight-liter kit at about 120°F in a container. Slowly add the contents of packet A to the water while stirring gently. Continue stirring for a minute or so, until the solution is clear. Slowly add the contents of packet B. Continue stirring for one minute. If the developer has not totally dissolved, leave it for fifteen minutes, then stir one minute again. Do not shake the developer or stir too vigorously: as any mixing that tends to aerate the solution w ill cause it to deteriorate more rapidly. Add more water to make one liter, four liters, or eight liters in all, depending on the kit size. Place the stock in bottles filled to the top, and seal tightly.

NOTE: better results may be obtained if the water used for making the stock and working solutions is boiled for three minutes, then cooled to 120°F before mixing. Use distilled water if there are any doubts about the quality of your water supply - especially if you live in a hard water area. In most areas, ordinary tap water can be used with no problem, but distilled or demineralized water is always preferable.

DEVELOPING TIMES FOR D-76

Since D-76 is such a popular developer, most photographers will already have determined their favorite times. Times in TD -16 will be identical. The suggestions in the following table are for 35mm and 120 equivalents. and have mostly been supplied by noted developing expert Walter Johnson, and are representative of what fine photographers are using with today's black and white films. These times assume a condenser enlarger; develop 20% longer if a diffusion enlarger will be used. Negatives with average contrast scenes should print on a grade 2 or 3 papers. Note that the shorter the developing time, the finer the grain, the better the acutance and sharpness. It is usually better to have a slightly flat negative, and print it on a higher grade of paper. The times below are in minutes, with ten seconds agitation each minute (five tank inversions), at 68°F.

	UNDILUTED	1 to 1	1 to 3
Plus-X(EI 80)	5	8	12
Prof. Plus-X 125	5 1/2	--	--
Tri-X(EI 200)	6.5	9.5	13
Prof. Tri-X 320	9	--	--
Prof. Tri-X 400	6 3/4	--	--
Prof. T-Max 100	6 1/2	--	--
Prof. T-Max 400	8	--	--