

Replacements for E6 Processing Kits

3E6 (3-bath) and Chrome 6X

FUJIFILM Europe have supplied E6 / Pro6 kits in various sizes for use by amateur photographers and small professional users. Many of these products are now being withdrawn due to decreased demand, and you may find that you have to change your normal way of working with E6 chemistry.

This Technical Information Sheet outlines the available options, and gives you all necessary mixing and usage instructions. Further information can also be found in the FUJIFILM E6 Technical Bulletin, available on request or from our web site at www.fujifilm.eu/feb. Your local FUJIFILM representative can also provide technical advice if required.

I. DISCONTINUED PRODUCTS

A 3E6 – 3 bath E6 process

All 3E6 individual products (15L pack sizes) are being withdrawn from 1 July 2009. After this date the products will continue to remain available until existing stocks are exhausted. The 5L 3E6 Kit, Cat. No. 958 967, continues to be available. You may wish to simply switch from the 15L packs to the 5L kit, in which case you will see little change in your working routine.

3E6 is a three bath process compatible with all slide films designed for the E6 process. It consists of a First Developer, a Colour Developer, and a Bleach/Fix. The 5 litre kit will make 5 litres working strength of each bath, (which is enough to process 50 films 135-36 exposure).

B Chrome 6X – 6 bath E6 Process

All Chrome 6X individual products (6x5L and 6x2.5L packs) are being withdrawn from 1 July 2009. After this date the products will continue to remain available until existing stocks are exhausted. The 5L Chrome 6X Kit, Cat. No. 979 641, continues to be available. You may wish to simply switch from the individual packs to the 5L kit, in which case you will see little change in your working routine.

Chrome 6X does not require a separate stabilizer; all necessary chemicals are included in the Chrome 6X Kit.

II. REPLACEMENT PRODUCTS

For both 3E6 and Chrome 6X processes.

The 5L 3E6 and Chrome 6X kits continue to be available. For users requiring larger pack sizes, you must use regular Pro6 chemistry, as below.

Product Name	Size	Cat N°
Pro6		
3E6 Kit	5L	958 967
Chrome 6x Kit	5L	979 641
Pro6 First Developer Replenisher ⁽¹⁾	20L	944 645
Pro6 Reversal 2 Bath & Replenisher	20L	991 323
Pro6 Colour Developer Replenisher Kit ⁽²⁾	20L	944 694
Pro6 Pre-Bleach 2 & Replenisher	2 x 20L	979 070
Pro6 Bleach Replenisher ⁽³⁾	20L cube	818 377
Unimatic Fixer ⁽⁴⁾	4L conc.	919 407
Pro6 Final Rinse	6 x 20L	979 088

Notes

- ⁽¹⁾ Pro6 First Developer Replenisher also requires use of Pro6 First Developer Starter (# 944 637) for use as working solution.
- ⁽²⁾ Pro6 Colour Developer Replenisher also requires use of Pro6 Universal Colour Developer Starter (# 976 977) for use as working solution.
- ⁽³⁾ Pro6 Bleach Replenisher also requires use of Pro6 Bleach Starter (# 818 369) for use as working solution. Pro6 Bleach Replenisher is supplied as a concentrate in a 20L cubitainer – equivalent to 20L replenisher or 40L working tank solution.
- ⁽⁴⁾ Unimatic Fixer is supplied as 4L concentrate to make 40L working fixer for the E6 process.

The catalogue numbers shown above for Pro6 First and Colour Developer Starters are for 6x1L bottles. Your local FUJIFILM supplier should be able to provide these starters as single 1L packs on request.

III. MIXING RECOMMENDATIONS

- Always mix the solutions with water at 30-40°C.
- Ideally only mix the volume recommended by the processor manufacturer. If splitting the concentrate solutions, be very careful to split them accurately following the mixing instructions found below.
- If you intend to use the kits over a long period of time, it is recommended that you split the concentrates into several smaller bottles to avoid air oxidation due to partially empty bottles. If you are splitting the larger 20L Pro6 chemistry packs to use over an extended period of time, storage of unused concentrates (once first opened) in full, smaller bottles is an essential factor in achieving a consistent, high quality E6 process.

IV. SOLUTION CAPACITY AND USAGE INSTRUCTIONS¹

As the solution is gradually exhausted during each developing sequence, the processing times will have to be slightly increased to compensate (see Table below).

DEVELOPER TIME AND TEMPERATURE

Process E-6 is sensitive to time, temperature and agitation. To obtain the correct density level in the film, you can adjust the First Developer time and temperature within the ranges given in the table of processing steps and conditions for your type of processor.

Once you have selected these conditions, hold them to the following tolerances for consistent results:

First Developer Time \pm 5 seconds Temperature \pm 0.3°C

Colour Developer Time \pm 15 seconds Temperature \pm 0.6°C

If the First Developer and Colour Developer are heated by the same system, the First Developer temperature will determine the Colour Developer temperature.

CAPACITY OF NON-REPLENISHED SOLUTIONS

The capacity of the First Developer and Colour Developer solutions is about 2.2 m² of film per 5 litres. The capacities of the other solutions are three times the capacity of the developers, except with small tanks. The capacity of the other solutions with small tanks is *twice* that of the developers. Process as much film as you can in each process to reduce the number of separate processes. After you have processed 1.1 m² of film, increase the First Developer time by 30 seconds. The table below gives the solution capacity for the available film sizes.

Film Size	First Developer Time		Discard after this many Rolls or Sheets		
	Rolls or Sheets per 5 litres (6 minute First Developer Time)	Rolls or Sheets per 5 litres (increase First Developer Time to 6'30")	First & Colour Developers	the other solutions without small tanks	the other solutions with small tanks
110-20	1 to 140	141 to 210	210	630	420
126-20	1 to 56	57 to 86	86	258	172
135-24	1 to 40	41 to 60	60	180	120
135-36	1 to 28	29 to 44	44	132	88
120	1 to 30	31 to 44	44	132	88
220	1 to 15	16 to 22	22	66	44
4 x 5 inch	1 to 118	119 to 175	175	525	350
5 x 7 inch	1 to 60	61 to 95	95	285	190
8 x 10 inch	1 to 28	29 to 43	43	129	86

The solution must completely cover the film. You may need to add solution. Discard solutions that exceed the recommended storage times regardless of unused capacity.

¹ The capacity is only indicative and can vary greatly, depending on working conditions, film exposure, storage, type and brand of film, etc....

PROCESS ADJUSTMENTS FOR UNDEREXPOSED AND OVEREXPOSED FILM

You will get the best quality by using the normal speed ratings and normal processing. However, if you are willing to accept somewhat different quality, you can expose these films one stop higher or lower than their normal speed and then adjust the First Developer time or temperature during processing.

Don't use speed adjustments of more than one stop, unless you are trying to save film accidentally exposed at the wrong film-speed rating. Use the following table as a guide to adjust the First Developer time or temperature to compensate for a film speed other than the recommended speed. Use normal times and temperatures for all others solutions.

Camera Exposure First Developer Time	Adjustment
2 1/2 Stops Under	Increase by 8 minutes
2 Stops Under	Increase by 5 minutes
1 Stop Under	Increase by 2 minutes
Normal	None
1/2 Stop Over	Decrease by 1 minute
1 Stop Over	Decrease by 2 minutes, but not recommended
2, 3 & 4 Stops Over	Not Recommended

COLOUR-BALANCE ADJUSTMENT

Green or magenta colour balance on Fuji films can be caused by incorrect Colour Developer alkalinity (pH) or improper Colour Developer mixing. To adjust Colour Developer alkalinity, add small measured amounts of 5N sodium hydroxide (NaOH 20%) to correct for a process with a magenta colour balance (for Fuji and E100 series Kodak films – blue for older Kodak EPR/EPN/EPP films); add 5N sulphuric acid (H₂SO₄ 20%) to correct for a process with a green colour balance (yellow for older Kodak).

Add 2 ml/L of 5N NaOH for approximately each 0.03 density unit more green you want in your colour balance (for older Kodak: add 1 ml/L 5N NaOH for each 0.05 density unit more yellow).

Add 2 ml/L of 5N H₂SO₄ for approximately each 0.05 density unit more magenta you want in your colour balance (for older Kodak: add 1 ml/L 5N H₂SO₄ for each 0.05 density unit more blue).

BATCH OR SINK-LINE PROCESSING

Steps and Conditions for Batch or Sink-Line Processing

Solution/Step	Time*	Temperature	Gaseous - Burst** or Manual Agitation	
First Developer***	6'00"	36.5 to 39.5°C	Nitrogen. One 2-second burst every 10 seconds.	A
First Wash	2'00"	33 to 39.5°C	Manual agitation. One cycle every 30 seconds	
Reversal 2 Bath	2'00"	24 to 39.5°C	None. Tap to dislodge air bubbles.	
Colour Developer***	6'00"	36.5 to 39.5°C	Nitrogen. One 2-second burst every 10 seconds.	B
Pre-Bleach 2	2'00"	24 to 39.5°C	Tap to dislodge any air bubbles	
Bleach	6'00"	33 to 39.5°C	Air. One 2-second burst every 10 seconds.	
Fixer	4'00"	33 to 39.5°C	Air. One 2-second burst every 10 seconds.	
Final Wash	4'00"	33 to 39.5°C	Manual agitation. One cycle every 30 seconds.	
Final Rinse	0'30"	Ambient	None. Tap to dislodge air bubbles.	

* All times include a 10-second drain time. Increase the First Developer time by 15 seconds when you process roll films on reels with manual agitation.

** For sheet films or hangers. Provide initial manual agitation followed by gaseous-burst agitation. For roll films on reels, use only manual agitation.

***See "Developer Time and Temperature".

A Process in total darkness

B These steps can be carried out in normal room lighting

AGITATION

Gaseous Burst Agitation For Sheet Films Only

Do not use gaseous-burst agitation for roll films on reels; uniformity will be unacceptable.

Initial Agitation: All solutions except the Reversal 2 Bath, Pre-Bleach 2 or Final Rinse. Lower the loaded film hangers into the solution and tap them sharply against the bottom of the tank to dislodge any air bubbles on the film.

Use no other agitation in the Reversal 2 Bath, Pre-Bleach 2 and Final Rinse. For all other solutions, agitate the films continuously for 15 seconds by lifting the hangers about three-quarters of the way out of the solution and reimmersing them.

Subsequent Agitation: Use nitrogen-burst agitation for the First and Colour Developers. Provide enough pressure for a 2-second burst to raise the solution level approximately 15 mm. Give one 2-second burst every 10 seconds. Use oil-free compressed air for the Bleach, Fixer and Washes. The pressure should raise the solution level 15 mm.

Agitation may be either continuous or burst. The burst rate should be at least one 2-second burst every 10 seconds.

DO NOT substitute nitrogen for air in the Bleach and Fixer.

Manual Agitation for Roll and Sheet Films

Use this procedure for processing film on reels. You can also use it for sheet film.

Initial Agitation: All solutions except the Reversal 2 Bath, Pre-Bleach 2 or Final Rinse. Lower the loaded reels or film hangers into the solution and tap them sharply against the bottom of the tank to dislodge any air bubbles on the film. Use no other agitation in the Reversal 2 Bath, Pre-Bleach 2 and Final Rinse. For the other solutions, agitate the films continuously for 15 seconds by lifting the reels or hangers about three-quarters of the way out of the solution and reimmersing them.

Subsequent Agitation: Use for all solutions and washes except the Reversal 2 Bath, Pre-Bleach 2 and Final Rinse. Every 20 seconds, lift the hangers or reels out of the solution and then lower them to the bottom of the tank. Repeat for two lift cycles (approximately 5 seconds).

SMALL TANK PROCESSING

Steps and Conditions for Small Tank Processing

Solution/Step	Time*	Temperature	Agitation
These steps must be carried out in total darkness			
First Developer***	6'00" - 7'00"	38 ± 0.3°C**	Initial and subsequent
Wash	1'00"	33 to 39°C	Initial and subsequent
Wash	1'00"	33 to 39°C	Initial and subsequent
Reversal 2 Bath	2'00"	33 to 39°C	Initial only
Remaining steps can be carried out in room light			
Colour Developer	6'00"	38 ± 0.6°C**	Initial and subsequent
Pre-Bleach 2	2'00"	33 to 39°C	Initial only
Bleach	7'00"	33 to 39°C	Initial and subsequent
Fixer	4'00"	33 to 39°C	Initial and subsequent
Wash (running water)	6'00"	33 to 39°C	Initial and subsequent
Final Rinse	0'30"	Ambient	Initial only
Drying		Up to 60°C	Remove film from reels

* The processing time includes a 10 sec. drain time.

** Use a water-tempering bath to maintain the solution temperatures to within ± 0.3°C.

*** See "Developer Time and Temperature".

Agitation – Invertible Tanks

First Developer, Colour Developer, Bleach, Fixer, Washes.

Initial Agitation: Tap the tank to remove air bubbles; then turn the tank over and back 7 or 8 times without stopping during the first 15 seconds. Return the tank to the tempering bath.

Subsequent Agitation: At 30-second intervals, remove the tank from the tempering bath and quickly turn the tank over and back 2 times. Return the tank to the bath.

Reversal 2 Bath, Pre-Bleach 2, Final Rinse

Initial Agitation only: As soon as you've added solution to the tank, tap the tank against the tabletop several times to remove any air bubbles on the film. Turn the over and back once. Return the tank to the tempering bath.

Agitation – Non-Invertible Tanks

First Developer, Colour Developer, Bleach, Fixer, Washes.

Initial Agitation: Tap the tank to remove air bubbles; return the tank to the tempering bath, and rotate the reel 4 or 5 times during the first 5 seconds in the solution.

Subsequent Agitation: At 30-second intervals, rotate the reel 4 or 5 times.

Reversal 2 Bath, Pre-Bleach 2, Final Rinse

Initial Agitation only: As soon as you've added solution to the tank, tap the tank against the tabletop several times to remove air bubbles on the film. Follow with one agitation cycle. Return the tank to the tempering bath.

V. PRO6 MIXING INSTRUCTIONS

Mixing Instructions for your 3E6 or Chrome 6X chemistry are packed with your existing chemistry, or available in the specific Technical Information Sheets for these products.

The Mixing Instructions for the replacement Pro6 chemistry are as follows. Please note that use of Pro6 First Developer and Pro6 Colour Developer as working tank solution requires the use of a special starter solution for each developer. This is not optional; you will not achieve a satisfactory E6 process without use of the correct starters. See also "Notes for 3-E6 and Chrome 6X Users" below.

Pro6 First Developer Replenisher				
To make 1 litre	Water	Conc.	Replenisher	Pro6 First Developer Starter
TANK	795 ml	200 ml	/	5 ml
REPLENISHER	800 ml	200 ml	/	/
Tank from Repl	/	/	995 ml	5 ml

Pro6 Reversal 2 Bath & Replenisher			
To make 1 litre	Water	Conc.	Replenisher
TANK	965 ml	35 ml	/
REPLENISHER	950 ml	50 ml	/
Tank from Repl	175 ml		825 ml

Pro6 Colour Developer Replenisher

To make 1 litre	Water	Part A	Part B	Replenisher	Pro6 Universal Colour Dev. Starter
TANK	657 ml	170 ml	170 ml	/	3 ml
REPLENISHER	600 ml	200 ml	200 ml	/	/
Tank from Repl	147 ml	/	/	850 ml	3 ml

Pro6 Pre-Bleach 2 & Replenisher

To make 1 litre	Water	Conc.
TANK & REPLENISHER	900 ml	100 ml

Pro6 Bleach Replenisher

To make 1 litre	Water	Conc.
TANK	500 ml	500 ml
REPLENISHER	/	1000 ml

Unimatic Fixer

To make 1 litre	Water	Conc.
TANK & REPLENISHER	900 ml	100 ml

Pro6 Final Rinse & Replenisher

To make 1 litre	Water	Conc.
TANK & REPLENISHER	990 ml	10 ml

VI. STORAGE ADVICE

Always store chemicals in a cool and well ventilated room.

Avoid air oxidation of opened concentrates and mixed solutions.

- Unopened Concentrates will keep maximum 18 months under normal storage conditions (temperatures of between 15 and 25°C).
- Opened Concentrates will last at least 3-6 months if kept in closed air tight bottles with a minimum of air space. Use of glass or other bottles with well sealing caps and providing a good barrier to oxygen will prolong concentrate lifetime. Following the recommendations below will give maximum chemistry lifetime :
 - The First Developer and Colour Developer (parts A and B) PRO6 concentrates are supplied as single 4L bottles. You are advised to split these into (for example) 4 x 1 litre bottles from the time that you first use these concentrates. These bottles should be filled to within about 2cm of the top of the neck, and should have airtight, well fitting caps. The temptation is to start using the chemistry and just leave it in the bottle originally supplied. This is a very bad idea, as the original bottles have a foil seal that cannot be replaced once the bottle has been opened – so rebottle it right from the start to prevent future problems and ensure a consistent process.
 - If you use good quality oxygen barrier bottles (e.g. glass) the full resealed bottles will last as long as the original package – giving you 18 months lifetime. Similarly, if you have a 1 litre bottle that is half full and unlikely to be used immediately, repack this into a full smaller bottle. This may sound inconvenient, but will repay you many times over with improved process consistency.
 - Reversal Bath is unavoidably susceptible to aerial oxidation, and can be the cause of significant process variations. Once the Reversal bottle has been opened, repack into smaller full bottles as soon as possible for optimum results. Pre-Bleach is also subject to oxidation, but less critical than Reversal Bath – but would still benefit from repacking into smaller filled bottles.
 - PRO6 Bleach is very stable. It can be used directly from the 20L cube as required and excess air can simply be removed by pushing it out of the plastic cube liner as it is used. Some air remaining in a partly used cube will have little effect.
 - Unimatic Fixer – like all fixers – is also subject to aerial oxidation, but is unlikely to present any problems under normal usage conditions. If kept for very extended periods, a yellow or yellow-green deposit may be seen on the bottle walls or bottom. If this is seen the fixer is no longer suitable for use and should be discarded in a safe and proper manner and replaced with fresh product.
 - PRO6 Final Rinse is unlikely to present any problems if kept in closed bottles.
- Unused working strength Developers will last 4 weeks if kept in closed air tight bottles with a minimum of air space.
- Partially used Developers will last 2 weeks if kept in closed air tight bottles with a minimum of air space.

VII. REPLENISHMENT

Unlike the 3-E6 and Chrome 6X kits, PRO6 chemistry for the E6 process has been designed for replenishment processing as well as the one-shot system used by 3-E6 and Chrome 6X. Instructions given in this Technical Information Sheet are for one-shot or non-replenished processing as you would do with 3-E6 or Chrome 6X. If you wish to run a replenished system – perhaps on a hand line – please see our E6 Technical Bulletin for full details. This can be downloaded from our web site www.fujifilm.eu/feb.

VIII. TROUBLESHOOTING – PROBLEM CORRECTION

Light crescents

Kinked films. Handle film gently when you load it onto the processing reel.

Streak or blotches

Poor agitation. Be sure you are agitating for the correct number of seconds and that you are using the right technique. Check that film was properly loaded on the reel.

Transparencies too light

Check your camera exposure. Overexposure is a frequent cause of transparencies that are too light. See that the First Developer temperature does not drift above 38.1 °C. Be sure you agitate correctly. Do not keep the film in the First Developer too long; take care to include the drain time in the total bath time.

Colour Developer temperature too low.

Transparencies too dark

Check your camera exposure. Underexposure is a frequent cause of transparencies that are too dark. First development time too short, temperature too low or agitation insufficient. Do not start with the First Developer temperature below 37.5 °C. Pour all of the Developer into the tank. If this is the second, third or fourth process for the same First Developer, develop for a longer time.

Unusual or unrealistic colour balance

One solution contaminated Clean the tank and reels (or holders) thoroughly after each process so that chemicals are not carried over into the next process. Organise your solutions so that you use them in the proper sequence.

Overall red cast

Leuco cyan dye caused by insufficient Bleach aeration. Be sure that you vigorously agitate the film in the Bleach. You can correct this film problem by rebleaching in a properly aerated Bleach.

Green shadows

Exhausted Reversal 2 Bath. Replace your Reversal 2 Bath.

Overall green balance

Reversal 2 Bath omitted. For Fuji film: also too much NaOH 5 N in the Colour Developer or too high pH.

(See "Colour-Balance Adjustment" on page 4)

Overall magenta or blue balance

See "Colour-Balance Adjustment" on page 4.

Transparencies appear both negative and positive or very light

Exhausted Colour Developer. Replace your Colour Developer.

Colour Developer temperature much too low.

Yellow or muddy highlights

Fixer exhausted. This problem can be corrected by re-fixing in fresh Fixer followed by the Wash and Final Rinse.

Red Spots

Rebleaching may correct this problem. Start with fresh Bleach and reprocess.

IX. SAFETY INFORMATION

All photographic processing solutions can exert harmful effects when brought into contact with human tissue to a greater or lesser extent depending on the nature of the solution and its concentration. All users of such solutions should exercise the greatest care to avoid the chemicals contacting the skin, eyes or other parts of the body. Always wear solution resistant gloves and effective eye protection.

In case of accidental contact with processing solutions wash the affected part with plenty of clean cold running water. Wash with an acidic soap and rinse thoroughly with water. Consult a medical doctor. Some photographic solutions produce irritating vapours therefore thorough ventilation is essential. Do not inhale air above processing solutions.

Always read the hazard information on the packs of solution concentrate before attempting to handle the solution.