

# **FUJI HUNT**

## **CHROME 6X PROCESSING KIT**

**For processing Fujichrome Films  
and all other films compatible  
with the E-6 process.  
5 litres size.**

# GENERAL INFORMATION

## HANDLING PROCESSING SOLUTIONS

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 solutions.

## PROCESSING CHEMICALS

This 5 litres kit contains:

- 1 x 1L Chrome 6-X First developer
- 1x175 ml Chrome 6-X Reversal 2 Bath
- 1 x 1L Chrome 6-X Colour Developer Part A
- 1 x 1L Chrome 6-X Colour Developer Part B
- 1 x 500 ml Chrome 6-X Pre-Bleach 2
- 1 x 2.5L Chrome 6-X Bleach
- 1 x 500 ml Chrome 6-X Fix
- 1 x 50 ml Chrome 6-X Final Rinse

## MIXING SOLUTIONS

The cleanliness of the mixing and storage equipment affect the photographic quality and life of the processing solutions. Contamination of the other solutions by minute amounts of fixer will cause large processing variations. Always mix fixers in separate equipment, and wash all equipment thoroughly after each use.

Mix chemicals to make 5 litres of solution. Unless all the solutions are to be used immediately it is better to use smaller containers and open each as required.

Do not store unused concentrates in the original containers; air in the container will cause them to deteriorate rapidly. Store concentrates in flexible containers so that you can press out the air and adjust the container to fit the amount of concentrate.

## TO MAKE 5 LITRES

<p><b>FIRST DEVELOPER</b></p> <p>4 L + 1 L = 5 L</p>	<p><b>REVERSAL 2 BATH</b></p> <p>4.825 L + 175 ml = 5 L</p>	<p><b>COLOUR DEVELOPER</b></p> <p>3 L + 1 L + 1 L = 5 L</p>	
<p><b>PRE-BLEACH 2</b></p> <p>4.5 L + 500 ml = 5 L</p>	<p><b>BLEACH</b></p> <p>2.5 L + 2.5 L = 5 L</p>	<p><b>FIX</b></p> <p>4.5 L + 500 ml = 5 L</p>	<p><b>FINAL RINSE</b></p> <p>4.95 L + 50 ml = 5 L</p>

## STORAGE OF SOLUTIONS

Store mixed solutions, unused or partially used at 5°C to 20°C. Store them in full bottles or containers with floating lids to minimize oxidation. Store unused concentrates in full containers. Do not use solutions that have been stored longer than the following times (WEEKS):

MIXED SOLUTION (Tank or Replenisher)	Full, tightly stoppered glass bottles		Partially filled bottles of used or unused solutions
	Unused solution	Used solution	
FIRST DEVELOPER	6	3	1
REVERSAL 2 BATH, PRE-BLEACH 2	6	3	1
COLOUR DEVELOPER	6	3	1
BLEACH, FIXER, FINAL RINSE	24	12	6

## 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 m<sup>2</sup> 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 m<sup>2</sup> of film, increase the First Developer time by 30 seconds. The table below gives the solution capacity for the available film sizes.

Film Size	Rolls or Sheets per 5 litres (6 minute First Developer Time)	Rolls or Sheets per 5 litres (increase First Developer Time to 6'30")	Discard First & Colour Developers After This Many Rolls or Sheets
110-20	1 to 140	141 to 210	210
126-20	1 to 56	57 to 86	86
135-24	1 to 40	41 to 60	60
135-36	1 to 28	29 to 44	44
127	1 to 50	51 to 77	77
120	1 to 30	31 to 44	44
220	1 to 15	16 to 22	22
4 x 5-in.	1 to 118	119 to 175	175
5 x 7-in.	1 to 60	61 to 95	95
8 x 10-in.	1 to 28	29 to 43	43

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.

**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.

**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 (blue for Kodak); add 5N sulfuric acid (H<sub>2</sub>SO<sub>4</sub> 20%) to correct for a process with a green colour balance (yellow for Kodak).

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

Add 2 ml/L of 5N H<sub>2</sub>SO<sub>4</sub> for approximately each 0.05 density unit more magenta you want in your colour balance (For Kodak: add 1 ml/L 5N H<sub>2</sub>SO<sub>4</sub> for each 0.05 density unit more blue).

**BATCH OR SINK-LINE PROCESSING**

**Steps and Conditions for Batch or Sink-Line Processing**

- \* 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".

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 Stop Over	Decrease by 2 minutes
2 Stops Over	Not Recommended
3 & 4 Stops Over	Not Recommended

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.	Total darkness
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.	Remaining steps can be done in roomlight
Pre-Bleach 2	2'00"	24 to 39.5°C	None. Tap to dislodge 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.	
Dry		Up to 63°C		

## 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).

## ROTARY-TUBE PROCESSORS

### Steps and conditions for Rotary-Tube Processing

Solution/Step	Time*	Temperature	Comments
Machine warm-up, running water 10L/min. <small>This step may not be necessary for water-jacketed processors. Determine the exact time and temperature for your processor.</small>	6' 00"	38 ± 1°C	No film in processor
Film warm-up. <small>Determine the exact time and temperature for your processor.</small>	4' 00"	38°C	Tube loaded with film and inserted in processor; avoid water drops on film
<b>Prewet</b> <small>Not all equipment manufacturers recommend this step. If your processor instructions recommend a prewet, check them for specific recommendations (time, temperature, etc.). Note that testing shows that prewetting may result in a slight sensitometric effect. The effect is greater with some emulsions; therefore the control strip may show a different result from that of the emulsion you process. This effect is slight and occurs randomly.</small>			
<b>First Developer</b> <small>The temperature you use may range from 36.5°C to 39.5°C. Once you select the temperature, control it within ± 0.3°C. You will need to match your temperature with the appropriate time for an "in-control" process. The time you use may range from 6' to 8'30" to produce an in-control process at a selected temperature. Control the time you select within ± 5 seconds for a consistent process.</small>	6' 00" to 8'30"	38 ± 0.3 °C	Working solution: 200 ml of concentrate
Wash 10L/min	2' 00"	33 to 39.5°C	Running water
<b>Reversal 2 Bath</b> <small>You can expose partially processed transparencies to roomlights after the Reversal 2 Bath. However, to avoid heat loss in the tube, don't open it until after the Colour Developer step.</small>	2' 00"	38 ± 1°C	Working solution: 35 ml/L of concentrate. Note: use 50 ml/L of concentrate to make replenisher solution
<b>Colour Developer</b> <small>Increase the time to 6 minutes if maximum density is found to be too low.</small>	4' 00"	38 ± 0.6°C	Working solution: 200 ml/L concentrate part A + 200 ml/L concentrate part B
Pre-Bleach 2	2' 00"	33 to 39.5°C	Working solution: 100 ml/L concentrate
Bleach	6' 00"	33 to 39.5°C	Working solution: 500 ml/L concentrate
Fixer	4' 00"	33 to 39.5°C	Working solution: 100 ml/L concentrate
Wash 10L/min.	1' 00"	33 to 39.5°C	Three 1-minute running water washes with 10 to 15 sec. drain time between
Final Rinse	0' 30"	Ambient	Use separate tank outside processor. Working solution: 10 ml/L concentrate
Dry	as needed	60°C maximum	Do not exceed maximum temperature

Remove film and wash the inside of the tube with running water at 24°C.

\*All times include a 10 to 15 second drain time.

## SMALL-TANK PROCESSING

### Steps and Conditions for Small-Tank Processing

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

\*\* Use a water-tempering bath to maintain the solution temperatures to within  $\pm 0.3^{\circ}\text{C}$ .

\*\*\* See "Developer Time and Temperature".

Solution/Step	Time*	Temperature	Agitation
<b>Total darkness</b>			
First Developer***	6' 00" - 7' 00"	38 $\pm$ 0.3°C**	Initial and subsequent
Wash	1' 00"	33 to 39°C	
Wash	1' 00"		
Reversal 2 Bath	2' 00"		Initial only
<b>Remaining steps can be done in room light.</b>			
Colour Developer	6' 00"	38 $\pm$ 0.6°C	Initial and subsequent
Pre-Bleach 2	2' 00"	33 to 39°C	Initial only
Bleach	7' 00"		
Fixer	4' 00"		
Wash (running water)	6' 00"	Up to 60°C	Initial and subsequent
Final Rinse	1' 00"		
Dry			Remove film from reels

## 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.

### 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.

# **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 by another. 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 3)

### **Overall magenta or blue balance**

See "Colour-Balance Adjustment" on page 3.

### **Transparencies appear both negative and positive or very light**

Exhausted Colour Developer. Replace your Colour Developer. Colour Developer temperature too low.

### **Yellow or muddy highlights**

Fixer exhausted. You can correct this problem by refixing the film in a fresh Fixer followed by the Wash and Final Rinse.

### **Red Spots**

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