

1. Introduction

This information contains specifications describing processing of Motion Picture Negative Films (compatible with ECN-2) and Motion Picture Positive Films (compatible with ECP-2D) in continuous machines with liquid and solid chemical kits.

Kit chemicals make it easier to prepare the processing solutions. Mixing is simpler. The mixing time is lower. You produce most constant quality and reduce faults and your production costs

Calbe Chemie GmbH guarantee that the kits are meeting our required Quality Control Specifications.

Color-Processes

2. Chemicals and general information for the handling

2.1 Assortment

Process ECN-2

Ref. Number	Product	Mixing size for (l)	Contents (l)	Weight per unit (kg)	Capacity 35 mm Film (m)
19510	Prebath and Replenisher ECN-2 VB-R	1 x 66,6	20 l	24,7	5080
19511	Prebath and Replenisher ECN-2 VB-R	1 x 50	15 l	18,7	3810
19520	Colour Developer Replenisher ECN-2 CD-R	1 x 100	A: 20 l B: 5 l C: 2 l	A: 24,5 B+C: 7,9 (1 box)	3390
19521	Colour Developer Replenisher ECN-2 CD-R	1 x 50	A: 10 l B: 2,5 l C: 1 l	A: 11,8 B+C: 4,0 (1 box)	1695
19525	Colour Developer Starter ECN-2 CD-S	2 x 100	2 x 5 l	12,2	-
19530	Stop Bath and Replenisher ECN-2 STOP-R	2 x 100	2 x 5 l	13,0	10150
19540	Bleach Bath and Replenisher ECN-2 BL-R	1 x 33,3	16,7 l	19,6	5045
19541	Bleach Bath and Replenisher ECN-2 BL-R	1 x 20	10 l	11,7	3030
19550	Fixing Bath and Replenisher ECN-2 FX-R	1 x 66,6	16,7 l	23,5	3380
19560	Final Rinse and Replenisher ECN-2 RINSE	8 x 100	8 x 1 l	9,1	61000

Process ECP-2D

Ref. Number	Product	Mixing size for (l)	Contents (l)	Weight per unit (kg)	Capacity 35 mm Film (m)
19620	Colour Developer Replenisher ECP-2 CD-R	1 x 100	A: 20 l B: 5 l	A: 23,2 B: 5,5	4420
19625	Colour Developer Starter ECP-2 CD-S	1 x 100	2 x 5 l	12,1	-
19530	Stop Bath and Replenisher ECN-2/ECP-2 STOP-R	2 x 100	2 x 5 l	13,0	10150
19640	Bleach Bath and Replenisher ECP-2 BL-R	1 x 33,3	16,7 l	20,0	5032
19641	Bleach Bath and Replenisher ECP-2 BL-R	1 x 20	10 l	12,0	3020
19653	Fixing Bath and Replenisher ECP-2 FX-R	1 x 66,6 l	20 l	26,3	10156
19655	Sound Track Developer ECP-2 ST-DEV	2 x 5	2 x 5 l	12,5	-
19560	Final Rinse and Replenisher ECN-2/ECP-2 RINSE	8 x 100	8 x 1 l	9,0	61000

2.2 General safe handling

All photographic processing solution 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 user of such solution should exercise the greatest care to avoid the chemicals contacting the skin, eyes or other parts of 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. Consult a medical doctor. Some photographic solutions produce irritating vapours therefore thorough ventilation is essential. Do not inhale air processing solution.

Always read the hazard information on the packs of solution concentrate or the material safety data sheets (MSDS) before attempting to handle the solution.

2.3 Storage of chemicals and ready to use solutions

Store the chemicals in cool, dry conditions in well sealed containers.

Protect the kits from heat, direct sunlight and frost.

Store ready to use solution at normal room temperature of 21 to 24°C. Storage temperature higher than 24°C will decrease the storage life of the solutions. Storage below 16°C can cause some solution constituents to precipitate.

For the storage life of the solution see the following table.

Ready to use solution	Open tank	Floating cover
Developer and Prebath	1 week	2 weeks
Sound track developer	1 day	1 week
Stop bath	8 weeks	Indefinite, if solution is kept clean
Others	4 weeks	8 weeks

Color-Processes

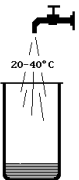
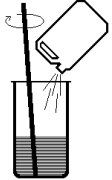
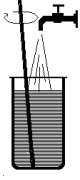
3. Process ECN-2

3.1 Mechanical Specification

Process steps	Chemicals		Temperature °C	Time min:sec	Replenishment (Wash rate) with 35 mm Film: per 30,5 m	Recirculation (R); Filtration (F); Turbulation (T)
	Tank	Replenisher				
Prebath	ECN-2 VB-R	ECN-2 VB-R	27±1	:10	400 ml	R & F 20 to 40 L/min
Rem-Jet Removal & Rinse	-	-	27 to 38	-	-	None
Developer	ECN-2 CD	ECN-2 CD-R	41,1±0,1	3:00	900 ml	R, F & T
Stop	ECN-2/ECP-2 STOP-R	ECN-2/ECP-2 STOP-R	27 to 38	:30	600 ml	R & F 20 to 40 L/min
Wash	-	-	27 to 38	:30	1,3 l	None
Bleach	ECN-2 BL	ECN-2 BL-R	27±1	3:00	200 ml	R & F 20 to 40 L/min
Wash	-	-	27 to 38	1:00	1,3 l	None
Fixer	ECN-2 FX	ECN-2 FX-R	38±1	2:00	600 ml	R & F 20 to 40 L/min
Wash	-	-	27 to 38	2:00	270 ml	None
Final Rinse	ECN-2/ECP-2 RINSE	ECN-2/ECP-2 RINSE	27 to 38	:10	400 ml	R & F 20 to 40 L/min
	Type	Temperature °C	Relative Humidity %	Air Flow m ³ /min	Time min	
Dryer	Impingement Nonimpingement	32 to 47 30 to 38	30 to 50	280	5 to 7 6 to 8	

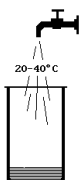
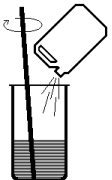
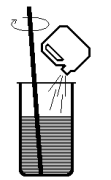
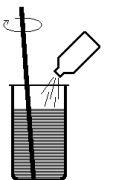
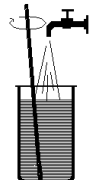
3.2 Mix Instructions for ECN-2 Chemicals

3.2.1 Prebath and Replenisher ECN-2 VB-R


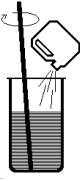
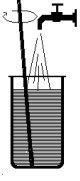
Water	ECN-2 VB-R	Water to make
		
40	20 l	66,6 l
30 l	15 l	50 l

Replenisher = Tank solution

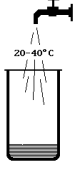
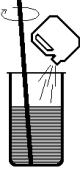
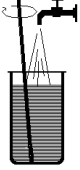
3.2.2 Developer Replenisher ECN-2 CD-R

Water	ECN-2 CD-R Teil A	ECN-2 CD-R Teil B	ECN-2 CD-R Teil C	Water to make
				
65 l	20 l	5 l	2 l	100 l
35 l	10 l	2,5 l	1 l	50 l

Tank solution ECN-2 CD

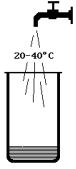

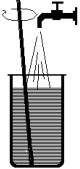
Replenisher ECN-2 CD-R	Developer Starter ECN-2 CD-S	Water to make
		
75 L	5 L	100 L

3.2.3 Stop Bath and Replenisher ECN-2/ECP-2 STOP-R

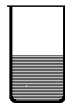
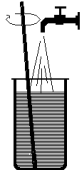
Water	ECN-2/ECP-2 STOP-R	Water to make
		
90 l	5 l	100 l

Replenisher = Tank solution

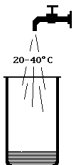
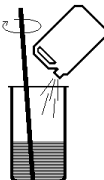
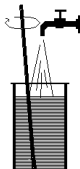
3.2.4 Bleach and Replenisher ECN-2 BL-R

Water	ECN-2 BL-R	Water to make
		
15 l	16,7 l	33,3 l
8 l	10 l	20 l

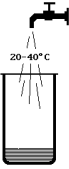
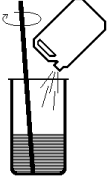
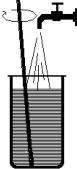
Tank solution ECN-2 BL
(using replenisher)

Replenisher ECN-2 BL-R	Water to make
	
33,3 L	53 L
20 l	32 l


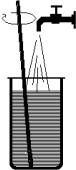
(using concentrate)

Water	ECN-2 BL-R (concentrate)	Water to make
		
30 L	16,7 L	53 L
20 l	10 l	32

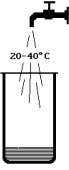
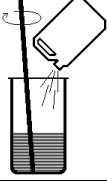
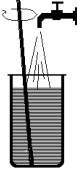
3.2.5 Fixer and Replenisher ECN-2 FX-R

Water	ECN-2 FX-R	Water to make
		
45 l	16,7 l	66,6 l

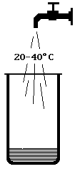
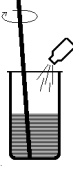
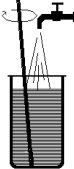
Tank solution ECN-2 FX
(using replenisher)

Replenisher ECN-2 FX-R	Water to make
	
66,6 l	75 l

(using concentrate)

Water	ECN-2 FX-R (concentrate)	Water to make
		
55 l	16,7 l	75 l

3.2.6 Rinse Bath and Replenisher ECN-2/ECP-2 RINSE

Water	ECN-2/ECP-2 RINSE	Water to make
		
95 L	1 L	100 L

Replenisher = Tank solution

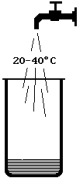
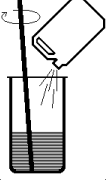
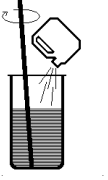
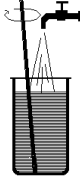
4. Process ECP-2D

4.1 Mechanical Specification


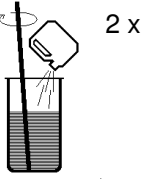
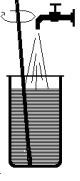
Process steps	Chemicals		Temperature °C	Time min:sec	Replenishment (Wash rate) with 35 mm Film: per 30,5 m	Recirculation (R); Filtration (F); Turbulation (T)
	Tank	Replenisher				
Developer	ECP-2 CD	ECP-2 CD-R	36,7±0,1	3:00	690 ml	R, F & T 125 to 175 L/min
Stop bath	ECN-2/ECP-2 STOP-R	ECN-2/ECP-2 STOP-R	27±1	:40	770 ml	R & F 40 to 60 L/min
Wash	-	-	27±3	:40	1,2 l	None
1. Fixer	ECP-2 FX	ECP-2 FX-R	27±1	:40	200 ml	R & F 40 to 60 L/min
Wash	-	-	27±3	:40	1,2 l	None
Bleach	ECP-2 BL	ECP-2 BL-R	27±1	1:00	200 ml	R & F 40 to 60 L/min
Wash	-	-	27±3	:40	1,2 l	None
Dry film surface before sound track developer application.						
Sound Track Developer	ECP-2 ST-DEV	-	Ambient	:10 to :20	-	keine
Spray Rinse	-	-	27±3	:01 to :02	depend on machine speed and equipment	keine
Second Fixer	ECP-2 FX	ECP-2 FX-R	27±1	:40	200 ml	U & F 40 bis 60 l/min
Wash	-	-	27±3	1:00	1,2 L	keine
Final Rinse	ECN-2/ECP-2 RINSE	ECN-2/ECP-2 RINSE	27±1	:10	400 ml	U & F 40 bis 60 l/min
	Type	Temperature °C	Relative Humidity %	Air Flow m ³ /min	Time min	
Dryer	Impingement Nonimpingement	57 43 to 49	15 to 25	140	3 to 5 5 to 7	

4.2 Mix instructions for ECP-2D chemicals

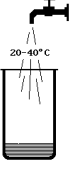
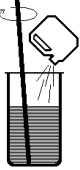
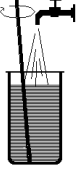
4.2.1 Developer Replenisher ECP-2 CD-R

Water	ECP-2 CD-R Part A	ECP-2 CD-R Part B	Water to make
			
70 l	20 l	5 l	100 l

Tank solution ECP-2 CD

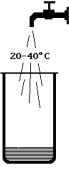
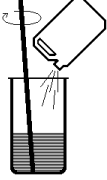
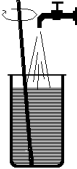
Replenisher ECP-2 CD-R	Developer Starter ECP-2 CD-S	Water to make
		
52 L	10 L	100 L

4.2.2 Stop Bath and Replenisher ECN-2/ECP-2 STOP-R

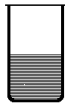
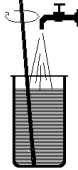
Water	ECN-2/ECP-2 STOP-R	Water to make
		
90 l	5 l	100 l

Replenisher = Tank solution

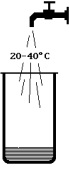
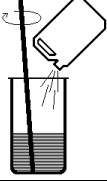
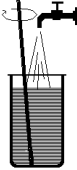
4.2.3 Fixer and Replenisher ECP-2 FX-R

Water	ECP-2 FX-R	Water to make
		
40 l	20 l	66,6 l

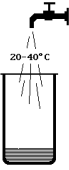
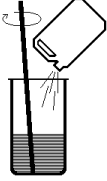
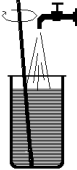
Tank solution ECP-2 FX
(using replenisher)

Replenisher ECP-2 FX-R	Water to make
	
66,6 l	100 l


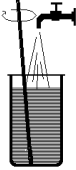
(using concentrate)

Water	ECP-2 FX-R (concentrate)	Water to make
		
75 l	20 l	100 l

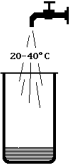
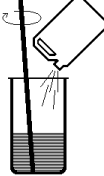
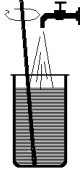
4.2.4 Bleach and Replenisher ECP-2 BL-R

Water	ECP-2 BL-R	Water to make
		
15 L	16,7 L	33,3 L
8 l	10 l	20 l

Tank solution ECP-2 BL
(using replenisher)

Replenisher ECP-2 BL-R	Water to make
	
33,3 l	51 l
20 l	30 l

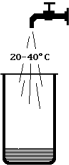
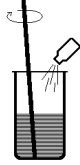
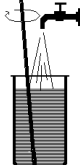
(using cocentrate)

Water	ECP-2 BL-R (concentrate)	Water to make
		
30 l	16,7 l	51 l
15 l	10 l	30 l

4.2.5 Sound Track Developer

The Sound Track Developer is a ready to use solution.

4.2.6 Rinse Bath and Replenisher ECN-2/ECP-2 RINSE

Water	ECN-2/ECP-2 RINSE	Water to make
		
95 l	1 l	100 l

Replenisher = Tank solution

5. pH and specific gravity

Bath	Replenisher		Tank	
	Specific Gravity (20 °C)	pH (25 °C)	Specific Gravity (20 °C)	pH (25 °C)
ECN-2 VB-R	1,062 ± 0,004	10,20 ± 0,10 ¹⁾	1,062 ± 0,004	10,20 ± 0,10 ¹⁾
ECN-2 CD-R	1,031 ± 0,003	10,37 ± 0,05 ¹⁾	1,030 ± 0,003	10,27 ± 0,05 ¹⁾
ECN-2/ECP-2 STOP-R	1,010 ± 0,005	0,8 - 1,5	1,010 ± 0,005	0,8 - 1,5
ECN-2 BL-R	1,064 ± 0,003	5,00 ± 0,20 ²⁾	1,042 ± 0,003	5,00 ± 0,20 ²⁾
ECN-2 FX-R	1,105 ± 0,003	7,20 ± 0,20 ²⁾	1,088 ± 0,003	7,20 ± 0,20 ²⁾
ECN-2/ECP-2 Rinse	1,000 ± 0,005	-	1,000 ± 0,005	-
ECP-2 CD-R	1,026 ± 0,003	11,16 ± 0,05 ¹⁾	1,025 ± 0,003	10,61 ± 0,05 ¹⁾
ECP-2 BL-R	1,045 ± 0,003	7,50 ± 0,30 ³⁾	1,029 ± 0,003	7,40 ± 0,30 ³⁾
ECP-2 FX-R	1,085 ± 0,003	6,00 ± 0,20 ²⁾	1,055 ± 0,003	6,10 ± 0,20 ²⁾
ECP-2 ST-DEV	1,118 ± 0,003	-		

- 1) add sulphuric acid 7 N to lower the pH
add sodium hydroxide solution 2,5 N to raise the pH
- 2) add acetic acid 80 % to lower the pH
add ammonium hydroxyde solution 25 % to raise the pH
- 3) add sulphuric acid 2,5 N to lower the pH
add sodium hydroxide solution 2,5 N to raise the pH