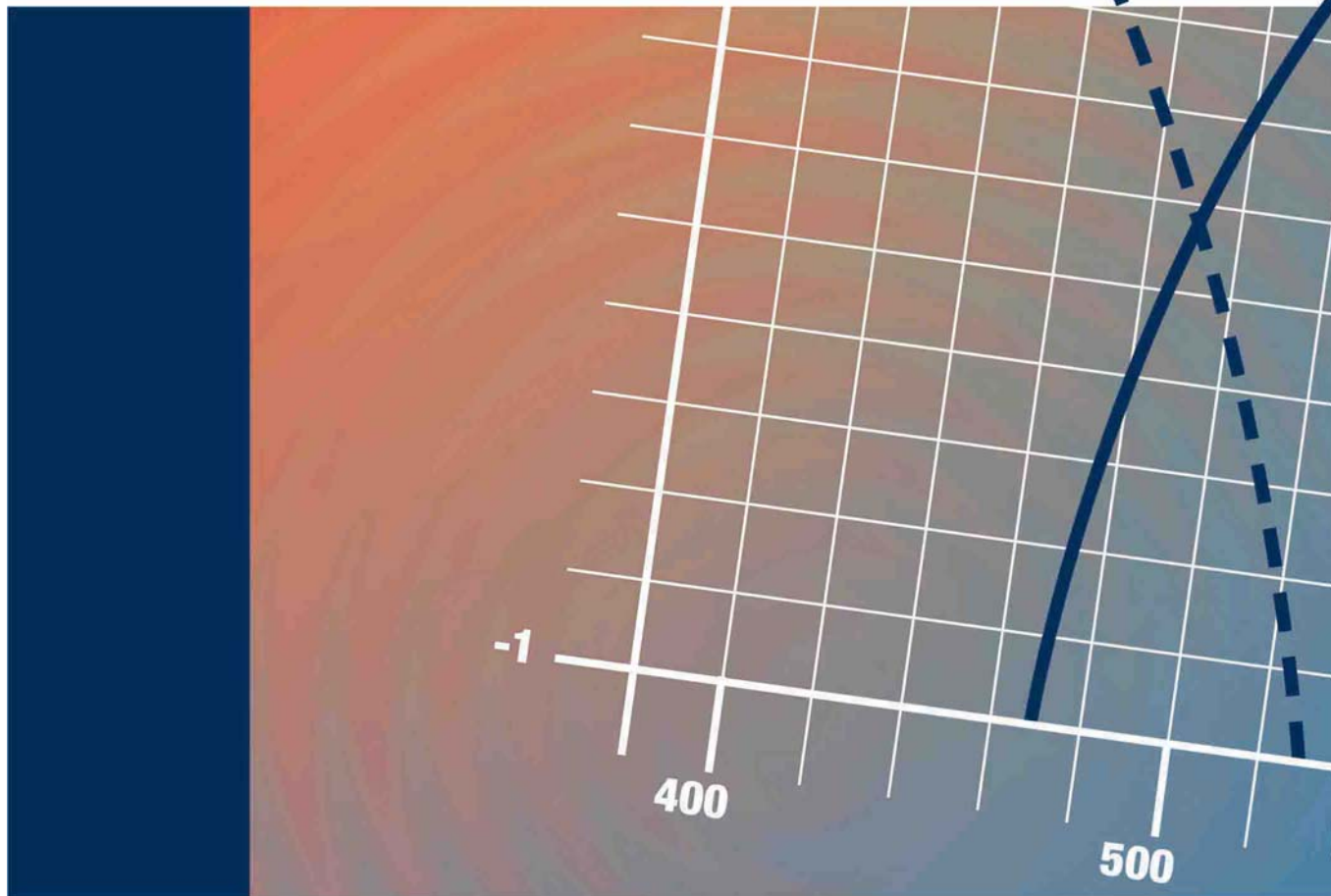


Technical Data

Agfacolor Process 71 and 72



The Agfacolor Processes 71 and 72 from a&o imaging solutions are compatible with the Processes C-41 B/BNP and C-41 RA/RANP. They are intended for processing all colour negative films, for which AP 70/C-41 Process is specified. The following information on the Processes AP 71 and AP 72 in minilabs is intended to serve as a processing guideline. Consistent processing conditions are a pre-requirement for good results. This consistency can be ensured by carrying out regular chemical and sensitometric monitoring.

1. Storage, industrial safety, handling photo-chemicals, environmental protection and disposal

Storage

The chemicals should be stored in their original packaging at temperatures of between 8°C and 25°C. If the temperature is too low, certain substances may crystallise in the liquid concentrates, which could result in wrong bath mixtures if this is not taken into account when making up the mixing. The effects of direct heat must also be avoided because high temperatures can trigger a premature chemical reaction in concentrates that are prone to oxidation, and this in turn can lead to the bath becoming spoilt.

Safety aspects when handling with photo-chemicals

There are certain precautions (e.g. avoiding contact with food and drinks) and safety measures which should be observed when working with photographic processing chemistry. They include adequate ventilation at the workplace and, when necessary, the wearing of protective gloves and goggles.

Observing all the safety precautions will ensure a high level of safety at work. Nevertheless, with particularly sensitive people, the possibility of irritation to the skin and mucous membranes and, in isolated cases, allergenic reactions, cannot be excluded when working with photographic chemicals.

Special instructions for transport and hazardous substances in regard to certain photochemicals are given on the labels of the packs of all products which are subject to labelling regulations. Extra safety recommendations for the chemicals are given in the notes enclosed with the following products:

- AP71, enclosed in 71 BL-R
- AP72, enclosed in 72 BL-R

For all photo-chemical products safety data sheets can be requested in several languages. These also include specific information on the constituents.

Environmental protection and disposal

Wash water from processors containing small quantities of process solutions are subject to local and often general effluent regulations covering disposal into the public sewage system.

If the effluent regulations do not permit used photographic solutions to be discarded into the public sewer even after treatment, they must be disposed of as special waste.

The packaging of a&o imaging solutions photo-chemicals conforms to the requirements for safety (during transport, storage and handling) and recycling.

Photo-chemical packaging must not contain any harmful impurities if it takes part in collection and recycling systems. For this purpose the packs must be absolutely empty, that is free of leftover powder, sludge and drops. Photo-chemical containers should preferably be rinsed out as well. It is best to use some of the mixing water for this.

2. Process control

The process should be sensitometrically monitored with suitable control strips. These strips should be regularly developed (at least once a week), and the densitometric reading should be compared with the reference strip.

3. Processing in minilabs

3.1 Process AP72

Process solution	Time	Temp. (°C)	Replenisher	Replenishment rates (per 135-24 film)
Developer	3 min 15s	37.8 ± 0.2*	71 CD-R 71/72 CD-LR	45 ml 22.5 ml
Bleach	46 s	38 ± 3	72 BL-R	5 ml
Fixer	1 min 30 s	38 ± 3	72 FX-R	33 ml
Stabilizer	3 x 20 s	38 ± 3	71/72 SB-R "NF"	40 ml

* The exact temperature is based on the processed control strips and must be kept constant ± 0.2 °C.

3.2 Process AP71

Process solution	Time	Temp. (°C)	Replenisher	Replenishment rates (per 135-24 film)
Developer	3 min 15s	37.8 ± 0.2*	71 CD-R 71/72 CD-LR	45 ml 22.5 ml
Bleach	3 min	38 ± 3	71 BL-R	5 ml
Fixer	4 min	38 ± 3	71 FX-R	33 ml
Stabilizer	140 s	38 ± 3	71/72 SB-R "NF"	40 ml

* The exact temperature is based on the processed control strips and must be kept constant ± 0.2 °C.

3.3 Supplementary instructions for processing

Replenishment rate

The replenishment rates must be set exactly, and then regularly monitored. To do this, the replenisher should be allowed to run into a graduated cylinder while a certain number of films pass through the machine and, after checking the volume, the replenisher should be poured slowly into the tank.

For processing 1m² film (equivalent to approx. 28 films 135-24), the following replenisher volumes (starting value) should be replenished in:

- Replenisher 71 CD-R = 1260 ml
- Replenisher 71/72 CD-LR = 630 ml
- Replenisher 71 BL-R/72 BL-R = 140 ml
- Replenisher 71 FX-R/72FX-R = 924 ml
- Replenisher 71/72 SB-R "NF" = 1120 ml

The given replenishment rates refer to average values for ISO 100 and ISO 200 films. For ISO 400 films, the replenishment rates should be raised by 10% and for faster films by 20%.

The replenishment rates apply to a bath carry-over of 80ml/m². If the actual carry-over is higher, the replenishment rates for the bleach, fixer and stabilizer should be increased accordingly.

In addition, the following points should be observed:

- For all processing baths, pumping, filtering and temperature control units are required. Pumping output in the
 - Developer tank = 1.0 – 1.5 tank volumes/min.
 - Bleach tank = 0.5 – 0.75 tank volumes/min.
 - First fixer tank = 0.75 – 1.0 tank volumes/min.
 - Second fixer tank = 0.5 – 0.75 tank volumes/min.
 - Stabilizer tank (per tank) = 0.5 – 0.75 tank volumes/min.
- The bleach solution must be pumped around the circuit and aerated. With inadequate aeration, the films may have a tendency to form leuco-cyan or/and residual silver.
- The fixer bath should be designed as a double cascade (in counter-current)
- The stabilizer is distributed over three tanks (cascade in counter-current). Each tank required its own pumping, filtering and temperature control devices. If the minilab has a two tank cascade tanks followed by a single tank, the first two tanks should be replenished with 40 ml and the single tank with 20 ml per 135-24 film.

Compensation evaporation

To compensate for evaporation, 100 ml water should be added to the tanks each day.

4. Mixing instructions for replenishers

For mixing the replenishers we recommend a water temperature of approx. 30°C. Use part of the mixing water for rinsing out the chemical containers. This removes chemical residues, making it easier to reuse the containers properly.

The volume of all replenisher tanks for the developer, bleach, fixer and stabilizer is 10 litres in the Agfa minilab FP-71, FP-72, FP100 and FP200.

4.1 Process AP72

Mixing colour developer replenisher 71/72 CD-LR

for	10 litres	1 litre
1. Water first	8.9 litres	890 ml
2. Add 71/72 CD-LR/Part A	1 pack for 10 litres	60 ml
3. Add 71/72 CD-LR/Part B	1 pack for 10 litres	10 ml
4. Add 71/72 CD-LR/Part C	1 pack for 10 litres	40 ml

Mixing bleach replenisher 72 BL-R (concentrate = replenisher)

for	10 litres	5 litres	1 litre
1. Add 72 BL-R	2 packs for 5 litres	1 pack for 5 litres	1 litre

Mixing fixer replenisher 72 FX-R

for	10 litres	1 litre
1. Water first	5 litres	500 ml
2. Add 72 FX-R	1 pack for 10 litres	500 ml

Mixing stabilizer replenisher 71/72 SB-R "NF" (Dosage bottle)

for	10 litres	1 litre
1. Water first	9.9 litres	990 ml
2. Add 71/72 SB-R "NF"	100 ml	10ml

4.2 Process AP71

Mixing colour developer replenisher 71 CD-R

for	10 litres	1 litre
1. Water first	8.9 litres	890 ml
2. Add 71 CD-R/Part A	1 pack for 10 litres	60 ml
3. Add 71 CD-R/Part B	1 pack for 10 litres	10 ml
4. Add 71 CD-R/Part C	1 pack for 10 litres	40 ml

Mixing bleach replenisher 71 BL-R (concentrate = replenisher)

for	10 litres	5 litres	1 litre
1. Add 71 BL-R Part A	2 packs for 5 litres	1 pack for 5 litres	500 ml
2. Add 71 BL-R Part B	2 packs for 5 litres	1 pack for 5 litres	500 ml

Mixing fixer replenisher 71 FX-R

for	10 litres	1 litre
1. Water first	8 litres	800 ml
2. Add 71 FX-R	1 pack for 10 litres	200 ml

Mixing stabilizer replenisher 71/72 SB-R "NF" (Dosage bottle)

for	10 litres	1 litre
1. Water first	9.9 litres	990 ml
2. Add 71/72 SB-R "NF"	100 ml	10ml

5. Mixing instructions for tank solutions

Tank volumes of Agfa minilabs (litres) (for FX and SB sum of the volumes of all tanks)

Machine	Process	CD	BL	FX	SB
FP1-71	AP71	12	9	14	12
FP1-72	AP72	12.8	4.9	8.5	10.4
FP2-72	AP72	21	5.5	10.3	10
FP3-72	AP72	29.4	7.4	13.8	13.2
FP100	AP72	16.7	4.7	8.8	10.4
FP200	AP72	20.8	5.6	10.6	10.4
FP210	AP72*	21	5.6	13	12

* easy film boxes as replenisher

To prevent cross-contamination of the chemistry, the tanks must be filled in the following order:

- SB
- FX
- BL
- CD

Individual tank solutions can be mixed with replenishers and starter. For the film developer tank solution CN-Film CD-Starter is needed in addition and for the bleach tank solution BL-S Universal Starter. If you mix the solutions directly in the machine tank, we recommend you to start the machine immediately after filling up with water, so that the solution is mixed quickly by the circulation system. Clean external mixing vessels or buckets carefully with hot water.

5.1 Process AP72

Mixing colour developer tank solution 71/72 CD (-LR) (with 71/72 CD-LR)

from mixed replenisher 71/72 CD-LR	from the single concentrates 71/72 CD-LR
1. Add 750 ml mixed replenisher 71/72 CD-LR	Add 877 ml water
2. Add 40 ml CN-Film CD-S Universal	Add 45 ml 71/72 CD-LR/Part A
3. Top up with 210 ml water	Add 8 ml 71/72 CD-LR/Part B
4.	Add 30 ml 71/72 CD-LR/Part C
5.	Add 40 ml CN-Film CD-S Universal
6. = 1 litre of 71/72 CD tank solution	

For direct mixing in the Agfa minilabs CD-tank this corresponds to following amounts of mixed replenisher, starter and water

Machine	71/72 CD-LR Repl. (litres)	CN-Film CD-Starter (ml)	Top up with water (litres) approx.	= tank solution (litres)
FP1-71	9	480	2.5	12
FP1-72	9.6	510	2.7	12.8
FP2-72	15.75	840	4.4	21
FP3-72	22	1175	6.2	29.4
FP100	12.5	670	3.5	16.7
FP200	15.6	830	4.4	20.8
FP210	15.75	840	4.4	21

For direct mixing in the Agfa minilabs CD-tank this corresponds to following amounts of single concentrates, starter and water

Machine	Water first* (litres)	Parts 71/72 CD-LR (ml)			CN-Film CD-Starter (ml)	= tank solution (litres)
		A	B	C		
FP1-71	10	540	95	360	480	12
FP1-72	11	575	100	385	510	12.8
FP2-72	18	945	170	630	840	21
FP3-72	25	1325	235	880	1175	29.4
FP100	14	750	135	500	670	16.7
FP200	18	935	165	625	830	20.8
FP210	18	945	170	630	840	21

* top-up tank with water after mixing

Mixing beach tank solution 72 BL (with 72 BL-R concentrate)

for	1 litre
1. 72 BL-R concentrate	Add 700 ml
2. Add BL-S Universal	Add 55 ml
3. Top up with water	Add 245 ml
4. = 1 litre of 72 BL tank solution	

For direct mixing in the Agfa minilabs BL-tank this corresponds to following amounts of 72 BL-R, BL-Starter and water

Machine	72 BL-R concentrate (litres)	BL-S Universal (ml)	Top up with water (litres) approx.	= tank solution (litres)
FP1-72	3.4	270	1.2	4.9
FP2-72	3.8	300	1.4	5.5
FP3-72	5.2	410	1.8	7.4
FP100	3.3	260	1.2	4.7
FP200	3.9	310	1.4	5.6
FP210	3.9	310	1.4	5.6

Mixing fixer tank solution 72 FX (tank solution = replenisher)

for	1 litre
1. 72 FX-R concentrate	Add 500 ml
2. Top up with water	Add 500 ml
3. = 1 litre of 72 FX tank solution	

For direct mixing in the Agfa minilabs FX-tanks this corresponds to following amounts of 72 FX-R and water (per tank)*

Machine	72 FX-R concentrate (litres)	Top up with water (litres) approx.	= tank solution (litres)
FP1-72	2 x 2	2 x 2	2 x 4
FP2-72	2 x 2.5	2 x 2.5	2 x 5
FP3-72	2 x 3.5	2 x 3.5	2 x 7
FP100	2 x 2.2	2 x 2.2	2 x 4.4
FP200	2 x 2.5	2 x 2.5	2 x 5
FP210	3 x 2	3 x 2	3 x 4

* depending on the machine the different FX tanks of the counter-current might have a slight different volume. These differences could be ignored for fresh mixing

**Mixing stabilizer tank solution 71/72 SB
(tank solution = replenisher) with dosage bottle**

for	1 litre
1. water first concentrate	Add 990 ml
2. Add 71/72 SB-R "NF"	Add 10 ml
3. = 1 litre of 71/72 SB tank solution	

For direct mixing in the Agfa minilabs SB-tanks this corresponds to following amounts of 71/72 SB-R and water (per tank)*

Machine*	71/72 SB-R concentrate (ml)	Top up with water (litres) approx.	= tank solution (litres)
FP1-71	3 x 400	3 x 3.6	3 x 4.0
FP1-72	3 x 350	3 x 3.1	3 x 3.5
FP2-72	3 x 350	3 x 3	3 x 3.4
FP3-72	3 x 450	3 x 4	3 x 4.5
FP100	3 x 350	3 x 3.1	3 x 3.5
FP200	3 x 350	3 x 3.1	3 x 3.5
FP210	3 x 350	3 x 3.1	3 x 3.5

* depending on the machine the different SB tanks of the counter-current might have a slight different volume. These differences could be ignored for fresh mixing

5.2 Process AP71

Mixing colour developer tank solution 71 CD (-R) (with 71 CD-R)

from mixed replenisher 71 CD-R	from the single concentrates 71 CD-R
1. Add 860 ml mixed replenisher 71 CD-R	Add 885 ml water
2. Add 20 ml CN-Film CD-S Universal	Add 52 ml 71 CD-R/Part A
3. Top up with 120 ml water	Add 9 ml 71 CD-R/Part B
4.	Add 34ml 71 CD-R/Part C
5.	Add 20 ml CN-Film CD-S Universal
6. = 1 litre of 71 CD tank solution	

For direct mixing in the Agfa minilabs CD-tank this corresponds to following amounts of mixed replenisher, starter and water

Machine	71 CD-R Repl. (litres)	CN-Film CD-Starter (ml)	Top up with water (litres) approx.	= tank solution (litres)
FP1-71	10.3	240	1.5	12
FP1-72	11	255	1.7	12.8
FP2-72	18	420	2.5	21
FP3-72	25.3	590	3.5	29.4
FP100	14.4	335	3	16.7
FP200	17.9	415	2.5	20.8

For direct mixing in the Agfa minilabs CD-tank this corresponds to following amounts of single concentrates, starter and water

Machine	Water first* (litres)	Parts 71 CD-R (ml)			CN-Film CD-Starter (ml)	= tank solution (litres)
		A	B	C		
FP1-71	10	625	110	410	240	12
FP1-72	11	665	115	435	255	12.8
FP2-72	18	1090	190	715	420	21
FP3-72	25	1530	265	1000	590	29.4
FP100	14	870	150	570	335	16.7
FP200	18	1080	185	710	415	20.8

* top-up tank with water after mixing

**Mixing beach tank solution 71 BL
(with 71 BL-R concentrate)**

from mixed replenisher 71 BL-R	from the single concentrates 71 BL-R
1. Add 610 ml mixed replenisher 71 BL-R	Add 355 ml water
2. Add 35 ml BL-S Universal	Add 305 ml 71 BL-R/Part A
3. Top up with 355 ml water	Add 305 ml 71 BL-R/Part B
4.	Add 35 ml BL-S Universal
5. = 1 litre of 71 BL tank solution	

For direct mixing in the Agfa minilab FP1-71 BL-tank this correspond to following amounts of concentrates, starter and water

Machine	Water first* (litres)	Parts 71 BL-R (litres)		BL-S Universal (ml)	= tank solution (litres)
		A	B		
FP1-71	3	2.75	2.75	315	9

* top-up tank with water after mixing

Mixing fixer tank solution 71 FX (tank solution = replenisher)

for		1 litre
1. 71 FX-R concentrate		Add 200 ml
2. Top up with water		Add 800 ml

For direct mixing in the Agfa minilab FP1-71 FX-tanks this corresponds to following amounts of 71 FX-R and water (per tank)*

Machine	71 FX-R concentrate (litres)	Top up with water (litres) approx.	= tank solution (litres)
FP1-71	2 x 1.4	2 x 5.6	2 x 7

*depending on the machine the different FX tanks of the counter-current might have a slight different volume. These differences could be ignored for fresh mixing

6. Storage life, pH and specific gravity of mixed solutions

Storage life of mixed solutions

Process	Life in tanks or storage containers	
solution	Tank solution	Replenishers freshly mixed
Developer	1 week	6 weeks*
Bleach	8 weeks	16 weeks
Fixer	4 weeks	8 weeks
Stabilizer	3 weeks	8 weeks

* with floating lid

The figures given for the lives of solutions are intended only as guides. Their service depends on the methods used in the lab (percentage turnover of tank solution and replenisher in a week, state of processor, cleanliness of processing etc.), and must be found individually for each processor by developing control strips regularly.

pH and specific gravity of freshly mixed solutions (at 20°C)

Processing solution	Designation	pH	Specific gravity
Developer replenisher	71 CD-R	10.1	1.040
	71/72 CD-LR	10.3	1.038
Developer tank solution	all tank solutions	10.1	1.037
Bleach replenisher	71 BL-R	4.5	1.128
	72 BL-R	3.5	1.154
Bleach tank solution	from 71 BL-R	5.2	1.084
	from 72 BL-R	4.2	1.112
Fixer replenisher (=tank solution)	71 FX-R	7.5	1.078
	72 FX-R	7.7	1.119
Stabilizer replenisher (= tank solution)	71/72 SB-R "NF"	7.0	Approx. 1.000

7. Further Information

The information given here is based on the evaluation of typical products at the time when this technical data was made. Slight deviations are possible through production tolerances. a&o imaging solutions is constantly endeavouring to improve the quality of the products and therefore reserves the right to alter the product specifications without notice.

Notification of any technical changes, such as replenishment rate or mixing instructions, will be given immediately in the package inserts and will be updated in all publications.

8. Relation between CD-tank size, average film processing, CD-replenishment rate and recommended developer

8.1 Use of 71/72 CD-LR

Average of processed films/day	CD-Tank size (litres) / Example of machines (approx. tank volumes)					
	4	8	12	16	20	30
			Agfa FP1	Agfa FP100	Agfa FP200/FP2	Agfa FP3
5	30.0	38.0	CD-R	CD-R	CD-R	CD-R
10	22.5	30.0	38.0	CD-R	CD-R	CD-R
15	22.5	22.5	30.0	38.0	CD-R	CD-R
20	22.5	22.5	22.5	30.0	38.0	CD-R
30	22.5	22.5	22.5	22.5	30.0	38.0
40	22.5	22.5	22.5	22.5	22.5	30.0
50	22.5	22.5	22.5	22.5	22.5	22.5

22.5 = 71/72 CD-LR with a replenishment rate of 22.5 ml/film

30.0 = 71/72 CD-LR with a replenishment rate of approx. 30 ml/film

38.0 = 71/72 CD-LR with a replenishment rate of approx. 38 ml/film

CD-R = 71 CD-R recommended

8.2 Use of 71 CD-R

Average of processed films/day	CD-Tank size (litres) / Example of machines (approx. tank volumes)					
	4	8	12	16	20	30
			Agfa FP1	Agfa FP100	Agfa FP200/FP2	Agfa FP3
5	45.0	58.0	76.0	76.0	76.0	
10	45.0	45.0	45.0	58.0	58.0	76.0
15	45.0	45.0	45.0	45.0	45.0	76.0
20	45.0	45.0	45.0	45.0	45.0	58.0
30	45.0	45.0	45.0	45.0	45.0	45.0
40	45.0	45.0	45.0	45.0	45.0	45.0
50	45.0	45.0	45.0	45.0	45.0	45.0

45.0 = 71 CD-R with a replenishment rate of 45 ml/film

58.0 = 71 CD-R with a replenishment rate of approx. 58 ml/film

76.0 = 71 CD-R with a replenishment rate of approx. 76 ml/film

= 71 CD-R, in cases of very low throughput even an increased replenishment rate could lead to sensitometric problems. New tank solutions would have to be made whenever process control results show that they have become strongly oxidised.

The figures given in the table are intended only as guides. Their application depends on the machine characteristics (volume of replenisher tanks, floating lids, daily times of heating the tank solutions, cleanliness of processing etc.), and must be established individually for each processor by regular processing and reading of control strips.

9. Chemical range AP71 and AP72 for processing in minilabs (for all countries with exception of countries listed in chapter 10. and 11.)

Replenisher (for all minilabs)

Processing solution	Product name	Pack size	Yield	Code
Colour developer replenisher -LR	71/72 CD-LR	for 4 x 10 l	1778 films	BZ86A
Colour developer replenisher -R	71 CD-R	for 4 x 10 l	888 films	BW97Q
Stabilizer replenisher	71/72 SB-R "NF" (Dosage bottle)	2 x for 20 x 10 l	2 x 5000 films	5LQDR

Replenisher (for AP72 minilabs)

Processing solution	Product name	Pack size	Yield	Code
Bleach replenisher	72 BL-R	for 2 x 5 l	2000 films	BZ9ET
Fixer replenisher	72 FX-R	for 2 x 10 l	606 films	BZ9FV

Replenisher (for AP71 minilabs)

Processing solution	Product name	Pack size	Yield	Code
Bleach replenisher	71 BL-R	for 2 x 5 l	2000 films	BW98S
Fixer replenisher	71 FX-R	for 2 x 10 l	606 films	BW99U

Starter for individual tank solutions

Processing solution	Product name	Pack size	Yield	Code
Bleach	BL-S Universal	3 l		5FXEG
Colour developer	CN Film CD-S Universal	3 l		5FXFJ

10. Chemical range AP71 and AP72 for processing in minilabs for following countries:
SWE, FIN, EST, LTU, LVA, NOR, POL, HUN, CZE, SLO, GRC

Replenisher (for all minilabs)

Processing solution	Product name	Pack size	Yield	Code
Colour developer replenisher -LR	71/72 CD-LR	for 4 x 10 l	1778 films	5JCDP
Colour developer replenisher -R	71 CD-R	for 4 x 10 l	888 films	5JCCN
Stabilizer replenisher	71/72 SB-R "NF" (Dosage bottle)	2 x for 20 x 10 l	2 x 5000 films	5LQDR

Replenisher (for AP72 minilabs)

Processing solution	Product name	Pack size	Yield	Code
Bleach replenisher	72 BL-R	for 2 x 5 l	2000 films	BZ9ET
Fixer replenisher	72 FX-R	for 2 x 10 l	606 films	BZ9FV

Replenisher (for AP71 minilabs)

Processing solution	Product name	Pack size	Yield	Code
Bleach replenisher	71 BL-R	for 2 x 5 l	2000 films	BW98S
Fixer replenisher	71 FX-R	for 2 x 10 l	606 films	BW99U

Starter for individual tank solutions

Processing solution	Product name	Pack size	Yield	Code
Bleach	BL-S Universal	3 l		5FXEG
Colour developer	CN Film CD-S Universal	3 l		5FXFJ

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