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OECD Matrix Project

Branch- and product-related emission estimation tool for manufacturers, importers, and downstream users within the REACH-system

Supplement M6

Document Emission Estimation of Photochemicals

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Chemie Daten

This publication is part of the OECD Matrix Project ("Branch- and product-related emission estimation tool for manufacturers, importers, and downstream users within the REACH-system", UBA R+D Project FKZ 204 67 456).

The results of the OECD Matrix Project are documented in a summary report with six supplements.

The **summary report** contains the main results of the OECD Matrix Project

The additional reports (**supplement M1 – M6**) refer in detail to specific parts of the OECD Matrix Project:

Supplement M1: Developing the Target Funnel [Results of Project Part A]
Supplement M2: Developing the ESD Matrix [Results of Project Part B1]
Supplement M3: The ESD Matrix
Supplement M4: Manual for Emission Estimation, Plastic Additives (Project Part B2)
Supplement M5: IT System Manual (Part I); IT Design Document (Part II) (Project Part B2)
Supplement M6: Document Emission Estimation Photochemicals (Project Part B2)

The summary report and the supplements are available as a zip-file. Please contact us.

R+D Project FKZ 204 67 456/02

Branch- and product-related emission estimation tool for manufacturers, importers, and downstream users within the REACH-system

-Photochemicals-

Background document:

- **module “industrial use”**

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This document is a guidance for developing a specific module within the IT emission estimation tool referring to photochemicals. It is based on the OECD Emission Scenario Document on photographic industry (OECD 2004: OECD Series on Emission Scenario Documents, No. 5, Emission Scenario Document on Photographic Industry. OECD, Environment Directorate, June 2004).

The following descriptions refer to the industrial use of photochemicals by a wholesale finisher. The generic structure of the IT-tool and the principles of the estimations are described in the manual for emission estimation of plastic additives (supplement M4 of the OECD Matrix Report).

For the industrial use of photochemicals, three different types of emissions to wastewater can be distinguished. Accordingly three different formulas for the emission estimation are used in the second and third iteration of the emission estimation module. A short description of the three bath types is given in annex 1 of this document. Annex 2 gives an overview on processing baths and correlated bath types.

Options for further development of the IT module are described in the text.

1 Generic structure of IT-tool

See Manual for emission estimation of plastic additives (supplement M4 of the OECD Matrix Report).

2 Input of basic information

See Manual for emission estimation of plastic additives (supplement M4 of the OECD Matrix Report).

3 Emission estimation for each life-cycle stage

3.1 Production

3.2 Formulation

3.3 Industrial use

3.3.1 1st iteration

$$E = \frac{Q_{own} * f_{mainsource} * F_{local,ind.use} * 1000}{T}$$

Equ.1: Emissions during industrial use of photochemicals

E [kg/d] = local emissions from industrial use per day

Q_{own} [t/a] = production / import or use volume of the substance[1], depending on the supply chain position of the safety assessor

$f_{mainsource}$ = fraction used by the main client

$F_{local,ind.use}$ = emission factor from industrial use → 1st iteration conservative default, 2nd iteration: use of process-specific parameters, see equations 2 – 4!

T [d/a] = number of release days at main source

Assumptions for the first iteration:

- In the first iteration, it is assumed that the entire amount of the substance is used by one industrial user. Therefore the $f_{mainsource}$ is set to the value 1 in equ. 1.
- The entire amount of the substance is used in a process without disposal of processing baths. A direct discharge of the process overflows to the wastewater takes place (bath type B, see description of the three different process types in annex 1). For this bath type, the emission factor from industrial use to the compartment water is set to the value 1. (Source: ESD Photochemicals, page 23, art. 29, comment).
- No process-specific emissions occur to air, no process-specific emissions occur to waste.
- Emission take place 300 days / year (Source: TGD, table B 3.8).

[1] If an industrial developer of photographic materials estimates emissions, the own use volume of the substance is entered for Q_{prod} and the value for fraction of main source is set to the value 1 in the equation 1.

The following values are used for the parameters in equ. 1:

$\mathbf{Q_{own}}$ = own production, import or use amount [t/a]

$\mathbf{f_{mainsource}}$ = 1

$\mathbf{F_{local,ind.use,water}}$ = 1

$\mathbf{F_{local,conv,air}}$ = 0

$\mathbf{F_{local,conv,waste}}$ = 0

T = 300 [d/a]

No selection of the function of the substance

The result and assumptions are shown

NO REFINEMENT

3.3.2 2nd iteration

3.3.2.1 BASIC estimation of the 2nd iteration

For the industrial use of photochemicals, three different types of emissions to wastewater can be distinguished (see annex 1 of this document)

Bath type A: process baths with emission to wastewater due to carry-over of the processing liquid to a washing or a stop bath.

Eq. 2 $E_{local\ water} = C_{bath} \cdot Area_{mat} \cdot CO \cdot (1\text{-}F_R) \cdot 10^{-3}$

Bath type B: process baths with emission to wastewater due to carry-over of the processing liquid to a washing or a stop bath and with direct discharge to waste water.

Eq. 3 $E_{local\ water} = C_{bath} \cdot Area_{mat} \cdot RR \cdot (1\text{-}F_R) \cdot 10^{-3}$

Bath type C: process baths with emission to wastewater due to carry-over of the processing liquid to a washing or a stop bath after a second processing bath.

Eq.4 $E_{local\ water} = C_{bath2} \cdot Area_{mat} \cdot CO \cdot (1\text{-}F_R) \cdot 10^{-3}$

Equ.1-3: Emissions from industrial use of photochemicals

$\mathbf{E_{local\ water}}$ [kg/d] = local emissions from industrial use per day

$\mathbf{Area_{mat}}$ [m^2/d] = area of photographic material processed per day

$\mathbf{C_{bath}}$ [g/L] = substance concentration in the first processing bath

$\mathbf{C_{bath2}}$ [g/L] = substance concentration in the second processing bath

CO [L/m^2] = carry-over rate (amount of processing solution carried over to the subsequent bath per m² of photographic material)

RR [L/m^2] = replenishment rate (amount of regenerating solution added to the first bath per m² of photographic material)

$\mathbf{F_R}$ = fraction removed or converted during processing

MEMO 1

Remark: If the process-type for a specific substance is not known, **bath type B** is assumed for the emission estimation (in the second iteration).

In the following, for each of the input parameters required for the emission estimation, default values are proposed. They can be chosen from pick up-tables.

1. Parameter $Area_{mat}$: the area processed per day

The following table 1 gives typical values for the area of photographic material processed per day, for a single process whole sale finisher (Source: ESD 2004, p. 21 / workshop on photochemicals, 2005)).

Select the appropriate value from the upper part of the table, if the developing process is known (black and white processes (b/w-processes), C-41, R A-4 or E-6). Otherwise, select a default value in relation to the function of the substance. If neither the process nor the function of the substance is known, select the default value for "not specified" (last line of table 1).

TABLE 1: AREA PROCESSED PER DAY FOR DEVELOPING PROCESSES. SOURCE: ESD 2004, P. 21 AND PHOTOCHEMICALS WORKSHOP

process	function of ingredient	$Area_{mat}$ (in m²/d)
BW-N, BW-P or E-6	not specified	60
C-41	not specified	320
RA-4	not specified	5900
not specified	hardening agent or reversing agent	60
not specified	antifogging agent or stabilizing agent	320
not specified	antioxidant, auxiliary solvent, bleach accelerator, bleaching agent, complexing agent, developing agent, fixing agent, pH-regulating agent, rehalogenating agent or sequestering agent	5900
not specified	not specified	5900

2. Parameters CO, RR, C_{bath}, C_{bath2}: process-specific factors

This chapter describes the selection of the appropriate process-specific parameters.

The carry-over rate (CO) describes carry-over of the processing liquid from one bath to another and is identical for all baths in one process. The replenishment rate (RR), on the contrary, is a bath-specific magnitude, differing between the different baths of a process. Finally, the substance concentration in a bath (C_{bath}) is substance-specific, since it depends on the substance properties, which determine its function in the process.

- select the process-specific factors from the following pick

Note: An overview of bath types and a list of baths is given in annex 1 and 2.

****Option 1 for further development: adaption to professional labs.**

The values for the carry-over rates (CO) in the pick up lists refer to the situation of wholesale-finishers. In professional laboratories, the carry-over rates for some developing processes are different. In this case, a specific adaption factor for the carry-over rate is considered in the estimation. **Please indicate in the following table, whether the emission estimation is to be performed for a wholesale finisher or a professional lab.**

TABLE 2: TYPE OF INDUSTRIAL USER

Type of industrial user	Adaption factor $AF_{proflab}$	Select
Whole sale finisher	no	
Professional laboratory	yes	

*******End of development option 1 *****

****Option 2 for further development**

- If neither the process nor the bath are known, select the default values for the process specific parameters from the pick up list in table 3 (process / bath type not specified).

Bath type not specified: no information about the bath type and the process available.

TABLE 3

process	bath	function of ingredient	RR_1 or CO (in L/m²)	C_{bath1} (in g/L)
not specified	not specified	antifogging agent	0,18	0,9
		antioxidant	0,18	20
		auxiliary solvent	0,08	19
		bleach accelerator	0,08	0,4
		bleaching agent	0,08	120
		complexing agent	0,18	10
		developing agent	0,18	30
		fixing agent	0,18	180
		hardening agent	0,18	5
		pH-regulating agent	1,1	20
		rehalogenating agent	0,08	120
		reversing agent	0,08	0,1
		sequestering agent	0,04	3
		stabilizing agent	1	2
		not specified	0,18	180

*******End of development option 2 *****

Bath type A: process baths with emission to wastewater due to carry-over of the processing liquid to a washing or a stop bath.

The following pick uplist relates to colour material processing. Process specific parameters for black and white material processing can be inserted as a further development option (see table 4, part 2, development option 3).

TABLE 4, PART 1 (COLOUR PROCESSING)

process	bath	function of ingredient	CO (in L/m²)	C_{bath} (in g/L)	$AF_{prof.\ lab}$
C-41	bleaching	bleach accelerator	0,08	0,4	2,1
		bleaching agent	0,08	120	2,1
		pH-regulating agent	0,08	20	2,1
		rehalogenating agent	0,08	120	2,1
		not specified	0,08	120	2,1
	fixing	fixing agent	0,08	150	2,1
		pH-regulating agent	0,08	20	2,1
		not specified	0,08	150	2,1
	not specified	not specified	0,08	150	2,1
RA-4 with combined bleach-fix-bath	developing	antioxidant	0,04	8	0,9
		auxiliary solvent	0,04	19	0,9
		complexing agent	0,04	4	0,9
		developing agent	0,04	8	0,9
		pH-regulating agent	0,04	40	0,9
		not specified	0,04	40	0,9
	bleach-fixing	antioxidant	0,04	10	0,9
		bleaching agent	0,04	80	0,9
		fixing agent	0,04	100	0,9
		pH-regulating agent	0,04	20	0,9
		not specified	0,04	100	0,9
	not specified	not specified	0,04	100	0,9
RA-4 with bleach- and fixer- bath	developing	antioxidant	0,04	8	0,9
		auxiliary solvent	0,04	19	0,9
		complexing agent	0,04	4	0,9
		developing agent	0,04	8	0,9
		pH-regulating agent	0,04	40	0,9
		not specified	0,04	40	0,9
	bleaching	bleach accelerator	0,04	0,4	0,9
		bleaching agent	0,04	80	0,9
		pH-regulating agent	0,04	10	0,9
		rehalogenating agent	0,04	120	0,9
		not specified	0,04	120	0,9
	fixing	antioxidant	0,04	10	0,9
		fixing agent	0,04	120	0,9
		sequestering agent	0,04	3	0,9
		not specified	0,04	120	0,9
	not specified	not specified	0,04	120	0,9
E-6	primary developing	antifogging agent	0,08	2	2,1
		complexing agent	0,08	10	2,1
		developing agent	0,08	30	2,1
		pH-regulating agent	0,08	35	2,1
		not specified	0,08	35	2,1
	colour developing	antioxidant	0,08	6	2,1
		auxiliary solvent	0,08	19	2,1
		complexing agent	0,08	4	2,1
		developing agent	0,08	10	2,1
		pH-regulating agent	0,08	50	2,1
		not specified	0,08	50	2,1
	fixing	fixing agent	0,08	180	2,1
		not specified	0,08	180	2,1
	not specified	not specified	0,08	180	2,1

The values for RA-4 processes with combined bleach-fix-bath are not implemented in the basic version of the IT module. They can be implemented during further development of the tool (development option 4).

TABLE 4, PART 2 (BLACK/WHITE PROCESSING)

process	bath	function of ingredient	CO (in L/m²)	C_{bath} (in g/L)	$AF_{prof.\ lab}$
BW-N	developing	antifogging agent	0,18	10	1
		complexing agent	0,18	10	1
		developing agent	0,18	15	1
		pH-regulating agent	0,18	70	1
		not specified	0,18	70	1
	fixing	antioxidant	0,18	20	1
		fixing agent	0,18	150	1
		hardening agent	0,18	5	1
		pH-regulating agent	0,18	20	1
		not specified	0,18	150	1
	not specified	not specified	0,18	150	1
BW-P	developing	antifogging agent	0,07	10	1
		complexing agent	0,07	10	1
		developing agent	0,07	15	1
		pH-regulating agent	0,07	70	1
		not specified	0,07	70	1
	fixing	antioxidant	0,07	20	1
		fixing agent	0,07	150	1
		hardening agent	0,07	5	1
		pH-regulating agent	0,07	20	1
		not specified	0,07	150	1
	not specified	not specified	0,07	150	1

Bath type B: process baths with emission to wastewater due to carry-over of the processing liquid to a washing or a stop bath and with direct discharge to waste water.

TABLE 5

process	bath	function of ingredient	RR_1 (in L/m²)	C_{bath1} (in g/L)	$AF_{prof.\ lab}$
C-41	stabilizing	stabilizing agent	0,9	2	1
		not specified	0,9	2	1
	not specified	not specified	0,9	2	1
RA-4 with bleach- and fixer- bath	stopping	pH-regulating agent	0,2	20	1
		not specified	0,2	20	1
	stabilizing	stabilizing agent	1	2	1
		not specified	1	2	1
	not specified	not specified	0,2	20	1
E-6	conditioning	antioxidant	1,1	12	1
		pH-regulating agent	1,1	20	1
		not specified	1,1	20	1
	stabilizing	stabilizing agent	1	2	1
		not specified	1	2	1
	not specified	not specified	1,1	20	1

Bath type C: process baths with emission to wastewater due to carry-over of the processing liquid to a washing or a stop bath after a second processing bath.

TABLE 6

process	bath	function of ingredient	CO (in L/m²)	C_{bath2} (in g/L)	$AF_{prof.\ lab}$
C-41	developing	developing agent	0,08	5,1	3
		pH-regulating agent	0,08	22,2	3
		complexing agent	0,08	1,8	3
		auxiliary solvent	0,08	8,4	3
		antioxidant	0,08	2,9	3
		antifogging agent	0,08	0,9	3
		not specified	0,08	22,2	3
E-6	reversing	reversing agent	0,08	0,1	4,2
		not specified	0,08	0,1	4,2
	bleaching	bleaching agent	0,08	25,0	3,8
		bleach accelerator	0,08	0,1	3,8
		rehalogenating agent	0,08	20,0	3,8
		not specified	0,08	25,0	3,8

3. Parameter F_R: the substance-specific removal factor

The following table 7 gives typical values for the removal values of specific photochemicals (Source: own estimations). Select the appropriate value from the upper part (section A) of the table. If for a substance the removal factor is not known, the factor is set to 0 (section B of the table).

TABLE 7: REMOVAL FACTORS FOR PHOTOCHEMICALS

Section A	Removal in %	**F_R**	
Photochemical			
Hydrochinone	85	0.85	
Na Sulfit	0	0	
Acetic acid	0	0	
Section B	Removal in %	**F_R**	
Chemical, removal factor not known	0	0	

The distinct values for this table have to be confirmed by the actors of the photochemical supply chain.

The result and the underlying assumptions are shown

3.3.2.2 REFINEMENT of the 2nd iteration

-1- Do you want to change the default value for the amount of photographic material processed per day)? If yes, enter the amount processed per day.

AREA OF PHOTOGRAPHIC MATERIAL PROCESSED PER DAY BY THE MAIN CLIENT

____ [m2/d]

-2- Which share of the wastewater is discharged to a wastewater treatment plant?

WASTEWATER TREATMENT APPLICABLE

____ [%]

The result and the underlying assumptions are shown

3.3.3 3rd iteration

In the third iteration,

- site-specific values for the process parameters CO , RR and Cbath can be used;
- site specific values for the removal factor FR can be used;
- on-site-emission treatment measures can be selected.

-1- Do you want to change the default factors for the process-/bath-/substance-specific parameters CO, RR and C_{bath}? If yes, enter these parameters.

CO, RR, CBATH

CO

RR

CBATH1

CBATH 2

Option 5: structuring of the parameters according to the three bath types.

BATH-TYPE A:

SUBSTANCE CONCENTRATION IN THE BATH (BATH 1) PRECEEDING THE WASHING OR STOP BATH (C_{BATH1}) _23 [g/l]

CARRY OVER-RATE (CO) _0,25 [L/m2]

BATH-TYPE B:

SUBSTANCE CONCENTRATION IN THE BATH (BATH 1) PRECEEDING THE WASHING OR STOP BATH (C_{BATH1}) [g/L]

REPLENISHMENT-RATE OF BATH 1 (RR_1) [L/m2]

BATH-TYPE C:

SUBSTANCE CONCENTRATION IN BATH 1 PRECEEDING THE WASHING OR STOP BATH (C_{BATH1}) [g/L]

CARRY OVER-RATE (CO) [L/m²]

REPLENISHMENT-RATE OF BATH 2 (RR_2) [L/m²]

IF THE SUBSTANCE CONCENTRATION IN BATH 1 IS KNOWN (C_{BATH1})., THE CONCENTRATION OF THE SUBSTANCE IN THE FOLLOWING BATH (C_{BATH2}) IS CALCULATED AUTOMATICALLY USING C_{BATH1}, CO AND RR_2.

BATH-TYPE NOT SPECIFIED = BATH-TYPE B:

SUBSTANCE CONCENTRATION IN THE BATH (BATH 1) PRECEEDING THE WASHING OR STOP BATH (C_{BATH1}) [g/L]

REPLENISHMENT-RATE OF BATH 1 (RR_1) [L/m2]

Option 6 for further development: Calculation of Cbath2 as part of the IT module.

$$C_{bath2} = C_{bath1} \cdot CO \cdot (CO+RR_2)^{-1}$$

*******End of development options 5 and 6 *****

-2- Do you want to change the default factors for the substance-specific removal? If yes, enter the percentage of removal.

REMOVAL DUE TO REACTION

____ [%]

F_R = (% of removal / 100)

-3- Do you want to select on-site-emission treatment measures?

Eq. 5 $$E_{local\ water\ emred} = E_{local\ water} \cdot (1\text{-}con) + E_{local\ water} \cdot con \cdot (1\text{-}F_{emred})$$

$E_{local\ water}$ [kg/d] = Emission to the environment (without on-site-emission treatment measures), see Eq. 1-3 in chapter 3.3.1

$E_{local\ water\ emred}$ [kg/d] = Emission rate after application of emission treatment measures

con = fraction of emission captured by the respective emission treatment device (100% = 1)

F_{emred} = efficacy of the emission treatment (100% = 1)

Find some standard risk management options for waste water in the following table 8

TABLE 8: EMISSION REDUCTION FACTORS FOR STANDARD RISK MANAGEMENT OPTIONS

Name of measure	Types of photochemicals for which measure is applicable	efficacy of the emission treatment (F_{emred})
Waste water, chemical oxidation	Types have to be specified	80 %
Waste water, treatment with membrane techniques	Types have to be specified	50 %
Waste water, anaerobic removal of additives	Types have to be specified	50 %
Waste water, anaerobic removal of additives	Types have to be specified	90 %

Refinement

Which share of the wastewater is treated on-site

(value for "con" , free text __ [%]

con = percentage treated

By which percentage are the original emissions reduced due to the emission treatment? (= efficacy)

Free text: ___[%]

Femred= efficacy

The result and the underlying assumptions are shown

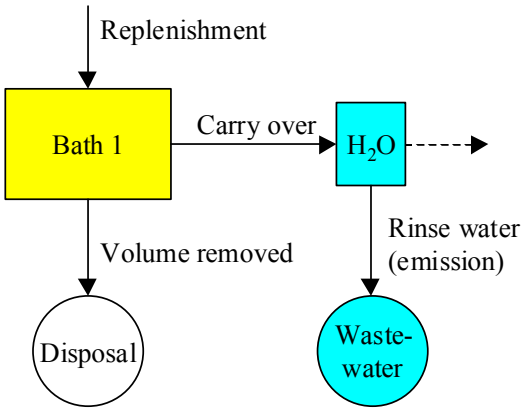
Annex 1

Substances used in photochemical process baths can be released into waste water. On the basis of the pathway on which this emission takes places three types of photochemical process baths can be distinguished. The emission out of each of these bath types is estimated using a different formula.

Bath type A:

The addition of regenerating solution (Replenishment) to this bath leads to an overflow, which is collected and turned over to a waste disposal specialist. Consequently the overflow does not enter the waste water.

In this bath type, the processing solution is carried over together with the photographic material to the subsequent bath. This second bath is a washing or a stop bath. The substance contained in the processing solution transferred is then emitted with the rinse water.



(source: EUSES 2.0 background report)

To calculate the amount of the substance under consideration emitted into waste water the following formula is to be used:

Eq. 1 $$E_{local\ water} = C_{bath} \cdot Area_{mat} \cdot CO \cdot (1-F_R) \cdot 10^{-3}$$

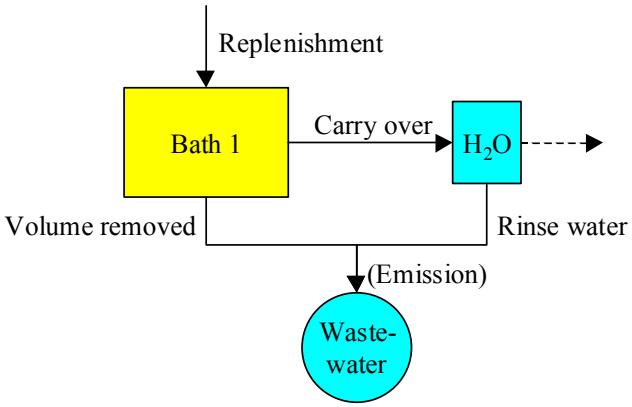
$E_{local\ water}$	=	emission to waste water (in kg/d)
C_{bath}	=	substance concentration in bath 1 (in g/L)
$Area_{mat}$	=	area of photographic material processed per day (in m²/d)
CO	=	carry-over rate (in L/m²)
F_R	=	fraction removed or converted during processing

Most baths are of type A. So are the developing baths of the processes BW-N, BW-P, RA-4 and E-6, as well as the fixing or bleach-fixing baths of the processes BW-N, BW-P, RA-4, E-6 and C-41 and the bleaching baths of the processes RA-4 and C-41.

process	bath	bath type
C-41	bleaching fixing	A A
RA-4 with combined bleach-fix-bath	developing bleach-fixing	A A
RA-4 with bleach- and fixer- bath	developing bleaching fixing	A A A
E-6	primary developing colour developing fixing	A A A
BW-N	developing fixing	A A
BW-P	developing fixing	A A

Bath type B: Like in bath type A, the processing solution wetting the photographic material is carried over to a washing or stop bath. The substance contained in this processing solution is then emitted into waste water.

In addition, the overflow resulting from the replenishment of baths of type B is also discharged into waste water. Hence the whole amount of substance added to the processing bath ends up in the waste water (in the case that no substance is removed during the process (due to reaction or up-take by the photographic material)).



(source: EUSES 2.0 background report)

To calculate the amount of the substance under consideration emitted into waste water the following formula is to be used:

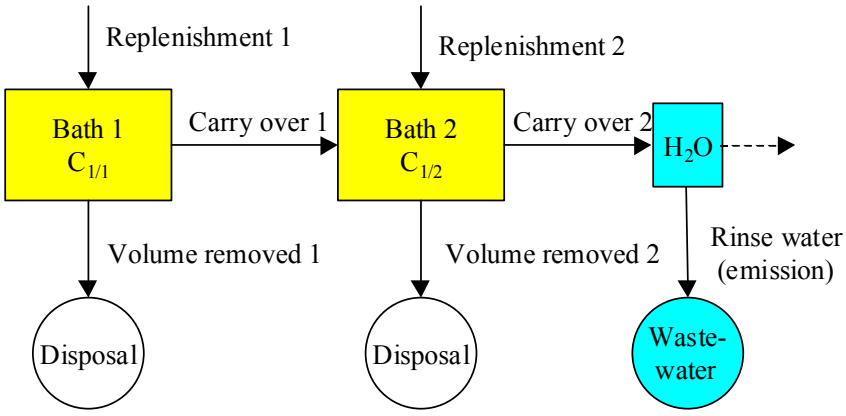
Eq. 2 $E_{local\ water} = C_{bath} \cdot Area_{mat} \cdot RR \cdot (1-F_R) \cdot 10^{-3}$

$E_{local\ water}$	=	emission to waste water (in kg/d)
C_{bath}	=	substance concentration in Bath 1 (in g/L)
$Area_{mat}$	=	area of photographic material processed per day (in m²/d)
RR	=	replenishment rate of bath 1 (in L/m²)
F_R	=	fraction removed or converted during processing

Typical baths of type B are the stabilizing baths of the processes E-6, C-41 and RA-4, as well as the conditioning bath of process E-6 and the stop bath of process RA-4.

process	bath	bath type
C-41	stabilizing	B
RA-4 with bleach- and fixer- bath	stopping stabilizing	B B
E-6	conditioning stabilizing	B B

Bath type C: Unlike in bath types A and B the subsequent bath substances are carried over to is another processing bath. The overflow due to replenishment from both processing baths is collected and turned over to a waste disposal specialist. Due to the replenishment of the second processing bath the concentration of the substance that was transferred from the first bath is decreased. The lower concentrated processing solution from the second processing bath is again carried over with the photographic material to the next bath, which this time is a washing or a stop bath. From there the substance is then discharged into waste water.



(source: EUSES 2.0 background report)

To calculate the amount of the substance under consideration emitted into waste water the following formula is to be used:

Eq.3a $E_{local\ water} = C_{bath2} \cdot Area_{mat} \cdot CO \cdot (1-F_R) \cdot 10^{-3}$

$E_{local\ water}$	=	emission to waste water (in kg/d)
C_{bath2} *or* $C_{1/2}$	=	substance concentration in bath 2 (in g/L)
$Area_{mat}$	=	area of photographic material processed per day (in m²/d)
CO	=	carry-over rate (in L/m²) (there is only one CO for the whole process)
F_R	=	fraction removed or converted during processing

The substance concentration in bath 2 can be calculated as follows:

Eq.3b $C_{bath2} = C_{bath1} \cdot CO \cdot (CO+RR_2)^{-1}$

C_{bath2} *or* $C_{1/2}$	=	substance concentration in bath 2 (in g/L)
C_{bath1} *or* $C_{1/1}$	=	substance concentration in bath 1 (in g/L)
CO	=	carry-over rate (in L/m²)
RR_2	=	replenishment rate of bath 2 (in L/m²)

Examples for baths of type C are the bleaching and reversing baths of process E-6, as well as the developing bath of process C-41.

process	bath	bath type
C-41	developing	C
E-6	reversing	C
	bleaching	C

Annex 2

PROCESSSING BATHS AND CORRELATED BATH TYPE

process	bath	bath type
C-41	developing	C
	bleaching	A
	fixing	A
	stabilizing	B
	not specified	B
RA-4	developing	A
with combined	bleach-fixing	A
bleach-fix-bath	not specified	A
RA-4	developing	A
with bleach-	stopping	B
and fixer- bath	bleaching	A
	fixing	A
	stabilizing	B
	not specified	B
E-6	primary developing	A
	reversing	C
	colour developing	A
	conditioning	B
	bleaching	C
	fixing	A
	stabilizing	B
	not specified	B
BW-N	developing	A
	fixing	A
	not specified	A
BW-P	developing	A
	fixing	A
	not specified	A