Worksheet for Storage Process

Use this worksheet to calculate the quantity of specified substance released to the environment or that in waste in a storage process.
Refer to the calculation example given in 1-1 Storage Process (pIII-4) of Part III of this manual.

If not known, assume 1/2 of the height of the tank.
If the storage height has been set, enter it.

White: 1.0
Silver: 1.2
Light brown/cream: 1.33
Others: 1.46

Internal diameter of the tank
5m or less: 0.3
More than 5m to less than 9m: 0.8
9m or more: 1.0

Sum up 1R when exhaust gas treatment is not performed and 1U when it is performed as "air emission."

Sum up "Off-site transfer in waste" or "Landfills in the business establishment" by category of transfer.

I. Engineering calculations

Serial number	Raw material, manufactured goods, etc.		Properties of specified substance contained in raw materials, manufactured goods, etc.					Size of the storage tank, etc.								Calculation of air emission								
	Name of raw materials, manufactured goods, etc.	Annual quantity of raw materials or manufactured goods taken in m^3	Name of specified substance contained in 1A	Content of 1C in 1A	Molecular mass of 1C	Vapor pressure of 1C	Partial pressure of 1C in tank	Internal diameter of the tank	Tank volume	Tank height	Average storage height	Average annual outdoor temperature difference	Internal pressure of the tank	Color factor of the tank	Diameter factor of the tank	Breathing loss	Loss at acceptance	Potential air emission	Removal rate of exhaust gas treatment	Decomposition rate of exhaust gas treatment	Air emission	Name of waste generated by treatment	Classification of transfer of 1V	Quantity of 1V in waste
				%	g/mol	Pa	Pa	m	kL	m	m	℃	Pa (Absolute pressure)			kg/year	kg/year	kg/year	%	%	kg/year			kg/year
	1A	1B	1C	1D	1E	1F	1G ※1	1H	1I	1J =1I×4÷(1H²×3.14)	1K	1L	1M	1N	1O	1P ※2	1Q ※3	1R =1P+1Q	1S	1T	1U =1R×(100-1S)÷100	1V	1W	1X =1R×(1S−1T)÷100

※1 1G = 1F × (1D/1E)/[(1D/1E) + (Content of component a in 1A except for 1C (%)/Molecular mass of component a in 1A except for 1C) + (Content of component b in 1A except for 1C (%)/Molecular mass of comp

※2 $1P = 0.3 \times 1E \times [1G \div (760 - 1G)]^{0.68} \times 1H^{1.73} \times (1J - 1K)^{0.51} \times 1L^{0.5} \times 1N \times 1O$

※3 $1Q = 0.041 \times 1E \times 1B \times (1G \div \times 1M)$

Quantity taken in: Acceptance loss
Quantity taken out: Delivery loss
Fueled quantity: Fueling loss
} Fill out

To calculate the release from filling station: Factor given in 4-3-3 a) in Part III (pIII-250)
To calculate the release of designated pure substance: Factor given in 4-3-2) in Part III (pIII-247) × 2E/420

Sum up 1R when exhaust gas treatment is not performed and 1U when it is performed as "air emission."

Sum up "Off-site transfer in waste" or "Landfills in the business establishment" by category of transfer.

II. Emission Factors

Serial number	Raw material, manufactured goods, etc.		Properties of specified substance contained in raw materials, manufactured goods, etc.					Emission factor of specified substance			Calculation of air emission											
	Name of raw materials, manufactured goods, etc.	Annual quantity of raw materials or manufactured goods taken in, taken out, or oil absorption	Name of specified substance in 2A	Content of 2C in 2A	Vapor pressure of 2C	Tank volume	Number of days used	Emission factor of 2C (breathing loss)	Emission factor of 2C (acceptance loss)	Emission factor of 2C (delivery or fueling loss)	Breathing loss	Loss at acceptance	Delivery or fueling loss	Potential air emission	Removal rate of exhaust gas treatment	Decomposition rate of exhaust gas treatment	Air emission	Name of waste generated by treatment	Classification of transfer of 2R	Quantity of 2R in waste
		m^3=kL		%	Pa	kL	day				kg/year	kg/year	kg/year	kg/year	%	%	kg/year			kg/year
	2A	2B	2C	2D	2E	2F	2G	2H	2I	2J	2K =2G×2H	2L =2B×2I	2M =2B×2J	2N =2K+2L+2M	2O	2P	2Q =2N×(100-2O)÷100	2R	2S	2T =2N×(2O−2P)÷100

Sum up 3F when exhaust gas treatment is not performed and 3I when it is performed as "air emission."

Sum up as "off-site transfer in waste" or "landfill in the business establishment" per classification of transfer.

III Mass Balance

Serial number	Raw material, manufactured goods, etc.			Specified substance in raw materials or manufactured goods		Calculation of air emission							
	Name of raw materials, manufactured goods, etc.	Annual quantity of raw materials or manufactured goods taken in	Annual quantity of raw materials or manufactured goods taken out	Name of specified substance in 3A	Content of 3D in 3A	Potential air emission	Removal rate of exhaust gas treatment	Decomposition rate of exhaust gas treatment	Air emission	Name of waste generated by treatment	Classification of transfer of 3J	Quantity of 3J in waste
		kg/year	kg/year		%	kg/year	%	%	kg/year			kg/year
	3A	3B	3C	3D	3E	3F =(3B−3C)×3E÷100	3G	3H	3I =3F×(100-3G)÷100	3J	3K	3L =3F×(3G−3H)÷100

Worksheet for Reaction and Mixing Process

Use this worksheet to calculate the quantity of raw materials or manufactured goods released to the environment and that in waste in reaction and mixing process. (Use one copy per substance.)
Refer to the calculation example given in 1-2 Reaction and mixing process in Part III of this manual (pIII-21).

When a new substance is manufactured with a specified substance used as a raw material, calculate the quantity consumed by reaction using reaction rate.

If the content of the specified substance in waste is not known, use the content of the substance in used raw material or in manufactured goods.

Name of specified substance and process where it is handled			Calculation of annual quantity of specified substance handled						Calculation of the quantity of specified substance released as manufactured goods					Calculation of the quantity of specified substance in waste							Calculation of maximum potential discharge of specified substance to the environment
Name of process where raw materials or materials containing the specified substance is handled	Name of specified substance contained in raw materials or materials handled in A	Name of individual substance in the case where material group name is entered in B	Name of raw materials or materials that contain B	Annual quantity of C handled	Content of B (B') in C	Conversion factor used for the conversion from B' to B	Annual quantity of B (B') contained in C handled	Annual quantity of B handled (Sum of G)	Name of manufactured goods that contain B manufactured in A	Quantity of I manufactured	Content of B (B') in I	Quantity of B in I released as manufactured goods	Sum of the quantity of B taken out as manufactured goods	Name of waste containing B generated in A	Quantity of N generated	Content of B (B') in N	Classification of transfer of N	Quantity of B in N	Sum of B in waste (Sum of R)	Maximum potential discharge of B to the environment
A	B	B'	C	kg/year D	% E	F	kg/year G =D×E÷100	kg/year H (Sum of G)	I	kg/year J	% K	kg/year L =J×K×F÷100	kg/year M (Sum of L)	N	kg/year O	% P	Q	kg/year R =O×P×F÷100	kg/year S (Rの合計)	kg/year T =H-M-S
																			→ Sum them up as "Off-site transfer in waste" or "Landfills in the business establishment" by category of transfer.	

Calculation of release to water

Judgment of the medium (air or water) to which smaller quantity is released: **U**

Enter the medium (air or water) to which smaller quantity is released.

Water

To calculate using solubility to water

Concentration of B in effluent	Quantity of effluent	Potential released to water
mg/L V	m^3/year W	kg/year X =V×W÷1000
α →		kg/year X'

Fill out if the substance is released to water by exhaust gas treatment (the same for the following columns)

Enter the actual measurement value if the concentration in effluent is measured.

①When effluent treatment is not performed

Release to water＝X	
Release to water by exhaust gas treatment ＝X'	

Sum up X/X' when effluent treatment is not performed and AA/AA' when it is performed as "surface water discharge" or "transfer to sewage."

②When effluent treatment is performed

Removal rate of effluent treatment	Decomposition rate of effluent treatment	Release to water after treatment	Quantity decomposed by treatment
% Y	% Z	kg/year AA =X×(100-Y)÷100	kg/year AB =X×Z÷100
% Y'	% Z'	kg/year AA'	kg/year AB'

②-1 When released to air by effluent treatment

Air emission by effluent treatment
kg/year AC =X×(Y-Z)÷100
→ Fill out AH' (β)

②-2 When waste is generated by effluent treatment

Name of waste generated by effluent treatment	Quantity of B in AD	Classification of transfer of AD
AD	kg/year AE =X×(Y-Z)÷100	AF
AD'	kg/year AE'	AF'

Sum up AE/AE' as "Off-site transfer in waste" or "Landfills in the business establishment" by category of transfer.

Calculation of air emission

Medium to which larger quantity is released	Potential air emission kg/year AH *
AG Enter the medium to which larger quantity is released (air or water)	
Air	
β →	kg/year AH'

Fill out when the substance is released to air by effluent treatment (the same for the following columns)

* Calculate "potential air emission AH" as follows by the method of "calculation of release to water."
① ：AH＝T－X
②-1：AH＝T－AA－AB－AC
②-2：AH＝T－AA－AB－AE

①When exhaust gas treatment is not performed

Release to air＝AH	
Air emission by effluent treatment ＝AH'	

Sum up AH/AH' when exhaust gas treatment is not performed and AK/AK' when it is performed as "air emission."

②When exhaust gas treatment is performed

Removal rate of exhaust gas treatment	Decomposition rate of exhaust gas treatment	Air emission after treatment	Quantity decomposed by treatment
% AI	% AJ	kg/year AK =AH×(100-AI)÷100	kg/year AL =AH×AJ÷100
% AI'	% AJ'	kg/year AK'	kg/year AL'

②-1 When released to water by exhaust gas treatment

Release to water by exhaust gas treatment
kg/year AM =AH×(AI－AJ)÷100
→ Fill out X' (α)

②-2 When waste is generated by exhaust gas treatment

Name of waste generated by waste gas treatment	Quantity of B in AN	Classification of transfer of AN
AN	kg/year AO =AH×(AI－AJ)÷100	AP
AN'	kg/year AO'	AP'

Sum up AO/AO' as "Off-site transfer in waste" or "Landfills in the business establishment" by category of transfer.

Worksheet for Machining Process

Use this worksheet to calculate the quantity of additives released to the environment contained in cutting oil or in waste in machining processes. (Use one copy per substance).
Refer to the calculation example given in 1-3 Machining process in Part III of this manual (pIII-42).

If the content of the specified substance in spent cutting fluid is not known, use the content in the cutting fluid.

Name of specified substance and process where it is handled		Calculation of annual quantity of specified substance handled					Calculation of the quantity of specified substance released as manufactured goods	Calculation of the quantity of specified substance in waste						Calculation of maximum potential discharge of specified substance to the environment
Name of process where raw materials or materials containing the specified substance is handled **A**	Name of specified substance contained in raw materials or materials handled in A **B**	Name of raw materials or materials that contain B **C**	Annual quantity of C handled **kg/year** **D**	Content of B in C **%** **E**	Annual quantity of B contained in C handled **kg/year** **F** **=D×E÷100**	Annual quantity of B handled **kg/year** **G** **(Sum of**	Sum of the quantity of B taken out as manufactured goods **kg/year** **H**	Name of waste containing B generated in A **I**	Quantity of I generated **kg/year** **J**	Content of B in I **%** **K**	Classification of transfer of I **L**	Quantity of B in I **kg/year** **M** **=J×K÷100**	Sum of B in waste **kg/year** **N** **(Sum of M)**	Maximum potential discharge of B to the environment **kg/year** **O** **=G-N**
Machining							**0**							
													→ Sum them up as "off-site transfer in waste" or "landfills in the business establishment" by category of transfer.	

Calculation of air emission

Judgment of the medium (air or water) to which smaller quantity is released **P** Enter the medium (air or water) to which smaller quantity is released.	air emission **kg/year** **Q**
Air	**0**

→ Sum up as "air emission."

Calculation of release to water

Medium to which larger quantity is released **R** Enter the medium to which larger quantity is released (air or water)	Potential released to water **kg/year** **S** **=O**
Water	

① **When effluent treatment is not performed**

Release to water＝S	

→ Sum up S when effluent treatment is not performed and V when it is performed as "surface water discharge" or "transfer to sewage."

② **When effluent treatment is performed**

Sum up as "off-site transfer in waste" or "landfills in the business establishment" by classification of transfer.

Removal rate of effluent treatment **%** **T**	Decomposition rate of effluent treatment **%** **U**	Release to water after treatment **kg/year** **V** **=S×(100-T)÷100**	Quantity decomposed by treatment **kg/year** **W** **=S×U÷100**	Name of waste generated by effluent treatment **X**	Quantity of B in X **kg/year** **Y** **=S×(T−U)÷100**	Classification of transfer of X **Z**

Worksheet for Washing Process

Use this worksheet to calculate the quantity of specified substance released to the environment contained in detergent or waste in washing process. (Use one copy per substance).
Refer to the calculation example given in 1-4 Washing process in Part III of this manual (pIII-47).

① If the content of the specified substance in spent detergent is not known, use the content in the detergent.
② If waste is generated, make calculations using the difference between the weight of the waste including the detergent and that not including the detergent.

Name of specified substance and process where it is handled		Calculation of annual quantity of specified substance handled					Calculation of the quantity of specified substance released as manufactured goods	Calculation of the quantity of specified substance in waste						Calculation of maximum potential discharge of specified substance to the environment
Name of process where raw materials or materials containing the specified substance is A	Name of specified substance contained in raw materials or materials handled in A B	Name of raw materials or materials that contain B C	Annual quantity of C handled kg/year D	Content of B in C % E	Annual quantity of B contained in C handled kg/year F =D×E÷100	Annual quantity of B handled kg/year G (Sum of F)	Sum of the quantity of B taken out as manufactured goods kg/year H	Name of waste containing B generated in A I	Quantity of I generated kg/year J	Content of B in I % K	Classification of transfer of I L	Quantity of B in I kg/year M =J×K÷100	Sum of B in waste kg/year N (Sum of M)	Maximum potential discharge of B to the environment kg/year O =G-N
Washing							0						→ Sum them up as "off-site transfer in waste" or "landfills in the business establishment" by category of transfer.	

Calculation of release to water

Judgment of the medium (air or water) to which smaller quantity is released
P
Enter the medium (air or water) to which smaller quantity is released

To calculate using solubility to water
Concentration of B in effluent: mg/L Q
Quantity of effluent: m³/year R
Potential released to water: kg/year S =Q×R÷1000

Water

α →

Fill out if the substance is released to water by exhaust gas treatment (the same for the following columns)

Enter the actual measurement value if the concentration in effluent is measured.

① When effluent treatment is not performed

Release to water＝S	
Release to water by exhaust gas treatment ＝S'	

Sum up S/S' when effluent treatment is not performed and V/V' when it is performed as "surface water discharge" or "transfer to sewage."

② When effluent treatment is performed

Removal rate of effluent treatment % T	Decomposition rate of effluent treatment % U	Release to water after treatment kg/year V =S×(100-T)÷100	Quantity decomposed by treatment kg/year W =S×U÷100
% T'	% U'	kg/year V'	kg/year W'

②-1 When released to air by effluent treatment

Air emission by effluent treatment kg/year X =S×(T-U)÷100
→ Fill out AC' (β)

②-2 When waste is generated by effluent treatment

Name of waste generated by effluent treatment Y	Quantity of B in Y kg/year Z =S×(T-U)÷100	Classification of transfer of Y AA
Y'	kg/year Z'	AA'

Sum up Z/Z' as "Off-site transfer in waste" or "Landfills in the business establishment" by category of transfer.

Calculation of air emission

Medium to which larger quantity is released AB Enter the medium to which larger quantity is released (air or water)	Potential air emission kg/year AC *
Air	
β →	kg/year AC'

Fill out when the substance is released to air by effluent treatment (the same for the following columns)

* Calculate "potential air emission AH" as follows by the method of "calculation of release to water."
① :AC＝O－S
②-1:AC＝O－V－W－X
②-2:AC＝O－V－W－Z

① When exhaust gas treatment is not performed

Release to air＝AC	
Air emission by effluent treatment ＝AC'	

Sum up AC/AC' when exhaust gas treatment is not performed and AF/AF' when it is performed as "air emission."

② When exhaust gas treatment is performed

Removal rate of exhaust gas treatment % AD	Decomposition rate of exhaust gas treatment % AE	Air emission after treatment kg/year AF =AC×(100-AD)÷100	Quantity decomposed by treatment kg/year AG =AC×AE÷100
% AD'	% AE'	kg/year AF'	kg/year AG'

②-1 When released to water by exhaust gas treatment

Release to water by exhaust gas treatment kg/year AH =AC×(AD－AE)÷100
→ Fill out S' (α)

②-2 When waste is generated by exhaust gas treatment

Name of waste generated by waste gas treatment AI	Quantity of B in AI kg/year AJ =AC×(AD－AE)÷100	Classification of transfer of AI AK
AI'	kg/year AJ'	AK'

Sum up AJ/AJ' as "Off-site transfer in waste" or "Landfills in the business establishment" by category of transfer.

Worksheet for Coating Process

Use this worksheet to calculate the quantity of volatile solvent released to the environment contained in paint or in waste in coating process. (Use one copy per substance.)
Refer to the calculation example given in 1-5 Coating process in Part III of this manual (pIII-59).

If the content of the specified substance in spent paint is not known, use the content in the paint.

Name of specified substance and process where it is handled		Calculation of annual quantity of specified substance handled					Calculation of the quantity of specified substance released as manufactured goods	Calculation of the quantity of specified substance in waste						Calculation of maximum potential discharge of specified substance to the environment
Name of process where raw materials or materials containing the specified substance is	Name of specified substance contained in raw materials or materials handled in A	Name of raw materials or materials that contain B	Annual quantity of C handled	Content of B in C	Annual quantity of B contained in C handled	Annual quantity of B handled	Sum of the quantity of B taken out as manufactured goods	Name of waste containing B generated in A	Quantity of I generated	Content of B in I	Classification of transfer of I	Quantity of B in I	Sum of B in waste	Maximum potential discharge of B to the environment
A	B	C	kg/year D	% E	kg/year F =D×E÷100	kg/year G (Sum of F)	kg/year H	I	kg/year J	% K	L	kg/year M =J×K÷100	kg/year N (Sum of M)	kg/year O =G-N
Coating							0						→ Sum them up as "off-site transfer in waste" or "landfills in the business establishment" by category of transfer.	

Calculation of release to water

Judgment of the medium (air or water) to which smaller quantity is released: P (Enter the medium (air or water) to which smaller quantity is released.)

To calculate using solubility to water:

Concentration of B in effluent	Quantity of effluent	Potential released to water
mg/L Q	m^3/year R	kg/year S =Q×R÷1000
Water		
α →		kg/year S'

Fill out if the substance is released to water by exhaust gas treatment (the same for the following columns)

Enter the actual measurement value if the concentration in effluent is measured.

① When effluent treatment is not performed

Release to water = S	
Release to water by exhaust gas treatment = S'	

Sum up S/S' when effluent treatment is not performed and V/V' when it is performed as "surface water discharge" or "transfer to sewage."

② When effluent treatment is performed

Removal rate of effluent treatment	Decomposition rate of effluent treatment	Release to water after treatment	Quantity decomposed by treatment
% T	% U	kg/year V =S×(100-T)÷100	kg/year W =S×U÷100
% T'	% U'	kg/year V'	kg/year W'

②-1 When released to air by effluent treatment

Air emission by effluent treatment kg/year X =S×(T-U)÷100
→ Fill out AC' (β)

②-2 When waste is generated by effluent treatment

Name of waste generated by effluent treatment	Quantity of B in Y	Classification of transfer of Y
Y	kg/year Z =S×(T-U)÷100	AA
Y'	kg/year Z'	AA'

Sum up Z/Z' as "Off-site transfer in waste" or "Landfills in the business establishment" by category of transfer.

Calculation of air emission

Medium to which larger quantity is released	Potential air emission kg/year AC *
AB Enter the medium to which larger quantity is released (air or water)	
Air	
β →	kg/year AC'

Fill out when the substance is released to air by effluent treatment (the same for the following columns)

* Calculate "potential air emission AH" as follows by the method of "calculation of release to water."
① : AC=O−S
②-1: AC=O−V−W−X
②-2: AC=O−V−W−Z

① When exhaust gas treatment is not performed

Release to air = AC	
Air emission by effluent treatment = AC'	

Sum up AC/AC' when exhaust gas treatment is not performed and AF/AF' when it is performed as "air emission."

② When exhaust gas treatment is performed

Removal rate of exhaust gas treatment	Decomposition rate of exhaust gas treatment	Air emission after treatment	Quantity decomposed by treatment
% AD	% AE	kg/year AF =AC×(100-AD)÷100	kg/year AG =AC×AE÷100
% AD'	% AE'	kg/year AF'	kg/year AG'

②-1 When released to water by exhaust gas treatment

Release to water by exhaust gas treatment kg/year AH =AC×(AD−AE)÷100
→ Fill out S' (α)

②-2 When waste is generated by exhaust gas treatment

Name of waste generated by waste gas treatment	Quantity of B in AI	Classification of transfer of AI
AI	kg/year AJ =AC×(AD−AE)÷100	AK
AI'	kg/year AJ'	AK'

Sum up AJ/AJ' as "Off-site transfer in waste" or "Landfills in the business establishment" by category of transfer.

Worksheet for Coating Process (pigment)

Use this worksheet to calculate the quantity of pigments such as metallic compounds released to the environment contained in paint or in waste in painting process. (Use one copy per substance.)
Refer to the calculation example in 1-5 Painting process in Part III of this manual (pIII-59).

If the content in manufactured goods is not known, make calculations using the following formulas.
(1) Painted area × painted film thickness × content of specified substance in painted film
(2) Adherence efficiency × Quantity of specified substance handled
(Refer to 4-3-4 in Part III of this manual (pIII-281).

If the content of the specified substance in waste paint is not known, use the content in the paint.

Name of specified substance and process where it is handled			Calculation of annual quantity of specified substance handled					Calculation of the quantity of specified substance released as manufactured goods					Calculation of the quantity of specified substance in waste						Calculation of maximum potential discharge of specified substance to the environment
Name of process where raw materials or materials containing the specified substance is handled **A**	Name of specified substance contained in raw materials or materials handled in A **B**	Name of individual substance in the case where material group name is entered in B **B'**	Name of raw materials or materials that contain B **C**	Annual quantity of C handled **kg/year D**	Content of B in C **% E**	Annual quantity of B (B') contained in C handled **kg/year F =D×E÷100**	Annual quantity of B handled **kg/year G (Sum of F)**	Name of manufactured goods that contain B manufactured in A **H**	Quantity of H manufactured **kg/year I**	Content of B in H **% J**	Quantity of B in H released as manufactured goods **kg/year K =I×J÷100**	Sum of the quantity of B taken out as manufactured goods **kg/year L (Sum of K)**	Name of waste containing B generated in A **M**	Quantity of M generated **kg/year N**	Content of B in M **% O**	Classification of transfer of M **P**	Quantity of B in M **kg/year Q =N×O÷100**	Sum of B in waste **kg/year R (Sum of Q)**	Maximum potential discharge of B to the environment **kg/year S =G-L-R**
Coating																		→ Sum them up as "Off-site transfer in waste" or "Landfills in the business establishment" by category of transfer.	

Calculation of air emission			Calculation of release to water		
Judgment of the medium (air or water) to which smaller quantity is released **T** Enter the medium (air or water) to which smaller quantity is released.	air emission **kg/year U**		Medium to which larger quantity is released **V** Enter the medium to which larger quantity is released (air or water)	Potential released to water **kg/year W =S**	
Air	**0**	Sum up as "air emission."	**Water**		① **When effluent treatment is not performed**: Release to water=W → Sum up W when effluent treatment is not performed and Z when it is performed as "surface water discharge" or "transfer to sewage."

② **When effluent treatment is performed**

Removal rate of effluent treatment **% X**	Decomposition rate of effluent treatment **% Y**	Release to water after treatment **kg/year Z =W×(100-X)÷100**	Quantity decomposed by treatment **kg/year AA =W×Y÷100**	Name of waste generated by effluent treatment **AB**	Quantity of B in AB **kg/year AC =W×(X−Y)÷100**	Classification of transfer of AB **AD**

Sum up as "off-site transfer in waste" or "landfills in the business establishment" by classification of transfer.

Worksheet for Printing Process

Use this worksheet to calculate the quantity of volatile solvent released to the environment contained in printing ink or in waste in printing process. (Use one copy per substance.)
Refer to the calculation example given in 1-6 Printing process in Part III of this manual (pIII-66).

If the content of the specified substance in spent ink is not known, use the content in the ink.

Name of specified substance and process where it is handled		Calculation of annual quantity of specified substance handled					Calculation of the quantity of specified substance released as manufactured goods	Calculation of the quantity of specified substance in waste						Calculation of maximum potential discharge of specified substance to the environment
Name of process where raw materials or materials containing the specified substance is handled **A**	Name of specified substance contained in raw materials or materials handled in A **B**	Name of raw materials or materials that contain B **C**	Annual quantity of C handled **kg/year D**	Content of B in C **% E**	Annual quantity of B contained in C handled **kg/year F =D×E÷100**	Annual quantity of B handled **kg/year G (Sum of F)**	Sum of the quantity of B taken out as manufactured goods **kg/year H**	Name of waste containing B generated in A **I**	Quantity of I generated **kg/year J**	Content of B in I **% K**	Classification of transfer of I **L**	Quantity of B in I **kg/year M =J×K÷100**	Sum of B in waste **kg/year N (Sum of M)**	Maximum potential discharge of B to the environment **kg/year O =G-N**
Printing							**0**						→ Sum them up as "off-site transfer in waste" or "landfills in the business establishment" by category of transfer.	

Calculation of release to water

Judgment of the medium (air or water) to which smaller quantity is released
P
Enter the medium (air or water) to which smaller quantity is released.

To calculate using solubility to water

Concentration of B in effluent **mg/L Q**	Quantity of effluent **m^3/year R**	Potential released to water **kg/year S =Q×R÷1000**
Water		
α → Fill out if the substance is released to water by exhaust gas treatment (the same for the following columns)		kg/year S'

Enter the actual measurement value if the concentration in effluent is measured.

①When effluent treatment is not performed

Release to water=S	
Release to water by exhaust gas treatment =S'	

Sum up S/S' when effluent treatment is not performed and V/V' when it is performed as "surface water discharge" or "transfer to sewage."

②When effluent treatment is performed

Removal rate of effluent treatment **% T**	Decomposition rate of effluent treatment **% U**	Release to water after treatment **kg/year V =S×(100-T)÷100**	Quantity decomposed by treatment **kg/year W =S×U÷100**
% T'	% U'	kg/year V'	kg/year W'

②-1 When released to air by effluent treatment

Air emission by effluent treatment **kg/year X =S×(T-U)÷100**
→ Fill out AC' (β)

②-2 When waste is generated by effluent treatment

Name of waste generated by effluent treatment **Y**	Quantity of B in Y **kg/year Z =S×(T-U)÷100**	Classification of transfer of Y **AA**
Y'	kg/year Z'	AA'

Sum up Z/Z' as "Off-site transfer in waste" or "Landfills in the business establishment" by category of transfer.

Calculation of air emission

Medium to which larger quantity is released **AB** Enter the medium to which larger quantity is released (air or water)	Potential air emission **kg/year AC ***
Air	
β → Fill out when the substance is released to air by effluent treatment (the same for the following columns)	kg/year AC'

* Calculate "potential air emission AH" as follows by the method of "calculation of release to water."
① :AC=O−S
②-1:AC=O−V−W−X
②-2:AC=O−V−W−Z

①When exhaust gas treatment is not performed

Release to air=AC	
Air emission by effluent treatment =AC'	

Sum up AC/AC' when exhaust gas treatment is not performed and AF/AF' when it is performed as "air emission."

②When exhaust gas treatment is performed

Removal rate of exhaust gas treatment **% AD**	Decomposition rate of exhaust gas treatment **% AE**	Air emission after treatment **kg/year AF =AC×(100-AD)÷100**	Quantity decomposed by treatment **kg/year AG =AC×AE÷100**
% AD'	% AE'	kg/year AF'	kg/year AG'

②-1 When released to water by exhaust gas treatment

Release to water by exhaust gas treatment **kg/year AH =AC×(AD−AE)÷100**
→ Fill out S' (α)

②-2 When waste is generated by exhaust gas treatment

Name of waste generated by waste gas treatment **AI**	Quantity of B in AI **kg/year AJ =AC×(AD−AE)÷100**	Classification of transfer of AI **AK**
AI'	kg/year AJ'	AK'

Sum up AJ/AJ' as "Off-site transfer in waste" or "Landfills in the business establishment" by category of transfer.

Worksheet for Printing Process (pigment)

Use this worksheet to calculate the quantity of pigments such as metallic compounds released to the environment contained in printing ink or in waste in printing process. (Use one copy per substance.)
Refer to the calculation example in 1-6 Printing process in Part III of this manual (pIII-66).

If the content in manufactured goods is not known, make calculations using mass balance.

If the content of the specified substance in spent printing ink is not known, use the content in the printing ink used.

Name of specified substance and process where it is handled			Calculation of annual quantity of specified substance handled					Calculation of the quantity of specified substance released as manufactured goods					Calculation of the quantity of specified substance in waste						Calculation of maximum potential discharge of specified substance to the environment
Name of process where raw materials or materials containing the specified substance is handled **A**	Name of specified substance contained in raw materials or materials handled in A **B**	Name of individual substance in the case where material group name is entered in B **B'**	Name of raw materials or materials that contain B **C**	Annual quantity of C handled **kg/year** **D**	Content of B in C **%** **E**	Annual quantity of B (B') contained in C handled **kg/year** **F** **=D×E÷100**	Annual quantity of B handled **kg/year** **G** **(Sum of F)**	Name of manufactured goods that contain B manufactured in A **H**	Quantity of H manufactured **kg/year** **I**	Content of B in H **%** **J**	Quantity of B in H released as manufactured goods **kg/year** **K** **=I×J÷100**	Sum of the quantity of B taken out as manufactured goods **kg/year** **L** **(Sum of K)**	Name of waste containing B generated in A **M**	Quantity of M generated **kg/year** **N**	Content of B in M **%** **O**	Classification of transfer of M **P**	Quantity of B in M **kg/year** **Q** **=N×O÷100**	Sum of B in waste **kg/year** **R** **(Sum of Q)**	Maximum potential discharge of B to the environment **kg/year** **S** **=G-L-R**
Printing																		→ Sum them up as "Off-site transfer in waste" or "Landfills in the business establishment" by category of transfer.	

Calculation of air emission

Judgment of the medium (air or water) to which smaller quantity is released **T** Enter the medium (air or water) to which smaller quantity is released.	air emission **kg/year** **U**
Air	**0** → Sum up as "air emission."

Calculation of release to water

Medium to which larger quantity is released **V** Enter the medium to which larger quantity is released (air or water)	Potential released to water **kg/year** **W** **=S**
Water	

① → **①When effluent treatment is not performed**

Release to water=W	

Sum up W when effluent treatment is not performed and Z when it is performed as "surface water discharge" or "transfer to sewage."

② → **②When effluent treatment is performed**

Removal rate of effluent treatment **%** **X**	Decomposition rate of effluent treatment **%** **Y**	Release to water after treatment **kg/year** **Z** **=W×(100-X)÷100**	Quantity decomposed by treatment **kg/year** **AA** **=W×Y÷100**	Name of waste generated by effluent treatment **AB**	Quantity of B in AB **kg/year** **AC** **=W×(X−Y)÷100**	Classification of transfer of AB **AD**

Sum up as "off-site transfer in waste" or "landfills in the business establishment" by classification of transfer.

Worksheet for Adhesion Process

Use this worksheet to calculate the quantity of volatile solvent released to the environment contained in adhesive agent or in waste in adhesion process. (Use one copy per substance.)
Refer to the calculation example given in 1-7 Adhesion process in Part III of this manual (pIII-74).

If the content of the specified substance in spent adhesive agent is not known, use the content in the adhesive agent used.

Name of specified substance and process where it is handled		Calculation of annual quantity of specified substance handled					Calculation of the quantity of specified substance as manufactured goods	Calculation of the quantity of specified substance in waste						Calculation of maximum potential discharge of specified substance to the environment
Name of process where raw materials or materials containing the specified substance is handled A	Name of specified substance contained in raw materials or materials handled in A B	Name of raw materials or materials that contain B C	Annual quantity of C handled kg/year D	Content of B in C % E	Annual quantity of B contained in C handled kg/year F =D×E÷100	Annual quantity of B handled kg/year G (Sum of F)	Sum of the quantity of B taken out as manufactured goods kg/year H	Name of waste containing B generated in A I	Quantity of I generated kg/year J	Content of B in I % K	Classification of transfer of I L	Quantity of B in I kg/year M =J×K÷100	Sum of B in waste kg/year N (Sum of M)	Maximum potential discharge of B to the environment kg/year O =G-N
Adhesion							0						→ Sum them up as "off-site transfer in waste" or "landfills in the business establishment" by category of transfer.	

Calculation of release to water

Judgment of the medium (air or water) to which smaller quantity is released
P
Enter the medium (air or water) to which smaller quantity is released.

To calculate using solubility to water

Concentration of B in effluent mg/L Q	Quantity of effluent m^3/year R	Potential released to water kg/year S =Q×R÷1000
		Water
		α → kg/year S'

Fill out if the substance is released to water by exhaust gas treatment (the same for the following columns)

When concentration in effluent is measured

① When effluent treatment is not performed

Release to water=S	
Release to water by exhaust gas treatment =S'	

Sum up S/S' when effluent treatment is not performed and V/V' when it is performed as "surface water discharge" or "transfer to sewage."

② When effluent treatment is performed

Removal rate of effluent treatment % T	Decomposition rate of effluent treatment % U	Release to water after treatment kg/year V =S×(100-T)÷100	Quantity decomposed by treatment kg/year W =S×U÷100
% T'	% U'	kg/year V'	kg/year W'

②-1 When released to air by effluent treatment

Air emission by effluent treatment kg/year X =S×(T-U)÷100
→ Fill out AC' (β)

②-2 When waste is generated by effluent treatment

Name of waste generated by effluent treatment Y	Quantity of B in Y kg/year Z =S×(T-U)÷100	Classification of transfer of Y AA
Y'	kg/year Z'	AA'

Sum up Z/Z' as "Off-site transfer in waste" or "Landfills in the business establishment" by category of transfer.

Calculation of air emission

Medium to which larger quantity is released AB Enter the medium to which larger quantity is released (air or water)	Potential air emission kg/year AC *
Air	
β → Fill out when the substance is released to air by effluent treatment (the same for the following columns)	kg/year AC'

* Calculate "potential air emission AH" as follows by the method of "calculation of release to water."
① :AC=O−S
②-1:AC=O−V−W−X
②-2:AC=O−V−W−Z

① When exhaust gas treatment is not performed

Release to air=AC	
Air emission by effluent treatment =AC'	

Sum up AC/AC' when exhaust gas treatment is not performed and AF/AF' when it is performed as "air emission."

② When exhaust gas treatment is performed

Removal rate of exhaust gas treatment % AD	Decomposition rate of exhaust gas treatment % AE	Air emission after treatment kg/year AF =AC×(100-AD)÷100	Quantity decomposed by treatment kg/year AG =AC×AE÷100
% AD'	% AE'	kg/year AF'	kg/year AG'

②-1 When released to water by exhaust gas treatment

Release to water by exhaust gas treatment kg/year AH =AC×(AD−AE)÷100
→ Fill out S' (α)

②-2 When waste is generated by exhaust gas treatment

Name of waste generated by waste gas treatment AI	Quantity of B in AI kg/year AJ =AC×(AD−AE)÷100	Classification of transfer of AI AK
AI'	kg/year AJ'	AK'

Sum up AJ/AJ' as "Off-site transfer in waste" or "Landfills in the business establishment" by category of transfer.

Worksheet for Adhesion Process (additives)

Use this worksheet to calculate the quantity of additives released to the environment contained in adhesives or in waste in adhesion process. (Use one copy per substance).
Refer to the calculation example given in 1-7 Adhesion process in Part III of this manual (pIII-74).

Use the formula “adhesion area” × “content in coated film.”

If the content of the specified substance in spent adhesive is not know use the content in the adhesive used.

Name of specified substance and process where it is handled		Calculation of annual quantity of specified substance handled					Calculation of the quantity of specified substance released as manufactured goods				Calculation of the quantity of specified substance in waste						Calculation of maximum potential discharge of specified substance to the environment
Name of process where raw materials or materials containing the specified substance is handled **A**	Name of specified substance contained in raw materials or materials handled in A **B**	Name of raw materials or materials that contain B **C**	Annual quantity of C handled **kg/year** **D**	Content of B in C **%** **E**	Annual quantity of B contained in C handled **kg/year** **F** **=D×E÷100**	Annual quantity of B handled **kg/year** **G** **(Sum of F)**	Name of manufactured goods that contain B manufactured in A **H**	Method to calculate the quantity of specified substance released as manufactured goods **I**	Quantity of B in H released as manufactured goods **kg/year** **J**	Sum of the quantity of B taken out as manufactured goods **kg/year** **K** **(Sum of J)**	Name of waste containing B generated in A **L**	Quantity of L generated **kg/year** **M**	Content of B in L **%** **N**	Classification of transfer of L **O**	Quantity of B in L **kg/year** **P** **=M×N÷100**	Sum of B in waste **kg/year** **Q** **(Sum of P)**	Maximum potential discharge of B to the environment **kg/year** **R** **=G-K-Q**
Adhesion																	
																→ Sum them up as “Off-site transfer in waste” or “Landfills in the business establishment” by category of transfer.	

Calculation of air emission

Judgment of the medium (air or water) to which smaller quantity is released **S** Enter the medium (air or water) to which smaller quantity is released.	air emission **kg/year** **T**
Air	**0** → Sum up as “air emission.”

Calculation of release to water

Medium to which larger quantity is released **U** Enter the medium to which larger quantity is released (air or water)	Potential released to water **kg/year** **V** **=R**
Water	

① **When effluent treatment is not performed**

Release to water=V	

→ Sum up V when effluent treatment is not performed and Y when it is performed as “surface water discharge” or “transfer to sewage.”

② **When effluent treatment is performed**

Removal rate of effluent treatment **%** **W**	Decomposition rate of effluent treatment **%** **X**	Release to water after treatment **kg/year** **Y** **=V×(100-W)÷100**	Quantity decomposed by treatment **kg/year** **Z** **=V×X÷100**	Name of waste generated by effluent treatment **AA**	Quantity of B in AA **kg/year** **AB** **=V×(W−X)÷100**	Classification of transfer of AA **AC**

Sum up as “off-site transfer in waste” or “landfills in the business establishment” by classification of transfer.

Worksheet for Plating Process

Use this worksheet to calculate the quantity of metallic compounds released to the environment contained in plating liquid or in waste in plating process. (Use one copy per substance.)
Refer to the calculation example in 1-8 Plating process in Part III of this manual (pIII-81).

If the content in manufactured goods is not known, make calculations using the following formulas.
(1) Plating thickness × Plated area × Density of metallic compound
(2) Electric current × Duration of plating × Current efficiency
(Refer to 4-3-5 in Part III of this manual (pIII-282).

If the content of the specified substance in spent plating liquid is not know the content in the plating liquid used.

Name of specified substance and process where it is handled			Calculation of annual quantity of specified substance handled					Calculation of the quantity of specified substance released as manufactured goods				Calculation of the quantity of specified substance in waste						Calculation of maximum potential discharge of specified substance to the environment
Name of process where raw materials or materials containing the specified substance is handled **A**	Name of specified substance contained in raw materials or materials handled in A **B**	Name of individual substance in the case where material group name is entered in B **B'**	Name of raw materials or materials that contain B **C**	Annual quantity of C handled **kg/year D**	Content of B in C **% E**	Annual quantity of B contained in C handled **kg/year F =D×E÷100**	Annual quantity of B handled **kg/year G (Sum of F)**	Name of manufactured goods that contain B manufactured in A **H**	Method to calculate the quantity of specified substance released as manufactured goods **I**	Quantity of B in H released as manufactured goods **kg/year J**	Sum of the quantity of B taken out as manufactured goods **kg/year K (Sum of J)**	Name of waste containing B generated in A **L**	Quantity of L generated **kg/year M**	Content of B in L **% N**	Classification of transfer of L **O**	Quantity of B in L **kg/year P =M×N÷100**	Sum of B in waste **kg/year Q (Sum of P)**	Maximum potential discharge of B to the environment **kg/year R =G-K-Q**
Plating																		
																	→ Sum them up as "Off-site transfer in waste" or "Landfills in the business establishment" by category of transfer.	

Calculation of air emission		Calculation of release to water								
Judgment of the medium (air or water) to which smaller quantity is released **S** Enter the medium (air or water) to which smaller quantity is released.	air emission **kg/year T**	Medium to which larger quantity is released **U** Enter the medium to which larger quantity is released (air or water)	Potential released to water **kg/year V =R**							
Air	**0** → Sum up as "air emission."	**Water**		① **When effluent treatment is not performed**	Release to water=V		→ Sum up V when effluent treatment is not performed and Y when it is performed as "surface water discharge" or "transfer to sewage."			
				② **When effluent treatment is performed**	Removal rate of effluent treatment **% W**	Decomposition rate of effluent treatment **% X**	Release to water after treatment **kg/year Y =V×(100-W)÷100**	Quantity decomposed by treatment **kg/year Z =V×X÷100**	Name of waste generated by effluent treatment **AA**	Quantity of B in AA **kg/year AB =V×(W−X)÷100**	Classification of transfer of AA **AC**

Sum up as "off-site transfer in waste" or "landfills in the business establishment" by classification of transfer.

Worksheet for Dyeing Process (dyestuff)

Use this worksheet to calculate the quantity of metallic compounds released to the environment contained in dyestuff or in waste in dyeing process. (Use one copy per substance.)
Refer to the calculation example in 1-9 Dyeing process in Part III of this manual (pIII-95).

If the content in manufactured goods is not known, use the value obtained through experience.

If the content of the specified substance in spent dyestuff is not known, use the content in the dyestuff used.

Name of specified substance and process where it is handled			Calculation of annual quantity of specified substance handled					Calculation of the quantity of specified substance released as manufactured goods					Calculation of the quantity of specified substance in waste						Calculation of maximum potential discharge of specified substance to the environment
Name of process where raw materials or materials containing the specified substance is handled **A**	Name of specified substance contained in raw materials or materials handled in A **B**	Name of individual substance in the case where material group name is entered in B **B'**	Name of raw materials or materials that contain B **C**	Annual quantity of C handled **kg/year D**	Content of B in C **% E**	Annual quantity of B (B') contained in C handled **kg/year F =D×E÷100**	Annual quantity of B handled **kg/year G (Sum of F)**	Name of manufactured goods that contain B manufactured in A **H**	Quantity of H manufactured **kg/year I**	Content of B in H **% J**	Quantity of B in H released as manufactured goods **kg/year K =I×J÷100**	Sum of the quantity of B taken out as manufactured goods **kg/year L (Sum of K)**	Name of waste containing B generated in A **M**	Quantity of M generated **kg/year N**	Content of B in M **% O**	Classification of transfer of M **P**	Quantity of B in M **kg/year Q =N×O÷100**	Sum of B in waste **kg/year R (Sum of Q)**	Maximum potential discharge of B to the environment **kg/year S =G-L-R**
Dyeing																		→ Sum them up as "Off-site transfer in waste" or "Landfills in the business establishment" by category of transfer.	

Calculation of air emission

Judgment of the medium (air or water) to which smaller quantity is released **T** Enter the medium (air or water) to which smaller quantity is released.	air emission **kg/year U**
Air	**0**

Sum up as "air emission."

Calculation of release to water

Medium to which larger quantity is released **V** Enter the medium to which larger quantity is released (air or water)	Potential released to water **kg/year W =S**
Water	

① **When effluent treatment is not performed**

Release to water=W	

Sum up W when effluent treatment is not performed and Z when it is performed as "surface water discharge" or "transfer to sewage."

② **When effluent treatment is performed**

Removal rate of effluent treatment **% X**	Decomposition rate of effluent treatment **% Y**	Release to water after treatment **kg/year Z =W×(100-X)÷100**	Quantity decomposed by treatment **kg/year AA =W×Y÷100**	Name of waste generated by effluent treatment **AB**	Quantity of B in AB **kg/year AC =W×(X−Y)÷100**	Classification of transfer of AB **AD**

Sum up as "off-site transfer in waste" or "landfills in the business establishment" by classification of transfer.

Worksheet for Dyeing Process (fabric treatment agent)

Use this worksheet to calculate the quantity of specified substance released to the environment contained in fabric treatment agent or in waste in dyeing process. (Use one copy per substance.)
Refer to the calculation example in 1-9 Dyeing process in Part III of this manual (pIII-95).

If the content in the manufactured goods is not known, use the value obtained through experience.

If the content of the specified substance in spent agent is not known, use the content in the fabric treatment agent used.

Name of specified substance and process where it is handled			Calculation of annual quantity of specified substance handled					対象物質の製造品としての搬出量の算出					Calculation of the quantity of specified substance in waste						Calculation of maximum potential discharge of specified substance to the environment
Name of process where raw materials or materials containing the specified substance is handled **A**	Name of specified substance contained in raw materials or materials handled in A **B**	Name of individual substance in the case where material group name is entered in B **B'**	Name of raw materials or materials that contain B **C**	Annual quantity of C handled **kg/year D**	Content of B in C **% E**	Annual quantity of B (B') contained in C handled **kg/year F =D×E÷100**	Annual quantity of B handled **kg/year G (Sum of F)**	Name of manufactured goods that contain B manufactured in A **H**	Quantity of H manufactured **kg/year I**	Content of B in H **% J**	Quantity of B in H released as manufactured goods **kg/year K =I×J÷100**	Sum of the quantity of B taken out as manufactured goods **kg/year L (Sum of K)**	Name of waste containing B generated in A **M**	Quantity of M generated **kg/year N**	Content of B in M **% O**	Classification of transfer of M **P**	Quantity of B in M **kg/year Q =N×O÷100**	Sum of B in waste **kg/year R (Sum of Q)**	Maximum potential discharge of B to the environment **kg/year S =G-L-R**
Dyeing																		→ Sum them up as "Off-site transfer in waste" or "Landfills in the business establishment" by category of transfer.	

Calculation of release to water

Judgment of the medium (air or water) to which smaller quantity is released
T
Enter the medium (air or water) to which smaller quantity is released.

To calculate using solubility to water

Concentration of B in effluent **mg/L U**	Quantity of effluent **m^3/year V**	Potential released to water **kg/year W =U×V÷1000**
		Water
		α → kg/year W'

Fill out if the substance is released to water by exhaust gas treatment (the same for the following columns)

Enter the actual measurement value if the concentration in effluent is measured.

①When effluent treatment is not performed

Release to water＝W	
Release to water by exhaust gas treatment ＝W'	

Sum up W/W' when effluent treatment is not performed and Z/Z' when it is performed as "surface water discharge" or "transfer to sewage."

②When effluent treatment is performed

Removal rate of effluent treatment **% X**	Decomposition rate of effluent treatment **% Y**	Release to water after treatment **kg/year Z =W×(100-X)÷100**	Quantity decomposed by treatment **kg/year AA =W×Y÷100**
% X'	% Y'	kg/year Z'	kg/year AA'

②-1 When released to air by effluent treatment

Air emission by effluent treatment **kg/year AB =W×(X-Y)÷100**
→ Fill out AG' (β)

②-2 When waste is generated by effluent treatment

Name of waste generated by effluent treatment **AC**	Quantity of B in AC **kg/year AD =W×(X-Y)÷100**	Classification of transfer of AC **AE**
AC'	kg/year AD'	AE'

Sum up AD/AD' as "Off-site transfer in waste" or "Landfills in the business establishment" by category of transfer.

Calculation of air emission

Medium to which larger quantity is released **AF** Enter the medium to which larger quantity is released (air or water)	Potential air emission **kg/year AG ***
Air	
β →	kg/year AG'

Fill out when the substance is released to air by effluent treatment (the same for the following columns)

*** Calculate "potential air emission AH" as follows by the method of "calculation of release to water."**
① :AG＝S－W
②-1:AG＝S－Z－AA－AB
②-2:AG＝S－Z－AA－AD

①When exhaust gas treatment is not performed

Release to air＝AG	
Air emission by effluent treatment ＝AG'	

Sum up AG/AG' when exhaust gas treatment is not performed and AJ/AJ' when it is performed as "air emission."

②When exhaust gas treatment is performed

Removal rate of exhaust gas treatment **% AH**	Decomposition rate of exhaust gas treatment **% AI**	Air emission after treatment **kg/year AJ =AG×(100-AH)÷100**	Quantity decomposed by treatment **kg/year AK =AG×AI÷100**
% AH'	% AI'	kg/year AJ'	kg/year AK'

②-1 When released to water by exhaust gas treatment

Release to water by exhaust gas treatment **kg/year AL =AG×(AH－AI)÷100**
→ Fill out X' (α)

②-2 When waste is generated by exhaust gas treatment

Name of waste generated by waste gas treatment **AM**	Quantity of B in AM **kg/year AN =AG×(AH－AI)÷100**	Classification of transfer of AM **AO**
AM'	kg/year AN'	AO'

Sum up AN/AN' as "Off-site transfer in waste" or "Landfills in the business establishment" by category of transfer.

Worksheet for Sterilizing and Disinfecting Process

Use this worksheet to calculate the quantity of specified substance released to the environment contained in sterilizing or disinfecting agent or in waste in sterilizing and disinfecting process. (Use one copy per substance.)
Refer to the calculation example in 1-10 Sterilizing or disinfecting process in Part III of this manual (pIII-101).

If the content of the specified substance in spent liquid is not known, use the content in the sterilizing or disinfecting agent used.

Name of specified substance and process where it is handled		Calculation of annual quantity of specified substance handled					Calculation of the quantity of specified substance released as manufactured goods	Calculation of the quantity of specified substance in waste						Calculation of maximum potential discharge of specified substance to the environment
Name of process where raw materials or materials containing the specified substance is **A**	Name of specified substance contained in raw materials or materials handled in A **B**	Name of raw materials or materials that contain B **C**	Annual quantity of C handled **kg/year D**	Content of B in C **% E**	Annual quantity of B contained in C handled **kg/year F =D×E÷100**	Annual quantity of B handled **kg/year G (Sum of F)**	Sum of the quantity of B taken out as manufactured goods **kg/year H**	Name of waste containing B generated in A **I**	Quantity of I generated **kg/year J**	Content of B in I **% K**	Classification of transfer of I **L**	Quantity of B in I **kg/year M =J×K÷100**	Sum of B in waste **kg/year N (Sum of M)**	Maximum potential discharge of B to the environment **kg/year O =G-N**
Sterilizing and Disinfecting							**0**						→ Sum them up as "off-site transfer in waste" or "landfills in the business establishment" by category of transfer.	

Calculation of release to water

Judgment of the medium (air or water) to which smaller quantity is released
P
Enter the medium (air or water) to which smaller quantity is released.

To calculate using solubility to water

Concentration of B in effluent **mg/L Q**	Quantity of effluent **m³/year R**	Potential released to water **kg/year S =Q×R÷1000**
Water		
		kg/year S'

α → Fill out if the substance is released to water by exhaust gas treatment (the same for the following columns)

Enter the actual measurement value if the concentration in effluent is measured.

①When effluent treatment is not performed

Release to water＝S	
Release to water by exhaust gas treatment ＝S'	

Sum up S/S' when effluent treatment is not performed and V/V' when it is performed as "surface water discharge" or "transfer to sewage."

②When effluent treatment is performed

Removal rate of effluent treatment **% T**	Decomposition rate of effluent treatment **% U**	Release to water after treatment **kg/year V =S×(100-T)÷100**	Quantity decomposed by treatment **kg/year W =S×U÷100**
% T'	% U'	kg/year V'	kg/year W'

②-1 When released to air by effluent treatment

Air emission by effluent treatment **kg/year X =S×(T-U)÷100**
→ Fill out AC' (β)

②-2 When waste is generated by effluent treatment

Name of waste generated by effluent treatment **Y**	Quantity of B in Y **kg/year Z =S×(T-U)÷100**	Classification of transfer of Y **AA**
Y'	kg/year Z'	AA'

Sum up Z/Z' as "Off-site transfer in waste" or "Landfills in the business establishment" by category of transfer.

Calculation of air emission

Medium to which larger quantity is released **AB Enter the medium to which larger quantity is released (air or water)**	Potential air emission **kg/year AC ***
Air	
β → Fill out when the substance is released to air by effluent treatment (the same for the following columns)	kg/year AC'

* Calculate "potential air emission AH" as follows by the method of "calculation of release to water."
① ：AC＝O－S
②-1：AC＝O－V－W－X
②-2：AC＝O－V－W－Z

①When exhaust gas treatment is not performed

Release to air＝AC	
Air emission by effluent treatment ＝AC'	

Sum up AC/AC' when exhaust gas treatment is not performed and AF/AF' when it is performed as "air emission."

②When exhaust gas treatment is performed

Removal rate of exhaust gas treatment **% AD**	Decomposition rate of exhaust gas treatment **% AE**	Air emission after treatment **kg/year AF =AC×(100-AD)÷100**	Quantity decomposed by treatment **kg/year AG =AC×AE÷100**
% AD'	% AE'	kg/year AF'	kg/year AG'

②-1 When released to water by exhaust gas treatment

Release to water by exhaust gas treatment **kg/year AH =AC×(AD－AE)÷100**
→ Fill out S' (α)

②-2 When waste is generated by exhaust gas treatment

Name of waste generated by waste gas treatment **AI**	Quantity of B in AI **kg/year AJ =AC×(AD－AE)÷100**	Classification of transfer of AI **AK**
AI'	kg/year AJ'	AK'

Sum up AJ/AJ' as "Off-site transfer in waste" or "Landfills in the business establishment" by category of transfer.

Worksheet for the Process Using Other Solvents

Use this worksheet to calculate the quantity of specified substance released to the environment contained in other solvents or in waste in the process using other solvents. (Use one copy per substance.)
Refer to the calculation example in 1-11 Process using other solvents in Part III of this manual (pIII-106).

If the content of the specified substance in spent solvent is not known, use the content in the solvent used.

Name of specified substance and process where it is handled		Calculation of annual quantity of specified substance handled					Calculation of the quantity of specified substance released as manufactured goods	Calculation of the quantity of specified substance in waste						Calculation of maximum potential discharge of specified substance to the environment
Name of process where raw materials or materials containing the specified substance is handled **A**	Name of specified substance contained in raw materials or materials handled in A **B**	Name of raw materials or materials that contain B **C**	Annual quantity of C handled **kg/year D**	Content of B in C **% E**	Annual quantity of B contained in C handled **kg/year F =D×E÷100**	Annual quantity of B handled **kg/year G (Sum of F)**	Sum of the quantity of B taken out as manufactured goods **kg/year H**	Name of waste containing B generated in A **I**	Quantity of I generated **kg/year J**	Content of B in I **% K**	Classification of transfer of I **L**	Quantity of B in I **kg/year M =J×K÷100**	Sum of B in waste **kg/year N (Sum of M)**	Maximum potential discharge of B to the environment **kg/year O =G-N**
							0						→ Sum them up as "off-site transfer in waste" or "landfills in the business establishment" by category of transfer.	

Calculation of release to water

Judgment of the medium (air or water) to which smaller quantity is released
P
Enter the medium (air or water) to which smaller quantity is released.

To calculate using solubility to water

Concentration of B in effluent **mg/L Q**	Quantity of effluent **m^3/year R**	Potential released to water **kg/year S =Q×R÷1000**
Water		
α →		kg/year S'

Fill out if the substance is released to water by exhaust gas treatment (the same for the following columns)

Enter the actual measurement value if the concentration in effluent is measured.

①When effluent treatment is not performed

Release to water=S	
Release to water by exhaust gas treatment =S'	

Sum up S/S' when effluent treatment is not performed and V/V' when it is performed as "surface water discharge" or "transfer to sewage."

②When effluent treatment is performed

Removal rate of effluent treatment **% T**	Decomposition rate of effluent treatment **% U**	Release to water after treatment **kg/year V =S×(100-T)÷100**	Quantity decomposed by treatment **kg/year W =S×U÷100**
% T'	% U'	kg/year V'	kg/year W'

②-1 When released to air by effluent treatment

Air emission by effluent treatment **kg/year X =S×(T-U)÷100**
→ Fill out AC' (β)

②-2 When waste is generated by effluent treatment

Name of waste generated by effluent treatment **Y**	Quantity of B in Y **kg/year Z =S×(T-U)÷100**	Classification of transfer of Y **AA**
Y'	kg/year Z'	AA'

Sum up Z/Z' as "Off-site transfer in waste" or "Landfills in the business establishment" by category of transfer.

Calculation of air emission

Medium to which larger quantity is released **AB Enter the medium to which larger quantity is released (air or water)**	Potential air emission **kg/year AC ***
Air	
β →	kg/year AC'

Fill out when the substance is released to air by effluent treatment (the same for the following columns)

*** Calculate "potential air emission AH" as follows by the method of "calculation of release to water."**
① :AC=O−S
②-1:AC=O−V−W−X
②-2:AC=O−V−W−Z

①When exhaust gas treatment is not performed

Release to air=AC	
Air emission by effluent treatment =AC'	

Sum up AC/AC' when exhaust gas treatment is not performed and AF/AF' when it is performed as "air emission."

②When exhaust gas treatment is performed

Removal rate of exhaust gas treatment **% AD**	Decomposition rate of exhaust gas treatment **% AE**	Air emission after treatment **kg/year AF =AC×(100-AD)÷100**	Quantity decomposed by treatment **kg/year AG =AC×AE÷100**
% AD'	% AE'	kg/year AF'	kg/year AG'

②-1 When released to water by exhaust gas treatment

Release to water by exhaust gas treatment **kg/year AH =AC×(AD−AE)÷100**
→ Fill out S' (α)

②-2 When waste is generated by exhaust gas treatment

Name of waste generated by waste gas treatment **AI**	Quantity of B in AI **kg/year AJ =AC×(AD−AE)÷100**	Classification of transfer of AI **AK**
AI'	kg/year AJ'	AK'

Sum up AJ/AJ' as "Off-site transfer in waste" or "Landfills in the business establishment" by category of transfer.