

Safety & Environmental Report 2022

Data by Site

Notes on figures

- The Energy Consumption statistics are crude-oil equivalents of heavy oil, diesel oil, kerosene, gasoline, LP gas or etc.
- The recycling ratio represents the percentage of sold-off/recycled waste.
- Air emission data is measured at exhaust vents and water quality data at the final discharge outlet.
- For PRTR-targeted substances, Special Class 1 restricted substances (the amount usage of 0.5 ton or more per year) and Class 1 restricted substances (the amount usage of 1 ton or more per year) are stated in this report. Figures are rounded to one decimal place.
- All data was from FY2021. It was measured between April 1st, 2021 and March 31, 2022.

Notes on Standard Values

- The standard value for air emission is set to the strictest standard value referring to applicable laws, regulations and standards for the equipments. The observed values are the minimum/maximum among recorded values during the period.
- The standard values for air emission and water quality are the strictest values referring to the applicable laws, regulations and customer's agreements at each site.
- Column marked with an Em Dash ("-") indicates that they are not indispensable.

About Self-Control Standard

- It is the standard to control which defined by calculating value of processing ability from value of past performance. (self-control standard \leq legal standard)

TAIYO YUDEN CO., LTD. Takasaki Global Center

- Total energy consumption (Crude oil equivalent) : 322 kL/year
- Total waste generated : 49 tons/year (recycling rate: 100 %)
- Air emission : Measurement was not performed since no facility was subject to legal regulations.
- Water quality : Measurement was not performed since no facility was subject to legal regulations.
- PRTR restricted substances : Total usage amount is under notification obligation.
- Water source : Tone River
- Drain destination : Karasu River(Via Sewage)

TAIYO YUDEN CO., LTD. Haruna Plant

- Total energy consumption (Crude oil equivalent) : 8,934 kL/year
- Total waste generated : 247 tons/year (recycling rate: 100 %)
- Air emission : **Air Pollution Control Act and Prefectural Ordinances**

Equipment	Fuel	Emissions to Air	Emission Limit	Self-control Standard	Unit	Actual Max.
Firing furnace (Electricity)		Soot and dust	0.25	0.01	g/m ³ N	0.004
Generator (Diesel)	Heavy oil A	NOx	950	950	ppm	760
		SOx	8.0	8.0	K value	0.1
		Soot and dust	0.1	0.1	g/m ³ N	0.04

- Water quality : **Water Quality Pollution Control Act**

Item	Effluent Std.	Self-control Standard	Unit	Actual		
				Min.	Ave.	Max.
Hydrogen ion concentration	5.8~8.6	6.5~8.0	-	7.2	7.5	7.7
Biochemical oxygen demand	25	15	mg/L	1.0	2.1	5.0
Suspended solids	50	20	mg/L	1.0		
N-hexane extract (mineral content)	5	2.0	mg/L	<1		
Copper content	3	0.1	mg/L	<0.01		
Zinc content	2	0.5	mg/L	0.02	0.03	0.05
Soluble iron content	10	0.1	mg/L	<0.01		
Soluble manganese content	10	0.1	mg/L	<0.01		
Chromium content	2	0.02	mg/L	<0.01		
Nitrogen content	120	15	mg/L	4.1	5.0	5.7
Phosphorus content	16	0.1	mg/L	<0.05	<0.05	0.07

- PRTR restricted substances In tons/year

Chemical Substance Name	Total Emissions	Total Transfers	Total Recycles
Vanadium compound	0	0	0
Manganese and its compounds	0	0.02	0

- Water source : Spring Water
- Drain destination : Karasu River

TAIYO YUDEN CO., LTD. Nakanojo Plant

- Total energy consumption (Crude oil equivalent) : 3,994 kL/year
- Total waste generated : 321 tons/year (recycling rate: 100 %)
- Air emission : **Air Pollution Control Act and Prefectural Ordinances**

Equipment	Fuel	Emissions to Air	Emission Limit	Self-control Standard	Unit	Actual Max.
Drying furnace	Kerosene	NOx	230	35	ppm	16
		Soot and dust	0.2	0.005	g/m ³ N	<0.002
		Sox	8.0	0.1	K value	0.01
Firing furnace (Electricity)		Soot and dust	0.25	0.06	g/m ³ N	<0.009
Firing furnace	LP gas	NOx	180	35	ppm	41
		Soot and dust	0.25	0.005	g/m ³ N	<0.002

- Water quality : **Sawage Ordinance (Town of Nakanojo)**

Item	Effluent Std.	Self-control Standard	Unit	Actual		
				Min.	Ave.	Max.
Boron and its compounds	10	8.5	mg/L	0.01	0.03	0.08
Hydrogen ion concentration	5.0~9.0	5.0~8.1	-	7.3	7.7	8.0
Biochemical oxygen demand	600	124	mg/L	2.0	69	120
Suspended solids	600	31	mg/L	2.0	8.6	21
N-hexane extract (mineral content)	5	3.0	mg/L	1.0	1.6	4.0
N-hexane extract (animal/plant content)	30	3.0	mg/L	1.0	1.9	6.0
Copper content	3	0.4	mg/L	0.01	0.02	0.05
Zinc content	2	0.7	mg/L	0.02	0.09	0.3
Soluble iron content	10	0.3	mg/L	<0.01		
Soluble manganese content	10	0.3	mg/L	<0.01		

- PRTR restricted substances

In tons/year

Chemical Substance Name	Total Emissions	Total Transfers	Total Recycles
Silver and its water-soluble compounds	0	0	0.1
Chromium and chromium(III) compounds	0	0	0.3
Nickel compound	0	0	9.2

- Water source : Spring Water
- Drain destination : Momose River(Via Sewage)

TAIYO YUDEN CO., LTD. Tamamura Plant

- Total energy consumption (Crude oil equivalent) : 27,364 kL/year
- Total waste generated : 2,385 tons/year (recycling rate: 100 %)
- Air emission : **Air Pollution Control Act**

Equipment	Fuel	Emissions to Air	Emission Limit	Self-control Standard	Unit	Actual Max.
Firing furnace (Electricity)		Soot and dust	0.25	0.16	g/m ³ N	0.04

- Water quality : **Water Quality Pollution Control Act and Agreement**

Item	Effluent Std.	Self-control Standard	Unit	Actual		
				Min.	Ave.	Max.
Lead and its compounds	0.1	0.01	mg/L	0.01		
Arsenic and its compounds	0.1	0.01	mg/L	0.01		
Fluorine and its compounds	8	0.3	mg/L	0.1		
Hydrogen ion concentration	5.8~8.6	6.9~8.0	-	7.4	7.7	7.9
Biochemical oxygen demand	25	13	mg/L	2.0	5.1	8.0
Suspended solids	50	30	mg/L	1.0	2.0	3.0
N-hexane extract (mineral content)	5	1.0	mg/L	<1		
N-hexane extract (animal/plant content)	30	1.0	mg/L			
Copper content	3	0.03	mg/L	0.01		
Zinc content	2	0.5	mg/L	0.01		
Soluble iron content	10	0.1	mg/L	0.01		
Soluble manganese content	10	0.5	mg/L	0.01		
Chromium content	2	0.01	mg/L	0.01		
Coliform bacteria count	3,000	1,400	Num/cm ³	57	189	320
Nitrogen content	120	18	mg/L	0.7	6.8	11
Phosphorus content	16	5.0	mg/L	0.3	1.0	1.6

- PRTR restricted substances

In tons/year

Chemical Substance Name	Total Emissions	Total Transfers	Total Recycles
Toluene	12	0	11
Nickel	0.03	0	22
Nickel compound	0	0	0.5
Methylnaphthalene	0.09	0	0

- Water source : Tone River
- Drain destination : Karasu River

TAIYO YUDEN CO., LTD. Yawatabara Plant

- Total energy consumption (Crude oil equivalent) : 362 kL/year
- Total waste generated : 126 tons/year (recycling rate: 100 %)
- Air emission : Measurement was not performed since no facility was subject to legal regulations.
- Water quality: **Pollution Control Agreement**

Item	Effluent Std.	Self-control Standard	Unit	Actual		
				Min.	Ave.	Max.
Hydrogen ion concentration	5.8~8.6	6.4~8.3	-	7.4	7.7	8.0
Biochemical oxygen demand	25	14	mg/L	1.0	1.5	3.0
Suspended solids	50	12	mg/L	1.0	7.2	19
N-hexane extract (animal/plant content)	30	1.2	mg/L	1.0		
Coliform bacteria count	3,000	1,500	Num/cm ³	30	76	330
Nitrogen content	120	16	mg/L	0.5	5.7	14
Phosphorus content	16	2.7	mg/L	0.2	1.0	2.0

- PRTR restricted substances : Total usage amount is under notification obligation.
- Water source : Tone River
- Drain destination : Karasu River

TAIYO YUDEN CO., LTD. R&D Center

- Total energy consumption (Crude oil equivalent) : 1,621 kL/year
- Total waste generated : 114 tons/year (recycling rate: 100 %)
- Air emission : **Air Pollution Control Act**

Equipment	Fuel	Emissions to Air	Emission Limit	Self-control Standard	Unit	Actual Max.
Generator (Diesel)	Heavy fuel oil	NOx	950	900	ppm	591
		SOx	8	2.7	K value	0.9
		Soot and dust	0.1	0.06	g/m ³ N	0.02

- Water quality : **Pollution Control Agreement**

Item	Effluent Std.	Self-control Standard	Unit	Actual		
				Min.	Ave.	Max.
Boron and its compounds	10	0.2	mg/L	0.01		
Fluorine and its compounds	8	0.2	mg/L	0.1		
Ammonia and its compounds, Nitrous and Nitric acid compound	100	60	mg/L	28		
Hydrogen ion concentration	5.8~8.6	6.0~8.4	-	6.8	7.4	7.7
Biochemical oxygen demand	25	18	mg/L	2.0	5.8	15
Suspended solids	50	30	mg/L	1.0	7.0	14
N-hexane extract (animal/plant content)	30	10	mg/L	1.0		
Phenolic content	1	0.3	mg/L	0.1		
Copper content	3	0.1	mg/L	0.01		
Zinc content	2	0.2	mg/L	0.02		
Soluble iron content	10	0.1	mg/L	0.04		
Soluble manganese content	10	0.1	mg/L	0.01		
Chromium content	2	0.1	mg/L	0.01		
Coliform bacteria count	3,000	500	Num/cm ³	30		
Nitrogen content	120	80	mg/L	17	39	57
Phosphorus content	16	12	mg/L	1.1	4.5	6.3

- PRTR restricted substances : Total usage amount is under notification obligation.
- Water source : Groundwater Wells
- Drain destination : Karasu River

TAIYO YUDEN CHEMICAL TECHNOLOGY CO., LTD.

- Total energy consumption (Crude oil equivalent) : 3,373 kL/year
- Total waste generated : 1,174 tons/year (recycling rate: 100 %)

<<Head Office / Main Plant>> -> Fujioka Plant in next page

- Air emission : Measurement was not performed since no facility was subject to legal regulations.
- Water quality : **Water Quality Pollution Control Act and Prefectural Ordinances**

Item	Effluent Std.	Self-control Standard	Unit	Actual		
				Min.	Ave.	Max.
Boron and its compounds	10	4.0	mg/L	0.03		
Fluorine and its compounds	8	4.0	mg/L	<0.1		
Ammonia (Sum of Ammonia, Nitric & Nitrous acid)	100	30	mg/L	41		
Hydrogen ion concentration	5.8~8.6	6.2~8.2	-	6.5	6.8	7.2
Biochemical oxygen demand	25	11	mg/L	<1.0	2.2	5.0
Suspended solids	50	9.0	mg/L	<1.0	6.1	12
N-hexane extract (animal/plant content)	5	4.0	mg/L	<1.0		
Phenolic content	1	0.5	mg/L	<0.1		
Copper content	3	0.1	mg/L	<0.01		
Zinc content	2	1.0	mg/L	0.01		
Soluble iron content	10	0.1	mg/L	0.01		
Soluble manganese content	10	3.0	mg/L	<0.01		
Coliform bacteria count	3,000	330	Num/cm ³	<30	136	300
Nitrogen content	60	50	mg/L	11	27	50
Phosphorus content	8	6.0	mg/L	0.1	0.7	2.8
Formaldehyde	10	2.0	mg/L	<1.0		

■ PRTR restricted substances

In tons/year

Chemical Substance Name	Total Emissions	Total Transfers	Total Recycles
copper salt(water-soluble, except complex salts)	0.01	0.3	0.2
Nickel	0.2	0	15
Nickel compound	1.1	8.5	0
Boron compound	0.8	0.9	0

- Water source : Tone River
- Drain destination : Karasu River

<<Fujioka Plant>>

■ Air emission : Measurement was not performed since no facility was subject to legal regulations.

■ Water quality : **Water Quality Pollution Control Act and Agreement**

Item	Effluent Std.	Self-control Standard	Unit	Actual		
				Min.	Ave.	Max.
Boron and its compounds	10	1.0	mg/L	0.4	1.3	2.3
Fluorine and its compounds	8	6.0	mg/L	0.2	0.5	1.1
Ammonia (Sum of Ammonia, Nitric & Nitrous acid)	100	30	mg/L	3.4	14	26
Hydrogen ion concentration	5.8~8.6	6.2~8.3	-	6.3	7.2	8.1
Biochemical oxygen demand	25	7.0	mg/L	1.0	4.6	14
Suspended solids	50	6.0	mg/L	1.0	5.4	26
N-hexane extract (animal/plant content)	5	1.0	mg/L	<1.0		
Copper content	3	0.02	mg/L	0.01	1.0	2.6
Zinc content	2	0.05	mg/L	0.04	0.1	0.2
Soluble iron content	10	0.3	mg/L	0.05	1.1	3.4
Soluble manganese content	10	0.1	mg/L	0.02	0.1	0.1
Chromium content	2	0.1	mg/L	<0.01		
Coliform bacteria count	1,000	400	Num/cm ³	30	32	52
Nitrogen content	60	18	mg/L	5.6	28	54
Phosphorus content	8	2.0	mg/L	0.1	3.2	7.3
Formaldehyde	10	1.0	mg/L	<1.0		
Phenol	1	0.2	mg/L	<0.1		

■ PRTR restricted substances

In tons/year

Chemical Substance Name	Total Emissions	Total Transfers	Total Recycles
Ferric Chloride	0.002	2.3	0

■ Water source : Kanna River

■ Drain destination : Ayu River

TAIYO YUDEN TECHNO SOLUTIONS CO., LTD.

- Total energy consumption (Crude oil equivalent) : 976 kL/year
- Total waste generated : 75 tons/year (recycling rate: 100 %)
- Air emission : Measurement was not performed since no facility was subject to legal regulations.
- Water quality : Measurement was not performed since no facility was subject to legal regulations.

■ PRTR restricted substances In tons/year

Chemical Substance Name	Total Emissions	Total Transfers	Total Recycles
Methylenebis(4,1-phenylene) diisocyanate	0	0	0.1
Tritolyl phosphate	0	0	0.2

- Water source : Tone River
- Drain destination : Karasu River

FUKUSHIMA TAIYO YUDEN CO., LTD.

- Total energy consumption (Crude oil equivalent) : 4,352 kL/year
- Total waste generated : 355 tons/year (recycling rate: 100 %)
- Air emission : Measurement was not performed since the facility subjected to legal regulations was out of service.
- Water quality : **Pollution Control Agreement**

Item	Effluent Std.	Self-control Standard	Unit	Actual		
				Min.	Ave.	Max.
Boron and its compounds	10	1.5	mg/L	0.6	1.0	1.4
Fluorine and its compounds	8	0.05	mg/L	0.05		
Hydrogen ion concentration	5.8~8.6	6.8~7.9	-	6.8	7.3	7.9
Biochemical oxygen demand	20	5.8	mg/L	1.0	1.7	5.7
Suspended solids	50	3.6	mg/L	1.0	1.6	3.2
N-hexane extract (mineral content)	1	0.5	mg/L	<0.5		
N-hexane extract (animal/plant content)	10	0.6	mg/L	<0.5		
Phenolic content	1	0.03	mg/L	<0.02		
Copper content	2	0.06	mg/L	0.02	0.05	0.09
Zinc content	2	0.4	mg/L	0.05	0.1	0.5
Soluble iron content	10	0.3	mg/L	0.1	0.1	0.3
Soluble manganese content	10	0.04	mg/L	0.01	0.02	0.04
Chromium content	2	0.06	mg/L	<0.05		
Coliform bacteria count	3,000	648	Num/cm ³	0	8.3	84
Nitrogen content	120	19	mg/L	0.8	7.9	25
Phosphorus content	16	2.8	mg/L	0.02	0.7	3.1

■ PRTR restricted substances In tons/year

Chemical Substance Name	Total Emissions	Total Transfers	Total Recycles
Silver and its water-soluble compounds	0	0.2	3.7
Boron compound	0	0.2	0

- Water source : Surigami River
- Drain destination : Abukuma River

NIIGATA TAIYO YUDEN CO., LTD.

- Total energy consumption (Crude oil equivalent) : 49,404 kL/year
- Total waste generated : 6,784 tons/year (recycling rate: 100 %)
- Air emission : **Air Pollution Control Act**

Equipment	Fuel	Emissions to Air	Emission Limit	Self-control Standard	Unit	Actual Max.
Firing furnace (Electricity)		Soot and dust	0.25	0.2	g/m ³ N	0.07

- Water quality : **Water Quality Pollution Control Act is not applicable to this site and measurement was performed voluntarily.**

Item	Effluent Std.	Self-control Standard	Unit	Actual		
				Min.	Ave.	Max.
Hydrogen ion concentration	5.8~8.6	6.0~8.4	-	6.9	7.5	7.9
Biochemical oxygen demand	160	12	mg/L	1.1	5.5	20
Suspended solids	200	20	mg/L	1.0	3.8	9.0
N-hexane extract (mineral content)	5	1.0	mg/L	<0.5		
N-hexane extract (animal/plant content)	30		mg/L			
Coliform bacteria count	3,000	33	Num/cm ³	0		
Nitrogen content	120	5.0	mg/L	1.5	2.2	4.1
Phosphorus content	16	1.3	mg/L	0.2	0.4	0.9
Lead and its compounds	0.1	0.01	mg/L	<0.01		
Arsenic and its compounds	0.1	0.01	mg/L	<0.01		
Copper content	3	0.2	mg/L	0.03	0.04	0.05
Zinc content	2	1.2	mg/L	0.3	0.4	0.4
Soluble iron content	10	0.4	mg/L	0.04		
Soluble manganese content	10	0.05	mg/L	0.02	0.03	0.04
Chromium content	2	0.01	mg/L	<0.01		
Fluorine and its compounds	8	0.6	mg/L	<0.5		

- PRTR restricted substances In tons/year

Chemical Substance Name	Total Emissions	Total Transfers	Total Recycles
Toluene	23	0	20
Nickel	0	3.5	63
Nickel compound	0	0.2	2.9

- Water source : Kakizaki River
- Drain destination : Hokura River

TAIYO YUDEN ENERGY DEVICE CO., LTD.

- Total energy consumption (Crude oil equivalent) : 606 kL/year
- Total waste generated : 123 tons/year (recycling rate: 100 %)
- Air emission : Measurement was not performed since no facility was subject to legal regulations.
- Water quality : Measurement was not performed since no facility was subject to legal regulations.
- PRTR restricted substances : Total usage amount is under notification obligation.
- Water source : Hokkwa River
- Drain destination : Hokkwa River

WAKAYAMA TAIYO YUDEN CO., LTD.

- Total energy consumption (Crude oil equivalent) : 4,657 kL/year
- Total waste generated : 287 tons/year (recycling rate: 100 %)
- Air emission : Measurement was not performed since no facility was subject to legal regulations.
- Water quality : **Water Quality Pollution Control Act and**

Enforcement Ordinance of the Anti-pollution Regulation (Wakayama Prefecture)

Item	Effluent Std.	Self-control Standard	Unit	Actual		
				Min.	Ave.	Max.
Boron and its compounds	10	1.1	mg/L	0.1		
Fluorine and its compounds	8	0.8	mg/L	0.8		
Ammonia	100	9.3	mg/L	0.1	0.7	4.1
Hydrogen ion concentration	5.8~8.6	6.5~8.6	-	6.6	7.0	8.1
Biochemical oxygen demand	160	28	mg/L	2.7	5.9	14
Chemical oxygen demand	160	16	mg/L	4.1	9.5	21
Suspended solids	200	17.8	mg/L	1.0	6.4	18
N-hexane extract (mineral content)	5	0.5	mg/L	0.5	0.6	1.8
N-hexane extract (animal/plant content)	30	1.9	mg/L	0.5	0.9	1.2
Phenolic content	5	0.5	mg/L	0.5		
Copper content	3	0.3	mg/L	0.3		
Zinc content	2	0.3	mg/L	0.2	0.2	0.5
Soluble iron content	10	0.1	mg/L	0.1	0.1	0.2
Soluble manganese content	10	0.1	mg/L	0.1		
Chromium content	2	0.2	mg/L	0.2		
Coliform bacteria count	3,000	683	Num/cm ³	1.0	65	550
Nitrogen content	120	26	mg/L	0.3	2.4	13
Phosphorus content	16	0.05	mg/L	0.01	0.01	0.02
Nickel	3	0.08	mg/L	0.01		

■ PRTR restricted substances

In tons/year

Chemical Substance Name	Total Emissions	Total Transfers	Total Recycles
Ferric Chloride	0	9.1	0
Silver and its water-soluble compounds	0	2.5	0
Chromium and chromium(III) compounds	0	0.7	0
Toluene	1.4	4.7	0

- Water source : Kirime River
- Drain destination : Inami River

TAIYO YUDEN Mobile Technology Co., Ltd.

- Total energy consumption (Crude oil equivalent) : 16,068 kL/year
- Total waste generated : 211 tons/year (recycling rate: 100 %)

<<Head Office / Main Plant>>

■ Air emission : **Air Pollution Control Act**

Equipment	Fuel	Emissions to Air	Emission Limit	Self-control Standard	Unit	Actual Max.
Boiler	Town gas	NOx	45	42	ppm	32

■ Water quality : **Sewerage Act, Sewerage Regulations**

Item	Effluent Std.	Self-control Standard	Unit	Actual		
				Min.	Ave.	Max.
Boron and its compounds	10	2.0	mg/L	0.1	0.1	0.2
Fluorine and its compounds	8	5.5	mg/L	0.3	1.3	1.9
Hydrogen ion concentration	5.7~8.7	6.1~8.3	-	6.9	7.2	7.7
Biochemical oxygen demand	300	240	mg/L	19	59	86
Suspended solids	300	84	mg/L	18	32	52
Copper content	3	1.5	mg/L	0.05	0.05	0.06
Nitrogen content	120	102	mg/L	11	17	24
Phosphorus content	16	6.0	mg/L	0.3	1.0	1.7

■ PRTR restricted substances

In tons/year

Chemical Substance Name	Total Emissions	Total Transfers	Total Recycles
Hydrogen fluoride and its water-soluble salts	0	1.5	0

- Water source : Tama River
- Drain destination : Tama River(Via sewage)

<<Tokorozawa Plant>>

- Air emission : Measurement was not performed since no facility was subject to legal regulations.
- Water quality : **Water Quality Pollution Control Act and Sewerage Act**

Item	Effluent Std.	Self-control Standard	Unit	Actual		
				Min.	Ave.	Max.
Hydrogen ion concentration	5.0~9.0	6.2~8.6	-	6.8	7.2	7.7
Biochemical oxygen demand	600	120	mg/L	<1	2.0	6.8
Suspended solids	600	120	mg/L	<1	5.4	25
N-hexane extract (mineral content)	5	1.0	mg/L	<0.2		
Nitrogen content	240	48	mg/L	<0.1	2.5	17
Phosphorus content	32	6.4	mg/L	<0.1	0.2	0.9

- PRTR restricted substances : Total usage amount is under notification obligation.
- Water source : Ara River
- Drain destination : Singashi River(Via Sewage)

Kankyo Assist Co., Ltd.

- Total energy consumption (Crude oil equivalent) : 28 kL/year
- Total waste generated : 2.8 ton/year (recycling rate: 100 %)
- Air emission : Measurement was not performed since no facility was subject to legal regulations.
- Water quality : Measurement was not performed since no facility was subject to legal regulations.
- PRTR restricted substances : Total usage amount is under notification obligation.
- Water source : Tone River
- Drain destination : Karasu River

ELNA CO., LTD.

- Total energy consumption (Crude oil equivalent) : 327 kL/year
- Total waste generated : 48 tons/year (recycling rate: 100 %)
- Air emission : Measurement was not performed since no facility was subject to legal regulations.
- Water quality : Measurement was not performed since no facility was subject to legal regulations.
- PRTR restricted substances : Total usage amount is under notification obligation.
- Water source : Hokkwa River
- Drain destination : Hokkwa River

ELNA TOHOKU CO., LTD.

- Total energy consumption (Crude oil equivalent) : 2,029 kL/year
- Total waste generated : 239 tons/year (recycling rate: 77.4 %)
- Air emission : Measurement was not performed since no facility was subject to legal regulations.
- Water quality : **Sewerage Regulations**

Item	Effluent Std.	Self-control Standard	Unit	Actual		
				Min.	Ave.	Max.
Hydrogen ion concentration	5.0~9.0	5.0~9.0	-	6.2	7.0	8.2
Biochemical oxygen demand	600	176	mg/L	1.7	20	53
Suspended solids	600	21	mg/L	1.0	3.0	8.0
N-hexane extract (mineral content)	5	1.0	mg/L	0.5		
N-hexane extract (animal/plant content)	30	7.3	mg/L	0.7	1.9	5.1
Iodine consumption	220	6.0	mg/L	0.5	0.9	2.0

- PRTR restricted substances : Total usage amount is under notification obligation.
- Water source : Asaseishikawa River
- Drain destination : Iwaki River(Via Sewage)

KOREA KYONG NAM TAIYO YUDEN CO., LTD.

- Total energy consumption (Crude oil equivalent) : 42,094 kL/year
- Total waste generated : 6,373 tons/year (recycling rate: 88.4 %)

<<Head Office / Main Plant>> -> Tongyeong Plant in next page

■ Air emission :

Equipment	Fuel	Emissions to Air	Emission Limit	Self-control Standard	Unit	Actual Max.
Scrubber		Soot and dust	30	5.9	g/m ³ N	1.9
		SOx	200	6.7	ppm	<1.0
		Ammonia	30	3.0	ppm	1.5
		Nickel	2	1.0	g/m ³ N	0.4
		Copper	4	0.2	g/m ³ N	0.03
		Total Hydrocarbon (THC)	200	55	ppm	0.5
RTO		Toluene	30	0.8	ppm	0.8
		Nickel	2	1.0	g/m ³ N	0.008
		Total Hydrocarbon (THC)	110	45	ppm	40
Drying furnace		Soot and dust	30	4.5	g/m ³ N	1.0
Bag filter		Soot and dust	30	4.5	g/m ³ N	2.1

■ Water quality :

Item	Effluent Std.	Self-control Standard	Unit	Actual		
				Min.	Ave.	Max.
Hydrogen ion concentration	5.8~8.6	6.0~8.0	-	6.9	7.3	7.5
Biochemical oxygen demand	300	34	mg/L	3.7	10	30
Chemical oxygen demand	300	20	mg/L	3.0	5.5	8.5
Total organic carbon	170	10	mg/L	2.1	4.1	7.9
Suspended solids	300	25	mg/L	1.8	7.2	16
N-hexane extract (mineral content)	5	1.1	mg/L	0.2		
N-hexane extract (animal/plant content)	30	1.1	mg/L	0.2		
Copper content	3	1.0	mg/L	0.02	0.08	0.3
Fluorine and its compounds	15	2.0	mg/L	0.2	0.5	1.1
Nitrogen content	60	42	mg/L	19	28	32
Phosphorus content	20	1.5	mg/L	0.04	0.2	0.4
Anionic surfactant	5	0.5	mg/L	<0.090		
Tin	5	0.5	mg/L	0.05	0.1	0.2
Nickel	3	2.7	mg/L	0.09	0.5	0.9
Chromium content	2	1.0	mg/L	<0.007		
Zinc content	5	0.3	mg/L	0.04		
Phenol	3	1.5	mg/L	<0.007		
Soluble manganese content	10	0.2	mg/L	0.02		
Soluble iron content	10	0.5	mg/L	0.1		
Coliform bacteria count	3,000	100	Num/cm ³	2		
Trichloroethylene	0.3	0.2	mg/L	<0.001		
Tetrachloroethylene	0.1	0.05	mg/L	<0.001		

- Water source : Jinjunamgang River
- Drain destination : Yonghyeon Sea

<<Tongyeong Plant>>

- Total energy consumption (Crude oil equivalent) : 248 kL/year
- Total waste generated : 4.8 tons/year (recycling rate: 0.0 %)
- Air emission : Measurement was not performed since no facility was subject to legal regulations.
- Water quality : Measurement was not performed since no facility was subject to legal regulations.
- Water source : Jinjunamgang River
- Drain destination : Tongyeong Sea

TAIYO YUDEN (GUANGDONG) CO., LTD.

- Total energy consumption (Crude oil equivalent) : 35,576 kL/year
- Total waste generated : 2,128 tons/year (recycling rate: 100 %)
- Air emission :

Equipment	Fuel	Emissions to Air	Emission Limit	Self-control Standard	Unit	Actual Max.
Boiler	Natural gas	Ringelmann smoke density	1	1	class	0.3
		Sulfur dioxide	50	50	mg/m ³ N	13
		Total suspended particulates	20	20	mg/m ³ N	6.4
		NOx	150	150	mg/m ³ N	89
Generator	Kerosene	Ringelmann smoke density	1	1	class	0.8
		Sulfur dioxide	550	338	mg/m ³ N	113
		Total suspended particulates	120	93	mg/m ³ N	26
		NOx	240	240	mg/m ³ N	117
Cafeteria	Natural gas	Oily smoke	2	2	ppm	0.5
Scrubber	-	Hydrogen chloride	30	15	mg/m ³ N	4.3
		NOx	120	100	mg/m ³ N	6.9
RTO	Natural gas	Toluene	20	20	mg/m ³ N	0.7
		Methanol	190	190	mg/m ³ N	6.8
Firing furnace	-	Non-Methane Hydrocarbons	120	60	mg/m ³ N	1.7
		Particulate matter	120	120	mg/m ³ N	67

- Water quality :
- Industrial wastewater

Item	Effluent Std.	Self-control Standard	Unit	Actual		
				Min.	Ave.	Max.
Ammonia and similar nitrogen compounds	15	6.0	mg/L	0.008	0.2	1.8
Hydrogen ion concentration	6.0~9.0	6.8~8.5	-	6.7	7.3	8.1
Chemical oxygen demand	80	50	mg/L	9.0	24	70
Suspended solids	30	15	mg/L	5.0	6.4	11
Zinc content	1	0.5	mg/L	0.06		
Nitrogen content	20	15	mg/L	4.1	9.4	15.4
Copper content	0.5	0.2	mg/L	0.01	0.05	0.1
Nickel	0.5	0.3	mg/L	0.01	0.05	0.1

Human sewage

Item	Effluent Std.	Self-control Standard	Unit	Actual		
				Min.	Ave.	Max.
Hydrogen ion concentration	6.0~9.0	6.0~9.0	-	6.9	7.0	7.1
Biochemical oxygen demand	300	300	mg/L	6.7	7.8	8.9
Chemical oxygen demand	500	500	mg/L	24	30	36
Suspended solids	400	400	mg/L	8.0	9.0	10
Animal/Vegetable oils	100	100	mg/L	0.09	0.1	0.1
Petroleum	20	20	mg/L	0.27	0.29	0.30

- Water source : Dong River
- Drain destination : Dong River

TAIYO YUDEN (PHILIPPINES), INC.

- Total energy consumption (Crude oil equivalent) : 16,919 kL/year
- Total waste generated : 1,308 tons/year (recycling rate: 89.2 %)
- Air emission :

Equipment	Fuel	Emissions to Air	Emission Limit	Self-control Standard	Unit	Actual Max.
Generator	Kerosene	Nitrogen dioxide	2,000	1,500	mg/m ³ N	45
		Carbon monoxide	500	400	mg/m ³ N	435
Scrubber	-	Hydrogen sulfide	7	5.6	mg/m ³ N	<1
		Nitrogen oxides	500	400	mg/m ³ N	12
		Pariculate matter	200	160	mg/m ³ N	4.4
		Sulfur oxides	700	600	mg/m ³ N	5.0

- Water quality :

Item	Effluent Std.	Self-control Standard	Unit	Actual		
				Min.	Ave.	Max.
Hydrogen ion concentration	6.0~9.0	6.6 ~ 8.4	-	6.6	7.4	8.3
Biochemical oxygen demand	100	80	mg/L	4.0		
Chemical oxygen demand	200	160	mg/L	7.0	42	183
Suspended solids	100	80	mg/L	2.0	4.4	9.0
Oil & Grease	10	8.0	mg/L	<1		
Silver	1	0.8	mg/L	<0.01		
Lead and its compounds	0.1	0.08	mg/L	<0.01		
Zinc content	1.5	1.2	mg/L	<0.003		
Nickel	0.3	0.2	mg/L	0.05	0.2	0.3
Fluorine and its compounds	3.0	2.4	mg/L	0.02	0.03	0.07
Boron and its compounds	20	16	mg/L	<1.0		
Trichloroethylene	9.0	7.2	mg/L	<0.0016		
Arsenic and its compounds	0.04	0.03	mg/L	<0.0007		
Chromium content	0.1	0.08	mg/L	<0.002		
Soluble iron content	7.5	6.0	mg/L	0.02	0.5	1.0
Soluble manganese content	4.0	3.2	mg/L	0.01	0.2	0.4
Mercury	0.004	0.003	mg/L	<0.0004		
Phenol	0.5	0.4	mg/L	<0.001		
Anionic surfactant	15	12	mg/L	0.12		

- Water source : Groundwater Wells
- Drain destination : Mactan Channel Sea

TAIYO YUDEN (SARAWAK) SDN.BHD.

- Total energy consumption (Crude oil equivalent) : 39,350 kL/year
- Total waste generated : 5,904 tons/year (recycling rate: 80.8 %)
- Air emission :

Equipment	Fuel	Emissions to Air	Emission Limit	Self-control Standard	Unit	Actual Max.
Scrubber		Hydrogen chloride	0.03	0.0007	g/m ³ N	0.0008
		Sulfuric acid	0.005	0.04	g/m ³ N	0.002
Boiler	LP gas	Dust Particulate	0.05	0.01	g/m ³ N	0.01
		Dark Smoke	20	20	%	0
RTO	LP gas	Dust Particulate	0.05	0.02	mg/m ³ N	0.02
		Dark Smoke	20	20	%	0

- Water quality :

Industrial wastewater

Item	Effluent Std.	Self-control Standard	Unit	Actual		
				Min.	Ave.	Max.
Temperature	40	31	°C	27	28	30
Hydrogen ion concentration	5.5~9.0	6.3~9.0	-	7.2	7.8	8.5
Biochemical oxygen demand	50	10	mg/L	2.0	6.0	12
Chemical oxygen demand	200	160	mg/L	21	45	65
Suspended solids	100	6.7	mg/L	4.0	7.0	20
Zinc content	2	0.1	mg/L	0	0.04	0.2
Copper content	1	0.8	mg/L	0.07	0.2	0.5
Nickel	1	0.8	mg/L	0.1	0.3	0.7
Tin	1	0.8	mg/L	0.08	0.3	0.7
Soluble iron content	5	3.9	mg/L	0.2	1.3	2.8

Human sewage

Item	Effluent Std.	Self-control Standard	Unit	Actual		
				Min.	Ave.	Max.
Hydrogen ion concentration	5.5~9.0	6.8 ~ 8.8	-	6.6	7.3	8.4
Biochemical oxygen demand	50	2.5	mg/L	2.0		
Chemical oxygen demand	200	36	mg/L	10	15	22
Suspended solids	100	5.0	mg/L	5.0		
Ammonia Nitrogen	50	3.6	mg/L	0.3	1.7	3.9
Oil & Grease	20	1.2	mg/L	1.0		

- Water source : Kitang River
- Drain destination : Sarawak River

ELNA-SONIC SDN. BHD.

- Total energy consumption (Crude oil equivalent) : 3,751 kL/year
- Total waste generated : 256 tons/year (recycling rate: 100 %)
- Air emission :

Equipment	Fuel	Emissions to Air	Emission Limit	Self-control Standard	Unit	Actual Max.
Equipment exhaust	-	Particulate matter	150	100	g/m ³ N	2.4

- Water quality :
- Industrial wastewater

Item	Effluent Std.	Self-control Standard	Unit	Actual		
				Min.	Ave.	Max.
Hydrogen ion concentration	5.5~9.0	6.0~8.5	-	7.3	7.3	7.5
Biochemical oxygen demand	50	40	mg/L	9.0	14	18
Chemical oxygen demand	200	160	mg/L	40	58	76
Suspended solids	100	80	mg/L	3.0	4.7	5.0
Zinc content	2	1.6	mg/L	0.08	0.1	0.2
Copper content	1	0.8	mg/L	0.05	0.1	0.3
Nickel	1	0.8	mg/L	0.1		
Tin	1	0.8	mg/L	0.5		
Boron and its compounds	4	3.2	mg/L	0.1		
Oil & Grease	10	8.0	mg/L	1.0		
Lead and its compounds	1	0.4	mg/L	0.1		
Soluble iron content	5	4.0	mg/L	0.1	0.3	0.9

Human sewage

Item	Effluent Std.	Self-control Standard	Unit	Actual		
				Min.	Ave.	Max.
Biochemical oxygen demand	100	80	mg/L	9.0	14	20
Chemical oxygen demand	300	240	mg/L	40	60	84
Suspended solids	120	96	mg/L	6.0	10	15
Ammoniacal nitrogen	80	64	mg/L	7.2	11	20

- Water source : Muda River
- Drain destination : Juru River

TANIN ELNA CO., LTD.

- Total energy consumption (Crude oil equivalent) : 3,070 kL/year
- Total waste generated : 392 tons/year (recycling rate: 37.6 %)
- Air emission : Measurement was not performed since no facility was subject to legal regulations.
- Water quality :

Industrial wastewater

Item	Effluent Std.	Self-control Standard	Unit	Actual		
				Min.	Ave.	Max.
Hydrogen ion concentration	5.5~9.0	6.0~8.0	-	7.7		
Total Dissolved Solids	3,000	2,700	mg/L	464		
Suspended solids	50	45	mg/L	5.0		
Biochemical oxygen demand	20	18	mg/L	5.0		
Chemical oxygen demand	120	108	mg/L	19		
Sulfide as H ₂ S	1	0.9	mg/L	1.0		
Cyanide as HCN	0.2	0.2	mg/L	ND		
Oil & Grease	5	4.5	mg/L	1.1		
Formaldehyde	1	0.9	mg/L	0.2		
Phenol	1	0.9	mg/L	ND		
Free chlorine	1	0.9	mg/L	1.0		
Total kjeldahl Nitrogen	100	90	mg/L	2.0		
Zinc content	5	4.5	mg/L	0.03		
Chromium hexavalent	0.3	0.2	mg/L	ND		
Chromium trivalent	0.8	0.7	mg/L	ND		
Arsenic and its compounds	0.3	0.2	mg/L	0.005		
Copper content	2	1.8	mg/L	0.005		
Mercury	0.005	0.005	mg/L	ND		
Cadmium	0.03	0.03	mg/L	ND		
Barium	1	0.9	mg/L	0.05		
Selenium	0.02	0.02	mg/L	ND		
Lead and its compounds	0.2	0.2	mg/L	ND		
Nickel	1	0.9	mg/L	ND		
Soluble manganese content	5	4.5	mg/L	0.08		

Human sewage

Item	Effluent Std.	Self-control Standard	Unit	Actual		
				Min.	Ave.	Max.
Hydrogen ion concentration	5.5~9.0	6.0~8.0	-	6.7	7.5	7.9
Biochemical oxygen demand	20	18	mg/L	4.0	8.4	17
Chemical oxygen demand	120	108	mg/L	15	33	61
Suspended solids	50	45	mg/L	5.0	9.9	13
Nitrogen content	100	90	mg/L	2.0	4.2	29
Oil & Grease	5	4.5	mg/L	0.9	1.3	3.6

- Water source : Groundwater Wells
- Drain destination : Ping River