

# Safety & Environmental Report 2019

## 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 FY2018. It was measured between April 1st, 2018 and March 31, 2019.

### 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.

## TAIYO YUDEN CO., LTD. Takasaki Global Center

- Total energy consumption (Crude oil equivalent) : 536 kL/year
- Total waste generated : 56 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. Yawatabara Plant

- Total energy consumption (Crude oil equivalent) : 147 kL/year
- Total waste generated : 51 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.	Unit	Actual		
			Min.	Ave.	Max.
Hydrogen ion concentration	5.8~8.6	-	7.4	7.8	8.0
Biochemical oxygen demand	25	mg/L	1.0	2.3	4.0
Suspended solids	50	mg/L	1.0		
N-hexane extract (animal/plant content)	30	mg/L	1.0		
Coliform bacteria count	3,000	Num/cm <sup>3</sup>	3.8	43	130
Nitrogen content	120	mg/L	0.1	2.1	4.7
Phosphorus content	16	mg/L	0.1	0.4	0.6

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

## TAIYO YUDEN CO., LTD. Tamamura Plant

- Total energy consumption (Crude oil equivalent) : 26,779 kL/year
- Total waste generated : 2,196 tons/year (recycling rate: 100 %)
- Air emission : **Air Pollution Control Act**

Equipment	Fuel	Emissions to Air	Emission Limit	Unit	Actual Max.
Firing furnace (Electricity)		Soot and dust	0.25	g/m <sup>3</sup> N	0.02

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

Item	Effluent Std.	Unit	Actual		
			Min.	Ave.	Max.
Lead and its compounds	0.1	mg/L	<0.01		
Arsenic and its compounds	0.1	mg/L	<0.01		
Fluorine and its compounds	8	mg/L	0.1		
Hydrogen ion concentration	5.8~8.6	-	7.3	7.6	7.7
Biochemical oxygen demand	25	mg/L	2.0	3.2	7.0
Suspended solids	50	mg/L	1.0	1.1	2.0
N-hexane extract (mineral content )	5	mg/L	1.0		
Copper content	3	mg/L	0.01		
Zinc content	2	mg/L	0.12		
Soluble iron content	10	mg/L	0.03		
Soluble manganese content	10	mg/L	0.02		
Chromium content	2	mg/L	<0.01		
Coliform bacteria count	3,000	Num/cm <sup>3</sup>	30	33	68
Nitrogen content	120	mg/L	1.5	3.4	6.4
Phosphorus content	16	mg/L	0.6	1.1	2.3

- PRTR restricted substances In tons/year

Chemical Substance Name	Total Emissions	Total Transfers	Total Recycles
Toluene	13	0	12
Nickel	0.03	0	24
Nickel compound	0.0006	0	0.4
Methylnaphthalene	0.1	0	0

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

## TAIYO YUDEN CO., LTD. Haruna Plant

- Total energy consumption (Crude oil equivalent) : 8,900 kL/year
- Total waste generated : 342 tons/year (recycling rate: 100 %)
- Air emission : **Air Pollution Control Act and Prefectural Ordinances**

Equipment	Fuel	Emissions to Air	Emission Limit	Unit	Actual Max.
Firing furnace (Electricity)		Soot and dust	0.1	g/m <sup>3</sup> N	0.004
Generator (Diesel)	Heavy oil A	NOx	950	ppm	723
		SOx	8.0	K value	0.1
		Soot and dust	0.1	g/m <sup>3</sup> N	0.02

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

Item	Effluent Std.	Unit	Actual		
			Min.	Ave.	Max.
Hydrogen ion concentration	5.8~8.6	-	7.1	7.4	7.6
Biochemical oxygen demand	25	mg/L	1.0	2.3	4.0
Suspended solids	50	mg/L	1.0	1.3	3.0
N-hexane extract (mineral content )	5	mg/L	1.0		
Copper content	3	mg/L	0.01		
Zinc content	2	mg/L	0.01		
Soluble iron content	10	mg/L	0.01		
Soluble manganese content	10	mg/L	0.01	0.01	0.06
Chromium content	2	mg/L	0.01		
Nitrogen content	120	mg/L	4.2	5.4	6.2
Phosphorus content	16	mg/L	0.05		

- 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	0

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

## TAIYO YUDEN CO., LTD. Nakanojo Plant

- Total energy consumption (Crude oil equivalent) : 4,785 kL/year
- Total waste generated : 431 tons/year (recycling rate: 99.2 %)
- Air emission : **Air Pollution Control Act and Prefectural Ordinances**

Equipment	Fuel	Emissions to Air	Emission Limit	Unit	Actual Max.
Drying furnace	LP gas	NOx	230	ppm	25
		Soot and dust	0.2	g/m <sup>3</sup> N	0.006
	Kerosene	NOx	230	ppm	18
		Soot and dust	0.2	g/m <sup>3</sup> N	0.006
		Sox	8.0	K value	<0.02
Firing furnace (Electricity)		Soot and dust	0.25	g/m <sup>3</sup> N	0.005
Firing furnace	LP gas	NOx	180	ppm	26
		Soot and dust	0.25	g/m <sup>3</sup> N	0.01

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

Item	Effluent Std.	Unit	Actual		
			Min.	Ave.	Max.
Boron and its compounds	10	mg/L	0.03	0.06	0.2
Hydrogen ion concentration	5.0~9.0	-	7.0	7.5	8.1
Biochemical oxygen demand	600	mg/L	5.0	47	100
Suspended solids	600	mg/L	2.0	12	26
N-hexane extract (mineral content )	5	mg/L	1.0	1.7	3.0
N-hexane extract (animal/plant content)	30	mg/L			
Copper content	3	mg/L	0.02	0.09	0.9
Zinc content	2	mg/L	0.05	0.2	0.6
Soluble iron content	10	mg/L	0.01	0.02	0.05
Soluble manganese content	10	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	0.2
Nickel compound	0	0	15

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

## TAIYO YUDEN CO., LTD. R&D Center

- Total energy consumption (Crude oil equivalent) : 1,510 kL/year
- Total waste generated : 94 tons/year (recycling rate: 100 %)
- Air emission : **Air Pollution Control Act**

Equipment	Fuel	Emissions to Air	Emission Limit	Unit	Actual Max.
Diesel engine	Heavy fuel oil	NOx	950	ppm	601
		SOx	8.0	K value	1.1
		Soot and dust	0.1	g/m <sup>3</sup> N	0.03

- Water quality : **Pollution Control Agreement**

Item	Effluent Std.	Unit	Actual		
			Min.	Ave.	Max.
Boron and its compounds	10	mg/L	0.01		
Fluorine and its compounds	8	mg/L	0.1		
Ammonia and its compounds, Nitrous and Nitric acid compound	100	mg/L	20		
Hydrogen ion concentration	5.8~8.6	-	7.2	7.5	7.7
Biochemical oxygen demand	25	mg/L	2.0	5.7	13
Suspended solids	50	mg/L	1.0	3.0	10
N-hexane extract (animal/plant content)	30	mg/L	0.1	1.0	2.0
Phenolic content	1	mg/L	0.1		
Copper content	3	mg/L	0.01		
Zinc content	2	mg/L	0.02		
Soluble iron content	10	mg/L	0.08		
Soluble manganese content	10	mg/L	0.03		
Chromium content	2	mg/L	0.01		
Coliform bacteria count	3,000	Num/cm <sup>3</sup>	30		
Nitrogen content	120	mg/L	15	31	42
Phosphorus content	16	mg/L	1.4	4.0	5.0

- PRTR restricted substances : Total usage amount is under notification obligation.

## TAIYO YUDEN TECHNO SOLUTIONS CO., LTD.

- Total energy consumption (Crude oil equivalent) : 2,529 kL/year
- Total waste generated : 79 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

## Kankyo Assist Co., Ltd.

- Total energy consumption (Crude oil equivalent) : 40 kL/year
- Total waste generated : 3.5 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.

## TAIYO YUDEN ENERGY DEVICE CO., LTD.

- Total energy consumption (Crude oil equivalent) : 523 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 : Tone River
- Drain destination : Tone River(Via Sewage)

## TAIYO YUDEN CHEMICAL TECHNOLOGY CO., LTD.

- Total energy consumption (Crude oil equivalent) : 2,580 kL/year
- Total waste generated : 991 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.	Unit	Actual		
			Min.	Ave.	Max.
Boron and its compounds	10	mg/L	0.03		
Fluorine and its compounds	8	mg/L	<0.1		
Ammonia (Sum of Ammonia, Nitric & Nitrous acid)	100	mg/L	29		
Hydrogen ion concentration	5.8~8.6	-	6.6	7.1	7.5
Biochemical oxygen demand	25	mg/L	2.0	9.6	23
Suspended solids	50	mg/L	1.0	11	26
N-hexane extract (animal/plant content)	5	mg/L	<1.0		
Phenolic content	1	mg/L	<0.1		
Copper content	3	mg/L	<0.01		
Zinc content	2	mg/L	<0.01		
Soluble iron content	10	mg/L	0.01		
Soluble manganese content	10	mg/L	<0.01		
Coliform bacteria count	3,000	Num/cm <sup>3</sup>	220	923	2,200
Nitrogen content	60	mg/L	13	32	55
Phosphorus content	8	mg/L	0.1	0.6	1.0
Formaldehyde	10	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	0.2	0.1
Nickel	0.1	0	7.8
Nickel compound	0.7	5.1	0
Boron compound	0.3	0.3	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.	Unit	Actual		
			Min.	Ave.	Max.
Boron and its compounds	10	mg/L	0.2	0.3	0.5
Fluorine and its compounds	8	mg/L	0.7	1.0	1.7
Ammonia (Sum of Ammonia, Nitric & Nitrous acid)	100	mg/L	2.1	3.6	6.0
Hydrogen ion concentration	5.8~8.6	-	6.8	7.1	7.6
Biochemical oxygen demand	25	mg/L	2.0	4.0	10
Suspended solids	50	mg/L	1.0	2.3	4.0
N-hexane extract (animal/plant content)	5	mg/L	<1.0		
Copper content	3	mg/L	<0.01		
Zinc content	2	mg/L	<0.01		
Soluble iron content	10	mg/L	0.2	0.2	0.3
Soluble manganese content	10	mg/L	<0.01		
Chromium content	2	mg/L	<0.01		
Coliform bacteria count	1,000	Num/cm <sup>3</sup>	35	72	130
Nitrogen content	60	mg/L	2.8	5.0	8.0
Phosphorus content	8	mg/L	0.2	0.4	0.7
Formaldehyde	10	mg/L	<1.0		
Phenol	1	mg/L	<0.1		

■ PRTR restricted substances

In tons/year

Chemical Substance Name	Total Emissions	Total Transfers	Total Recycles
Ferric Chloride	0.02	20	0

■ Water source : Kanna River

■ Drain destination : Ayu River

## FUKUSHIMA TAIYO YUDEN CO., LTD.

- Total energy consumption (Crude oil equivalent) : 3,803 kL/year
- Total waste generated : 405 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.	Unit	Actual		
			Min.	Ave.	Max.
Boron and its compounds	10	mg/L	0.07	0.8	1.1
Fluorine and its compounds	8	mg/L	0.05		
Hydrogen ion concentration	5.8~8.6	-	6.7	7.2	7.8
Biochemical oxygen demand	20	mg/L	1.0	1.7	5.2
Suspended solids	50	mg/L	1.0	1.4	3.8
N-hexane extract (animal/plant content)	1	mg/L	0.5		
Zinc content	2	mg/L	0.05	0.1	0.5
Soluble iron content	10	mg/L	0.05	0.2	0.7
Chromium content	2	mg/L	0.05		
Coliform bacteria count	3,000	Num/cm <sup>3</sup>	0	32	380
Nitrogen content	120	mg/L	1.9	6.0	22
Phosphorus content	16	mg/L	0.02	0.3	4.4

- PRTR restricted substances In tons/year

Chemical Substance Name	Total Emissions	Total Transfers	Total Recycles
Silver and its water-soluble compounds	0	0.2	3.1
Boron compound	0	0.4	0

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

## WAKAYAMA TAIYO YUDEN CO., LTD.

- Total energy consumption (Crude oil equivalent) : 4,276 kL/year
- Total waste generated : 204 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.	Unit	Actual		
			Min.	Ave.	Max.
Boron and its compounds	10	mg/L	0.1	0.5	1.0
Fluorine and its compounds	8	mg/L	0.8		
Ammonia	100	mg/L	0.1	4.4	11
Hydrogen ion concentration	5.8~8.6	-	6.4	6.9	7.9
Biochemical oxygen demand	160	mg/L	0.5	4.8	12
Chemical oxygen demand	160	mg/L	4.6	7.6	12
Suspended solids	200	mg/L	1.0	4.2	18
N-hexane extract (mineral content )	5	mg/L	0.5		
N-hexane extract (animal/plant content)	30	mg/L	0.5	0.8	1.3
Phenolic content	5	mg/L	0.5		
Copper content	3	mg/L	0.3		
Zinc content	2	mg/L	0.2	0.2	0.3
Soluble iron content	10	mg/L	0.1		
Soluble manganese content	10	mg/L	0.1		
Chromium content	2	mg/L	0.2		
Coliform bacteria count	3,000	Num/cm <sup>3</sup>	2.0	69	550
Nitrogen content	120	mg/L	0.5	15	38
Phosphorus content	16	mg/L	0.01	0.02	0.04
Nickel	3	mg/L	0.01	0.02	0.04

- PRTR restricted substances In tons/year

Chemical Substance Name	Total Emissions	Total Transfers	Total Recycles
Toluene	1.5	3.9	0

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

## NIIGATA TAIYO YUDEN CO., LTD.

- Total energy consumption (Crude oil equivalent) : 23,301 kL/year
- Total waste generated : 3,076 tons/year (recycling rate: 100 %)
- Air emission : **Air Pollution Control Act**

Equipment	Fuel	Emissions to Air	Emission Limit	Unit	Actual Max.
Firing furnace (Electricity)		Soot and dust	0.25	g/m <sup>3</sup> N	0.02

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

Item	Effluent Std.	Unit	Actual		
			Min.	Ave.	Max.
Hydrogen ion concentration	-	-	7.2	7.8	8.1
Biochemical oxygen demand	-	mg/L	1.5	2.7	3.5
Suspended solids	-	mg/L	1.0	3.1	5.8
N-hexane extract (mineral content )	-	mg/L	0.5		
Coliform bacteria count	-	Num/cm <sup>3</sup>	0		
Nitrogen content	-	mg/L	1.0	1.9	3.5
Phosphorus content	-	mg/L	0.2	0.3	0.6
Lead and its compounds	-	mg/L	0.01		
Arsenic and its compounds	-	mg/L	0.01		
Copper content	-	mg/L	0.03		
Zinc content	-	mg/L	0.09		
Soluble iron content	-	mg/L	0.09		
Soluble manganese content	-	mg/L	0.03		
Chromium content	-	mg/L	0.01		
Fluorine and its compounds	-	mg/L	0.5		

- PRTR restricted substances

In tons/year

Chemical Substance Name	Total Emissions	Total Transfers	Total Recycles
Toluene	10	0	20
Nickel	0	1.4	27
Nickel compound	0	0.07	3.5

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

## TAIYO YUDEN Mobile Technology Co., Ltd.

- Total energy consumption (Crude oil equivalent) : 15,045 kL/year
- Total waste generated : 240 tons/year (recycling rate: 100 %)

<<Head Office / Main Plant>>

- Air emission : **Air Pollution Control Act**

Equipment	Fuel	Emissions to Air	Emission Limit	Unit	Actual Max.
Boiler	Town gas	NOx	45	ppm	28

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

Item	Effluent Std.	Unit	Actual		
			Min.	Ave.	Max.
Boron and its compounds	10	mg/L	<0.1	0.1	0.3
Fluorine and its compounds	8	mg/L	0.1	0.3	0.9
Hydrogen ion concentration	5.7~8.7	-	6.8	7.1	7.3
Biochemical oxygen demand	300	mg/L	42	68	160
Suspended solids	300	mg/L	12	45	83
Copper content	3	mg/L	<0.05	<0.05	0.06
Nitrogen content	120	mg/L	13	21	38
Phosphorus content	16	mg/L	0.4	1.0	2.2

- 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.	Unit	Actual		
			Min.	Ave.	Max.
Hydrogen ion concentration	5.0~9.0	-	6.8	7.1	7.3
Biochemical oxygen demand	600	mg/L	2.0	4.1	7.5
Suspended solids	600	mg/L	2.8	7.0	11
N-hexane extract (mineral content )	5	mg/L	<1.0		
Nitrogen content	240	mg/L	1.2	2.7	9.5
Phosphorus content	32	mg/L	<0.1		

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

## KOREA KYONG NAM TAIYO YUDEN CO., LTD.

- Total energy consumption (Crude oil equivalent) : 37,057 kL/year
- Total waste generated : 5,345 tons/year (recycling rate: 88.1 %)

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■ Air emission :

Equipment	Emissions to Air	Emission Limit	Unit	Actual Max.
Scrubber	Soot and dust	50	g/m <sup>3</sup> N	2.6
	SOx	400	ppm	<1.0
	Ammonia	50	ppm	<0.3
	Nickel	2	g/m <sup>3</sup> N	<0.06
	Copper	5	g/m <sup>3</sup> N	<0.015
RTO	Toluene	30	ppm	0.5
	Terpineol	-	ppm	0.3
	Nickel	2	g/m <sup>3</sup> N	<0.06
	Total Hydrocarbon (THC)	200	ppm	27
Drying furnace	Soot and dust	50	g/m <sup>3</sup> N	4.4
Bag filter	Soot and dust	50	g/m <sup>3</sup> N	3.5
Firing furnace	Soot and dust	50	g/m <sup>3</sup> N	4.3

■ Water quality :

Item	Effluent Std.	Unit	Actual		
			Min.	Ave.	Max.
Hydrogen ion concentration	5.8~8.6	-	6.9	7.5	8.1
Biochemical oxygen demand	300	mg/L	1.4	7.6	29
Chemical oxygen demand	300	mg/L	3.1	7.5	15
Suspended solids	300	mg/L	2.6	8.2	15
N-hexane extract (mineral content )	5	mg/L	0.2	0.7	1.3
N-hexane extract (animal/plant content)	30	mg/L	<0.1		
Copper content	3	mg/L	0.01	0.07	0.1
Fluorine and its compounds	15	mg/L	0.3	0.6	1.4
Nitrogen content	60	mg/L	8.2	21	29
Phosphorus content	20	mg/L	0.05	0.2	0.4
Anionic surfactant	5	mg/L	<0.09		
Nickel	3	mg/L	0.02	0.7	2.3
Chromium content	2	mg/L	<0.007		
Zinc content	5	mg/L	0.03		
Phenol	3	mg/L	<0.007		
Soluble manganese content	10	mg/L	0.06		
Soluble iron content	10	mg/L	0.2		
Coliform bacteria count	3,000	Num/cm <sup>3</sup>	37		
Trichloroethylene	0.3	mg/L	<0.002		
Tetrachloroethylene	0.1	mg/L	<0.002		

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

<<Tongyeong Plant>>

- Total energy consumption (Crude oil equivalent) : 299 kL/year
- Total waste generated : 7.2 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) : 34,254 kL/year
- Total waste generated : 2,283 tons/year (recycling rate: 100 %)
- Air emission :

Equipment	Fuel	Emissions to Air	Emission Limit	Unit	Actual Max.
Boiler	Natural gas	Ringelmann smoke density	1	class	0.5
		Sulfur dioxide	50	mg/m <sup>3</sup> N	34
		Total suspended particulates	30	mg/m <sup>3</sup> N	28
Generator	Kerosene	Ringelmann smoke density	1	class	0.8
Cafeteria	Natural gas	Oily smoke	2	ppm	0.7
Scrubber	-	Hydrogen chloride	30	mg/m <sup>3</sup> N	0.2
RTO	Natural gas	Toluene	40	mg/m <sup>3</sup> N	0.3
		Methanol	190	mg/m <sup>3</sup> N	2.0

- Water quality :

### Industrial wastewater

Item	Effluent Std.	Unit	Actual		
			Min.	Ave.	Max.
Ammonia and similar nitrogen compounds	15	mg/L	0.006	0.07	0.2
Hydrogen ion concentration	6.0~9.0	-	6.8	7.2	7.6
Chemical oxygen demand	80	mg/L	10	18	20
Suspended solids	30	mg/L	3.0	3.2	4.0
Zinc content	1	mg/L	0.01		
Nitrogen content	20	mg/L	2.1	8.0	12
Copper content	0.5	mg/L	0.01	0.02	0.03
Nickel	0.5	mg/L	0.06	0.1	0.2

### Human sewage

Item	Effluent Std.	Unit	Actual		
			Min.	Ave.	Max.
Hydrogen ion concentration	6.0~9.0	-	7.1	7.1	7.1
Biochemical oxygen demand	300	mg/L	10	11	12
Chemical oxygen demand	500	mg/L	71	77	83
Suspended solids	400	mg/L	11	13	14
Animal/Vegetable oils	100	mg/L	0.5	0.6	0.6
Petroleum	20	mg/L	0.08	0.1	0.1

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



## TAIYO YUDEN (TIANJIN) ELECTRONICS CO., LTD.

- Total energy consumption (Crude oil equivalent) : 802 kL/year
- Total waste generated : 5.8 tons/year (recycling rate: 100 %)
- Air emission :

Equipment	Emissions to Air	Emission Limit	Unit	Actual Max.
Drying furnace	Non-methane hydrocarbon (NMHC)	120	mg/m <sup>3</sup> N	7.8
		10	kg/h	0.03
	Tin and its compounds	8.5	mg/m <sup>3</sup> N	0
		0.3	kg/h	2.8×10 <sup>-7</sup>

- Water quality :

Item	Effluent Std.	Unit	Actual		
			Min.	Ave.	Max.
Biochemical oxygen demand	300	mg/L	46		
Chemical oxygen demand	500	mg/L	124		
Suspended solids	400	mg/L	33		
N-hexane extract (animal/plant content)	100	mg/L	0.6		
Ammonical nitrogen	35	mg/L	26		
Phosphorus content	3	mg/L	2.0		

- Water source : Luan River
- Drain destination : Hai River

## TAIYO YUDEN (PHILIPPINES), INC.

- Total energy consumption (Crude oil equivalent) : 18,130 kL/year
- Total waste generated : 1,524 tons/year (recycling rate: 90.1 %)
- Air emission :

Equipment	Fuel	Emissions to Air	Emission Limit	Unit	Actual Max.
Generator	Kerosene	NOx	2,000	mg/m <sup>3</sup> N	397
		Carbon monoxide	500	mg/m <sup>3</sup> N	146
Scrubber	-	Hydrogen sulfide	7	mg/m <sup>3</sup> N	<1
		Nitrogen dioxide	500	mg/m <sup>3</sup> N	6.2
		Sulfur dioxide	200	mg/m <sup>3</sup> N	4.7
		Particulate matter	200	mg/m <sup>3</sup> N	1.1
		Nickel	20	mg/m <sup>3</sup> N	<0.006
		Ammonia	20	mg/m <sup>3</sup> N	<0.0008

- Water quality :

Items	Effluent Std.	Unit	Actual		
			Min.	Ave.	Max.
Hydrogen ion concentration	6.0~9.0	-	6.7	7.7	8.5
Biochemical oxygen demand	100	mg/L	8.0	19	32
Chemical oxygen demand	200	mg/L	23	41	86
Suspended solids	150	mg/L	3.0	12	22
Oil & Grease	10	mg/L	1.0	1.4	3.0
Silver	1	mg/L	<0.01		
Lead and its compounds	0.5	mg/L	<0.01		
Zinc content	10	mg/L	<0.003	0.006	0.04
Nickel	1	mg/L	0.1	0.2	0.3

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

## TAIYO YUDEN (SARAWAK) SDN.BHD.

- Total energy consumption (Crude oil equivalent) : 39,568 kL/year
- Total waste generated : 5,912 tons/year (recycling rate: 83.0 %)
- Air emission :

Equipment	Fuel	Emissions to Air	Emission Limit	Unit	Actual Max.
Scrubber		Hydrogen chloride	0.03	g/m <sup>3</sup> N	0.001
		Sulfuric acid	0.005	g/m <sup>3</sup> N	0.0008
Boiler	LP gas	Dust Particulate	0.05	g/m <sup>3</sup> N	0.02
		Dark Smoke	20	%	0.05
Sludge Dryer	LP gas	Dust Particulate	0.05	mg/m <sup>3</sup> N	0.03
		Dark Smoke	20	%	1.2
RTO	LP gas	Dust Particulate	0.05	g/m <sup>3</sup> N	0.01
		Dark Smoke	20	%	0

- Water quality :

Industrial wastewater

Item	Effluent Std.	Unit	Actual		
			Min.	Ave.	Max.
Temperature	40	°C	28	29	30
Hydrogen ion concentration	5.5~9.0	-	6.8	7.7	8.4
Biochemical oxygen demand	50	mg/L	2.0	4.7	11
Chemical oxygen demand	200	mg/L	14	32	145
Suspended solids	100	mg/L	5.0	5.4	10
Zinc content	2	mg/L	0.02	0.02	0.04
Copper content	1	mg/L	0.09	0.3	0.8
Nickel	1	mg/L	0.2	0.5	0.9
Tin	1	mg/L	0.2	0.4	0.99
Soluble iron content	5	mg/L	1.2	2.0	3.7

Human sewage

Item	Effluent Std.	Unit	Actual		
			Min.	Ave.	Max.
Hydrogen ion concentration	5.5~9.0	-	6.4	7.2	8.4
Biochemical oxygen demand	50	mg/L	2.0	2.0	2.1
Chemical oxygen demand	200	mg/L	10	12	27
Suspended solids	100	mg/L	5.0	5.1	6.6
Ammonia Nitrogen	50	mg/L	0.06	0.5	1.5
Oil & Grease	20	mg/L	1.0	1.2	1.5

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