# Atmosphere/Wastewater Quality/PRTR-designated Pollutants Data (Results from FY2019)

### Explanation of values

The regulation values indicate the strictest values in the text of laws, regulations and pollution prevention agreements.

For atmospheric emissions, the maximum values are indicated.

Regarding PRTR, Class I Designated Chemical Substances that are handled at a volume of a 1 t/year or more are listed.

Technical words in the charts NOx: Nitrogen oxide SOx: Sulfur oxide BOD: Biochemical oxygen demand COD: Chemical oxygen demand SS: Concentration of suspended solids in water

### Atmospheric pollutants

#### Okazaki Plant

| Atmospheric pollutants | Equipment | Unit | Regulation | Actual (maximum) |
|---|---|---|---|---|
| **NOx** | Boiler (Large-type, $NO_2$) | ppm | 130 | 67 |
| | (Other) | ppm | 150 | 68 |
| | Drying furnace (for coating) | ppm | 250 | 49 |
| **Soot dust** | Boiler | g/Nm³ | 0.1 | ≦0.002 |
| | Drying furnace (for coating) | g/Nm³ | 0.1 | ≦0.002 |
| **SOx (sulfur in fuel regulations)** | | wt% | 0.5 | – |
| **Formaldehyde** | Drying furnace | mg/m³ | 30 | 4.3 |

#### Mizushima Plant

| Atmospheric pollutants | Equipment | Unit | Regulation | Actual (maximum) |
|---|---|---|---|---|
| **NOx** | Boiler (Steam) | ppm | 150 | – |
| | (Heating) | ppm | 150 | 77 |
| | (Small-type) | ppm | 150 | 46 |
| | (Absorption-type air conditioner) | ppm | 180 | 58 |
| | (Booth fan heating facility) | ppm | 100 | <15 |
| | Drying furnace | ppm | 230 | 43 |
| | Melting furnace | ppm | 200 | <27 |
| | Metal heating furnace | ppm | 180 | 34 |
| | Total amount | Nm³/h | 12.749 | 6.246 |
| **Soot dust** | Boiler | g/Nm³ | 0.1 | 0.009 |
| | (Booth fan heating facility only) | g/Nm³ | 0.03 | 0.0007 |
| | Drying furnace | g/Nm³ | 0.1 | 0.093 |
| | Melting furnace | g/Nm³ | 0.1 | <0.001 |
| | Metal heating furnace | g/Nm³ | 0.1 | 0.028 |
| **SOx (sulfur in fuel regulations)** | | wt% | 0.50 | 0.025 |

#### Mizushima Plant (Harmful gases (Okayama Prefecture regulations))

| Atmospheric pollutants | Unit | Regulation | Actual (maximum) |
|---|---|---|---|
| **Acrylonitrile** | ppm | 40 | 0.1 |
| **Acetonitrile** | ppm | 80 | 0.5 |
| **Formaldehyde** | ppm | 10 | 0.4 |
| **Cyan and its compounds** | ppm | 10 | – |
| **Carbon disulfide** | ppm | 40 | – |
| **Phenol** | ppm | 10 | <0.1 |
| **Styrene** | ppm | 200 | <0.1 |
| **Benzene** | ppm | 50 | 1.2 |
| **Phosgene** | ppm | 0.1 | – |
| **Vinyl chloride** | ppm | 500 | – |

#### Kyoto Plant – Kyoto

| Atmospheric pollutants | Equipment | Unit | Regulation | Actual (maximum) |
|---|---|---|---|---|
| **NOx** | Boiler | ppm | 150 | 77 |
| | Drying furnace | ppm | 230 | ≦66 |
| | Melting furnace | ppm | 200 | ≦120 |
| | Metal heating furnace | ppm | 180 | ≦130 |
| **Soot dust** | Boiler | ppm | 0.1 | ≦0.0084 |
| | Drying furnace | ppm | 0.2 | ≦0.0034 |
| | Melting furnace | ppm | 0.1 | 0.0084 |
| | Metal heating furnace | ppm | 0.2 | 0.020 |
| **SOx (sulfur in fuel regulations)** | | wt% | 0.5 | 0 |
| **Dioxin** | Melting furnace | ng-TEQ/Nm³ | 1 | 0.10 |
| | Drying furnace | ng-TEQ/Nm³ | 1 | 0.0054 |

#### Kyoto Plant – Shiga

| Atmospheric pollutants | Equipment | Unit | Regulation | Actual (maximum) |
|---|---|---|---|---|
| **NOx** | Boiler | ppm | 150 | 78 |
| **Soot dust** | Boiler | g/Nm³ | 0.1 | ≦0.0038 |

## Water pollutants

### Okazaki Plant

| Water pollutants | Unit | Regulation | | Actual (Maximum) | | |
|---|---|---|---|---|---|---|
| | | Daily average shown in parentheses | | Maximum | Minimum | Average |
| **pH** | – | 5.8～8.6 | | 7.6 | 6.7 | 7.1 |
| **BOD** | mg/L | 25 | (20) | 3.6 | <0.5 | 1.9 |
| **COD** | mg/L | 25 | (20) | 8.9 | 0.5 | 4.9 |
| **SS** | mg/L | 30 | (20) | 6.0 | <1.0 | 1.5 |
| **Oil** | mg/L | 2 | | <0.5 | <0.5 | <0.5 |
| **Copper** | mg/L | 0.5 | | <0.01 | <0.01 | <0.01 |
| **Zinc** | mg/L | 1 | | 0.16 | 0.02 | 0.08 |
| **Soluble iron** | mg/L | 3 | | <0.1 | <0.1 | <0.1 |
| **Soluble manganese** | mg/L | 3 | | <0.1 | 0.1 | 0.1 |
| **Chromium** | mg/L | 0.1 | | <0.02 | <0.02 | <0.02 |
| **E-coli** | Unit/cm³ | 300 | | 280 | 30 | 66 |
| **Total nitrogen** | mg/L | 15 | | 10.0 | 4.9 | 7.2 |
| **Total phosphorus** | mg/L | 2 | | 0.40 | 0.10 | 0.20 |
| **Fluorine** | mg/L | 4.0 | | 0.90 | 0.10 | 0.50 |
| **COD total amount** | kg/day | 61.6 | | 22.7 | 1.0 | 9.2 |
| **Total amount of total nitrogen** | kg/day | 71.5 | | 36.2 | 0.2 | 14.7 |
| **Total amount of total phosphorus** | kg/day | 8.6 | | 2.48 | 0.04 | 0.73 |

- Other than the above, the following were all below lower limits (not detected): Cyan, hexavalent chromium, cadmium, organic phosphorus, lead, phenol, trichloroethylene, 1,1,1-trichloroethane, alkyl mercury, PCB, selenium, carbon tetrachloride, 1,2-dichloroethane, 1,1-dichloroethylene, dichloromethane, cis-1,2-dichloroethylene, tetrachloroethylene, 1,1,2-trichloroethane, benzene, 1,3-dichloropropene, simazine, and thiram, thiobencarb.

### Mizushima Plant

| Water pollutants | | Unit | Regulation | | Actual (Maximum) | | |
|---|---|---|---|---|---|---|---|
| | | | Daily average shown in parentheses | | Maximum | Minimum | Average |
| **pH** | **Rivers** | – | 6～8 | | 7.7 | 6.6 | 7.2 |
| **pH** | **Seas** | – | 6～8 | | 7.9 | 6.9 | 7.3 |
| **BOD** | **Rivers** | mg/L | 30 | (20) | 61.0 | 1.1 | 7.5 |
| **COD** | **Rivers** | mg/L | 30 | (20) | 24.0 | 3.2 | 5.9 |
| **COD** | **Seas** | mg/L | 20 | (15) | 7.1 | <0.5 | 2.1 |
| **COD Total amount** | **Rivers + Seas** | kg/day | 294 | | 25.9 | 7.3 | 40.6 |
| **SS** | **Rivers** | mg/L | 40 | (20) | 28.0 | <1.0 | 2.0 |
| **SS** | **Seas** | mg/L | 40 | (20) | <2.5 | <1.0 | <1.0 |
| **Oil** | **Rivers** | mg/L | 2 | (1) | 7.1 | <0.5 | <0.5 |
| **Oil** | **Seas** | mg/L | 2 | (1) | <0.5 | <0.5 | <0.5 |
| **Zinc** | **Rivers** | mg/L | 2 | | 0.06 | <1.0 | 0.05 |
| **Zinc** | **Seas** | mg/L | 2 | | 0.48 | <0.11 | 0.30 |
| **Soluble iron** | **Rivers** | mg/L | 10 | | <0.02 | <0.01 | <0.01 |
| **Soluble iron** | **Seas** | mg/L | 10 | | <0.01 | 0.01 | <0.01 |
| **Soluble manganese** | **Rivers** | mg/L | 10 | | 0.12 | <0.04 | <0.08 |
| **Soluble manganese** | **Seas** | mg/L | 10 | | <0.01 | <0.01 | <0.01 |
| **E-coli** | **Rivers** | Unit/cm³ | 3,000 | | 0 | 0 | 0 |
| **E-coli** | **Seas** | Unit/cm³ | 3,000 | | 0 | 0 | 0 |
| **Total amount of total nitrogen** | | kg/day | 123 | | 86.7 | 6.3 | 49.9 |
| **Total amount of total phosphorus** | | kg/day | 47.8 | | 45.9 | 0.3 | 16.5 |
| **Total nitrogen** | **Rivers** | mg/L | 120 | (60) | 14.0 | 1.8 | 8.2 |
| **Total nitrogen** | **Seas** | mg/L | 120 | (60) | 4.9 | 0.3 | 2.0 |
| **Total phosphorus** | **Rivers** | mg/L | 16 | (8) | 6.00 | 0.20 | 1.80 |
| **Total phosphorus** | **Seas** | mg/L | 16 | (8) | 0.14 | 0.01 | 0.08 |
| **Boron** | **Rivers** | mg/L | 10 | | <0.1 | <0.1 | <0.1 |
| **Boron** | **Seas** | mg/L | 230 | | <0.1 | <0.1 | <0.1 |
| **Fluorine** | **Rivers** | mg/L | 8 | | 2.0 | 0.9 | 1.5 |
| **Fluorine** | **Seas** | mg/L | 15 | | <0.2 | <0.2 | <0.2 |
| **Ammonia, ammonium compounds, nitrites, and nitric compounds** | **Rivers** | mg/L | 100 | | 4.6 | 2.3 | 3.5 |
| | **Seas** | mg/L | 100 | | 2.1 | 1.0 | 1.6 |

- Other than the above, the following were all below lower limits (not detected): Copper, lead, cyan, total chromium, hexavalent chromium, cadmium, organic phosphorus, total mercury, arsenic, phenol, trichloroethylene, trichloroethane, alkyl mercury, PCB, selenium, carbon tetrachloride, 1,2-dichloroethane, 1,1-dichloroethylene, dichloromethane, cis-1,2-dichloroethylene, tetrachloroethylene, 1,1,2-trichloroethane, benzene, 1,3-dichloropropene, simazine, thiram, and thiobencarb.

## Water pollutants

### Kyoto Plant - Kyoto

| Water pollutants | | Unit | Regulation | Actual (Maximum) | | |
|---|---|---|---|---|---|---|
| | | | | Maximum | Minimum | Average |
| **pH** | | – | 5–9 | 7.1 | 5.5 | 6.4 |
| **BOD** | | mg/L | 600 | 350.0 | 1.4 | 109.5 |
| **SS** | | mg/L | 600 | 46.5 | 8.5 | 17.8 |
| **Oil** | **Mineral oil** | mg/L | 5 | <1.0 | <1.0 | <1.0 |
| **Oil** | **Animal and vegetable oils** | mg/L | 30 | 13.8 | 1.0 | 5.5 |
| **Zinc** | | mg/L | 5 | 0.05 | 0.05 | 0.05 |
| **Soluble iron** | | mg/L | 10 | 0.36 | 0.09 | 0.20 |
| **Soluble manganese** | | mg/L | 10 | 0.78 | 0.42 | 0.53 |
| **Total nitrogen** | | mg/L | 240 | 49.4 | 16.8 | 31.4 |
| **Total phosphorus** | | mg/L | 32 | 0.35 | 0.10 | 0.14 |
| **Arsenic** | | mg/L | 0.1 | <0.05 | <0.05 | <0.05 |
| **Dioxins** | | pg-TEQ/L | 10 | 0.0036 | 0.0036 | 0.0036 |

- All drainage from processes is discharged to sewers, and the items for analysis have been determined in an agreement with the government of Kyoto City.

### Kyoto Plant - Shiga

| Water pollutants | Unit | Regulation | Actual (Maximum) | | |
|---|---|---|---|---|---|
| | | | Maximum | Minimum | Average |
| **pH** | – | 5–9 | 8.2 | 6.5 | 7.5 |
| **BOD** | mg/L | 600 | 31.0 | 1.0 | 6.3 |
| **SS** | mg/L | 600 | 6.0 | 5.0 | 5.1 |
| **Oil** | mg/L | 5 | 5.4 | 1.0 | 1.4 |
| **Total nitrogen** | mg/L | 60 | 7.4 | 0.1 | 4.0 |
| **Total phosphorus** | mg/L | 10 | 0.7 | 0.1 | 0.3 |

- All drainage from processes is discharged to sewers, and the items for analysis have been determined in an agreement with the government of Konan City.

## PRTR-designated pollutants

### Okazaki Plant

| NO. | Substance name | Unit | Amount handled | Emissions volume | | Removal volume | | Recycled volume | Consumed volume | Removal Treatment volume |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Atmosphere | Public waters | Sewage line | Waste | | | |
| 1 | Water-soluble zinc compounds | kg/year | 17,155 | 0 | 45 | 0 | 0* | 0 | 12,821 | 0 |
| 53 | Ethyl benzene | kg/year | 61,119 | 32,936 | 0 | 0 | 961 | 4,297 | 14,565 | 8,360 |
| 71 | Ferric chloride | kg/year | 14,765 | 0 | 0 | 0 | 0 | 0 | 0 | 14,765 |
| 80 | Xylene | kg/year | 135,022 | 40,691 | 0 | 0 | 1,067 | 2,871 | 61,757 | 28,636 |
| 239 | Organic tin compounds (Dibutyltin oxide) | kg/year | 3,330 | 0 | 0 | 0 | 500 | 0 | 2,831 | 0 |
| 240 | Styrene | kg/year | | | | 0 | | | | |
| 296 | 1,2,4-Trimethylbenzene | kg/year | 65,830 | 9,805 | 0 | 0 | 1,002 | 38 | 32,646 | 22,339 |
| 297 | 1,3,5-Trimethylbenzene | kg/year | 9,012 | 2,644 | 0 | 0 | 289 | 17 | 20 | 6,042 |
| 300 | Toluene | kg/year | 322,125 | 53,951 | 0 | 0 | 2,097 | 56,090 | 104,553 | 105,434 |
| 302 | Naphthalene | kg/year | | | | 0 | | | | |
| 309 | Nickel compounds | kg/year | 1,749 | 0 | 138 | 0 | 983 | 0 | 629 | 0 |
| 392 | n-Hexane | kg/year | 18,688 | 97 | 0 | 0 | 6 | 0 | 11,252 | 7,333 |
| 400 | Benzene | kg/year | 9,271 | 32 | 0 | 0 | 3 | 0 | 6,955 | 2,281 |
| 411 | Formaldehyde | kg/year | 948 | 142 | 0 | 0 | 1 | 0 | 0 | 805 |
| 412 | Manganese and its compounds | kg/year | 5,008 | 0 | 300 | 0 | 1,705 | 0 | 3,004 | 0 |
| Total | | kg/year | 664,023 | 140,297 | 482 | 0 | 12,903 | 63,313 | 251,032 | 195,996 |

- Amount handled=Emission+transport volume+recycled volume+consumed volume+removal processed volume
- Consumed volume: Volume transformed to other substances by means of a reaction or contained within a product
- Removal treatment volume: Volume transformed to other substances by means of incineration, decomposition or reaction

*The amount of sludge accounting for transported decomposed matter was 4,289 (kg/year). However, as this was not aqueous compounds, it has not been included in the amount of transported decomposed matter (confirmed by Okazaki City)

## PRTR-designated pollutants

### Mizushima Plant

| NO. | Substance name | Unit | Amount handled | Emissions volume | | Removal volume | | Recycled volume | Consumed volume | Removal Treatment volume |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Atmosphere | Public waters | Sewage line | Waste | | | |
| 1 | Water-soluble zinc compounds | kg/year | 21,035.9 | 0 | 817.2 | 0 | 5,918.5 | 0 | 14,300.3 | 0 |
| 53 | Ethyl benzene | kg/year | 21,657.7 | 2,669.4 | 0 | 0 | 194.0 | 5,675.1 | 12,980.5 | 138.7 |
| 80 | Xylene | kg/year | 67,093.0 | 3,162.8 | 0 | 0 | 215.6 | 6,148.0 | 57,412.5 | 154.1 |
| 188 | N, N-Dicyclohexylamine | kg/year | 1,569.7 | 0 | 0 | 0 | 1,569.7 | 0 | 0 | 0 |
| 239 | Organic tin compounds | kg/year | 5,836.6 | 0 | 0 | 0 | 291.8 | 0 | 5,544.8 | 0 |
| 296 | 1,2,4- Trimethylbenzene | kg/year | 56,984.2 | 17,026.2 | 0 | 0 | 1,009.6 | 0 | 36,581.6 | 2,366.7 |
| 297 | 1,3,5- Trimethylbenzene | kg/year | 5,928.2 | 4,941.2 | 0 | 0 | 294.9 | 0 | 0 | 691.8 |
| 300 | Toluene | kg/year | 125,149.5 | 661.6 | 0 | 0 | 0 | 13,714.8 | 110,773.2 | 0 |
| 309 | Nickel compounds | kg/year | 4,383.0 | 0 | 471.8 | 0 | 2,281.0 | 0 | 1,630.1 | 0 |
| 392 | n-Hexane | kg/year | 49,713.7 | 290.9 | 0 | 0 | 0 | 0 | 49,422.8 | 0 |
| 400 | Benzene | kg/year | 8,741.4 | 26.1 | 0 | 0 | 0 | 0 | 8,715.3 | 0 |
| 407 | Polyoxyethylene alkyl ether | kg/year | 11,881.9 | 0 | 118.8 | 0 | 11,763.1 | 0 | 0 | 0 |
| 411 | Formaldehyde | kg/year | 2,538.9 | 1,388.3 | 0 | 0 | 0 | 0 | 0 | 1,150.6 |
| 412 | Manganese and its compounds | kg/year | 4,362.4 | 0 | 220.0 | 0 | 1,687.7 | 0 | 2,414.4 | 40.3 |
| 438 | Methylnaphthalene | kg/year | 3,303.2 | 186.3 | 0 | 0 | 0 | 0 | 3,116.9 | 0 |
| Total | | kg/year | 390,179.3 | 30,352.8 | 1,627.8 | 0 | 25,225.9 | 25,537.9 | 302,892.4 | 4,542.2 |

- Amount handled=Emission+transport volume+recycled volume+consumed volume+removal processed volume
- Consumed volume: Volume transformed to other substances by means of a reaction or contained within a product
- Removal treatment volume: Volume transformed to other substances by means of incineration, decomposition or reaction

## PRTR-designated pollutants

### Kyoto Plant - Kyoto

| NO. | Substance name | Unit | Amount handled | Emissions volume | | Removal volume | | Recycled volume | Consumed volume | Removal Treatment volume |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Atmosphere | Public waters | Sewage line | Waste | | | |
| **37** | **Bisphenol A** | kg/year | 5,144.0 | 0 | 0 | 0 | 0 | 0 | 5,128.6 | 15.4 |
| **53** | **Ethyl benzene** | kg/year | 7,860.7 | 2.4 | 0 | 0 | 0 | 0 | 7,858.3 | 0 |
| **80** | **Xylene** | kg/year | 34,577.7 | 10.4 | 0 | 0 | 0 | 0 | 34,567.3 | 0 |
| **87** | **Chromium and chromium (III) compounds** | kg/year | 3,365.9 | 0.1 | 0 | 0 | 0 | 0 | 3,365.8 | 0 |
| **258** | **Hexamethylenetetramine** | kg/year | 41,982.8 | 0 | 0 | 0 | 0 | 0 | 29,387.9 | 12,594.8 |
| **296** | **1.2.4-Trimethylbenzene** | kg/year | 28,405.5 | 8.5 | 0 | 0 | 0 | 0 | 28,397.0 | 0 |
| **297** | **1.3.5-Trimethylbenzene** | kg/year | 4,902.6 | 1.5 | 0 | 0 | 0 | 0 | 4,901.1 | 0 |
| **300** | **Toluene** | kg/year | 138,859.3 | 41.7 | 0 | 0 | 0 | 0 | 138,817.7 | 0 |
| **349** | **Phenol** | kg/year | 4,584.1 | 0 | 0 | 0 | 0 | 0 | 3,667.2 | 916.8 |
| **392** | **n-Hexane** | kg/year | 13,936.5 | 2.8 | 0 | 0 | 0 | 0 | 13,933.7 | 0 |
| **400** | **Benzene** | kg/year | 4,179.0 | 0.4 | 0 | 0 | 0 | 0 | 4,178.6 | 0 |
| **411** | **Formaldehyde** | kg/year | 1,194.5 | 0 | 0 | 0 | 0 | 0 | 1,190.9 | 3.6 |
| **412** | **Manganese and its compounds** | kg/year | 4,890.3 | 0.1 | 0 | 0 | 0 | 0 | 4,890.2 | 0 |
| **Total** | | kg/year | 293,882.7 | 67.8 | 0 | 0 | 0 | 0 | 280,284.2 | 13,530.6 |
| **243** | **Dioxins** | mg-TEQ/year | | 6.8 | | 0.00000131 | | | | |

### Kyoto Plant - Shiga

| NO. | Substance name | Unit | Amount handled | Emissions volume | | Removal volume | | Recycled volume | Consumed volume | Removal Treatment volume |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Atmosphere | Public waters | Sewage line | Waste | | | |
| **300** | **Toluene** | kg/year | 2,082.0 | 0.6 | 0 | 0 | 0 | 0 | 2,081.4 | 0 |
| **Total** | | kg/year | 2,082.0 | 0.6 | 0 | 0 | 0 | 0 | 2,081.4 | 0 |

- Amount handled=Emission+transport volume+recycled volume+consumed volume+removal processed volume
- Consumed volume: Volume transformed to other substances by means of a reaction or contained within a product
- Removal treatment volume: Volume transformed to other substances by means of incineration, decomposition or reaction