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GB 51441-2022

Engineering Design Standards for Electronic Industry Wastewater Treatment

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1 General

1.0.1 This standard is formulated in order to standardize the design of waste water treatment projects in the electronics industry, to achieve safety and applicability, advanced technology, reasonable economy, energy saving and environmental protection.

1.0.2 This standard is applicable to the design of newly built, rebuilt and expanded electronics industry wastewater treatment projects. The electronic industry wastewater treatment project shall be designed, constructed and put into operation at the same time as the main project.

1.0.3 The design of the electronic industry wastewater treatment project shall not only comply with the provisions of this standard, but also comply with the provisions of the current relevant national standards.

2.1.1 acidic & alkaline wastewater

Acidic or alkaline wastewater discharged during the production process.

2.1.2 Grinding & sawing wastewater

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Wastewater containing solid particles or suspended matter discharged from the production process of grinding, cutting, etc.

2.1.3 chemical mechanical planarization (CMP) wastewater

Wastewater containing solid particles or suspended matter discharged from the chemical mechanical polishing production process.

2.1.4 fluoride wastewater

Wastewater containing fluoride ions and their compounds discharged during the production process.

2.1.5 Phosphorus wastewater phosphorus wastewater

Wastewater containing phosphoric acid, phosphate, metaphosphate, polyphosphate and organic phosphate discharged during the production process.

2.1.6 Arsenic wastewater arsenic wastewater

Wastewater containing various arsenic compounds discharged from the production process.

2.1.7 organic waste water

Wastewater containing organic matter discharged from the production process.

2.1.8 inorganic waste water

The wastewater discharged during the production process only contains compounds such as inorganic salts and does not contain organic compounds.

2.1.9 heavy metal containing waste water

Wastewater containing cadmium, chromium, lead, nickel, silver, copper, zinc and other metal ions, complexes and their compounds discharged during the production process. According to the heavy metal elements contained in the wastewater, it is also called cadmium-containing wastewater, chromium-containing wastewater, lead-containing wastewater, nickel-containing wastewater, silver-containing wastewater, copper-containing wastewater, zinc-containing wastewater, etc.

2.1.10 physical & chemical treatment

Wastewater is treated by physical and chemical methods. The physical and chemical treatment process of electronic wastewater mainly includes chemical reaction, coagulation precipitation, adsorption, ion exchange, filtration, evaporation and concentration and other

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methods.

2.1.11 biochemical treatment biochemical treatment

Using the metabolism of microorganisms to convert dissolved and colloidal organic pollutants in sewage into harmless substances to achieve purification, including aerobic treatment and anaerobic treatment.

2.1.12 reclaim water

Wastewater can be used directly or after proper treatment to meet certain water quality indicators and meet certain use requirements.

2.1.13 Gas stripping?oxidation process for ammonia wastewater

A wastewater treatment method that strips ammonia in ammonia nitrogen wastewater and oxidizes it into nitrogen by catalytic oxidation.

2.1.14 Sequencing batch reactor coagulating sedimentation process

In the same reactor, the coagulation-sedimentation wastewater treatment method consists of five basic processes of water intake, reaction, sedimentation, drainage and standby in chronological order.

3 basic rules

3.0.1 The process selection of wastewater treatment projects should follow the principles of comprehensive treatment, recycling, energy saving and emission reduction, and total volume control. Under the condition of reasonable technology and economy, the recyclable substances in water resources and waste water should be fully recycled.

3.0.2 When the main project is constructed in stages, the wastewater treatment project shall be uniformly planned, rationally arranged and implemented in stages according to the final scale.

3.0.3 Wastewater treatment should adopt a technological process with mature technology, safety and reliability, and convenient operation and maintenance. Scientifically, rationally, actively and prudently select proven and effective new technologies, new processes, new materials and new equipment.

3.0.4 Wastewater treatment requirements should be determined according to the requirements of the environmental impact assessment report approval, and pollutant discharge should meet the corresponding national, industry or local pollutant discharge standards.

3.0.5 The selection of technological process shall consider the influence of natural factors

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such as region, geography, geology, meteorology, earthquake and flood.

3.0.6 The influent water quality of the wastewater treatment project should be determined according to the actual measurement data or the operating practices of similar enterprises.

3.0.7 When there is no mature experience for reference in the treatment process of the wastewater treatment project, the treatment process and design parameters can be determined through experiments or based on similar water quality operation experience.

3.0.8 Wastewater treatment projects should be collected and treated by classification and quality according to the project scale and water quality characteristics in accordance with the principles of cleaning and diversion, and separation of concentration and light.

3.0.9 For the storage and treatment of waste water treatment devices and structures containing volatile toxic, harmful, flammable and odorous gases, the exhaust gas shall be collected and disposed of properly.

3.0.10 The pipes of the electronic industry wastewater treatment system shall be clearly marked according to different media.

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4.1 General provisions

4.1.1 The technological process shall be determined through technical and economical comparison, taking into account factors such as initial investment, operating cost, service life, resource occupation and energy consumption.

4.1.2 The wastewater treatment project should be equipped with an online monitoring system.

4.1.3 Waste gas, waste residue and other pollutants that may be generated during operation shall be properly disposed of in the process design of wastewater treatment engineering.

4.1.4 The waste water treatment station shall be equipped with an emergency pool, and its volume should not be less than the 6h average total discharge of the largest stream of waste water.

4.1.5 When coagulation-sedimentation method is used to treat wastewater and the volume of wastewater is less than 50m3/d, sequential batch coagulation-sedimentation method should be used for treatment.

4.2 Water quantity and quality

4.2.1 In the early stage of wastewater treatment project design, detailed investigation and analysis and demonstration should be carried out on the water quantity and quality of wastewater.

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