

**INDUSTRY STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

HJ 2024-2012

**Technical specifications for completely mixed anaerobic
reaction tank in wastewater treatment
(English Translation)**

Issued on: December 24, 2012

Implemented on: March 1, 2013

Issued by: Ministry of Ecology and Environment

Table of Contents

Foreword

1 Scope of application

2 Normative references

3 Terms and definitions

3.1 Completely mixed anaerobic reaction tank completely mixed anaerobic reaction tank

3.2 Complete mixed anaerobic reaction tank wastewater treatment process without
sludge reflux

3.3 Complete mixed anaerobic reaction tank wastewater treatment process with sludge
reflux

3.4 Normal temperature anaerobic reaction

3.5 Medium temperature anaerobic reaction mesophilic anaerobic reaction

3.6 High temperature anaerobic reaction thermophilic anaerobic reaction

4 Design water quantity and design water quality

4.1 Design water quantity

4.2 Design water quality

4.3 Pollutant removal rate

5 General requirements

6 Process design

6.1 General requirements

6.2 Process

6.3 Pretreatment

6.4 Completely mixed anaerobic reaction cell

Foreword

To implement the Law of the People's Republic of China on Water Pollution Prevention and Control, standardize the complete mixed anaerobic reaction tank in wastewater treatment Application, prevention of water pollution, protection of human health, the development of this standard.

This standard specifies the process design, main equipment, testing and control, construction and acceptance of a fully mixed anaerobic reactor.

Technical requirements for operation and maintenance.

This standard is a guiding standard.

This standard is the first release.

This standard was formulated by the Science and Technology Standards Department of the Ministry of Environmental Protection.

This standard is mainly drafted by. China Environmental Protection Industry Association, Harbin Institute of Technology, Dalian Nationalities College, Tsinghua University University, Harbin Engineering University, Shaoxing Water Conservancy Construction Engineering Co., Ltd., Beijing Municipal Environmental Protection Research Institute.

This standard was approved by the Ministry of Environmental Protection on December 24, 2012.

This standard has been implemented since March 1, 2013.

This standard is explained by the Ministry of Environmental Protection.

Complete mixed anaerobic reaction tank wastewater treatment engineering technical specification

1 Scope of application

This standard specifies the process design, main equipment, testing and control of the complete mixed anaerobic reaction tank wastewater treatment project.

Technical requirements for construction and acceptance, operation and maintenance.

This standard is applicable to high suspended solids and high concentration organic wastewater treatment projects using fully mixed anaerobic reaction tanks.

Environmental impact assessment and environmental engineering design, construction, environmental protection acceptance and technical basis for operation and management after completion.

2 Normative references

The contents of this standard refer to the terms in the following documents. For undated references, the valid version applies to this standard.

GB 3096 Acoustic Environmental Quality Standard GB 12348 industrial enterprise boundary environmental noise standard General rules for safety and health requirements of GB 12801 production process GB 18597 Hazardous Waste Storage Pollution Control Standard GB 18599 General industrial solid waste storage and disposal site pollution control standards GB 50014 Outdoor Drainage Design Code GB 50015 Building Water Supply and Drainage Design Code GB 50016 Building Design Fire Code GB 50040 power plant basic design specification GB 50053 10KV and below substation design specifications GB 50187 General Plan for Design of Industrial Enterprises GB 50204 Concrete Structure

Engineering Construction Quality Acceptance Specification GB 50222 Building interior decoration design fire protection specification General specification for construction and acceptance of GB 50231 mechanical equipment installation engineering GB 50268 Water supply and drainage pipeline engineering construction and acceptance specifications GB 500141 Water supply and drainage structures construction and acceptance specifications GB J 87 Industrial Enterprise Noise Control Design Specification GBZ 1 industrial enterprise design hygiene standard GBZ 2 workplace occupational exposure limit CJ 3025 Urban sewage treatment plant sewage sludge discharge standard CJJ 60 Urban Wastewater Treatment Plant Operation, Maintenance and Safety Technical Regulations CJ/T 51 Standard for urban sewage quality inspection methods JGJ 37 General Rules for Civil Building Design HJ/T 91 Surface Water and Wastewater Monitoring Technical Specifications HJ/T 242 environmental protection product technical requirements belt press filter for sludge dewatering HJ/T 279 environmental protection product technical requirements push flow submersible mixer HJ/T 283 environmental protection product technical requirements chamber filter press and plate and frame filter press HJ/T 335 environmental protection product technical requirements sludge concentration belt dewatering machine NY-T 1220 Biogas Engineering Technical Specification NY/T 1220.1 Technical Specifications for Biogas Engineering Part 1. Process Design NY/T 1220.2 Technical Specifications for Biogas Engineering - Part 2. Gas Supply Design SHT 3535 Petrochemical Concrete Pool Construction and Acceptance Specifications Measures for the Administration of Environmental Protection Acceptance for Completion of Construction Projects (Order No. 13 of the State Environmental Protection Administration)

3 Terms and definitions

The following terms and definitions apply to this standard.

3.1 Completely mixed anaerobic reaction tank completely mixed anaerobic reaction tank

Refers to the installation of a stirring device in the sewage treatment reaction tank to complete the high-concentration organic wastewater and anaerobic microorganisms an anaerobic wastewater biological treatment unit that is fully mixed to degrade organic contaminants in wastewater and remove suspended solids.

3.2 Complete mixed anaerobic reaction tank wastewater treatment process without sludge reflux

Completely mixed anaerobic reaction tank in wastewater treatment without return sludge Refers to high-suspension high-concentration organic wastewater pretreated by grid and primary sedimentation tank, and then treated by fully mixed anaerobic reaction tank.

The effluent enters the degassing device and the sedimentation tank and other subsequent

treatments, and there is no process of returning the sludge to the fully mixed anaerobic reaction tank.

3.3 Complete mixed anaerobic reaction tank wastewater treatment process with sludge reflux

Completely mixed anaerobic reaction tank in wastewater treatment with return sludge Refers to high-suspension high-concentration organic wastewater pretreated by grid and primary sedimentation tank, and then treated by fully mixed anaerobic reaction tank.

The effluent enters the deaerator and the sedimentation tank and other subsequent treatments, and the precipitated sludge in the sedimentation tank is partially returned to the fully mixed type.

Oxygen reaction cell to increase the biomass of the process.

3.4 Normal temperature anaerobic reaction

The reaction cell temperature is controlled by an anaerobic reaction at 25 °C to 30 °C.

3.5 Medium temperature anaerobic reaction mesophilic anaerobic reaction

The reaction cell temperature is controlled by an anaerobic reaction at 35 °C to 40 °C.

3.6 High temperature anaerobic reaction thermophilic anaerobic reaction

The reaction cell temperature is controlled by an anaerobic reaction at 45 °C to 55 °C.

4.1 Design water quantity

4.1.1

The designed water volume shall be designed according to the actual sewage flow measured at the total discharge of the plant or industrial park. Test method should be consistent HJ/T 91 regulations.

4.1.2

The change of wastewater flow rate should be measured according to the characteristics of the process, and the flow coefficient of variation should be determined.

4.1.3

When the actual measurement data cannot be obtained, it can be determined by reference to the relevant provisions of the current national industrial water consumption, or the same industry scale is the same as the existing plant drainage data of the process.