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Emission standard of pollutants for synthetic resin industry

合成树脂工业污染排放标准

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Emission standard of pollutants for synthetic resin industry

1 Scope

This standard specifies the emission limits, monitoring, supervision and management requirements for water pollutants and air pollutants from synthetic resin industrial enterprises and their production facilities (including the enterprises for synthetic resin processing and waste synthetic resin recycling and processing as well as their production facilities).

This standard is applicable to the management of emission of water pollutants and air pollutants in existing synthetic resin industrial enterprises or production facilities, as well as the environmental impact assessment of synthetic resin industrial construction projects, the design of environmental protection facilities, the completion environmental protection acceptance, and the management of emission of water pollutant and air pollutant after it is put into operation.

The monomer production equipment in the synthetic resin enterprise implements the "Emission standards for pollutant of petrochemical industry", the production equipment of polyvinyl chloride resin (PVC) implements the "Emission standards for emission of caustic soda and polyvinyl chloride industry".

This standard applies to the discharge of pollutants permitted by law. For the selection of location of the newly-established pollution sources and the management of the existing pollution source within the specially protected regions, it shall follow the relevant provisions of such laws, regulations and rules as the Water pollution prevention and control law of the People's Republic of China, the Air pollution prevention and control law of the People's Republic of China, the Marine environmental protection law of the People's Republic of China, the Law of the People's Republic of China on environmental pollution by solid wastes, the Law of the People's Republic of China on environmental impact assessment.

2 Normative references

The contents of this standard refer to the following documents or their clauses. For undated references, the latest version applies to this standard.

GB/T 6920 Water quality - determination of pH value - Glass electrode

GB/T 14678 Air quality - Determination of sulfuretted hydrogen, methyl sulphydryl, dimethyl sulfide and dimethyl disulfide - Gas chromatography

GB/T 15432 Ambient air - Determination of total suspended particulates - Gravimetric method

GB/T 15516 Air quality - Determination of formaldehyde - Acetylacetone spectrophotometric method

GB/T 15959 Water quality - Determination of absorbable organic halogens (AOX) - Microcoulometric method

GB/T 16157 The determination of particulates and sampling methods of gaseous pollutants emitted from exhaust gas of stationary source

HJ/T 27 Stationary source emission - Determination of hydrogen chloride - Mercuric thiocyanate spectrophotometric method

HJ/T 31 Stationary source emission - Determination of phosgene - Aniline ultraviolet spectrophotometric method

HJ/T 32 Stationary source emission - Determination of phenols - 4-Amino-antipyrine spectrophotometric method

HJ/T 35 Stationary source emission - Determination of acetaldehyde - Gas chromatography

HJ/T 37 Stationary source emission - Determination of acrylonitrile - Gas chromatography

HJ/T 38 Stationary source emission - Determination of nonmethane hydrocarbons - Gas chromatography

HJ/T 39 Stationary source emission - Determination of chlorobenzenes - Gas chromatography

HJ/T 42 Stationary source emission - Determination of nitrogen oxide - Ultraviolet spectrophotometric method

HJ/T 43 Stationary source emission - Determination of nitrogen oxide - N(1-naphtye)-Ethylenediamine dihydrochloride spectrophotometric method

HJ/T 55 Technical guidelines for fugitive emission monitoring of air pollutants

HJ/T 56 Determination of sulfur dioxide from exhausted gas of stationary source Iodine titration method

HJ/T 57 Determination of sulfur dioxide from exhausted gas of stationary source - Fixed-potential electrolysis method

zirconium alizsrinsulfonate

HJ 488 Water quality - Determination of Fluoride - Fluorine reagents spectrophotometry

HJ 493 Water quality sampling - Technical regulation of the preservation and handling of samples

HJ 494 Water quality - Guidance on sampling techniques

HJ 495 Water quality - Technical regulation on the design of sampling programs

HJ 501 Water quality - Determination of total organic carbon - Combustion oxidation nondispersive infrared absorption method

HJ 505 Water quality - Determination of biochemical oxygen demand after 5 days (BOD5) - Dilution and seeding method

HJ 533 Air and exhaust gas - Determination of ammonia - Nessler's reagent spectrophotometry

HJ 535 Water quality - Determination of ammonia nitrogen - Nessler's reagent spectrophotometry

HJ 536 Water quality - Determination of ammonia nitrogen - Salicylic acid spectrophotometry

HJ 537 Water quality - Determination of ammonia nitrogen - Distillation-neutralization titration

HJ 548 Stationary source emissions - Determination of hydrogen chloride - Silver nitrate titration method (provisional)

HJ 549 Ambient air and waste gas - Determination of hydrogen chloride - Ion chromatography (provisional)

HJ 583 Ambient air - Determination of benzene and its analogies using sorbent adsorption thermal desorption and gas chromatography

HJ 584 Ambient air - Determination of benzene and its analogies by activated charcoal adsorption carbon disulfide desorption and gas chromatography

HJ 597 Water quality - Determination of total mercury - Cold atomic absorption spectrophotometry

HJ 601 Water quality - Determination of formaldehyde - Acetylacetone spectrophotometric method

HJ 688 Water quality - Determination of volatile organic compounds - Purge and trap/gas chromatography (provisional)

HJ 692 Stationary source emission - Determination of nitrogen oxides - Non-dispersive infrared absorption method

HJ 693 Stationary source emission - Determination of nitrogen oxides - Fixed potential by electrolysis method

HJ 694 Water quality - Determination of mercury, arsenic, selenium, bismuth and antimony - Atomic fluorescence spectrometry

HJ 700 Water quality - Determination of 65 elements - Inductively coupled plasma mass spectrometry

HJ 732 Emission from stationary sources - Sampling of volatile organic compounds - Bags method

HJ 733 Guideline for the determination of volatile organic compound leaks and uncovered liquid surface emissions

HJ 734 Stationary source emission - Determination of volatile organic compounds - Sorbent adsorption and thermal desorption gas chromatography mass spectrometry method (for release)

Measures for automatic monitoring and control of pollution sources (Order No.28 of the State Environmental Protection Administration)

Measures for administration of environmental monitoring (Order No.39 of the State Environmental Protection Administration)

3 Terms and definitions

The following terms and definitions apply to this standard.

3.1

Synthetic resin

A kind of artificially synthetic polymer, which is divided into two types of synthetic resins, thermoplastic and thermosetting, according to the behavior after being heated. Wherein: the thermoplastic synthetic resin is a viscous liquid or a heating softenable solid, which melts or softens when heated, is in a plastic flow state under the action of an external force; the thermosetting synthetic resin is the insoluble, infusible synthetic resin which is subjected to chemical reactions under heating and pressure or under the action of the curing agent and UV-light and finally cross-linked and solidified, which is not

reach grade II or above.

3.6

Direct discharge

The behavior of pollutant discharge units directly discharging water pollutants into environmental water bodies.

3.7

Indirect discharge

The behavior of pollutant discharge units discharging water pollutants into the public wastewater treatment system.

3.8

Volatile organic compounds

An organic compound that participates in atmospheric photochemical reactions, or organic compound which is determined through measurement or verification in accordance with the specified methods.

3.9

Non-methane hydrocarbon

The general name of the hydrocarbons other than methane (in terms of carbon) which causes the detector to generate apparent response by the use of the specified monitoring method. This standard uses "Non-methane hydrocarbons (NMHC)" as a comprehensive control indicator for exhaust funnel and volatile organic emissions at the plant boundary.

3.10

Volatile organic liquid

Any organic liquid that releases volatile organic compounds to the atmosphere in any of the following conditions: (1) At 20 °C, the true vapor pressure of the volatile organic liquid is greater than 0.3 kPa; (2) At 20 °C, in the mixture, the total concentration of pure organic compound which has a true vapor pressure greater than 0.3 KPa is equal to or higher than 20% (by weight).

3.11

True vapor pressure

From the date of implementation of this standard, the construction projects of the newly-built, rebuilt and extended synthetic resin industry whose environmental impact assessment is approved.

3.18

Enterprise boundary

The legal boundary of synthetic resin industrial enterprises. If the boundary cannot be determined, it refers to the boundary of actual land occupation of the enterprise or production facility.

4 Control requirements for water pollutant discharge

4.1 Existing facility will still implement the current standards before July 1, 2017, implement the water pollutant discharge limits as specified in Table 1 from July 1, 2017.

4.2 From July 1, 2015, the new facility shall implement the limit of water pollutant discharge as specified in Table 1.

Table 1 -- Limit of water pollutant discharge

Unit: mg/L (except pH)

No.	Pollutant item	Limit value		Applicable type of synthetic resin	Monitoring location of pollution discharge
		Direct discharge	Indirect discharge ⁽¹⁾		
1	pH value	6.0 ~ 9.0	-	All synthetic resins	Trunk wastewater outlet of enterprise
2	Suspended matter	30	-		
3	Chemical oxygen demand	60	-		
4	5-day biochemical oxygen demand	20	-		
5	Ammonia nitrogen	8.0	-		
6	Total nitrogen	40	-		
7	Total phosphorus	1.0	-		
8	Total organic carbon	20	-		
9	Absorbable organic halides	1.0	5.0		
10	Styrene	0.3	0.6	Polystyrene resin ABS resin Unsaturated polyester resin	
11	Acrylonitrile	2.0	2.0	ABS resin	
12	Epichlorohydrin	0.02	0.02	Epoxy resin Amino resin	

synthetic resin recycling and reprocessing enterprises or production facilities shall, based on the corresponding types of synthetic resin, implement the standard limits of Table 4, Table 5, respectively.

5.1.5 For the non-incineration-type organic waste-gas discharge port, it uses the measured emission to determine whether the emission is up to standard. The measured concentration of air pollutant emission of the incineration-type organic waste-gas discharge port shall be converted into the benchmark emission concentration of air pollutant which has a benchmark oxygen content of 3%, compared with the emission limit to determine whether the emission is up to standard. The benchmark emission concentration of air pollutant is calculated according to formula (2).

$$\rho_{\text{benchmark}} = [(21 - O_{\text{benchmark}}) / (21 - O_{\text{measured}})] \times \rho_{\text{measured}} \quad (2)$$

Where:

$\rho_{\text{benchmark}}$ - Benchmark emission concentration of air pollutants, mg/m³;

$O_{\text{benchmark}}$ - Benchmark oxygen content of dry flue gas, %;

O_{measured} - Measured oxygen content of dry flue gas, %;

ρ_{measured} - Measured emission concentration of air pollutant, mg/m³.

5.2 Pollution control requirements for storage tank of volatile organic liquid

5.2.1 From July 1, 2015 for new facility and July 1, 2017 for existing facility, it shall implement the following pollution control requirements for the storage tank of volatile organic liquid.

5.2.2 Volatile organic liquids which has a true vapor pressure ≥ 76.6 kPa shall be stored in a pressure tank.

5.2.3 The storage tank for volatile organic liquids which has a true vapor pressure ≥ 5.2 kPa but < 27.6 kPa and a design volume ≥ 150 m³, as well as the storage tank for volatile organic liquids which has a true vapor pressure ≥ 27.6 kPa but < 76.6 kPa and a design volume ≥ 75 m³, shall comply with one of the following requirements:

- a) Use the covered floating-roof tank; use the liquid-inlaid, mechanical shoe-shaped, double-sealed and other high-efficiency sealing methods between the floating plate and the tank wall of the covered floating-roof tank.
- b) Use the external floating-roof tank; it shall use the double-seal between the floating plate and the tank wall of the external floating-roof tank, the

and pipeline components:

- a) Pumps, compressors, valves, open valves or open-ended lines, gas/vapor pressure relief equipment, sampling connection system are tested once every 3 months.
- b) Flanges and other connectors and other sealing equipment are tested once every 6 months.
- c) For the equipment and pipeline components that are operated after the initial start through which the volatile organic liquid flows shall be tested for the first time within 30 days after commencement of operation.
- d) Equipment and pipeline components through which volatile organic liquids flow shall be visually observed weekly, to check for signs of dripping at the seal.

5.3.4 Determination of leakage

Under the following conditions, it is determined that leakage occurs:

- a) For the equipment and pipeline components through which organic gases and volatile organic liquids flow, if using a hydrogen flame ionization detector (with methane or propane as the calibration gas), and the detected leakage is greater than or equal to 2000 $\mu\text{mol/mol}$.
- b) For equipment and pipeline components of other volatile organic streams, if using a hydrogen flame ionization detector (with methane or propane as the calibration gas), and the detected leakage is greater than or equal to 500 $\mu\text{mol/mol}$.

5.3.5 Repair of leakage

- a) When a leakage is detected, it shall be repaired as soon as practicable, generally no later than 15 days after the leakage is found.
- b) The first (attempted) repair shall be no later than 5 days after the leakage is detected. The first attempted repair shall include, but is not limited to, the following measures: tightening the seal nut or gland, seal flush at design pressure and temperature.
- c) After detecting the leakage, if the repair is not technically possible within 15 days without closing the process unit, the repair may be delayed, but not later than the most recent downtime.

5.3.6 Recording requirements

The leakage detection shall record the detection time and the reading of the

of the enterprise's pollutant discharge and the local natural and meteorological conditions, with reference to the technical guidelines for relevant environmental impact assessment. The local government shall be responsible for the environmental quality of its jurisdiction, take measures to ensure that the environmental conditions meet the requirements of environmental quality standards.

6 Monitoring requirements for pollutant

6.1 General requirements

6.1.1 The enterprise shall, in accordance with provisions of relevant laws and the "Administrative measures for environmental monitoring", establish an enterprise monitoring system, formulate a monitoring plan, conduct self-monitoring on the discharge status of pollutants and its impact on the quality of the surrounding environment, maintain the original monitoring records, release the monitoring results.

6.1.2 The requirements for the installation of automatic monitoring equipment for pollutant discharge by new facility and existing facility shall be implemented in accordance with the provisions of relevant laws and the "Administrative measures for automatic monitoring of pollution sources".

6.1.3 The enterprise shall, in accordance with the requirements of environmental monitoring management provisions and technical specifications, design, construct, maintain permanent sampling ports, sampling test platforms and discharge outlet signs.

6.1.4 Sampling of waste water and waste gas from enterprises shall be carried out, according to the type of pollutants to be monitored, at the specified position for pollutant discharge monitoring. If there are wastewater or waste gas treatment facilities, monitoring shall be carried out downstream of the treatment facility.

6.1.5 The verification of the output of synthetic resin enterprises shall be based on statutory statements.

6.2 Monitoring and analysis of water pollutants

6.2.1 Monitoring sampling of water pollutants shall be carried out in accordance with the provisions of HJ/T 91, HJ 493, HJ 494 and HJ 495.

6.2.2 The determination of the concentration of the water pollutant as discharged from the enterprise shall use the method standards as listed in Table 10.

26	Total chromium	Water quality - Determination of total chromium	GB/T 7466
		Water quality - Determination of 65 elements - Inductively coupled plasma mass spectrometry	HJ 700
27	Hexavalent chromium	Water quality - Determination of chromium (6) - 1.5 Diphenylcarbazide spectrophotometric method	GB/T 7467

6.3 Monitoring and analysis of air pollutant

6.3.1 Monitoring sampling of air pollutants in the exhaust funnel shall be carried out in accordance with the provisions of GB/T 16157, HJ/T 397, HJ 732, HJ/T 373 or HJ/T 75 and HJ/T 76. The monitoring of air pollutants at the enterprise boundary is carried out in accordance with the provisions of HJ/T 55.

6.3.2 Equipment and pipeline components of synthetic resin industrial enterprises shall be provided with numbers and permanent signs, the leakage detection shall be carried out in accordance with the provisions of HJ 733.

6.3.3 The determination of concentration of air pollutants emitted by enterprise shall use the method standards as listed in Table 11.

Table 11 -- Method standards for determination of air pollutant's concentration

No.	Pollutant item	Standard name	Standard number
1	Non-methane total hydrocarbon	Stationary source emission - Determination of nonmethane hydrocarbons - Gas chromatography	HJ/T 38
2	Particulate matter	The determination of particulates and sampling methods of gaseous pollutants emitted from exhaust gas of stationary source	GB/T 16157
		Ambient air - Determination of total suspended particulates - Gravimetric method	GB/T 15432
3	Acrylonitrile	Stationary source emission - Determination of acrylonitrile - Gas chromatography	HJ/T 37
4	Phenols	Stationary source emission - Determination of phenols - 4-Amino-antipyrine spectrophotometric method	HJ/T 32
5	Formaldehyde	Air quality - Determination of formaldehyde - Acetylacetone spectrophotometric method	GB/T 15516
6	Acetaldehyde	Stationary source emission - Determination of acetaldehyde - Gas chromatography	HJ/T 35
7	Ammonia	Air and exhaust gas - Determination of ammonia - Nessler's reagent spectrophotometry	HJ 533
8	Hydrogen fluoride	Stationary source emission - Determination of fluoride - Ion selective electrode method	HJ/T 67
		Water quality - Determination of volatile organic compounds - Purge and trap/gas chromatography (provisional)	HJ 688

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