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National Standard of the People's Republic of China

GB 21900—2008

电镀污染物排放标准
Emission Standard of Pollutants for
Electroplating
(Script for issuance)

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Foreword

This Standard is formulated to implement the laws and regulations, including *Environmental Protection Law of the People's Republic of China*, *Law of the People's Republic of China on Prevention and Control of Water Pollution*, *Law of the People's Republic of China on Prevention and Control of Air Pollution*, *Marine Environment Protection Law of the People's Republic of China* and *Decision of the State Council on Implementing Scientific Viewpoint of Development and Strengthening Environmental Protection*, etc, as well as *Opinions of the State Council on Compiling National Main Function Divisions*, protect environment, prevent/control pollution and promote the progress of electroplating manufacturing technique and pollution control technology.

This Standard has specified the limit values for water and atmospheric pollutants discharges from electroplating enterprises and the requirements for monitoring and supervision. In order to promote the harmonious development between regional economies and environment, drive the adjustment of economic structure and form transformation of economic growth and guide the developing direction of electroplating manufacturing technique and pollution control technology, This Standard has specified the special limit values for discharge of water pollutants.

The discharge of odor pollutant and ambient noise by electroplating enterprises shall be subject to the corresponding national standards for pollutant discharges, while the authentication, treatment and disposition of solid wastes produced shall be subject to the national standards for control of solid wastes.

This Standard is issued for the first time.

From the implementation date of this Standard, the discharge of water and atmospheric pollutants from electroplating enterprises shall execute the stipulations of this Standard and stop executing the relevant stipulations of *Integrated wastewater discharge standard* (GB 8978-1996) and *Integrated emission standard of air pollutants* (GB 16297-1996).

This Standard is developed by Department of Science & Technology and Standards of Ministry of Environmental Protection.

Main drafting units of this Standard: CNGC Enviro-tech Development Co., Ltd., Environmental Standards Research Institute of Ministry of Environmental Protection, China North Industry Group Corporation, Shijiazhuang Environmental Monitoring Centre Station, Beijing Electroplating Association and Inner Mongolia North Heavy Industries Group Corp. Ltd..

This Standard was approved by the Ministry of Environmental Protection on April 29, 2008.

This Standard shall be implemented from August 1, 2008.

This Standard shall be construed by Ministry of Environmental Protection.

Standard for discharge of electroplating pollutants

1. Scope of application

This Standard has stipulated the limit values and other contents for discharge of electroplating water pollutants and air pollutants from electroplating enterprises or the enterprises with electroplating facilities.

This Standard is applicable to water pollutant discharge management and air pollutant discharge management of existing electroplating enterprises.

This Standard is applicable to the evaluation on environmental impact, design of facilities for environmental protection, acceptance of facilities for environmental protection upon completion and water/ air pollutants discharge management after operation is started, of the construction projects in electroplating enterprises.

This Standard is also applicable to the facilities for anodisation surface treatment process.

This Standard is applicable to the pollutant discharge actions permitted by laws; the management on the pollution sources in new sites selected and the existing pollution sources within especially protected zones shall execute the relevant provisions set forth by such laws, rules and regulations as *Law of the People's Republic of China on Prevention and Control of Air Pollution*, *Law of the People's Republic of China on Prevention and Control of Water Pollution*, *Marine Environment Protection Law of the People's Republic of China*, *Law of the People's Republic of China on Prevention and Control of Solid Waste Pollution*, *Law of the People's Republic of China on Prevention and Control of Radioactive Pollution* and *Methods for Evaluation on Environmental Impact of the People's Republic of China*, etc.

The requirements for control of water pollutant discharge are applicable to the discharge into environmental water bodies by enterprises.

When an enterprise is discharging waste water to the drainage system of a city or town with sewage disposal plant, the total chromium, hexavalent chrome, total nickel, total cadmium, total silver, total lead and total mercury among pathogenic pollutants shall be subject to the corresponding discharge limits at monitoring locations as specified by this Standard; the requirements for discharge control of other pollutants shall be determined through discussions between enterprises and town sewage disposal plant based on the capacity of sewage disposal, or execute the relevant standards, which should be submitted to the competent department for environmental protection for reference; a town sewage disposal plant shall ensure that the discharged pollutants have reached the requirements of relevant discharge standard.

When a construction project is to discharge waste water to the drainage system of a city or town with sewage disposal plant, the Client and town sewage disposal plant shall execute the stipulations set forth in previous paragraph.

2. Normative references

This Standard has quoted the following documents or the articles thereof.

GB/T 6920 -1986 Water quality - Determination of pH value - Glass electrode method

GB/T 7466-1987 Water quality - Determination of total chromium - Potassium permanganate oxidation – diphenylcarbazide spectrophotometry

GB/T 7467-1987 Water quality - Determination of hexavalent chromium - diphenylcarbazide

spectrophotometry

GB/T 7468-1987 Water quality - Determination of total mercury - Cold atomic absorption spectrophotometry

GB/T 7469-1987 Water quality - Determination of mercury - Spectrophotometric method with Dithizonc

GB/T 7470-1987 Water quality - Determination of lead - Spectrophotometric method with Dithizonc

GB/T 7471-1987 Water quality - Determination of cadmium- Spectrophotometric method with Dithizonc

GB/T 7472-1987 Water quality - Determination of zinc - Spectrophotometric method with Dithizonc

GB/T 7473-1987 Water quality - Determination of copper - 2,9 Dimethy 1,10-phenanthrofine spectrophotometric method

GB/T 7474-1987 Water quality - Determination of copper-Sodium dtethyldithiocabamate spectrophotometric method

GB/T 7475-1987 Water quality - Determination of copper, zinc, lead and cadmium-Atomic absorption spectrometry

GB/T 7478-1987 Water quality - Determination of ammonium - Distillation and titration method

GB/T 7479-1987 Water quality - Determination of ammonium - Nesster's reagent colorimetric method

GB/T 7481-1987 Water quality - Determination of ammonium - Spectrophotometric method with salicylic acid

GB/T 7483-1987 Water quality - Determination of fluoride - Spectrophotometric method with fluoric reagent

GB/T 7484-1987 Water quality-Determination of fluoride-Ion selective electrode method

GB/T 7486-1987 Water quality-Determination of cyanide - Silver nitrate titration method

GB/T 7487-1987 Water quality-Determination of cyanide - Isonicotinic acid - pyrazolone colorimetric method

GB/T 11893-1989 Water quality - Determination of total phosphorus - Ammonium molybdate spectrophotometric method

GB/T 11894-1989 Water quality - Determination of total nitrogen - Alkaline potassium persulfate digestion - UV spectrophotometric method

GB/T 11901-1989 Water quality - Determination of suspended substance - Gravimetric method

GB/T 11907-1989 Water quality - Determination of silver - Flame atomic absorption spectrophotometric method.

GB/T 11908-1989 Water quality - Determination of silver - Spectrophotometry with cadion 2B

GB/T 11910-1989 Water quality - Determination of nickel - Dimethylglyoxime spectrophotometric method

GB/T 11911-1989 Water quality - Determination of iron - Flame atomic absorption spectrophotometric method.

GB/T 11912-1989 Water quality - Determination of nickel - Flame atomic absorption

spectrophotometric method

GB/T 11914-1989 Water quality - Determination of the chemical oxygen demand - Dichromate method

GB/T 16157-1996 The determination of particulates and sampling methods of gaseous pollutants from exhaust gas of stationary pollution source

GB/T 16488-1996 Water quality - Determination of petroleum oils - Infrared photometric method

GB 18871-2002 Basic safety standards for protection against ionizing radiation and for the safety of radiation resource

HJ/T 27-1999 Stationary source emission - determination of hydrogen chloride - Mercuric thiocyanate spectrophotometric method

HJ/T 28-1999 Stationary source emission - Determination of hydrogen cyanide - Isonicotinic-acid-3-methyl-1-phenyl-5- pyrazolone spectrophotometric method

HJ/T 29-1999 Stationary source emission - Determination of chromate fog - Diphenyl carbazide spectrophotometric method

HJ/T 42-1999 Stationary source emission - Determination of nitrogen oxide - Ultraviolet spectrophotometric method

HJ/T 43-1999 Stationary source emission - Determination of nitrogen oxide -N-(1-naphthyl)-ethylenediamine spectrophotometric method

HJ/T 67-2001 Stationary source emission- Determination of fluoride-Ion selective electrode method

HJ/T 84-2001 Water quality - Determination of fluoride - ion chromatography

HJ/T 195-2005 Water quality - Determination of ammonia - nitrogen by gas-phase molecular absorption spectrometry

HJ/T 199-2005 Water quality - Determination of total nitrogen by gas-phase molecular absorption spectrometry

HJ/T 345-2007 Water quality - Determination of iron - Phenanthroline spectrophotometry (try out)

The Method of Automatic Monitoring and Managing the Source of Pollution (Order No.28 by State Environmental Protection Administration)

Environmental Monitoring and Management Methods (Order No.39 by State Environmental Protection Administration)

3. Technical terms and definitions

The following technical terms and definitions are applicable to this Standard.

3.1 Electroplating

It means the process to deposit one layer of uniform, dense and well-coherent metal or alloy on the surface of parts by electrolytic method, including the treatments (deoil and derusting) before plating, plating of metallic layer and treatments after plating (passivation and dehydrogenation).

3.2 Existing enterprises

It means the plating enterprises and plating facilities that have been built and put into production or the documents for evaluation of environmental impact have been approved

before the implementation date of this Standard.

3.3 Newly-built enterprises

It means the construction projects of newly-built, reconstructed or expanded plating facilities that the documents for evaluation of environmental impact have been approved from the implementation date of this Standard.

3.4 Zinking

It means the process to deposit the plating coat of metallic zinc on the surface of parts by dipping the parts into zinc-plating solution as cathode and using zinc plate as anode while switching on DC power supply.

3.5 Chromium plating

It means the process to deposit the plating coat of metallic chrome on the surface of parts by dipping the parts into chrome-plating solution as cathode and using lead alloy as anode while switching on DC power supply.

3.6 Nickel plating

It means the process to deposit the plating coat of metallic nickel on the surface of parts by dipping the parts into nickel salt plating solution as cathode and using metallic nickel plate as anode while switching on DC power supply.

3.7 Copper plating

It means the process to deposit the plating coat of metallic copper on the surface of parts by dipping the parts into metallic copper salt plating solution as cathode and using electrolytic copper as anode while switching on DC power supply.

3.8 Anodisation

It means the process to form an oxide film on the surface of parts through electrolytic method by using metal or alloy parts as anode. The process of anodisation treatment on the surface of iron and steel parts is called bluing.

3.9 Monolayer plating

It means the process to form a single metal or alloy plating coat on the surface of parts through a single electroplating.

3.10 Multilayer plating

It means the process to form a composite plating coat on the surface of parts through two or more times of electroplating. For example, if a steel part needs to have a protection – decoration chromium plating coat, it is necessary to plate a medium plating coat (plated copper, nickel or low tin bronze) before chromium plating.

3.11 Water discharge

It means the volume of waste water discharged out of the legal boundary of an enterprise by production facilities or the enterprise, including various waste water discharged outwards that have direct or indirect connections with production (such as domestic sewage in factory area, waste water of cooling, drainages from boiler and transformer substation in factory area, etc).

3.12 Reference water discharge volume for per unit products

It means the upper limit of waste water discharge to generate unit area plating coat on plated parts for the specified concentration of water pollutant so approved.

3.13 Waste gas discharge

It means the volume of waste gas from production process discharged into environment through exhaust duct by the production facilities of an enterprise.

3.14 Reference waste gas discharge for per unit products

It means the upper limit of waste gas discharge to generate unit area plating coat on plated parts for the specified concentration of waste air pollutant so approved.

3.15 Standard condition

It means the condition when temperature is 273.15K and pressure is 101,325Pa. The concentration limit for discharge of air pollutant specified in this Standard is based on the dry gas under standard condition.

4 Requirements for control of pollutant discharge

4.1 Requirements for control of water pollutant discharge

4.1.1 The limit values for discharge of water pollutant from existing enterprises shall execute the stipulations specified in Table 1 during the time period from January 1st of 2009 to June 30th of 2010.

Table 1 Limit values for discharge of water pollutant from existing enterprises

No.	Pollutant item	Discharge limit	Monitoring location for pollutant discharge
1	Total chromium (mg/L)	1.5	Discharge outlet of waste water from workshop or production facilities
2	Sexavalent chromium (mg/L)	0.5	Discharge outlet of waste water from workshop or production facilities
3	Total nickel (mg/L)	1.0	Discharge outlet of waste water from workshop or production facilities
4	Total cadmium (mg/L)	0.1	Discharge outlet of waste water from workshop or production facilities
5	Total silver (mg/L)	0.5	Discharge outlet of waste water from workshop or production facilities
6	Total lead (mg/L)	0.1	Discharge outlet of waste water from workshop or production facilities
7	Total mercury (mg/L)	0.05	Discharge outlet of waste water from workshop or production facilities
8	Total copper (mg/L)	1.0	General discharge outlet of waste water from enterprises
9	Total zinc (mg/L)	2.0	General discharge outlet of waste water from enterprises
10	Total iron (mg/L)	5.0	General discharge outlet of waste water from enterprises
11	Total aluminum (mg/L)	5.0	General discharge outlet of waste water from enterprises
12	pH value	6~9	General discharge outlet of waste water from enterprises
13	Suspended substance (mg/L)	70	General discharge outlet of waste water from enterprises
14	Chemical oxygen demand (COD _{Cr} , mg/L)	100	General discharge outlet of waste water from enterprises
15	Ammonia - nitrogen (mg/L)	25	General discharge outlet of waste water from enterprises
16	Total nitrogen (mg/L)	30	General discharge outlet of waste water from enterprises
17	Total phosphonium (mg/L)	1.5	General discharge outlet of waste water from enterprises
18	Petroleum oils (mg/L)	5.0	General discharge outlet of waste water from enterprises
19	Fluoride (mg/L)	10	General discharge outlet of waste water from enterprises
20	Total cyanide (by CN ⁻ , mg/L)	0.5	General discharge outlet of waste water from enterprises
Reference water discharge per unit products, L/m ² (plating coat of plated parts)	Multiple plating coats	750	The location for measurement of water discharge shall be consistent with the location for pollutant discharge monitoring
	Single plating coats	300	

4.1.2 The existing enterprises shall begin to execute the limit values for discharge of water

pollutant specified in Table 2 from July 1st of 2010.

- 4.1.3** The newly-built enterprises shall begin to execute the limit values for discharge of water pollutant specified in Table 2 from August 1st of 2008.

Table 2 Limit values for discharge of water pollutant from newly-built enterprises

No.	Pollutant item	Discharge limit	Monitoring location for pollutant discharge
1	Total chromium (mg/L)	1.0	Discharge outlet of waste water from workshop or production facilities
2	Sexavalent chromium (mg/L)	0.2	Discharge outlet of waste water from workshop or production facilities
3	Total nickel (mg/L)	0.5	Discharge outlet of waste water from workshop or production facilities
4	Total cadmium (mg/L)	0.05	Discharge outlet of waste water from workshop or production facilities
5	Total silver (mg/L)	0.3	Discharge outlet of waste water from workshop or production facilities
6	Total lead (mg/L)	0.2	Discharge outlet of waste water from workshop or production facilities
7	Total mercury (mg/L)	0.01	Discharge outlet of waste water from workshop or production facilities
8	Total copper (mg/L)	0.5	General discharge outlet of waste water from enterprises
9	Total zinc (mg/L)	1.5	General discharge outlet of waste water from enterprises
10	Total iron (mg/L)	3.0	General discharge outlet of waste water from enterprises
11	Total aluminum (mg/L)	3.0	General discharge outlet of waste water from enterprises
12	pH value	6~9	General discharge outlet of waste water from enterprises
13	Suspended substance (mg/L)	50	General discharge outlet of waste water from enterprises
14	Chemical oxygen demand (COD _{Cr} , mg/L)	80	General discharge outlet of waste water from enterprises
15	Ammonia - nitrogen (mg/L)	15	General discharge outlet of waste water from enterprises
16	Total nitrogen (mg/L)	20	General discharge outlet of waste water from enterprises
17	Total phosphonium (mg/L)	1.0	General discharge outlet of waste water from enterprises
18	Petroleum oils (mg/L)	3.0	General discharge outlet of waste water from enterprises
19	Fluoride (mg/L)	10	General discharge outlet of waste water from enterprises
20	Total cyanide (by CN ⁻ , mg/L)	0.3	General discharge outlet of waste water from enterprises
Reference water discharge per unit products, L/m ² (plating coat of plated parts)	Multiple plating coats	500	The location for measurement of water discharge shall be consistent with the location for pollutant discharge monitoring
	Single plating coats	200	

- 4.1.4** In accordance with the requirements for environmental protection work, in the regions where it is necessary to take protective measures as the density of territorial development is higher, the bearing capacity of environment is becoming lower and lower, or the capacity of water environment is smaller and ecological environment is fragile, which is subject to severe water environmental pollution, it shall strictly control the discharge actions of facilities, and the enterprises located in above regions shall execute the special

limit values for discharge of water pollutant as specified in Table 3.

The territorial scope and time period for execution of the special limit values for water pollutant discharge shall be specified by the competent department for environmental protection of the State Council or the people's government above provincial level.

Table 3 Special limit values for water pollutant discharge

No.	Pollutant item		Discharge limit	Monitoring location for pollutant discharge
1	Total chromium (mg/L)		0.5	Discharge outlet of waste water from workshop or production facilities
2	Sexavalent chromium (mg/L)		0.1	Discharge outlet of waste water from workshop or production facilities
3	Total nickel (mg/L)		0.1	Discharge outlet of waste water from workshop or production facilities
4	Total cadmium (mg/L)		0.01	Discharge outlet of waste water from workshop or production facilities
5	Total silver (mg/L)		0.1	Discharge outlet of waste water from workshop or production facilities
6	Total lead (mg/L)		0.1	Discharge outlet of waste water from workshop or production facilities
7	Total mercury (mg/L)		0.005	Discharge outlet of waste water from workshop or production facilities
8	Total copper (mg/L)		0.3	General discharge outlet of waste water from enterprises
9	Total zinc (mg/L)		1.0	General discharge outlet of waste water from enterprises
10	Total iron (mg/L)		2.0	General discharge outlet of waste water from enterprises
11	Total aluminum (mg/L)		2.0	General discharge outlet of waste water from enterprises
12	pH value		6~9	General discharge outlet of waste water from enterprises
13	Suspended substance (mg/L)		30	General discharge outlet of waste water from enterprises
14	Chemical oxygen demand (COD _{Cr} , mg/L)		50	General discharge outlet of waste water from enterprises
15	Ammonia - nitrogen (mg/L)		8	General discharge outlet of waste water from enterprises
16	Total nitrogen (mg/L)		15	General discharge outlet of waste water from enterprises
17	Total phosphonium (mg/L)		0.5	General discharge outlet of waste water from enterprises
18	Petroleum oils (mg/L)		2.0	General discharge outlet of waste water from enterprises
19	Fluoride (mg/L)		10	General discharge outlet of waste water from enterprises
20	Total cyanide (by CN ⁻ , mg/L)		0.2	General discharge outlet of waste water from enterprises
Reference water discharge per unit products, L/m ² (plating coat of plated parts)	Multiple plating coats	250	The location for measurement of water discharge shall be consistent with the location for pollutant discharge monitoring	
	Single plating coats	100		

4.1.5 In addition to compliance with this Standard, the discharge of waste water containing radioactive substances shall also conform to the stipulations of GB 18871.

4.1.6 The limit values for the concentration of water pollutant discharge shall be applicable to the conditions that the actual water discharge per unit products is no higher than the reference water discharge per unit products. If the actual water discharge per unit products is higher than the reference water discharge per unit products, it shall use

Formula (1) to convert the measured concentration of water pollutant into the concentration of water pollutant for reference water discharge, and this concentration of water pollutant for reference water discharge shall be used as the basis to determine if the discharge has reached standard or not. The period for statistics on product yield and water discharge shall be one working day.

When the production facilities of an enterprise are producing two or more products, which can implement different discharge control requirements or the national standards for pollutant discharge for different industries, and the waste water from production facilities are treated and discharged in a combined manner, it shall execute the most rigorous limits for concentration specified in emission standards, while the concentration of water pollutant for reference water discharge is to be converted by Formula (1):

$$C_{base} = \frac{Q_{total}}{\sum Y_i Q_{ibase}} \times C_{actual}$$

Where:

C_{base} ----- concentration of water pollutant for reference water discharge (mg/L)

Q_{total} ----- total volume of water discharge (m³)

Y_i ----- yield of plating coat on certain plated parts (m²)

Q_{ibase} ----- reference volume of water discharge per products of certain plated parts (m³/m²)

C_{actual} ----- measured concentration of water pollutant (mg/L)

If the ratio between Q_{total} and $\sum Y_i Q_{ibase}$ is smaller than 1, then the measured concentration of water pollutant shall be used as basis to determine if the discharge has reached standard or not

4.2 Requirements for control of air pollutant discharge

4.2.1 The existing enterprises shall execute the limit values for air pollutant discharge as specified in Table 4 during the time period from January 1st of 2009 to June 30th of 2010.

Table 4 Limit values for air pollutant discharge from existing enterprises

No.	Pollutant item	Discharge limit (mg/m ³)	Monitoring location for pollutant discharge
1	hydrogen chloride	50	Exhaust duct of workshop or production facilities
2	chromic acid mist	0.07	Exhaust duct of workshop or production facilities
3	sulfuric acid mist	40	Exhaust duct of workshop or production facilities
4	Nitrogen oxide	240	Exhaust duct of workshop or production facilities
5	hydrogen cyanide	1.0	Exhaust duct of workshop or production facilities
6	fluoride	9	Exhaust duct of workshop or production facilities

4.2.2 The existing enterprises shall execute the limit values for air pollutant discharge as specified in Table 5 from July 1st of 2010.

4.2.3 The newly-built enterprises shall execute the limit values for air pollutant discharge as specified in Table 5 from August 1st of 2008.

Table 5 Limit values for air pollutant discharge from newly-built enterprises

No.	Pollutant item	Discharge limit (mg/m ³)	Monitoring location for pollutant discharge
1	hydrogen chloride	30	Exhaust duct of workshop or production facilities

2	chromic acid mist	0.05	Exhaust duct of workshop or production facilities
3	sulfuric acid mist	30	Exhaust duct of workshop or production facilities
4	Nitrogen oxide	200	Exhaust duct of workshop or production facilities
5	hydrogen cyanide	0.5	Exhaust duct of workshop or production facilities
6	fluoride	7	Exhaust duct of workshop or production facilities

4.2.4 Both of existing and newly-built enterprises shall execute the reference gas discharge per unit products as listed in Table 6

Table 6 Reference gas discharge per unit products

No.	Technique	Reference gas discharge m ³ /m ² (plating coat of plated parts)	Monitoring location for pollutant discharge
1	Zinking	18.6	Exhaust duct of workshop or production facilities
2	chromium plating	74.4	Exhaust duct of workshop or production facilities
3	Other types of plating (copper plating and nickel plating)	37.3	Exhaust duct of workshop or production facilities
4	Anodisation	18.6	Exhaust duct of workshop or production facilities
5	Bluing	55.8	Exhaust duct of workshop or production facilities

4.2.5 Devices for production process that produce air pollutant must be equipped with local gas collecting system and concentrated purifying device, where, the purified gas shall be discharged through exhaust duct. The height of said exhaust duct shall be no less than 15m, while the height of said exhaust duct to discharge the gas containing hydrogen cyanide shall be no less than 25m. The exhaust duct shall be 5m or more higher than the buildings within 200m radius around; for the exhaust duct that can not satisfy this required height, it shall be subject to 50% of limit value for discharge concentration.

4.2.6 The limit value for discharge concentration of air pollutant is applicable to the condition that the actual gas discharge per unit products is no higher than the reference gas discharge per unit products. If the actual gas discharge per unit products is higher than the reference gas discharge per unit products, it is necessary to convert the measured concentration of air pollutant into the concentration of air pollutant for reference water discharge, and this concentration of air pollutant for reference air discharge shall be used as the basis to determine if the discharge has reached standard or not. The conversion of reference air discharge concentration can refer to the formula for calculation of reference water pollutant discharge concentration.

The statistic period for product yield and gas discharge is one working day.

5 Requirements for monitoring of pollutants

5.1 General requirements for monitoring of pollutant

5.1.1 The waste water and gas discharged from enterprises shall be sampled according to the types of pollutant under monitoring at the specified location for pollutant discharge monitoring, if there are waste water and gas disposal facilities established, the monitoring should be conducted behind such facilities. It must erect a permanent pollutant discharge

outlet sign at the location for pollutant discharge monitoring.

- 5.1.2** Newly-built facilities shall be equipped with automatic monitoring equipment for pollutant discharge according to the stipulations of *Management methods for automatic monitoring of pollution source*, which should be networked with the monitoring center of local environmental protection department and the equipment be ensured to run in normal manner. The requirement for existing enterprises to install automatic monitoring equipment for pollutant discharge shall be specified by the competent department for environmental protection of provincial level.
- 5.1.3** The requirements for monitoring frequency and sampling time, etc, to the pollutant discharge of enterprises shall be subject to the state provisions on the technical norm of pollution source monitoring.
- 5.1.4** Determination of plating coat area of plated parts shall be based on legal report forms.
- 5.1.5** Enterprises shall conduct monitoring on pollution discharge according to the stipulations of relevant laws and *Management methods for environmental monitoring* and preserve the original monitoring records.
- 5.2** Requirements for monitoring of water pollutant
- 5.2.1** Concentration of water pollutant discharged from enterprises shall be determined by the method standards listed in Table 6.

Table 6 Method standards for determination of water pollutant concentration

No.	Pollutant item	Title of method standard	Code of method standard
1	Total chromium	Water quality - Determination of total chromium - Potassium permanganate oxidation - diphenylcarbazide spectrophotometry	GB/T 7466-1987
2	Sexavalent chromium	Water quality - Determination of sexavalent chromium - diphenylcarbazide spectrophotometry	GB/T 7467-1987
3	Total nickel	Water quality - Determination of nickel - Dimethylglyoxime spectrophotometric method	GB/T 11910-1989
		Water quality - Determination of nickel - Flame atomic absorption spectrophotometric method	GB/T 11912-1989
4	Total cadmium	Water quality - Determination of cadmium-Spectrophotometric method with Dithizone	GB/T 7471-1987
		Water quality - Determination of copper, zinc, lead and cadmium-Atomic absorption spectrometry	GB/T 7475-1987
5	Total silver	Water quality - Determination of silver - Flame atomic absorption spectrophotometric method.	GB/T 11907-1989
		Water quality - Determination of silver - Spectrophotometry with cadion 2B	GB/T 11908-1989
6	Total lead	Water quality - Determination of lead - Spectrophotometric method with Dithizone	GB/T 7470-1987
		Water quality - Determination of copper, zinc, lead and cadmium-Atomic absorption spectrometry	GB/T 7475-1987
7	Total mercury	Water quality - Determination of total mercury - Cold atomic absorption spectrophotometry	GB/T 7468-1987
		Water quality - Determination of mercury - Spectrophotometric method with Dithizone	GB/T 7469-1987
8	Total copper	Water quality - Determination of copper - 2,9 Dimethyl 1,10-phenanthroline spectrophotometric method	GB/T 7473-1987
		Water quality - Determination of copper-Sodium diethyldithiocarbamate spectrophotometric method	GB/T 7474-1987
		Water quality - Determination of copper, zinc, lead and cadmium-Atomic absorption spectrometry	GB/T 7475-1987
9	Total zinc	Water quality - Determination of zinc - Spectrophotometric method with Dithizone	GB/T 7472-1987
		Water quality - Determination of copper, zinc, lead and cadmium-Atomic absorption spectrometry	GB/T 7475-1987
10	Total iron	Water quality - Determination of iron - Flame atomic absorption spectrophotometric method	GB/T 11911-1989
		Water quality - Determination of iron - Phenanthroline spectrophotometry (try out)	HJ/T 345-2007
11	Total aluminum	Water quality - Determination of aluminium - indirect flame atomic absorption method	See appendix A
		Water quality - Determination of aluminium -Inductively Coupled Plasma Emission Spectroscopy	See appendix B

12	pH value	Water quality - Determination of pH value - Glass electrode method	GB/T 6920 -1986
13	Suspended substance	Water quality - Determination of suspended substance - Gravimetric method	GB/T 11901-1989
14	Chemical oxygen demand	Water quality - Determination of the chemical oxygen demand - Dichromate method	GB/T 11914-1989

15	Ammonia - nitrogen	Water quality - Determination of ammonium - Distillation and titration method	GB/T 7478-1987
		Water quality - Determination of ammonium - Nesster's reagent colorimetric method	GB/T 7479-1987
		Water quality - Determination of ammonium - Spectrophotometric method with salicylic acid	GB/T 7481-1987
		Water quality - Determination of ammonia - nitrogen by gas-phase molecular absorption spectrometry	HJ/T 195-2005
16	Total nitrogen	Water quality - Determination of total nitrogen - Alkaline potassium persulfate digestion - UV spectrophotometric method	GB/T 11894-1989
		Water quality - Determination of total nitrogen by gas-phase molecular absorption spectrometry	HJ/T 199-2005
17	Total phosphonium	Water quality - Determination of total phosphorus - Ammonium molybdate spectrophotometric method	GB/T 11893-1989
18	Petroleum oils	Water quality - Determination of petroleum oils - Infrared photometric method	GB/T 16488-1996
19	Fluoride	Water quality - Determination of fluoride - Spectrophotometric method with fluoric reagent	GB/T 7483-1987
		Water quality-Determination of fluoride-Ion selective electrode method	GB/T 7484-1987
		Water quality - Determination of fluoride - ion chromatography	HJ/T 84-2001
20	Total cyanide	Water quality-Determination of cyanide - Silver nitrate titration method	GB/T 7486-1987
		Water quality-Determination of cyanide - Isonicotinic acid - pyrazolone colorimetric method	GB/T 7487-1987
Note: If there is no applicable method standard to determine certain pollutant items, the methods listed in appendixes shall be applied until the state has issued and implemented corresponding method standards.			

5.3 Requirements for monitoring of air pollutant

5.3.1 The sampling location and sampling methods shall be subject to GB/T 16157.

5.3.2 Concentration of air pollutant discharged from enterprises shall be determined by the method standards listed in Table 7.

Table 7 Method standards for determination of air pollutant concentration

No.	Pollutant item	Title of method standard	Code of method standard
1	hydrogen chloride	Stationary source emission - determination of hydrogen chloride - Mercuric thiocyanate spectrophotometric method	HJ/T 27-1999
2	chromic acid mist	Stationary source emission - Determination of chromate fog - Diphenyl carbazide spectrophotometric method	HJ/T 29-1999
3	sulfuric acid mist	Determination of sulfuric acid mist in waste gas - barium chromate spectrophotometric method	See Appendix C
		Determination of sulfuric acid mist in waste gas - ion chromatography	See Appendix D
4	Nitrogen oxide	Stationary source emission - Determination of nitrogen oxide -N- (1-naphthyl)- ethylenediamine spectrophotometric method	HJ/T 43-1999
		Stationary source emission - Determination of nitrogen oxide - Ultraviolet spectrophotometric method	HJ/T 42-1999
5	hydrogen cyanide	Stationary source emission - Determination of	HJ/T 28-1999

		hydrogen cyanide - Isonicotinic- acid-3-methyl-1-phenyl-5- spectrophotometric method	
6	fluoride	Stationary source emission- Determination of fluoride-Ion selective electrode method	HJ/T 67-2001
Note: If there is no applicable method standard to determine certain pollutant items, the methods listed in appendixes shall be applied until the state has issued and implemented corresponding method standards.			

6 Standard implementation and supervision

- 6.1** The implementation and supervision of this Standard shall be carried out by the competent department for environmental protection of the people's governments above county level.
- 6.2** Under any circumstances, enterprises shall obey the requirements for pollutant discharge control as specified in this Standard and take all the necessary measures to ensure the normal operation of pollution prevention and control facilities. When the environmental protection departments at all levels are carrying out supervision inspections on such facilities, the samples taken on spot or the monitoring results can be used as the basis to determine if the discharge action conform to the discharge standard or not and implement relative measures for environmental protection and management. If abnormalities are discovered in connection with changes in water consumption or water discharge and gas discharge of facilities, it is necessary to verify the facilities' actual product yield, water discharge and air discharge, to convert into concentration of water pollutant for reference water discharge and concentration of air pollutant for reference gas discharge.