

## Chapter NR 260

## ELECTROPLATING

|                                     |  |
|-------------------------------------|--|
| NR 260.01 Purpose                   | NR 260.21 Compliance dates                             |
| NR 260.02 Applicability             | NR 260.22 Discharge standards                          |
| NR 260.03 Definitions               | NR 260.23 Total toxic organics monitoring requirements |
| Subchapter I - Direct Discharges    |  |
| NR 260.10 Applicability             |  |
| Subchapter II - Indirect Discharges |  |
| NR 260.20 Applicability             |  |

Note: Chapter NR 260 as it existed on October 31, 1986 was repealed and a new chapter NR 260 was created effective November 1, 1986.

**NR 260.01 Purpose.** The purpose of this chapter is to establish pretreatment standards and effluent limitations for existing sources in the electroplating industry which introduce pollutants into publicly owned treatment works.

History: Cr. Register, October, 1986, No. 370, eff. 11-1-86.

**NR 260.02 Applicability.** (1) The provisions of this chapter are applicable to existing sources which discharge pollutants into publicly owned treatment works resulting from operations in the following process subcategories as defined in s. NR 260.03 (3):

- (a) Electroplating of common metals.
- (b) Electroplating of precious metals.
- (c) Electroplating of specialty metals.

Note: This process subcategory is reserved.

- (d) Anodizing.
- (e) Coating (chromating, phosphating and coloring).
- (f) Chemical etching and milling.
- (g) Electroless plating.
- (h) Printed circuit board manufacture.

(2) The provisions of this chapter are not applicable to the following:

(a) Operations similar to electroplating which are specifically regulated by other categorical standards.

Note: These other applicable categorical standards include: aluminum forming, battery manufacturing, coil coating, copper forming, electrical and electronic components, iron and steel manufacturing, metal molding and casting (foundries), nonferrous metals forming, nonferrous metals manufacturing, plastic molding and forming, porcelain enameling.

(b) Metallic platemaking and gravure cylinder preparation conducted for use in the printing and publishing industry.

(c) Industrial users subject to pretreatment standards for new sources (PSNS), which are regulated under ch. NR 261.

(d) Industrial users subject to best practicable technology currently available (BPT), best available technology economically achievable

(BAT), and new source performance standards (NSPS), which are regulated under ch. NR 261.

History: Cr. Register, October, 1986, No. 370, eff. 11-1-86.

**NR 260.03 Definitions.** The following definitions are applicable to terms used in this chapter. Definitions of other terms and meanings of abbreviations are set forth in chs. NR 205 and 211, and the Development Document for Existing Source Pretreatment Standards for the Electroplating Point Source Category, EPA 440/1-79/003, August 1979.

Note: Copies of this document are available for inspection at the office of the department of natural resources, 101 S. Webster, Madison; the secretary of state's office, and the office of the revisor of statutes, and may be obtained for personal use from the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20460.

(1) "Cyanide, A" means cyanide amenable to alkaline chlorination as determined by ch. NR 219.

(2) "Captive facility" means a facility which owns more than 50% (annual area basis) of the materials undergoing electroplating.

(3) "Electroplating process wastewater" means wastewater generated in the operations defined below and listed in s. NR 260.02 (1).

(a) "Electroplating of common metals" means any step in a process in which a ferrous or nonferrous basis metal is electroplated with copper, nickel, chromium, zinc, tin, cadmium, iron, aluminum, or a combination thereof and which is followed by a rinse; this includes the related operations of alkaline cleaning, acid pickling, stripping, and coloring.

(b) "Electroplating of precious metals" means any step in a process in which a ferrous or nonferrous basis metal is electroplated with gold, silver, irridium, palladium, platinum, rhodium, ruthenium or combination thereof and which is followed by a rinse; this includes the related operations of alkaline cleaning, acid pickling, stripping, and coloring.

(c) "Electroplating of specialty metals" means any step in which a ferrous or nonferrous basis metal is electroplated with a metal not used in par. (a) or (b) which is followed by a rinse.

(d) "Anodizing" means any step in the production of a protective oxide film on a ferrous or nonferrous metal which passes an electric current through a bath where the metal is suspended and is followed by a rinse; this includes the related operations of cleaning and coloring.

(e) "Coating" means the processes of chromating, phosphating, or immersion plating of ferrous or nonferrous materials in which a basis material surface is acted upon by a process solution which is followed by a rinse; this includes the related operations of alkaline cleaning, acid pickling and sealing.

(f) "Chemical etching and milling" means any step in the process of etching or milling of ferrous or nonferrous material in which metal is chemically or electrochemically removed from the work piece and is followed by a rinse; this includes the related metal cleaning operations which precede chemical etching or milling.

(g) "Electroless plating" means any step in a process in which a metallic layer is deposited on a metallic or nonmetallic basis material and

which is followed by a rinse; this includes the related operations of alkaline cleaning, acid pickling and stripping.

(h) "Printed circuit manufacturing" means any step in the process of converting an insulating substrate to a finished printed circuit board in which the board is immersed in an aqueous process bath which is followed by a rinse.

(4) "Integrated facility" means a facility where manufacturing of a product at a single physical location includes electroplating as only one of several operations and produces significant quantities of process wastewater from nonelectroplating manufacturing operations and in which one or more plant electroplating process wastewater lines are combined prior to or at the point of treatment (or proposed treatment) with one or more plant sewers carrying nonelectroplating process wastewater.

(5) "New source" means any building, structure, facility or installation from which there is or may be a discharge of pollutants, the construction of which commenced after August 31, 1982.

(6) "Strong chelating agents" means compounds which form soluble metal complexes which are not removed by subsequent metals control techniques such as pH adjustment followed by clarification or filtration.

(7) "TTO" means total toxic organics, which is the sum of all quantifiable values greater than 0.01 milligrams per liter (10 micrograms per liter) of the toxic organics listed in s. NR 215.03 A through E.

History: Cr. Register, October, 1986, No. 370, eff. 11-1-86.

#### Subchapter I - Direct Discharges

**NR 260.10 Applicability.** All facilities which generate wastewater from any of the processes listed in s. NR 260.02 (1) discharging directly to waters of the state are subject to the provisions of ch. NR 261.

History: Cr. Register, October, 1986, No. 370, eff. 11-1-86.

#### Subchapter II - Indirect Discharges

**NR 260.20 Applicability.** All indirect discharges of wastewater generated from any of the processes listed in s. NR 260.02 (1) except those subject to pretreatment standards for new sources included under ch. NR 261, are subject to the provisions of this subchapter. All captive facilities are regulated under ch. NR 261, as of February 15, 1986, and the provisions of this chapter no longer apply.

History: Cr. Register, October, 1986, No. 370, eff. 11-1-86.

**NR 260.21 Compliance dates.** Industrial users subject to the provisions of this subchapter shall meet the following compliance dates:

(1) By April 27, 1984, for all facilities which are not integrated facilities and are subject to pretreatment standards for existing sources.

(2) By June 30, 1984, for all integrated facilities subject to pretreatment standards for existing sources.

(3) By July 15, 1986, for all industrial users subject to TTO limitations.

History: Cr. Register, October, 1986, No. 370, eff. 11-1-86.

**NR 260.22 Discharge standards.** (1) Any existing source which introduces pollutants into a publicly owned treatment works shall comply with ch. NR 211 and achieve the following pretreatment standards for existing sources (PSES). The subcategories referred to in Tables 1 through 4 are those process subcategories listed in s. NR 260.02 (1).

(a) No industrial user introducing wastewater pollutants into a publicly owned treatment works under the provisions of this chapter may augment the use of process wastewater or otherwise dilute the wastewater as a partial or total substitute for adequate treatment to achieve compliance with this standard.

(b) For facilities discharging less than 38,000 liters (10,000 gal.) per calendar day of electroplating process wastewater the following limitations shall apply:

**Table 1**  
**Facilities discharging less than 38,000 liters**  
**per day PSES limitations (mg/l)**

| Pollutant or pollutant property <sup>1</sup> | All subcategories |                         |                          |
|--|-------------------|-------------------------|--------------------------|
|  | 1 day max.        | 4 day avg. <sup>2</sup> | 30 day avg. <sup>3</sup> |
| Cyanide, A (CN, A)                           | 5.0               | 2.7                     | 1.5                      |
| Lead (Pb)                                    | 0.6               | 0.4                     | 0.3                      |
| Cadmium (Cd)                                 | 1.2               | 0.7                     | .5                       |
| Total Toxic Organics (TTO)                   | 4.57              |                         |                          |

<sup>1</sup>All metals shall be determined in "total" form.

<sup>2</sup>Average of daily values for 4 consecutive monitoring days.

<sup>3</sup>Limitations for integrated facilities using the combined wastestream formula as set forth in s. NR 211.12.

(c) Except as provided in pars. (d) and (e), for facilities discharging 38,000 liters (10,000 gal.) or more per calendar day of electroplating process wastewater the following limitations shall apply:

Table 2  
Facilities discharging 38,000 liters or more  
per day PSES limitations (mg/l)

| Pollutant or pollutant<br>property <sup>1</sup> | All subcategories |                         |                          |
|---|-------------------|-------------------------|--------------------------|
|   | 1 day max.        | 4 day avg. <sup>2</sup> | 30 day avg. <sup>3</sup> |
| Silver (Ag) <sup>4</sup>                        | 1.2               | 0.7                     | .5                       |
| Cyanide (CN)                                    | 1.9               | 1.0                     | .55                      |
| Copper (Cu)                                     | 4.5               | 2.7                     | 1.8                      |
| Nickel (Ni)                                     | 4.1               | 2.6                     | 1.8                      |
| Chromium (Cr)                                   | 7.0               | 4.0                     | 2.5                      |
| Zinc (Zn)                                       | 4.2               | 2.6                     | 1.8                      |
| Lead (Pb)                                       | 0.6               | 0.4                     | 0.3                      |
| Cadmium (Cd)                                    | 1.2               | 0.7                     | .5                       |
| Total Metals <sup>5</sup>                       | 10.5              | 6.8                     | 5.0                      |
| Total Toxic Organics<br>(TTO)                   | 2.13              |                         |                          |

<sup>1</sup>All metals and cyanide shall be determined in "total" form.

<sup>2</sup>Average of daily values for 4 consecutive monitoring days.

<sup>3</sup>Limitations for integrated facilities using the combined wastestream formula as set forth in s. NR 211.12.

<sup>4</sup>Applicable to subcategory (b) only - Electroplating of precious metals.

<sup>5</sup>Total Metals equals the sum of the concentrations of copper, nickel, chromium and zinc.

(d) The following optional mass based limitations are equivalent to and may apply in place of those outlined in Table 2 if there has been a prior agreement between the facility and the publicly owned treatment works receiving such regulated wastes:

**Table 3**  
**Optional Mass Limits**  
**Facilities discharging 38,000 liters or more**  
**per day PSES limitations (mg/sq m - operation<sup>1</sup>)**

| Pollutant or pollutant property <sup>2</sup> | Subcategories (a) to (g) |                         |                          | Subcategory (h) |                         |                          |
|--|--------------------------|-------------------------|--------------------------|-----------------|-------------------------|--------------------------|
|  | 1 day max.               | 4 day avg. <sup>3</sup> | 30 day avg. <sup>4</sup> | 1 day max.      | 4 day avg. <sup>3</sup> | 30 day avg. <sup>4</sup> |
| Silver (Ag) <sup>5</sup>                     | 47                       | 29                      | 20                       |                 |                         |                          |
| Cyanide (CN)                                 | 74                       | 39                      | 21                       | 169             | 89                      | 49                       |
| Copper (Cu)                                  | 176                      | 105                     | 70                       | 401             | 241                     | 160                      |
| Nickel (Ni)                                  | 160                      | 100                     | 70                       | 365             | 229                     | 160                      |
| Chromium (Cr)                                | 273                      | 156                     | 96                       | 623             | 357                     | 223                      |
| Zinc (Zn)                                    | 164                      | 102                     | 70                       | 374             | 232                     | 160                      |
| Lead (Pb)                                    | 23                       | 16                      | 13                       | 53              | 36                      | 27                       |
| Cadmium (Cd)                                 | 47                       | 29                      | 20                       | 107             | 65                      | 45                       |
| Total Metals <sup>6</sup>                    | 410                      | 267                     | 195                      | 935             | 609                     | 445                      |
| Total Toxic Organics (TTO) <sup>7</sup>      | 2.13                     |                         |                          | 2.13            |                         |                          |

<sup>1</sup>The area plated or acted upon by the processes described in ss. NR 260.02 (1) and 260.03 (3) which are expressed in square meters.

<sup>2</sup>All metals and cyanide shall be determined in "total" form.

<sup>3</sup>Average of daily values for 4 consecutive monitoring days.

<sup>4</sup>Limitations for integrated facilities using the combined wastestream formula as set forth in s. NR 211.12.

<sup>5</sup>Applicable to subcategory (b) only - Electroplating or precious metals.

<sup>6</sup>Total Metals equals the sum of the masses of copper, nickel, chromium and zinc.

<sup>7</sup>TTO shall be measured by mg/l.

(e) In the absence of strong chelating agents, after reduction of hexavalent chromium wastes, and after neutralization using calcium oxide (or hydroxide), the following control program may be elected by the industrial user, with the approval of the control authority, in place of the limitations in Table 2. These optional pollutant limitations are not eligible for allowance for removal achieved by the publicly owned treatment works.

**Table 4**  
**Optional Control Program Limits<sup>1</sup>**  
**Facilities discharging 38,000 liters or more**  
**per day PSES limitations (mg/l)**

| Pollutant or pollutant property <sup>2</sup> | All subcategories |                         |                          |
|--|-------------------|-------------------------|--------------------------|
|  | 1 day max.        | 4 day avg. <sup>3</sup> | 30 day avg. <sup>4</sup> |
| Cyanide (CN)                                 | 1.9               | 1.0                     | .55                      |
| Lead (Pb)                                    | 0.6               | 0.4                     | 0.3                      |
| Cadmium (Cd)                                 | 1.2               | 0.7                     | .5                       |
| Total Suspended Solids (TSS)                 | 20.0              | 13.4                    | 10.0                     |
| pH <sup>5</sup>                              | 7.5 - 10.0        | 7.5 - 10.0              |                          |
| Total Toxic Organics (TTO)                   | 2.13              |                         |                          |

<sup>1</sup>Optional pollutants agreed upon by facility and control authority.

<sup>2</sup>All metals and cyanide shall be determined in "total" form.

<sup>3</sup>Average of daily values for 4 consecutive monitoring days.

<sup>4</sup>Limitations for integrated facilities using the combined wastestream formula as set forth in s. NR 211.12.

<sup>5</sup>pH shall be measured in standard units.

(2) Where electroplating process wastewaters are combined with regulated wastewaters which have 30-day average standards, the corresponding 30-day average standard for the electroplating wastewaters shall be

used. The 30-day average for pollutants may be found in Tables 1 through 4.

History: Cr. Register, October, 1986, No. 370, eff. 11-1-86.

**NR 260.23 Total toxic organics monitoring requirements.** (1) In place of monitoring for TTO, the control authority may allow industrial users of publicly owned treatment works to make the following certification to replace the periodic reports required by s. NR 211.15:

“Based on my inquiry of the person or persons directly responsible for managing compliance with the pretreatment standard for total toxic organics (TTO), I certify that, to the best of my knowledge and belief, no dumping of concentrated toxic organics into the wastewaters has occurred since filing the last discharge monitoring report. I further certify that this facility is implementing the toxic organic plan submitted to the control authority.”

(2) Industrial users of publicly owned treatment works shall submit a toxic organic management plan when requesting that monitoring not be required. The plan shall specify the toxic organic compounds used; the method of disposal used instead of dumping, such as reclamation, contract hauling, or incineration; and procedures for assuring that toxic organics do not routinely spill or leak into the wastewater.

(3) An existing source submitting a certification in lieu of monitoring pursuant to subs. (1) and (2) shall implement the toxic organic management plan approved by the control authority.

(4) If monitoring is necessary to measure compliance with the TTO standard, the industrial user need analyze only for those pollutants reasonably expected to be present.

History: Cr. Register, October, 1986, No. 370, eff. 11-1-86.