

# Steel Industry Sintering Plant Dioxin Control and Emission Standards

Promulgated by Environmental Protection Administration order on June 16, 2004.

## Article 1

These Standards are determined pursuant to Article 20, Paragraph 2, Article 22, Paragraphs 2 and 3, and Article 23, Paragraph 2 of the Air Pollution Control Act.

## Article 2

Terms and symbols used in these Standards are defined as follows:

- I. "Dioxin" means polychlorinated dibenzo-*p*-dioxins and polychlorinated dibenzofurans.
- II. "I-TEF" means the International Toxicity Equivalency Factor used internationally to calculate the toxicity weighting of dioxin concentrations.
- III. "TEQ" (Toxicity Equivalency Quantity of 2,3,7,8-tetrachlorinated dibenzo-*p*-dioxin) means the method of calculating the toxicity weighting of dioxin concentrations.
- IV. "Newly established sintering plant" means a sintering plant that was established on or after the date of promulgation of these Standards.
- V. "Existing sintering plant" means a sintering plant that is already constructed or that is in the process of being constructed, for which project tender procedures have been completed, or if no tenders were invited, for which project contracts were issued and signed before the date of promulgation of these Standards. However, a sintering plant for which the dioxin emissions has increased by more than 10% of the annual allowable emissions as set forth in the operating permit due to the replacement or enlargement of relevant equipment shall be deemed a newly established sintering plant.

## Article 3

For matters not regulated in these Standards, the regulations of other relevant laws and regulations shall apply.

## Article 4

These Standards shall apply to emissions from the sintering machine smelting process in steel industry factories that use high temperatures to sinter a mixture of iron sands, coke and other ores into blocks. The controlled pollutant is dioxin.

## Article 5

The values determined by these Standards are as follows:

Pollution sources	Emission standard value (ng-TEQ/Nm <sup>3</sup> )	Effective Date
Existing sintering plant	2.0	January 1, 2006
	1.0	January 1, 2008
Newly established sintering plant	0.5	Date of promulgation

The concentrations of the standard values of the foregoing paragraph are expressed as TEQ. The measured concentrations listed in the following Table for dioxin pollutants multiplied by their I-TEF

shall be calculated as a total. Sampling and testing shall be conducted more than three times and the arithmetic mean value shall be used. Each sampling shall be done at intervals greater than one hour.

#### **Article 6**

The concentrations of dioxin pollutants in sintering plant stack emissions shall be calculated based on non-diluted dry emission volumes at a temperature of 273K and a pressure of 1 atmosphere. Moreover, they shall be corrected to 15% Standard Oxygen Basis. The correction formula is as follows:

$$C = \frac{21-15}{21-O_s} \cdot C_s$$

“C” means the pollutant concentration corrected to Standard Oxygen Basis, measured in ng-TEQ/Nm<sup>3</sup>.

“C<sub>s</sub>” means measured the pollutant concentration based on test method, not corrected to Standard Oxygen Basis, measured in ng-TEQ/Nm<sup>3</sup>.

“O<sub>s</sub>” means the actual measured emission oxygen content. Concentrations that are higher than 20% shall be calculated as 20%.

#### **Article 7**

The temperature of exhaust gas at the inlet of the dust collection equipment in the sintering plant smelting process shall be maintained at less than 200 degrees Celsius. Monitoring facilities shall be installed for the real-time display of the exhaust gas temperature.

During the normal operation of the sintering plant of the foregoing paragraph dioxin pollution prevention equipment shall be maintained at the operating conditions of the most recent sampling and analysis period that met dioxin emission standards. When the operating conditions of a sintering plant change, another dioxin sampling and analysis shall be conducted in order to adjust the operating conditions thereof.

#### **Article 8**

A sintering plant shall conduct tests of dioxin in emissions in accordance with the following regulations:

- I. Regular tests shall be conducted twice a year, once in the January-June period and once in the July-December period. The interval between the first and the second regular test may not be shorter than three months and not longer than nine months. Seven days before a regular test a test plan shall be submitted to the competent authority of the special municipality, county or city. The test results shall be reported to said competent authority in a test report within 60 days after the test.
- II. If the emission dioxin concentrations of two consecutive regular tests meet the emission standard values of Article 5, relevant documentary proof may be submitted to the competent authority of the special municipality, county or city to apply for an adjustment of the test frequency to once a year. However, if the results of an investigative test by the competent authority or the results of a regular test at a plant that has already been adjusted to one annual regular test violate the regulations of Article 5, tests shall be performed in accordance with the frequency determined in the foregoing paragraph.

#### **Article 9**

These Standards shall take effect on the announcement date except for articles whose enforcement date has been set separately.

Table of International Toxicity Equivalency Factor Values

Dioxin pollutants	International Toxicity Equivalency Factor
2,3,7,8-TeCDD	1.0
1,2,3,7,8-PeCDD	0.5
1,2,3,4,7,8-HxCDD	0.1
1,2,3,6,7,8-HxCDD	0.1
1,2,3,7,8,9-HxCDD	0.1
1,2,3,4,6,7,8-HpCDD	0.01
OCDD	0.001
2,3,7,8-TeCDF	0.1
1,2,3,7,8,PeCDF	0.05
2,3,4,7,8-PeCDF	0.5
1,2,3,4,7,8-HxCDF	0.1
1,2,3,6,7,8-HxCDF	0.1
1,2,3,7,8,9-HxCDF	0.1
2,3,4,6,7,8-HxCDF	0.1
1,2,3,4,6,7,8-HpCDF	0.01
1,2,3,4,7,8,9-HpCDF	0.01
OCDF	0.001
OtherPCDDsand PCDFs	0

**Notes:**

TeCDD: tetrachlorinated dibenzo-*p*-dioxin  
 PeCDD: pentachlorinated dibenzo-*p*-dioxin  
 HxCDD: hexachlorinated dibenzo-*p*-dioxin  
 HpCDD: heptachlorinated dibenzo-*p*-dioxin  
 OCDD: octachlorinated dibenzo-*p*-dioxin  
 PCDDs: polychlorinated dibenzodioxins  
 TeCDF: tetrachlorinated dibenzofuran  
 PeCDF: pentachlorinated dibenzofuran  
 HxCDF: hexachlorinated dibenzofuran  
 HpCDF: heptachlorinated dibenzofuran  
 OCDF: octachlorinated dibenzofuran  
 PCDFs: polychlorinated dibenzofurans