

2.28 Existing Kraft Pulp Mills

2.28.1 Applicability and Designation of Affected Facility

The provisions of this source category are applicable to the following affected facilities in kraft pulp mills: digester system, multiple effect evaporator system, recovery furnace, smelt dissolving tank, and lime kiln subject to Section 1.1 of the general provisions of this text. In pulp mills where kraft pulping is combined with soda-based semi-chemical pulping, the provisions of this source category are applicable when any portion of the material charged to an affected facility is produced by the kraft pulping operation.

Any facility under the preceding paragraph of this section that existed or had commenced construction or modification prior to September 24, 1976 is subject to the requirements of this source category.

2.28.2 Test Methods and Procedures

(a) In conducting the performance tests required in Section 1.2, the owner or operator shall use as reference methods and procedures the test methods in Appendix A of this text or other methods and procedures in this section, except as provided in Section 1.2(b). Acceptable alternative methods and procedures are given in paragraph (f) of this section.

(b) The owner or operator shall determine compliance with the particulate matter standards as follows:

(1) Method 5 shall be used to determine the particulate matter concentration. The sampling time and sample volume for each run shall be at least 60 minutes and 0.90 dscm (31.8 dscf). Water shall be used as the cleanup solvent instead of acetone in the sample recovery procedure.

(2) Method 9 and the procedures in Section 1.3 shall be used to determine opacity.

(c) The owner or operator shall determine compliance with the particulate matter standard as follows:

(1) The emission rate (E) of particulate matter shall be computed for each run using the following equation:

$$E = C_s Q_{sd}$$

Where:

E = emission rate of particulate matter, lbs/hr.

C_s = concentration of particulate matter, g/dsm (lb/dscf).

Q_{sd} = volumetric flow rate of effluent gas, dscm/hr (dscf/hr).

(d) The owner or operator shall determine compliance with the TRS standards for all affected sources except smelt dissolving tanks as follows:

(1) Method 16 shall be used to determine the TRS concentration. The TRS concentration shall be corrected to the appropriate oxygen concentration using the procedure in Section 2.28.3. The sampling time shall be at least 3 hours, but no longer than 6 hours.

(2) The emission rate correction factor, integrated sampling and analysis procedure of Method 3B shall be used to determine the oxygen concentration. The sample shall be taken over the same time period as the TRS samples.

(3) When determining whether a furnace is a straight kraft recovery furnace or a cross recovery furnace, TAPPI Method T.624 (incorporated by reference -- see Section 1.6) shall be used to determine sodium sulfide, sodium hydroxide, and sodium carbonate. These determinations shall be made 3 times daily from the green liquor, and the daily average values shall be converted to sodium oxide (Na₂O) and substituted into the following equation to determine the green liquor sulfidity:

$$GLS = 100 C_{Na_2S} / (C_{Na_2S} + C_{NaOH} + C_{Na_2CO_3})$$

Where:

- GLS = green liquor sulfidity, percent.
- C_{Na_2S} = concentration of Na_2S as Na_2O , mg/liter (gr/gal).
- C_{NaOH} = concentration of $NaOH$ as Na_2O , mg/liter (gr/gal).
- $C_{Na_2CO_3}$ = concentration of Na_2CO_3 as Na_2O , mg/liter (gr/gal).

(e) The owner or operator shall determine compliance with the TRS standards for smelt dissolving tanks as follows:

(1) The emission rate (E) of TRS shall be computed for each run using the following equation:

$$E = C_{TRS} F Q_{sd} / BLS$$

Where:

- E = emission rate of TRS, g/kg (lb/ton of BLS).
- C_{TRS} = average combined concentration of TRS, ppm.
- F = conversion factor, 0.001417 g H_2S/m^3 ppm (0.08844 x 10⁻⁶ lb H_2S/ft^3 ppm).
- Q_{sd} = volumetric flow rate of stack gas, dscm/hr (dscf/hr).
- BLS = black liquor solids feed rate, kg/hr (ton/hr).

- (2) Method 16 shall be used to determine the TRS concentration (C_{TRS}).
- (3) Method 2 shall be used to determine the volumetric flow rate (Q_{sd}) of the effluent gas.
- (4) Process data shall be used to determine the black liquor feed rate (BLS).

(f) The owner or operator may use the following as alternatives to the reference methods and procedures specified in this section:

- (1) For Method 5, Method 17 may be used if a constant value of 0.009 g/dscm (0.004 gr/dscf) is added to the results of Method 17 and the stack temperature is no greater than 205°C (400°F).
- (2) For Method 16, Method 16A or 16B may be used if the sampling time is 60 minutes.

(g) The owner or operator who is given approval by the Director to meet the provisions of Chapter 391-3-1-.02(2)(gg), paragraph 2 shall use process instrumentation and data to determine the pulp production rate.

2.28.3 Monitoring of Emissions and Operations

(a) Any owner or operator subject to the provisions of this source category shall, where required, install, calibrate, maintain, and operate the following continuous monitoring systems:

- (1) [Reserved]
- (2) A continuous monitoring system to monitor and record the concentration of TRS emissions on a dry basis and the percent of oxygen by volume on a dry basis in the gases discharged into the atmosphere from any lime kiln(s) and recovery furnace(s),

digester system or multiple-effect evaporator system, whose effluent gas streams are not incinerated in some other device. These systems shall be located downstream of the control device(s) and the span(s) of these continuous monitoring system(s) shall be set:

- (i) At a TRS concentration of 80 ppm for any lime kiln, at 40 ppm for any old recovery furnace, at 10 ppm for any new recovery furnace and at 50 ppm for any cross recovery furnace.
 - (ii) At 20 percent oxygen for the continuous oxygen monitoring system.
- (b) Any owner or operator subject to the provisions of this source category shall, where required, install, calibrate, maintain, and operate the following continuous monitoring devices:
- (1) For any incinerator, a monitoring device which measures the combustion temperature at the point of incineration of effluent gases which are emitted from any digester system or multiple-effect evaporator system. The monitoring device is to be certified by the manufacturer to be accurate within ± 1 percent of the temperature being measured.
 - (2) For any lime kiln or smelt dissolving tank using a scrubber emission control device:
 - (i) A monitoring device for the continuous measurement of the pressure loss of the gas stream through the control equipment. The monitoring device is to be certified by the manufacturer to be accurate to within a gauge pressure of ± 500 pascals (ca. ± 2 inches water gauge pressure).
 - (ii) A monitoring device for the continuous measurement of the scrubbing liquid supply pressure and/or flow rate subject to Division approval, to the control equipment. The monitoring device is to be certified by the manufacturer to be accurate within ± 15 percent of design scrubbing liquid supply pressure. The pressure sensor or tap is to be located close to the scrubber liquid discharge point. The Director may be consulted for approval of alternative locations.
 - (iii) A monitoring device for the continuous measurement of the weak wash flow rate and weak wash pump pressure (if weak wash is the only scrubbing liquid). The monitoring devices are to be certified by the manufacturer to be accurate as follows: for weak wash flow rate, ± 5 percent of the design scrubbing liquid flow rate, and for pump pressure, ± 15 percent of the normal operating pump pressure.
- (c) Any owner or operator subject to the provisions of this source category shall, where required:
- (1) Calculate and record on a daily basis, 24-hour average TRS concentrations for each operating day. Each 24-hour average shall be determined as the arithmetic mean of the appropriate 24 contiguous 1-hour average total reduced sulfur concentrations provided by each continuous monitoring system installed under paragraph (a)(2) of this section.
 - (2) Calculate and record on a daily basis, 24-hour average oxygen concentrations for each operating day for the recovery furnace and lime kiln. These 24-hour averages shall correspond to the 24-hour average TRS concentrations under paragraph (c)(1) of this section and shall be determined as an arithmetic mean of the appropriate 24 contiguous 1-hour average oxygen concentrations provided by each continuous monitoring system installed under paragraph (a)(2) of this section.
 - (3) Correct all 24-hour average TRS concentrations from a lime kiln to 10 volume percent oxygen, and all 24-hour average TRS concentrations from a recovery furnace shall be corrected to 8 volume percent using the following equation:

$$C_{corr} = C_{meas} \times (21 - X/21 - Y)$$

Where:

C_{corr} = the concentration corrected for oxygen.

C_{meas} = the concentration uncorrected for oxygen.

X = the volumetric oxygen concentration in percentage is to be corrected to 8 percent for recovery furnaces and 10 percent for lime kilns, incinerators, or other devices.

Y = the measured 24-hour average volumetric oxygen concentration.

All other process sources (digester systems or multiple-effect evaporator systems) shall have their concentrations of TRS corrected to the actual oxygen content of the untreated gas stream if the gases are controlled by a means other than combustion.

- (d) For the purpose of reports required under Section 1.5, any owner or operator subject to the provisions of this source category shall report periods of excess emissions, where required, as follows:
- (1) For emissions from any recovery furnace, periods of excess emissions are:
 - (i) All 24-hour averages of TRS concentrations above 5 ppm by volume for new kraft recovery furnaces, above 25 ppm by volume for cross recovery furnaces, and above 20 ppm by volume for old recovery furnaces.
 - (2) For emissions from any lime kiln, periods of excess emissions are all 24-hour average TRS concentrations above 40 ppm by volume.
 - (3) For emissions from any digester system or multiple-effect evaporator system, periods of excess emissions are:
 - (i) All 24-hour average TRS concentrations above 5 ppm by volume if TRS is monitored;
 - (ii) All periods in excess of 5 minutes and their duration during which the combustion temperature at the point of incineration is less than 1200°F if combustion zone temperature is monitored.