

Subpart BB - Standards of Performance for Kraft Pulp Mills

[any batch digester system, brown stock washer system, multiple-effect evaporator system, or condensate stripper system that commenced construction or modification after September 24, 1976, except as noted in 40 CFR 60.283(a)(1)(iv)]

o 40 CFR 60.281 Definitions.

As used in 40 CFR 60, Subpart BB, all terms not defined herein shall have the same meaning given them in the Act and in 40 CFR 60, Subpart A.

- (a) Kraft pulp mill means any stationary source which produces pulp from wood by cooking (digesting) wood chips in a water solution of sodium hydroxide and sodium sulfide (white liquor) at high temperature and pressure. Regeneration of the cooking chemicals through a recovery process is also considered part of the kraft pulp mill.
- (b) Neutral sulfite semichemical pulping operation means any operation in which pulp is produced from wood by cooking (digesting) wood chips in a solution of sodium sulfite and sodium bicarbonate, followed by mechanical defibrating (grinding).
- (c) Total reduced sulfur (TRS) means the sum of the sulfur compounds hydrogen sulfide, methyl mercaptan, dimethyl sulfide, and dimethyl disulfide, that are released during the kraft pulping operation and measured by Reference Method 16.
- (d) Digester system means each continuous digester or each batch digester used for the cooking of wood in white liquor, and associated flash tank(s), below tank(s), chip steamer(s), and condenser(s).
- (e) Brown stock washer system means brown stock washers and associated knotters, vacuum pumps, and filtrate tanks used to wash the pulp following the digestion system. Diffusion washers are excluded from this definition.
- (f) Multiple-effect evaporator system means the multiple-effect evaporators and associated condenser(s) and hotwell(s) used to concentrate the spent cooking liquid that is separated from the pulp (black liquor).
- (o) Condensate stripper system means a column, and associated condensers, used to strip, with air or steam, TRS compounds from condensate streams from various processes within a kraft pulp mill.

o 40 CFR 60.283 Standard for total reduced sulfur (TRS).

- (a) No owner or operator shall cause to be discharged into the atmosphere:
 - (1) From any digester system, brown stock washer system, multiple-effect evaporator system, or condensate stripper system any gases which contain TRS in excess of 5 ppm by volume on a dry basis, corrected to 10 percent oxygen (_____ lbs/hr, _____ TPY), unless the following conditions are met:
 - (i) The gases are combusted in a lime kiln subject to the provisions of 40 CFR 60.283(a)(5); or
 - (ii) The gases are combusted in a recovery furnace subject to the provisions of 40 CFR 60.283(a)(2) or (a)(3); or

(iii) The gases are combusted with other waste gases in an incinerator or other device, or combusted in a lime kiln or recovery furnace not subject to the provisions of this subpart, and are subjected to a minimum temperature of 1200° F. for at least 0.5 second; or

(iv) It has been demonstrated to the Administrator's satisfaction by the owner or operator that incinerating the exhaust gases from a new, modified, or reconstructed brown stock washer system is technologically or economically unfeasible. Any exempt system will become subject to the provisions of this subpart if the facility is changed so that the gases can be incinerated.

(v) The gases from the digester system, brown stock washer system, or condensate stripper system are controlled by a means other than combustion. In this case, this system shall not discharge any gases to the atmosphere which contain TRS in excess of 5 ppm by volume on a dry basis, corrected to the actual oxygen content of the untreated gas stream (_____ lbs/hr, _____ TPY).

(vi) The uncontrolled exhaust gases from a new, modified, or reconstructed digester system contain TRS less than 0.005 g/kg ADP (0.01 lb/ton ADP; _____ lbs/hr, _____ TPY).

o 40 CFR 60.284 Monitoring of emissions and operations.

(a) Any owner or operator shall install, calibrate, maintain, and operate the following continuous monitoring systems:

(2) Continuous monitoring systems 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 digester system, brown stock washer system, multiple-effect evaporator system, or condensate stripper system, except where the provisions of 40 CFR 60.283(a)(1)(iii) or (iv) apply. These systems shall be located downstream of the control device(s) and the spans of these continuous monitoring system(s) shall be set:

(i) At a TRS concentration of 30 ppm for the TRS continuous monitoring system, except that for any cross recovery furnace the span shall be set at 50 ppm.

(ii) At 20 percent oxygen for the continuous oxygen monitoring system.

(b) Any owner or operator shall install, calibrate, maintain, and operate the following continuous monitoring devices:

(1) For any incinerator, a monitoring device which measures and records the combustion temperature at the point of incineration of effluent gases which are emitted from any digester system, brown stock washer system, multiple-effect evaporator system, black liquor oxidation system, or condensate stripper system where the provisions of 40 CFR 60.283(a)(1)(iii) apply. The monitoring device is to be certified by the manufacturer to be accurate within ± 1 percent of the temperature being measured.

(c) Any owner or operator shall, except where the provisions of 40 CFR 60.283 (a)(1)(iv) apply.

(1) Calculate and record on a daily basis 12-hour average TRS concentrations for the two consecutive periods of each operating day. Each 12-hour average shall be

determined as the arithmetic mean of the appropriate 12 contiguous 1-hour average total reduced sulfur concentrations provided by each continuous monitoring system installed under 40 CFR 60.284(a)(2).

(3) Correct all 12-hour average TRS concentrations to 10 volume percent oxygen using the following equation:

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

where:

C_{corr} = the concentration corrected for oxygen

C_{meas} = the concentration uncorrected for oxygen.

X = the volumetric oxygen concentration in percentage to be corrected to (10 percent for incinerators or other devices.

Y = the measured 12-hour average volumetric oxygen concentration.

(d) For the purpose of reports required under 40 CFR 60.7(c), any owner or operator shall report semiannually periods of excess emissions as follows:

(3) For emissions from any digester system, brown stock washer system, multiple-effect evaporator system, or condensate stripper system periods of excess emissions are:

(i) All 12-hour average TRS concentrations above 5 ppm by volume unless the provisions of 40 CFR 60.283(a)(1)(i), (ii), or (iv) apply; or

(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, where the provisions of 40 CFR 60.283(a)(1)(iii) apply.

(e) The Administrator will not consider periods of excess emissions reported under 40 CFR 60.284(d) to be indicative of a violation of 40 CFR 60.11(d) provided that:

(2) The Administrator determines that the affected facility, including air pollution control equipment, is maintained and operated in a manner which is consistent with good air pollution control practice for minimizing emissions during periods of excess emissions.

o 40 CFR 60.285 Test methods and procedures.

(a) The owner or operator shall use as reference methods and procedures the test methods in 40 CFR 60, Appendix A, or other methods and procedures in this section, except as provided in 40 CFR 60.8(b). Acceptable alternative methods and procedures are given in 40 CFR 60.285(f).

(d) The owner or operator shall determine compliance with the TRS standards in 40 CFR 60.283, except 40 CFR 60.283(a)(1)(vi), 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 40 CFR 60.284(c)(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.

(e) The owner or operator shall determine compliance with the TRS standards in 40 CFR 60.283(a)(1)(vi) as follows:

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

$$E = \text{CTRS} F Q_{sd}/P$$

where:

E = emission rate of TRS, g/kg (lb/ton) of BLS or ADP.

CTRS = average combined concentration of TRS, ppm.

F = conversion factor, 0.001417 g H₂S/m³ ppm (0.08844*10⁻⁶ lb H₂S/ft³ ppm).

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

P = black liquor solids feed or pulp production rate, kg/hr (ton/hr).

(2) Method 16 shall be used to determine the TRS concentration (CTRS).

(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 or the pulp production rate (P).

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

(2) For Method 16, Method 16A or 16B may be used if the sampling time is 60 minutes.

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