

**SOUTH CAROLINA  
DEPARTMENT OF HEALTH AND ENVIRONMENTAL CONTROL  
AIR POLLUTION CONTROL REGULATIONS AND STANDARDS**

**REGULATION 61-62.5  
AIR POLLUTION CONTROL STANDARDS**

**STANDARD NO. 4  
EMISSIONS FROM PROCESS INDUSTRIES**

**SECTION I - GENERAL**

A. The method which is approved by the Department for determining compliance with opacity limitations under this standard is Environmental Protection Agency (EPA) Reference Method 9 (40 Code of Federal Regulations (CFR) 60, Appendix A, as revised July 1, 1984). Alternate methods may be utilized only if approved in advance by the Department and by the EPA.

B. This standard will not supersede any requirements imposed by Federal New Source Performance Standards (NSPS), National Emission Standards for Hazardous Air Pollutants (NESHAP), Federal or State Prevention of Significant Deterioration (PSD) Regulations, nor special permit conditions, unless this standard would impose a more restrictive emission limit.

**SECTION II - SULFURIC ACID MANUFACTURING**

A. The rate of emission of sulfur dioxide (SO<sub>2</sub>) from sulfuric acid manufacturing shall be limited to no more than four (4) pounds of SO<sub>2</sub> per ton of 100 percent sulfuric acid produced and emissions of acid mist to 0.5 pounds of sulfuric acid per ton of 100 percent acid produced.

B. The maximum allowable stack outlet opacity from any source under this category is twenty (20) percent.

**SECTION III - KRAFT PULP AND PAPER MANUFACTURING**

The opacity from kraft pulp and paper manufacturing shall be limited to the following:

	Maximum Allowable Stack Opacity
Recovery Furnace	40 percent
Dissolving Tank	20 percent
Lime Kiln	20 percent

**SECTION IV – [RESERVED]**

**SECTION V - COTTON GINS**

A. Definitions

1. 1D-3D cyclone – Any cyclone-type collector of the 1D-3D configuration. This designation refers to the ratio of the cylinder to cone length, where D is the diameter of the cylinder portion. A 1D-3D cyclone has a cylinder length of 1xD and a cone length of 3xD.

2. 2D-2D cyclone – Any cyclone-type collector of the 2D-2D configuration. This designation refers to the ratio of the cylinder to cone length, where D is the diameter of the cylinder portion. A 2D-2D cyclone has a cylinder length of 2xD and a cone length of 2xD.

3. Bale – A compressed package of cotton lint weighing nominally 500 pounds.

4. Gin yard - The land upon which a cotton gin is located and all contiguous land having common ownership or use.

5. Ginning operation – Any facility or plant that separates cotton lint from cotton seed. This process typically includes cleaning (removing plant material, dirt, and other foreign matter) and packaging the lint into bales.

6. Ginning season – The period of time during which the gin is in operation; usually between (but not limited to) September of the current year and January of the following year.

7. High pressure exhausts – The exhaust air systems at a cotton gin preceding the gin stand (including unloading, drying, extracting, cleaning, and overflow handling systems) in which material is conveyed by a higher pressure air and is typically controlled by cyclones.

8. Low pressure exhausts – The exhaust air systems at a cotton gin following the gin stand (including lint cotton cleaning and battery formation process) in which material is conveyed by low pressure air and is typically controlled by condensers.

9. Removal efficiency – Percent of total particulate matter removed from the gas stream between a cyclone's inlet and outlet.

## B. Applicability

1. This rule applies to all existing, new, and modified cotton ginning operations in South Carolina. These facilities will be subject to registration permit conditions as specified in Regulation 61-62.1, Section II.I.

2. Existing facilities with a maximum gin stand rated capacity (or documented equipment limitation) of less than twenty (20) bales per hour that do not have cyclones on lint cleaning system exhausts and battery condenser exhausts as of promulgation date of this rule, will not be required to add the emission control devices in paragraph C.2 below to lint cleaning exhausts or battery condenser exhausts if emissions from these exhausts are controlled by fine mesh screens.

## C. Emission Control Requirements

1. New facilities will be required to apply for a registration permit before commencement of construction. Existing facilities will be required to apply for a registration permit within ninety (90) days of the promulgation date of this rule. Until such time that a registration permit is issued by the Department, existing cotton ginning operations should operate with existing permits.

2. Each cotton ginning operation shall install and operate a particulate emission control system on all high and low pressure exhausts and lint cleaning system exhausts that includes one (1) or more 1D-3D or 2D-2D cyclones meeting the cylinder diameter requirements to produce a 3.5 to 6.0 or 3.0 to 5.5 inches of water pressure drop (respectively) as illustrated in Figure 6-20 and 6-21 of the Agricultural Handbook Number 503, Cotton Ginners Handbook, dated December 1994. Existing facilities shall comply with these control equipment requirements by August 31, 2012.

3. Air pollutant emissions shall not exceed twenty (20) percent opacity.

4. Stacks shall not be equipped with raincaps or other devices that deflect the emissions downward or outward.

5. Trash stacker areas shall contain one (1) of the following:

a. A three (3) sided enclosure with a roof whose sides are high enough above the opening of the dumping device to prevent wind from dispersing dust or debris; or

b. A device to provide wet suppression at the dump area of the trash cyclone and minimize free fall distance of waste material exiting the trash cyclone.

6. The owner or operator shall ensure that all trucks transporting gin trash material are covered and that the trucks are cleaned of over-spill material before trucks leave the trash hopper dump area.

7. Reasonable precautions should be taken when operating or maintaining storage piles, materials, equipment, or vehicles in order to prevent any substance from being scattered by the wind or air in order to prevent fugitive dust emissions in accordance with Regulation 61-62.6, Section II.

#### D. Alternative Control Measures

1. The owner or operator of a cotton ginning operation may petition the Department to use alternative control measures to those specified in this rule. The petition shall include:

a. The name and address of the petitioner;

b. The location and description of the cotton ginning operation;

c. A description of the alternative control measure; and

d. A demonstration that the alternative control measure is at least as effective as the control device or method specified in this rule.

2. Once approved, repairs and maintenance of such devices will not require notification to the Department.

#### E. Monitoring

1. To ensure that the minimum required removal efficiency is maintained, the owner or operator shall establish, based on manufacturer's recommendations or industry standards, an inspection and maintenance schedule for the control devices, other emission processing equipment, and monitoring devices that are used pursuant to this rule. The inspection and maintenance schedule shall be followed throughout the ginning season. The results of the inspections and any maintenance performed on the

control equipment, emission processing equipment, or monitoring devices shall be documented in an on-site logbook and made available to the Department upon request. The owner or operator should keep a copy of the manufacturer's specifications for each type of control device installed.

2. On a weekly basis, the owner or operator shall measure and calculate the pressure drops across all cyclones. Measurements shall be made using a manometer, a Magnahelic® gauge, or other device that the Department has approved as being equivalent to a manometer. These measurements should be recorded in the logbook referred to in paragraph E.1 above. If the owner or operator measures a static pressure out of the range indicated in paragraph C.2 above, the owner or operator shall initiate corrective action. Corrective action shall be recorded in the logbook. If corrective action will take more than forty-eight (48) hours to complete, the owner or operator shall notify the Department no later than the end of the day such static pressure is measured.

3. During the ginning season, the owner or operator shall weekly inspect for structural integrity of the control devices and other emissions processing systems and shall ensure that the control devices and emission processing systems conform to normal and proper operation of the gin. Fine mesh screens should be inspected daily throughout the ginning season and any clogs should be removed. If a problem is found, corrective action shall be taken and recorded in the logbook required in paragraph E.1 above.

4. If control devices are repaired or replaced with equivalent control equipment, the facility must maintain on-site documentation showing compliance with the conditions specified in Section V.C of this standard or previously allowed for under Section V.D of this standard.

5. The owner or operator shall retain all records required by this rule for three (3) years from the date of recording.

**SECTION VI - HOT MIX ASPHALT MANUFACTURING**

A. The rate of emissions of particulate matter from hot mix asphalt manufacturing shall be limited to the following:

Production Rate (Tons Per Hour)	Maximum Allowable Emission Rate (Pounds Per Hour)
20	22
50	31
100	38
150	45
200	51
250	56
300	61
350 and above	65

B. All hot mix asphalt plants shall be equipped with a fugitive dust and/or fugitive emissions control system which shall be operated and maintained in such a manner as to reduce to a minimum the emissions of particulate matter from any point other than the stack outlet.

C. The maximum allowable stack opacity from hot mix asphalt manufacturing shall be twenty (20) percent.

**SECTION VII - METAL REFINING**

The maximum allowable opacity from any furnace building and/or operations building (including but not limited to pollution control systems, louvers, doors, openings, etc.) shall be twenty (20) percent.

**SECTION VIII - OTHER MANUFACTURING**

A. Particulate matter emissions where not specified elsewhere shall be limited to the rate specified in Table A (modified using the effect factors (F) of Table B as required). Kraft Pulp and Paper Manufacturing facilities are excluded from Section VIII.

B. Interpolation of the data in Table A for process weights up to thirty (30) tons per hour shall be accomplished by use of the equation:

$$E = (F) 4.10 P^{0.67}$$

and interpolation and extrapolation of the data for process weight rates greater than thirty (30) tons per hour shall be accomplished by using the equation:

$$E = (F) (55.0 P^{0.11} - 40)$$

Where: E = the allowable emission rate in pounds per hour  
P = process weight rate in tons per hour  
F = effect factor from Table B

**TABLE A  
Allowable Rate of Emission Based on Process Weight Rate\***

Process Weight Rate (Tons/Hour)	Rate of Emission (Pounds/Hour)	Process Weight Rate (Tons/Hour)	Rate of Emission (Pounds/Hour)
0.05	0.551	8	16.5
0.10	0.877	9	17.9
0.20	1.40	10	19.2
0.30	1.83	15	25.2
0.40	2.22	20	30.5
0.50	2.58	25	35.4
0.75	3.38	30	40.0

Process Weight Rate (Tons/Hour)	Rate of Emission (Pounds/Hour)	Process Weight Rate (Tons/Hour)	Rate of Emission (Pounds/Hour)
1.00	4.10	35	41.3
1.25	4.75	40	42.5
1.50	5.38	45	43.6
1.75	5.96	50	44.6
2.00	6.52	60	46.3
2.50	7.58	70	47.8
3.00	8.56	80	49.0
3.50	9.49	100	51.2
4.00	10.4	500	69.0
4.50	11.2	1000	77.6
5.00	12.0	3000	92.7

\* Please note that certain small operations may not require a permit (see exemptions under Regulation 62.1, Section II).

**TABLE B**  
**Effect Factor for Particulate Matter Emissions\*\***  
**(To Be Used with Standard 4 - Section VIII)**

Material	Effect Factor (F)
a. All materials not specifically listed hereunder	1.0
b. Elements and their compounds on the basis of the element contained therein***	none assigned
c. Specific Materials: Acid Mists	0.25

\*\* The Board will make additions to this table as required from time to time to preserve public health and property in South Carolina.

\*\*\* When a material contains two (2) or more elements, the effect factor of the element having the lowest effect factor shall apply.

**SECTION IX - VISIBLE EMISSIONS (WHERE NOT SPECIFIED ELSEWHERE)**

A. Where construction or modification began on or before December 31, 1985, emissions (including fugitive emissions) shall not exhibit an opacity greater than forty (40) percent.

B. Where construction or modification began after December 31, 1985, emissions (including fugitive emissions) shall not exhibit an opacity greater than twenty (20) percent.

**SECTION X - NON-ENCLOSED OPERATIONS**

A. All non-enclosed operations shall be conducted in such a manner that a minimum of particulate matter becomes airborne. In no case shall established ambient air quality standards be exceeded at or beyond the property line.

B. The owner or operator of all such operations shall maintain dust control of the premises and any roadway owned or controlled by the owner or operator by paving or other suitable measures. Oil treatment is prohibited.

C. All crushing, drying, classification, and like operations shall employ a suitable control device acceptable to the Department, and shall discharge no more particulate matter than that specified in Section VIII of this standard.

**SECTION XI - TOTAL REDUCED SULFUR (TRS) EMISSIONS OF KRAFT PULP MILLS**

A. Applicability and Designation of Affected Sources

1. The provisions of this subpart are applicable to the following affected sources in kraft pulp mills which commenced construction prior to September 24, 1976: digester system, brown stock washer system, multiple-effect evaporator system, black liquor oxidation system, recovery furnace, smelt dissolving tank, lime kiln, and condensate stripper system.

2. The effective date of this section is February 22, 1980.

B. Total Reduced Sulfur (TRS) Emission Standards

The rate of TRS emissions from existing kraft pulp mills shall be limited to the following:

	Maximum Allowable Emission of TRS as Hydrogen Sulfide (H <sub>2</sub> S) by Dry Volume, Averaged Over Twelve (12) Hours
Recovery Furnace	
Cross Recovery Furnaces	25 ppm (corrected to 8 percent oxygen)
Old Design Furnaces <sup>1</sup>	20 ppm (corrected to 8 percent oxygen)
New Design Furnaces <sup>2</sup>	5 ppm (corrected to 8 percent oxygen)
Digester System	5 ppm
Multiple-Effect Evaporator System	5 ppm
Lime Kiln	20 ppm (corrected to 10 percent oxygen)
Brown Stock Washer System	no control
Black Liquor Oxidation System	no control
Condensate Stripper System	5 ppm
Smelt Dissolving Tank	0.016 gram per kilogram (g/kg) BLS <sup>3</sup>

<sup>1</sup> Old design furnaces are defined as furnaces without welded wall or membrane wall construction or emission control designed air systems.

<sup>2</sup> New design furnaces are defined as furnaces with either welded wall or membrane wall construction and also with emission control designed air systems.

<sup>3</sup> Black liquor solids (dry weights).

#### C. Case-by-Case Exceptions to Provisions of Section XI.B Above

1. If the owner or operator of a source of TRS compounds regulated by this standard can demonstrate that compliance with applicable portions of Section XI.B would not be economically feasible, the Department may, on a case-by-case basis, allow emission limitations less stringent than those required by applicable parts of Section XI.B. All data pertinent to the showing of economic infeasibility must accompany a petition for this relief, and shall include a present value analysis showing economic infeasibility.

2. Exceptions granted under this part are not effective until submitted to and approved by the Administrator as a revision of the Implementation Plan for Control of Designated Pollutants, pursuant to Section 111(d) of the Clean Air Act as amended November 1990.

#### D. Monitoring, Recordkeeping, and Reporting

1. The owner/operator shall:

a. Calibrate, maintain, and operate continuous monitoring equipment 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, recovery furnace, digester system, multiple-effect evaporator system, or condensate stripper system, except where these gases are subjected to a minimum temperature of 1200 degrees Fahrenheit (F) for at least 0.5 seconds in an incinerator or other device which does not generate TRS. The location of each monitoring system must be approved by the Department.

b. Install, calibrate, maintain, and operate a monitoring device which measures the combustion temperature at the point of incineration of effluent gases which are emitted from any lime kiln, recovery furnace, digester system, multiple-effect evaporator system, or condensate stripper system unless TRS monitors are required in paragraph D.1.a above. The monitoring device is to be certified by the manufacturer to be accurate within plus or minus one (1) percent of the temperature being measured.

c. Calibrate, maintain, and operate continuous monitoring equipment for any smelt dissolving tank.

(i) 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 plus or minus two (2) inches water.

(ii) For the continuous measurement of the scrubbing liquid supply pressure to the control equipment. The monitoring device is to be certified by the manufacturer to be accurate within plus or minus fifteen (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 Department may be consulted for approval of alternative locations.

d. (i) Continuously monitored operating and/or stack parameters may be used as substitutes for TRS monitors provided that it is demonstrated to the satisfaction of the Department that a correlation exists between the monitored parameter and TRS concentration and the other requirements in paragraph D.1 above are fulfilled.

(ii) Alternative equivalent methods of monitoring must be approved by the Department and EPA.

2. Any owner or operator subject to the provisions of this section shall:

a. Calculate and record on a daily basis 12-hour average TRS concentrations for the two (2) consecutive periods of each operating day. Each 12-hour average shall be determined as the arithmetic mean of the appropriate twelve (12) contiguous 1-hour average TRS concentrations provided by each continuous monitoring system installed under paragraph D.1.a above.

b. Calculate and record on a daily basis 12-hour average oxygen concentrations for the two (2) consecutive periods of each operating day for the recovery furnace and lime kiln. These 12-hour averages shall correspond to the 12-hour average TRS concentrations under paragraph D.2.a above and shall be determined as an arithmetic mean of the appropriate twelve (12) contiguous 1-hour average oxygen concentrations provided by each continuous monitoring system installed under paragraph D.1.a above.

c. Correct all 12-hour average TRS concentrations to ten (10) volume percent oxygen, except that all 12-hour average TRS concentrations from a recovery furnace shall be corrected to eight (8) volume percent using the following equation:

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

where:  $C_{\text{corr}}$  = the concentration corrected for oxygen  
 $C_{\text{uncorr}}$  = the concentration uncorrected for oxygen  
 $X$  = the volumetric oxygen concentration percentage to be corrected to eight (8) percent for recovery furnaces and ten (10) percent for lime kilns, incinerators, other devices  
or  
 $Y$  = the measured 12-hour average volumetric oxygen concentration

3. Each owner or operator required to install a continuous monitoring system shall submit a written report of excess emissions (as defined in applicable subparts) to the Department for every semi-annual period unless specified on a more frequent cycle by the Department. All semi-annual reports shall be postmarked by the 30th day following the end of each semi-annual period and shall include the following information:

a. For emissions from any recovery furnace, periods of excess emissions are all 12-hour average TRS concentrations above twenty (20) parts per million by volume (ppmv) for old design recovery furnaces, five (5) ppmv for new design recovery furnaces, and above twenty-five (25) ppmv for cross recovery furnaces;

b. For emissions from any lime kiln, periods of excess emissions are all 12-hour average TRS concentrations above twenty (20) ppmv;

c. For emissions from any digester system, multiple-effect evaporator system, or condensate stripper system, periods of excess emissions are:

(i) All 12-hour average TRS concentrations above five (5) ppmv unless the provisions of paragraph D.1.a above apply; or

(ii) All periods in excess of five (5) minutes and their duration during which the combustion temperature is less than 1200 degrees F if the gases are combusted in an incinerator or other device which does not generate TRS.

## **SECTION XII - PERIODIC TESTING – PARTICULATE MATTER EMISSIONS AND/OR SULFUR DIOXIDE (SO<sub>2</sub>)**

An owner or operator of a source listed below shall perform scheduled periodic tests for particulate matter emissions and/or SO<sub>2</sub> every two (2) years except as noted, or on a schedule as stipulated by special permit conditions, and shall ensure that source tests are conducted in accordance with Regulation 61-62.1, Section IV, Source Tests.

A. Rotary kilns, clinker coolers, and rotary dryers of Portland Cement plants.

B. Sulfuric acid plants.

C. Metallurgical furnaces greater than ten (10) tons per hour normal output.

D. Asphalt plants. Asphalt plants that have a baghouse operating in a satisfactory manner with sufficiently low visible emissions may be exempted at the discretion of the Department. Asphalt plants will be required to produce “surface mix” during compliance source testing. “Surface mix” is hot laid asphaltic concrete surface courses (except sand asphalt surface mix) as defined in Section 403 of the 1986 edition of the South Carolina State Highway Department’s “Standard Specifications for Highway Construction” manual. The Department may, at its discretion, waive this requirement if sufficient evidence indicates that less than twenty-five (25) percent of the plant’s total annual production is surface mix.

E. Fertilizer plants.

F. Any other sources which are deemed necessary.

## **SECTION XIII - [RESERVED]**

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