

Facts about control equipment performance standards

Background

The Minnesota Pollution Control Agency (MPCA) rules (Minn. R 7011.0060 to 7011.0080) allow facilities with certain types of pollution control equipment to take emission reductions into consideration and reduce the permitting requirements of the facility.

What are the advantages of using this rule?

You may use this rule to determine if you qualify for a state permit, capped permit, or a less-complex Option D Registration Permit instead of a federal Part 70 permit.

If you have an individual permit, you may also use this rule to calculate your facility's emission rate change resulting from a proposed modification. This may allow you to apply for a minor or moderate amendment instead of a major amendment; or you may determine that the change is an insignificant modification and may require no permit amendment.

The result of these reduced permitting requirements will save eligible facilities time and money. You can also reduce your annual emissions fees by following the requirements of this rule and claiming credit for a reduction in emissions.

Who is subject to the rule?

This is an elective rule. If you choose to use this rule to limit your facility's potential-to-emit, you are subject to its requirements. Facilities that do not choose to use this rule are not subject to the requirements.

Facilities can only use this rule to determine the type of permit needed, or to apply for a Capped permit or Option D Registration Permit. This rule cannot be used to avoid permitting altogether. For example, once a facility has determined that an air emission permit is needed, then the rule may be used to apply for an Option D Registration Permit instead of a State or Part 70 permit.

What types of control equipment are in the rule?

Table A, found on page 3, defines the types of pollution control equipment that are assigned a control efficiency under this rule.

This table also lists the pollutants for which a control efficiency has been assigned and the control efficiency (percent emission reduction) that the facility is allowed to claim when applying for a permit or permit amendment.

The assigned control efficiency does not apply to hazardous air pollutants (HAPs). The facility is allowed to assign a control efficiency for HAPs only after the efficiency has been demonstrated by conducting a performance test approved by the commissioner under Minn. R. 7017.2001 to 7017.2060.

For each type of control equipment listed in Table A there are three different control efficiencies listed for each controlled pollutant: one for a pollution control system that uses a total enclosure to capture the emissions from the source, one that uses a certified hood as the capture device, and a third that allows the use of a hood that is not certified.

A "total enclosure" means an enclosure that completely surrounds an emission unit so that all emissions are captured and discharged through ductwork to the control equipment.

A "hood" means a shaped inlet to a pollution control system that does not totally surround the emissions from an emission unit and is designed, used, and maintained, to capture and discharge the air emissions through ductwork to the control equipment. Hoods are designed and operated according to the practices recommended

in “Industrial Ventilation - A Manual of Recommended Practice, American Conference of Governmental Industrial Hygienists.”

In order to be considered a “certified hood”, the facility must have a testing company evaluate the design and operating characteristics of the hood system. The system must comply with the design and operating practices recommended in “Industrial Ventilation - A Manual of Recommended Practice, American Conference of Governmental Industrial Hygienists.” A form is available to help complete this certification.

The use of control efficiencies associated with a hood that is not certified is limited to the owner or operator of a stationary source that qualifies for a Registration Permit.

If I have control equipment that is not listed in Table A, may I consider its control efficiency when calculating potential to emit?

In general, no. However, if you have or are applying for an Option D permit or a Capped permit and have conducted a performance test approved by the MPCA, the control equipment may be eligible. See Minn. R. 7011.0070, subpart 2.

What are the requirements if I choose to use this rule?

If claiming credit for the Control Equipment rule, control and monitoring equipment are required to be used when operating the emission units.

This equipment should be operated in the ranges established by the manufacturer’s specifications for each monitoring parameter listed in Table C found on page 6 of this fact sheet.

What if I have a shutdown or breakdown?

If a shutdown or breakdown occurs on the listed control equipment, reporting requirements may apply. Additional information can be found in Minn. R. 7019.1000. Deviations from operating specifications of the listed control equipment should be reported by following the requirements in your permit.

Will I have any monitoring and/or recordkeeping responsibilities if I choose to use this rule?

Yes. A condition of being able to claim the assigned control efficiency for the pollution control equipment is that the equipment must be operated and maintained in accordance with the rule and the manufacturer’s specifications for the control equipment.

You must have the pollution control equipment manufacturer’s specifications to take advantage of this rule. You must also monitor control equipment operating parameters and keep records as specified in Table C. Unless a specific format is required, the records may be maintained in either electronic or paper format.

Additional maintenance requirements include:

- Maintain an inventory of spare parts that are subject to frequent replacement.
- Train staff on the operation and monitoring of control equipment and troubleshooting, and train and require staff to respond to indications of malfunctioning equipment.
- Thoroughly inspect all control equipment at least annually, or as required by the manufacturing specifications.
- Inspect monthly, or as required by the manufacturing specifications, components that are subject to wear or plugging (for example, bearings, belts, hoses, fans, nozzles, orifices, and ducts).
- Inspect quarterly, or according to manufacturer’s specifications, components that are not subject to wear including structural components, housing, ducts, and hoods.
- Check daily, or as required by the manufacturer’s specifications, monitoring equipment (for example, pressure gauges, chart recorders, temperature indicators, and recorders).
- Calibrate annually, or as required by the manufacturer’s specification, all monitoring equipment.
- Maintain a record of these items, indicating the activity, the date completed, and any corrective actions that were taken.
- In addition, maintain a record of the parts replaced, repaired, or modified for five years.

Who do I contact if I have any question about this rule?

Questions regarding this rule may be directed to the MPCA at 651-296-6300 or 800-657-3864. You may also contact the MPCA Small Business Environmental Assistance Program at 800-657-3938 or smallbizhelp.pca@state.mn.us.

Table A: Pollution control equipment and their control efficiencies

Section 1: Equipment designed primarily for particulate matter control

Control equipment description	Pollutant	Control efficiency		
		Total enclosure	Hood – certified	Hood – not certified
PM control category – cyclones				
A device where airflow is forced to spin in a vortex through a tube.				
Centrifugal Collector (cyclone) - high efficiency - a cyclonic device with parameters stated in Drawing 1 and Table B	PM	90%	72%	54%
	PM ₁₀	78%	62%	46%
Centrifugal Collector (cyclone) - medium efficiency - a cyclonic device with parameters stated in Drawing 1 and Table B	PM	80%	64%	48%
	PM ₁₀	60%	48%	36%
Centrifugal Collector (cyclone) - low efficiency - a cyclonic device with parameters stated in Drawing 1 and Table B	PM	25%	20%	15%
	PM ₁₀	25%	20%	15%
Multiple Cyclone without Fly Ash Re-injection - a cyclonic device with more than one tube where fly ash isn't reinjected	PM	90%	72%	54%
	PM ₁₀	72%	58%	43%
Wet Cyclone Separator or Cyclonic Scrubbers - a cyclonic device that sprays water into a cyclone.	PM	84%	68%	51%
	PM ₁₀	84%	68%	51%
PM control category – electrostatic precipitators				
Control devices in which incoming particulate matter receives an electrical charge and is then collected on a surface with the opposite electrical charge.				
– assumed efficiency for boiler fly ash control	PM ₁₀	40%	NA	NA
– assumed efficiency for other applications	PM	98%	78%	59%
	PM ₁₀	94%	75%	56%
PM control category – other controls				
Fabric Filter - the incoming gas stream to the filter passes through a porous fabric filter forming a dust cake	PM	99%	79%	59%
	PM ₁₀	93%	74%	56%
Spray Tower - the incoming gas stream to the tower passes through a chamber in which it contacts a liquid spray	PM	85%	68%	51%
	PM ₁₀	84%	68%	51%
Venturi Scrubber - the incoming gas stream to the scrubber passes through a venturi into which low pressure liquid is introduced	PM	94%	76%	57%
	PM ₁₀	84%	68%	51%
Impingement Plate Scrubber - the incoming gas stream to the scrubber passes a liquid spray and is then directed at high velocity into a plate	PM	77%	62%	46%
	PM ₁₀	77%	62%	46%
Mechanically Aided Separator - a device that relies on inertia for separating particles from the gas stream	PM	64%	52%	39%
	PM ₁₀	5%	4%	3%
Wall or Panel Filters - removable panels for cleaning and replacement, or liquid curtains for particulate removal that provide little resistance to air flow	PM	85%	68%	51%
	PM ₁₀	85%	68%	51%
HEPA Filter or ULPA Filter - a high efficiency wall or panel filter designed for collection of sub-micron particles	PM	99.98%	80%	60%
	PM ₁₀	99.98%	80%	60%
Charged Scrubber - electric power is used to precharge particulate matter in the gas stream as a means of increasing the scrubber's collection efficiency for fine particles.	PM	94%	76%	57%
	PM ₁₀	84%	68%	51%

Control equipment description	Pollutant	Control efficiency		
		Total enclosure	Hood – certified	Hood – not certified
Condensation Scrubber - a device in which steam is injected into a wet scrubber to create supersaturated conditions and promote condensation of water on fine particulate matter in the gas stream.	PM	94%	76%	57%
	PM ₁₀	84%	68%	51%

Section 2: Equipment designed for Volatile Organic Compound (VOC) control (includes efficiencies for pollutants where there is a co-benefit of control)

Control equipment description	Pollutant	Control efficiency		
		Total enclosure	Hood – certified	Hood – not certified
VOC control category				
Catalytic afterburners (catalytic oxidation) – a device used to reduce VOCs to the products of combustion through catalytic (use of a catalyst) oxidation in a combustion chamber.	VOC	94%	76%	57%
	PM	62%	50%	37%
	PM ₁₀	62%	50%	38%
	CO	94%	76%	57%
Thermal afterburners (thermal oxidation) – a device used to reduce VOCs to the products of combustion through thermal (high temperature) oxidation in a combustion chamber.	VOC	97%	78%	58%
	PM	62%	50%	37%
	PM ₁₀	62%	50%	37%
	CO	97%	78%	58%
Flaring or direct combustor – a device in which air, combustible organic waste gases, and supplementary fuel (if needed) react in the flame zone (e.g., at the flare tip) to destroy the VOCs	VOC	98%	79%	59%
	PM	61%	50%	37%
	PM ₁₀	61%	50%	37%
	CO	98%	79%	59%

VOC = volatile organic compounds

PM = particulate matter

PM₁₀ = particulate matter less than 10 um in size

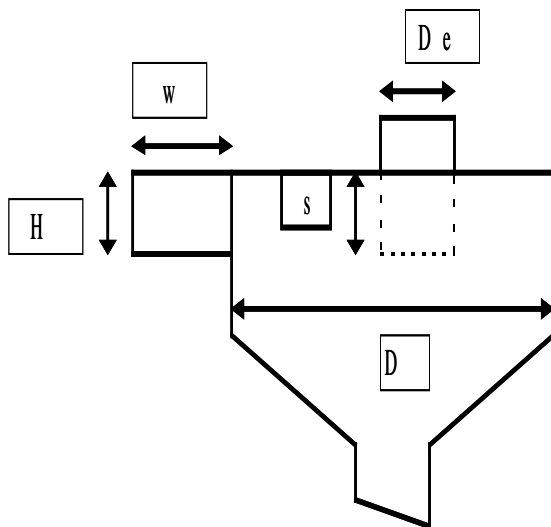
CO = carbon monoxide

Table B: Cyclone type

Ratio dimensions	High efficiency	Medium efficiency	Low efficiency
Height of inlet, H/D	≤ 0.44	> 0.44 and < 0.8	≥ 0.8
Width of inlet, W/D	≤ 0.2	> 0.2 and < 0.375	≥ 0.375
Diameter of gas exit, De/D	≤ 0.4	> 0.4 and < 0.75	≥ 0.75
Length of vortex finder, S/D	≤ 0.5	> 0.5 and < 0.875	≥ 0.875

If one or more of the ration dimensions, as listed in Table B, are in a different efficiency category (high, medium, low), then the lowest efficiency category shall be applied.

Drawing 1: Cyclone design



Key:

H = Height of inlet

D = Cyclone body

W = Width of inlet

De = Diameter of gas exit

S = length of vortex finder

Table C: Monitoring and recordkeeping requirements for control equipment

Pollution control equipment type	Monitoring parameters	Recordkeeping requirement
Centrifugal collector (cyclone)	Pressure drop	Record pressure drop every 24 hours if in operation
Electrostatic precipitator	Voltage, Secondary current, and, if used, conditioning agent flow rate	Continuous readout of voltage, and secondary current. If used, daily record of conditioning agent flow rate.
Fabric filter (baghouse) - high or medium temperature (≥ 180 °F)	Pressure drop	Record pressure drop every 24 hours if in operation
Fabric filter (baghouse) – low temperature (< 180 °F)	Pressure drop or visible emission observations from filter outlet during an entire cleaning cycle (unless one or the other is specified by the MPCA)	Record pressure drop every 24 hours if in operation, or record whether visible emissions are observed and the time period of observation (every 24 hours if in operation), or record both if both parameters are required by the MPCA
Spray tower	Liquid flow rate and pressure drop	Record each parameter every 24 hours if in operation
Venturi or impingement plate scrubber	Pressure drop and liquid flow rate	Record each parameter every 24 hours if in operation
Mechanically aided separator	Pressure drop	Record pressure drop every 24 hours if in operation
HEPA and other wall filters	Condition of the filters including, but not limited to, alignment; saturation; and tears and holes	Record of filter(s) condition every 24 hours if in operation
Wet cyclone separator	Pressure drop; and water pressure	Record each parameter every 24 hours if in operation
Charged scrubber	Pressure drop and liquid flow rate	Record each parameter every 24 hours if in operation
Condensation scrubber	Pressure drop and either steam supply rate or blowdown rate	Record each parameter every 24 hours if in operation

Pollution control equipment type	Monitoring parameters	Recordkeeping requirement
Thermal afterburner	Combustion temperature or inlet and outlet temperatures	Record temperatures at least once every 15 minutes
Catalytic afterburner	Inlet and outlet temperatures; and catalyst bed reactivity as per manufacturer's specifications	Record temperatures or manual readings at least once every 15 minutes; and results of catalyst bed reactivity
Flaring	Temperature indicating presence of a flame	Record temperatures at least once every 15 minutes

If one or more of the ration dimensions, as listed in Table B, are in a different efficiency category (high, medium, low), then the lowest efficiency category shall be applied.