



Lincoln-Lancaster County Health Department

Air Quality Program Environmental Public Health Division

CONTROL DEVICE EFFICIENCIES

The first column is the three digit control device code. The description column is a short description column to show the class of control device. The last six columns show common pollutant removal efficiencies, expressed in percent, for that type of control and particular pollutant. These removal efficiencies are only guidelines, your actual values may differ. If you wish to provide your own control efficiencies, be sure to include stack tests to demonstrate the efficiency provided.

Control Device No.	Control Device	Control Efficiency %						
		Lead	PM _{Total}	PM ₁₀	VOC	CO	SO ₂	NO _x
000	Uncontrolled	-	-	-	-	-	-	-
001	Wet Scrubber – High Efficiency	-	Note 1		-	-	Note 1	-
002	Wet Scrubber – Medium Efficiency	-	Note 1		-	-	Note 1	-
003	Wet Scrubber – Low Efficiency	-	Note 1		-	-	Note 1	-
005	Gravity Collector	2	3	-	-	-	-	-
007	Cyclone – High Efficiency	65	95	80	-	-	-	-
008	Cyclone – Med. Efficiency (conventional)	40	75	50	-	-	-	-
009	Cyclone – Low Efficiency (hi-throughput)	8	35	10	-	-	-	-
010	Electrostatic Precipitator – High Efficiency	75	95	95	-	-	-	-
011	Electrostatic Precipitator – Med. Efficiency	65	80	80	-	-	-	-
012	Electrostatic Precipitator – Low Efficiency	55	70	70	-	-	-	-
016	Fabric Filter – Temperature >250 °F	80	99	95	-	-	-	-
017	Fabric Filter – Temperature 180-250 °F	80	99	95	-	-	-	-
018	Fabric Filter – Temperature <180 °F	80	99	95	-	-	-	-
019	Catalytic Afterburner	-	-	-	95	-	-	-
020	Catalytic Afterburner w/ Heat Exchanger	-	-	-	95	-	-	-
021	Direct Flame Afterburner	-	-	-	95	-	-	-
022	Direct Flame Afterburner w/ Heat Exchanger	-	-	-	95	-	-	-
023	Flaring	-	-	-	90	-	-	-
024	Modified Furnace/Burner	-	-	-	-	-	-	50
025	Staged Combustion	-	-	-	-	-	-	40
026	Flue Gas Recirculation	-	-	-	-	-	-	50
027	Reduce Combustion Air Preheating	-	-	-	-	-	-	Varies ¹
028	Steam or Water Injection	-	-	-	-	-	-	65

Note 1: Particulate control equipment represented by these classifications should be included in the other, more specific categories (i.e., Venturi scrubbers or packed bed absorption columns). Control efficiency for these devices should be made on a case-by-case basis.

¹ - The amount of NO_x reduction achievable from reducing preheating of combustion air will vary according to the temperatures before and after the modification. Therefore, efficiencies for this process should be evaluated on a case-by-case basis.

Control Device No.	Control Device	Control Efficiency %						
		Lead	PM _{Total}	PM ₁₀	VOC	CO	SO ₂	NO _x
029	Low Excess Air Firing	-	-	-	-	-	-	30
030	Low Nitrogen Content Fuel	-	-	-	-	-	-	50
043	Sulfuric Acid Plant Single Contact Process	-	-	-	-	-	50	-
044	Sulfuric Acid Plant Double Contact Process	-	-	-	-	-	95	-
047	Vapor Recovery Sys. (hood, condenser, etc.)	-	-	-	Varies ²	-	-	-
048	Activated Carbon Adsorption	-	-	-	-	-	Varies ³	-
049	Liquid Filtration System	-	75	70	-	-	-	-
050	Packed Gas Adsorption Column	-	85	85	85	85	85	85
051	Tray Type Gas Adsorption Column	-	85	80	85	85	85	85
052	Spray Tower	-	20	20	-	-	Note 1	-
053	Venturi Scrubber	-	90	90	-	-	Note 1	-
055	Impingement Plate Scrubber	-	25-99 ⁴	-	-	-	-	-
058	Mat or Panel Filter	-	90	90	-	-	-	-
061	Dust Suppression by Water Spray	-	50	50	-	-	-	-
062	Dust Suppression by Chemical Stabilizers	-	50	50	-	-	-	-
065	Catalytic Reduction	-	-	-	-	-	-	Varies ⁵
067	Wet Lime Slurry Scrubbing	-	-	-	-	-	85	-
076	Multiple Cyclone w/o Flyash Reinjection	65	80	80	-	-	-	-
077	Multiple Cyclone w/ Flyash Reinjection	40	50	50	-	-	-	-
086	Water Curtain	0	50	10	-	-	-	-
139	Selective Catalytic Reduction (SCR)	-	-	-	-	-	-	60-90 ⁶
140	Selective Non-Catalytic Reduction (SNCR)	-	-	-	-	-	-	Varies ⁷

The following do not have readily available control efficiencies, and control efficiencies for these devices should be obtained from the equipment manufacturer. These are provided so you may include the correct device code.

Control Device No.	Control Device
099	Miscellaneous Control Devices
115	Impingement Type Wet Scrubber
117	Packed Bed Scrubber
119	Dry Scrubber

Control Device No.	Control Device
123	Spray Scrubber
124	High Pressure Scrubber
125	Low Pressure Scrubber
142	HEPA Filter

² - Control efficiencies for a particular condenser will vary for different VOC compounds and depends on both the partial pressure of the pollutant and the operating parameters of the condenser. Efficiencies should be evaluated on a case-by-case basis.

³ - Since the overall control efficiency will depend on source specific parameters such as the physical characteristics of the absorbent bed and gaseous stream, the temperature, and the choice of regeneration technique, efficiencies should be evaluated on a case-by-case basis.

⁴ - Depending on the application, the control efficiency may vary greatly. Determinations will be made on a case-by-case basis.

⁵ - This is a generic classification, and it is recommended that specific technologies be addressed on an individual basis. Refer to Selective Catalytic Reduction (SCR) and Selective Non-Catalytic Reduction (SNCR).

⁶ - Determinations will be made on a case-by-case basis.

⁷ - Urea-based SNCR can achieve reductions of 30-80%. Ammonia-based SNCR can achieve reductions of 55-85%. Determinations will be made on a case-by-case basis.