

Ohio EPA

Division of Air Pollution Control

Engineering Guide #13

**Question:**

How should “equivalent visible particulate emission limitations” under OAC rule 3745-17-07(C) be determined, and how should such limitations be expressed in the terms and conditions of permits to operate for emissions units which qualify for such limitations? (This question was submitted by Bob Goulish of the Northeast District Office on June 4, 1980.)

**Answer:**

The determination of an equivalent visible particulate emission limitation (“EVEL”) is described in paragraph (C)(1) of OAC rule 3745-17-07. This paragraph reads as follows:

“For the purpose of establishing an equivalent visible particulate emission limitation for stack emissions subject to a mass-based, particulate emission limitation, any owner or operator of an air contaminant source which is subject to the requirements of paragraph (A)(1) of this rule may request the director to determine the average opacity of the emissions from said source during any performance test(s) conducted pursuant to paragraph (B) of rule 3745-17-03 of the Administrative Code. Any such request shall be made in writing at the time the test specifications and procedures are submitted to the director pursuant to paragraph (B) of rule 3745-17-03 of the Administrative Code.” (emphasis added)

The procedure for determining an “average opacity” or an EVEL is as follows:

- (1) A minimum of 60 consecutive minutes of opacity readings (obtained in accordance with Test Method 9) should be taken during each sampling run. Therefore, for each performance test (which normally consists of three sampling runs), a total of three sets of opacity readings (totalling three hours or more) should be obtained. Note that any opacity readings taken during the exempt periods identified in OAC rule 3745-17-07(A)(2) and (A)(3) should not be used in the determination of an EVEL.
- (2) After the results of the performance tests are received from the company, the status of compliance with the applicable mass emission limitation from OAC rule 3745-17-08, -09, -10, -11, -12 or -13 should be determined. In accordance with USEPA Method 5, the average of the results of the three sampling runs must be less than the allowable mass emission rate in order for the emissions unit to be considered to be in compliance. If compliance is demonstrated, then only those test runs with results which are less than the allowable mass emission rate should

be considered as acceptable test runs for the purpose of establishing an EVEL, and only visible particulate emission readings from such acceptable test runs should be used in establishing an EVEL. (In general, for a specific emissions unit, there is a direct relation between opacity and mass emission rate.

Establishing an EVEL based upon a test run which exceeded the allowable mass emission rate would possibly allow an emissions unit to subsequently operate in violation of the allowable mass emission rate. For example, assume that stack tests were performed on a process which has an allowable particulate emission rate of 22 lbs/hr and that the results of the three test runs are 30 lbs/hr (run #1), 14 lbs/hr (run #2) and 16 lbs/hr (run #3). The average of the results of the three runs is 20 lbs/hr; therefore, compliance with rule 3745-17-11 was demonstrated. Also, assume that all visible particulate emission readings were less than 60% opacity and that the average opacities for the second highest, nonoverlapping, six-minute periods were 30% (run #1), 15% (run #2) and 19% (run #3). No EVEL is appropriate in this case since two of the three runs (#2 and #3) demonstrate compliance with the 20% opacity requirement and the run (#1) with a 30% average opacity failed to show compliance with the allowable mass emission rate. If the EVEL for the 20% opacity requirement of paragraph (A)(1)(a) was established at 30%, the process would be permitted to operate at a mass emission rate by 36% or 8 lbs/hr. Such an approach would obviously negate the usefulness of opacity as an enforcement tool and as an indicator of compliance with the mass emission limitations contained in OAC rules 3745-17-08, -09, -10, -11, -12 and -13.)

- (3) The opacity readings for each acceptable sampling run should be divided into “running” sets of 24 consecutive readings. [There are (n-23) separate sets of six-minute averages, where “n” equals the number of individual opacity readings. For example, for a one-hour reading, n = 240 and the number of separate sets equals 217.] The six-minute average opacity for each such set should be determined by dividing the sum of the 24 readings within each set by 24. (Central Office has a computer program which can be used to calculate the running averages or field office personnel may use their own programs.)
- (4) Upon completion of item #3, the field office personnel should determine if the emissions unit failed to comply with the requirements of paragraph (A)(1)(a) and/or (A)(1)(b) of OAC rule 3745-17-07.

If any of the test runs (that show compliance with the applicable mass emission limitation) contain two or more six-minute average, nonoverlapping sets from the same test run that exceed only the 20% opacity requirement in paragraph (A)(1)(a), then the highest value of the second highest nonoverlapping six-minute average from each such test run should be selected as the EVEL in lieu of the requirement in paragraph (A)(1)(a). For example, if each of three test runs shows compliance with the applicable mass emission limitation and the following

opacity values are obtained, the EVEL in lieu of the 20 percent opacity requirement in OAC rule 3745-17-07(A)(1)(a) would be 35 percent from test run #3.

	<u>Test Run #1</u>	<u>Test Run #2</u>	<u>Test Run #3</u>
Highest Six-Minute, Nonoverlapping, Average Opacity (%)	50	40	35
Second Highest Six-Minute, Nonoverlapping, Average Opacity (%)	25	30	35

If any of the six-minute average sets from any test run (that shows compliance with the applicable mass emission limitation) exceed the 60% opacity requirement in paragraph (A)(1)(b), but all other six-minute average values comply with the 20% opacity requirement of paragraph (A)(1)(a), then the highest six-minute average should be selected as the EVEL in lieu of the requirement in paragraph (A)(1)(b).

If the data show violations of both the 20% and 60% opacity requirements, then the highest six-minute average from any test run (that shows compliance with the applicable mass emission limitation) should be selected as the EVEL in lieu of the requirements in paragraph (A)(1)(b), and the highest of the second highest nonoverlapping six-minute averages should be selected as the EVEL in lieu of the requirement in paragraph (A)(1)(a). For example, if each of three test runs shows compliance with the applicable mass emission limitation and the following average opacity values are obtained, the EVELs in lieu of the 60 percent opacity and 20 percent opacity requirements in OAC rules 3745-17-07(A)(1)(a) and (A)(1)(b) are 80 percent and 65 percent from test run #1 and test run #3, respectively.

	<u>Test Run #1</u>	<u>Test Run #2</u>	<u>Test Run #3</u>
Highest Six-Minute, Nonoverlapping, Average Opacity (%)	80	60	70
Second Highest Six-Minute, Nonoverlapping, Average Opacity (%)	60	55	65

Once an EVEL has been determined, it should be reported in a letter to the entity. The letter should also indicate that the entity may request the Director to formally establish the EVEL for the emissions unit.

If the entity timely requests such an EVEL (i.e., within 30 days after receipt of notification) and otherwise complies with the requirements of paragraph (C)(1) to (C)(3) of OAC rule 3745-17-07, then, in accordance with paragraph (C)(4) of such rule, the EVEL may be specified in the terms and conditions (“TCs”) of the permit, variance or order issued by the Director for the emissions unit.

The EVEL should be expressed in the TCs in accordance with the following suggested language:

- (1) Use the following whenever an emissions unit is being granted an EVEL in lieu of the limitation in OAC rule 3745-17-07(A)(1)(a):

Equivalent Visible Particulate Emission Limitation

Pursuant to the provisions of OAC rule 3745-17-07(C), this facility is hereby granted the following equivalent visible particulate emission limitation for this emissions unit in lieu of the 20 percent opacity limitation specified in OAC rule 3745-17-07(A)(1)(a):

Except as otherwise provided in OAC rule 3745-17-07(A)(1)(b) to (A)(3), this facility shall not cause or allow the discharge into the ambient air from [either “any stack associated with this emissions unit” or identify the stack(s)] any air contaminant of a shade or density greater than \_\_\_ percent opacity, as a six-minute average.

For the purpose of determining compliance with the equivalent visible particulate emission limitation specified above, the opacity of visible particulate emissions shall be determined according to the test method and procedures prescribed in OAC rule 3745-17-03(B)(1).

- (2) Use the following whenever an emissions unit is being granted an EVEL in lieu of the limitation in OAC rule 3745-17-07(A)(1)(b):

Equivalent Visible Particulate Emission Limitation

Pursuant to the provisions of OAC rule 3745-17-07(C), this facility is hereby granted the following equivalent visible particulate emission limitation for this emissions unit in lieu of the 60 percent opacity limitation specified in OAC rule 3745-17-07(A)(1)(b):

Except as otherwise provided in OAC rule 3745-17-07(A)(2) and (A)(3), this

facility may cause or allow the discharge into the ambient air from [either “any stack associated with this emissions unit” or identify the stack(s)] for not more than six consecutive minutes in any 60 minutes any air contaminant of a shade or density not greater than \_\_\_ percent opacity, as a six-minute average.

For the purpose of determining compliance with the equivalent visible particulate emission limitation specified above, the opacity of visible particulate emissions shall be determined according to the test method and procedures prescribed in OAC rule 3745-17-03(B)(1).

- (3) Use the following whenever the emissions unit is being granted EVELs in lieu of the limitations in OAC rule 3745-17-07(A)(1)(a) and (A)(1)(b):

Equivalent Visible Particulate Emission Limitation

Pursuant to the provisions of OAC rule 3745-17-07(C), this facility is hereby granted the following equivalent visible particulate emission limitations for this emissions unit in lieu of the 20 and 60 percent opacity limitations specified in OAC rule 3745-17-07(A)(1)(a) and (A)(1)(b):

- (a) Except as otherwise specified in OAC rule 3745-17-07(A)(2) and (A)(3) and paragraph (b) below, this facility shall not cause or allow the discharge into the ambient air from [either “any stack associated with this emissions unit” or identify the stack(s)] any air contaminant of a shade or density greater than \_\_\_ percent opacity, as a six-minute average.
- (b) This facility may cause or allow the discharge into the ambient air from [either “any stack associated with this emissions unit” or identify the stack(s)] for not more than six consecutive minutes in any 60 minutes any air contaminant of a shade or density not greater than \_\_\_ percent opacity, as a six-minute average.

For the purpose of determining compliance with the equivalent visible particulate emission limitations specified above, the opacity of visible particulate emissions shall be determined according to the test method and procedures prescribed in OAC rule 3745-17-03(B)(1).

An EVEL should be reevaluated whenever there is a possibility that the EVEL is no longer appropriate. This might occur after modifications of the process or control equipment, or it might be indicated by continuous opacity monitoring data or additional emissions testing of the emissions unit. At a minimum, an EVEL should be reevaluated during the renewal of an operating permit (Title V or State PTO).

If, at the renewal of the operating permit, an emissions unit is required to perform an emission test to demonstrate compliance with the allowable mass emission limitation, then the Director and facility will follow the same procedure for renewing an EVEL as is outlined above for the determination of an EVEL. During this renewal process, it is conceivable that the Director will change or eliminate completely an EVEL. The new operating permit will reflect any changes to the EVEL.

TK/JO/

June 27, 1980

(revised February 27, 1981, December 23, 1994 and June 20, 1997; reviewed March 13, 2007 and no significant revisions were made)