

**Evaluation of Opacity Observations and Opacity Limit Considerations
of UFIP Emissions from BOPF Shop and BF Casthouses
February 2024**

Introduction

In light of there being no developments in practices, processes or control technologies that necessitate revision of standards, EPA nonetheless proposed new limitations for the BOPF and Blast Furnace Casthouse roofs and erred in doing so by not evaluating all available opacity data provided by Industry. The proposed limitations are set at such a low level of opacity (5%) that the continuous compliance required by the rule (i.e., the limit must be met at all times without exception) is not achievable, as evidenced through actual data provided by the steel industry.

EPA's proposed opacity limits are unachievable (even by MACT floor sources), and thus the agency should revise the proposed limits before finalizing the rule.¹ In our comments, we proposed using statistically derived upper prediction limit (UPLs) to set appropriate limits, and the results of these analyses indicate that the existing MACT limitations for opacity should be retained.² We are providing supplemental data and information on how the UFIP opacity limits should be incorporated if EPA were to continue to adjust the opacity limits downward in the final rule.

Opacity Data Set

The opacity data used in the evaluation includes the previously submitted UPL analysis (Method 9 testing conducted between January 2019 and May 2022) and additional opacity data taken after May 2022 and through 2023. Note that only those tests from May 2022 through 2023 which had at least one three- or six-minute average (for BOPF Shops and BF Casthouses, respectively) over 10% opacity were included in this analysis. Additional Method 9 testing may have been conducted but was not included in this analysis.

Concerns and Aspects Related to the Form of the Proposed Opacity Standard

As discussed in our comments, there are two elements that make the proposed opacity limit unachievable:

1. The absolute value of the opacity limit, 5% (on a six-minute average for BF Casthouses and a three-minute average for BOPF Shops) which must be met at all times.
2. Existing capture and control systems are not capable of continuously achieving compliance with 5% opacity without substantial retrofitting and expanding capture and control systems.

The sources in question, by their very nature, emit intermittently, meaning that a compliance standard which applies continuously (at all times) would require sources to design controls that meet the standards under infrequent conditions. This results in the need to install exorbitant controls for small, infrequent, episodic, and not easily controlled emissions occurrences.

We looked to other EPA precedent on how integrated steel sources are currently regulated and identified that under NSPS Subpart N³, the opacity standard is designed as follows:

¹ See Appendix B of Industry Comments, Docket ID EPA-HQ-OAR-2002-0083-1609.

² Ibid.

³ Also note that similar exception language already exists in the II&S MACT rule (40 CFR 63 Subpart FFFFF) for new BOPF sources. See Item 13 of Table 1 of 40 CFR Subpart FFFFF.

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- No emissions shall be discharged which exhibit “10 percent opacity or greater, except that an opacity of greater than 10 percent but less than 20 percent may occur once per steel production cycle.”⁴
- “Method 9 and the procedures in § 60.11 shall be used to determine opacity. Observations taken during a diversion period shall not be used in determining compliance with the opacity standard. Opacity observations taken at 15-second intervals immediately before and after a diversion of exhaust gases from the stack may be considered to be consecutive for the purpose of computing an average opacity for a 6-minute period.”⁵

Therefore, an alternative to continuous limits (that apply at all times), could be a limit form that mirrors this existing EPA NSPS standard for similar sources – an opacity limit with a certain number of exception events. Allowing exceptions is consistent both with EPA’s past decisions and with standards that facilities have designed for.

Analysis, Results and Observations

The opacity data was analyzed to understand the implications of an opacity limit with exceptions for this rulemaking. We defined four different possible opacity limits: 10%, 12.5%, 15% and 20%. Then we determined how many tests had an opacity reading over the respective proposed limit of two exception allowances (capped at 20% opacity) per Method 9 test, and how that would affect the compliance rate.

The results of the analysis are shown in Table 1 (BOPFs) and Table 2 (Casthouses) below:

Table 1. BOPF Analysis

Opacity Limit	Predicted BOPF Opacity Compliance Rates Based on Maximum 3-Minute Average		Predicted BOPF Opacity Compliance Rates Allowing Two 3-min Average Exceptions	
	# of Tests Over Limit	% Tests Reviewed Over Limit	# of Tests Over Limit	% Tests Reviewed Over Limit
10	164	13.5%	51	4.2%
12.5	97	8.0%	41	3.4%
15	68	5.6%	37	3.0%
20	37	3.0%	37	3.0%

⁴ See 40 CFR 60.142.

⁵ See 40 CFR 60.144(b)(3).

Table 2. BF Casthouse Analysis

Opacity Limit	Predicted BF Opacity Compliance Rates Based on Maximum 6-Minute Average		Predicted BF Opacity Compliance Rates Allowing Two 6-min Average Exceptions	
	# of Tests Over Limit	% Tests Reviewed Over Limit	# of Tests Over Limit	% Tests Reviewed Over Limit
10	73	4.1%	20	1.1%
12.5	45	2.5%	17	1.0%
15	25	1.4%	10	0.6%
20	10	0.6%	10	0.6%

Key Takeaways:

1. Even at the current opacity limit of 20% for UFIP sources, the analysis reinforces the steel industry's position that the existing 20% opacity standard for UFIP sources is very challenging to achieve continuously. Further lowering this standard, without the development of any new control technology, is not supported by the data.
2. Lowering the existing opacity standard of 20% by any amount will cause increased deviations and noncompliance rates for an opacity limit based on continuous compliance without exceptions for intermittent events.
3. Should EPA not wish to adopt a UPL approach, we believe EPA should follow the existing NSPS Subpart N limit form and set an opacity limit which has provision for infrequent, intermittent opacity episodes from UFIP sources on a 6-min average basis, including for BOPFs.
4. If EPA considers an exception element to the UFIP opacity standards, we recommend an opacity limit of 15% with two opacity exceptions per cast or heat cycle (i.e., two 6-minute average events) be allowed similar to the NSPS Subpart N framework, including for BOPFs.