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September 1987

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Rubber Tire Manufacturing Industry — Background Information for Promulgated Standards

Final EIS

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Rubber Tire Manufacturing Industry — Background Information for Promulgated Standards

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U.S. ENVIRONMENTAL PROTECTION AGENCY
Office of Air and Radiation
Office of Air Quality Planning and Standards
Research Triangle Park, North Carolina 27711

September 1987

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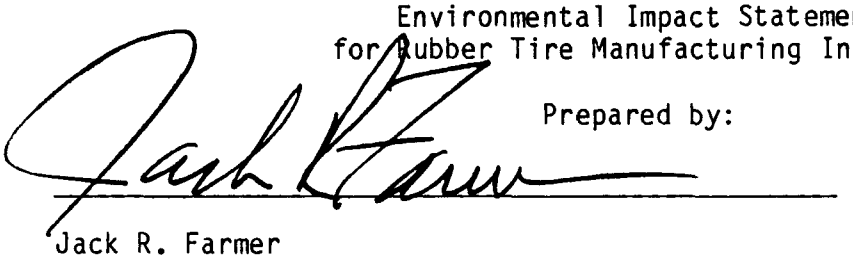
ENVIRONMENTAL PROTECTION AGENCY

Background Information
and Final
Environmental Impact Statement
for Rubber Tire Manufacturing Industry

Prepared by:



9/1/87

Jack R. Farmer
Director, Emission Standards and Engineering
Division
U.S. Environmental Protection Agency
Research Triangle Park, North Carolina 27711

(Date)

1. The promulgated standards of performance would limit emissions of volatile organic compounds (VOC) from new, modified, and reconstructed facilities in rubber tire manufacturing plants. Section 111 of the Clean Air Act (42 U.S.C. 7411), as amended, directs the Administrator to establish standards of performance for any category of new stationary source of air pollution that "...causes or contributes significantly to air pollution which may reasonably be anticipated to endanger public health or welfare."

2. Copies of this document have been sent to the following Federal Departments: Labor, Defense, Transportation, Commerce, Interior, and Energy; the Council on Environmental Quality; members of the State and Territorial Air Pollution Program Administrators; the Association of Local Air Pollution Control Officials; EPA Regional Administrators; and other interested parties.

3. For additional information contact:

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4. Copies of this document may be obtained from:

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1.0 SUMMARY

On January 20, 1983, the Environmental Protection Agency (EPA) proposed standards of performance for the rubber tire manufacturing industry (48 FR 2676) under authority of Section 111 of the Clean Air Act. Public comments were requested on the proposed standards in the Federal Register. There were nine commenters, mainly composed of tire manufacturers. Also commenting were the Rubber Manufacturers Association and the Alabama Department of Environmental Management. The comments that were submitted, along with responses to these comments, are summarized in this document. The summary of comments and responses serves as the basis for the revisions made to the standard between proposal and promulgation.

1.1 SUMMARY OF CHANGES SINCE PROPOSAL

The proposed standards have been revised as a result of reviewing public comments. The format of the volatile organic compounds (VOC) use cutoffs for undertread cementing and sidewall cementing facilities has been changed from a grams of VOC per tire basis to an equivalent total (uncontrolled) VOC use basis. A VOC use cutoff, an emission limit, and an alternative compliance method have been added for green tire spraying facilities that use organic solvent-based sprays. A VOC use cutoff has also been added for Michelin-A, -B, -C-automatic facilities. The format for the proposed bead cementing emission limit has been changed from a grams per tire basis to an equivalent grams per bead basis. The proposed definition of "month" also has been changed. These changes are explained in the responses to the comments that are provided in Chapter 2 of this document.

In addition to changes made to the proposed standards based on public comments received, inside and outside green tire spraying operations that are performed in the same spray booth have been designated one affected facility. Under the proposed standards, the limits for each inside and outside green tire spraying operation would have been met by using water-based sprays. Since there are different spray formulations for inside and outside water-based sprays, it was appropriate to have

separate limits for the two types of sprays, and it was simpler to treat each inside water-based spraying and each outside water-based spraying operation as separate affected facilities. With the addition of emission limits for organic solvent-based green tire spraying operations, which would be met using capture and control technology, it is appropriate to designate the spray booth as the affected facility. This would be the narrowest definition of a green tire spraying facility to which a capture and control system could be applied. It would not be feasible to construct an emission reduction system to control emissions from separate inside and outside green tire spray applicators (nozzles) within one spray booth. Consequently, a green tire spraying facility now is defined as the spray booth, spray application equipment, and related equipment used to apply inside and/or outside sprays to a green tire. However, because no emission reduction systems are anticipated for control of water-based sprays, separate emission limits for these sprays have been retained.

The monitoring requirements have changed for owners and operators who use a carbon adsorber to achieve compliance with a percent reduction requirement by meeting equipment specifications. At proposal, such owners and operators would have been required, upon EPA promulgation of the necessary continuous monitor performance specifications, to install an emissions monitor to measure the VOC concentration of the exhaust gases. The Agency has not developed such continuous monitor performance specifications for VOC. However, organics monitoring devices are available that can serve as concentration level indicators for determining proper operation and maintenance without the necessity for performance specifications. The final standards have been revised to require the installation of organics concentration monitoring devices (where carbon adsorbers are used to achieve compliance with a percent reduction requirement by meeting equipment specifications) for the purpose of determining proper operation and maintenance of the carbon adsorbers.

Reporting requirements have been changed to reflect the EPA's efforts to increase the efficiency of enforcement activities. Once every 6 months, facilities are being required to report periods when the applicable emission limit is exceeded and when the operating parameters being monitored are not within acceptable limits.

Language has been added to the preamble and regulation to clarify that the percent emission reduction requirement and monthly VOC use cut-offs for undertread cementing, sidewall cementing, green tire spraying, Michelin-A, Michelin-B, and Michelin-C -automatic operations apply to all VOC used in cements and organic solvent-based green tire sprays, including that VOC used for tire types other than those defined in the regulation [§60.541(a)].

1.2 SUMMARY OF IMPACTS OF PROMULGATED ACTION

1.2.1 Alternatives to Promulgated Action

The regulatory alternatives are discussed in Chapter 6 of the background information document for the proposed standards (BID) (EPA-450/3-81-008a). These regulatory alternatives reflect the different levels of emission reduction from which one is selected that represents best demonstrated technology (BDT), considering costs, nonair quality health, and environmental and economic impacts for rubber tire manufacturing. These alternatives remain the same.

1.2.2 Environmental Impacts of Promulgated Action

The environmental impacts are discussed in Chapter 7 of the BID. These impacts are based on the different levels of emission reduction as reflected by the regulatory alternatives. The environmental impacts were one factor used in selecting the proposed standards.

The environmental impact figures have been revised to reflect changes in the estimates of the emission level under baseline control, and changes that were made to the standards after proposal. Detailed calculations are provided in docket entry IV-B-12.

At proposal, the baseline level of emission control was assumed to be 70 percent overall emission reduction, using capture and control equipment, at each undertread cementing operation, each tread end cementing operation, each bead cementing operation, and each green tire spraying operation where organic solvent-based sprays are used. In addition, some green tire spraying operations were assumed to use water-based sprays, and VOC emissions from sidewall cementing operations were assumed to be uncontrolled. This baseline reflects the level of emission reduction recommended in the control technique guideline (CTG) document, "Control of Volatile Organic Compound Emissions from Manufacture of Pneumatic Rubber Tires" (EPA-450/2-78-030).

Since publication of the CTG, many States where rubber tire manufacturing plants are located have adopted regulations in their State implementation plans (SIP's) that can be met without installing capture and control equipment at tread end cementing and bead cementing operations. The EPA believes that this emission control scenario is a more representative emissions baseline and, therefore, has revised the baseline level of emission control accordingly. Capture and control equipment is no longer assumed to be used at these two types of operations under the emissions baseline.

The addition of percent emission reduction requirements for green tire spraying operations where organic solvent-based sprays are used also has changed the environmental impact of the standards. These impacts were previously based on the use of water-based sprays at all affected green tire spraying operations. The environmental impact of the promulgated standards are based on the use of some organic solvent-based sprays at 46 percent of the affected green tire spraying operations. A 75 percent efficient emission reduction system was assumed to be used whenever organic solvent-based sprays were used.

1.2.3 Energy, Control Costs, and Economic Impacts of Promulgated Action

The energy impacts are discussed in Section 7.4 of the BID. VOC control cost impacts for the regulatory alternatives, costs to comply with Occupational Safety and Health Administration regulations, and compliance costs of other environmental regulations are discussed in Chapter 8 of the BID. Chapter 9 of the BID describes the economic impacts of the proposed standards. The changes made in the standards have no effect on these impacts for the regulatory alternatives.

The control costs calculated for the promulgated standards have been revised to reflect changes in assumptions used to estimate baseline control costs and changes in the standards since proposal. Detailed calculations are provided in docket entry IV-B-12.

At proposal, the assumptions used to calcualte the baseline control costs were: (1) a separate capture and control system would be used at each undertread cementing operation, each tread end cementing operation, and each bead cementing operation; and (2) no capture and control systems would be used at green tire spraying operations and sidewall cementing operations. The assumptions used to calculate the baseline control costs for the promulgated standards were: (1) a separate

capture and control system would be used at each undertread cementing operation; (2) 54 percent of the green tire spraying operations would use only water-based sprays and, therefore, incur no control system costs; (3) 46 percent of the green tire spraying operations would use some organic solvent-based sprays and would use capture and control systems to reduce emissions; (4) no capture and control systems would be used at sidewall cementing operations, tread end cementing operations, and bead cementing operations.

The addition of percent emission reduction requirements for green tire spraying operations where organic solvent-based sprays are used also has changed the cost impact of the standards. These impacts were previously based on the use of water-based sprays at all affected green tire spraying operations. The cost impact of the promulgated standards is based on the use of some organic solvent-based sprays at 46 percent of the affected green tire spraying operations. A 75 percent efficient emission reduction system was assumed to be used whenever organic solvent-based sprays were used; and a particulate removal device was assumed to be used upstream of the VOC control device. Consequently, the energy and control cost impacts of the promulgated standards increased slightly. However, the economic impacts of the promulgated standards remain essentially the same.

1.2.4 Other Considerations

Section 7.5.3 of the BID concludes that the regulatory alternatives allow each company to develop the optimal strategy of emission reduction for each facility, and that future control options, therefore, are not expected to be affected adversely. The changes to the proposed standards have no effect on this conclusion.

1.2.4.1 Environmental and Energy Impacts of Delayed Standards. Section 7.5.4 of the BID concludes that if standards implementation is delayed, new plants in National Ambient Air Quality Standard (NAAQS) nonattainment areas for ozone would be subject to SIP requirements. Delay in implementation of the standards of performance, therefore, would result in about a 5 percent increase in annual nationwide VOC emissions from tire manufacturing plants. This projected impact has not changed since proposal of the standards.

1.2.4.2 Urban, Community, Socioeconomic, and Inflationary Impacts. Section 7.5.2.1 of the BID concludes that the regulatory alternatives are not expected to have an adverse impact on urban areas or communities. Section 9.3 of the BID concludes that the socioeconomic and inflationary impacts of the regulatory alternatives are minimal. Changes to the proposed standards have not affected these conclusions.

2.0 SUMMARY OF PUBLIC COMMENTS

A total of nine letters commenting on the proposed standards and on the BID (EPA-450/3-81-008a) were received. Two speakers made presentations at the public hearing on the proposed standards. Presentations and comments made at the public hearing were recorded, and a transcript of the hearing was placed in the project docket (docket A-80-9, entry number IV-F-1). A list of commenters, their affiliations, and the EPA docket entry number assigned to their correspondence or presentations is presented in Table 2-1.

For the purpose of orderly presentation, the comments have been organized under the following topics:

2.1 Selection of Affected Facilities

2.2 Modification and Reconstruction

2.3 Emission Control Technology

2.4 Selection of Emission Limits and VOC Use Cutoffs

2.5 Compliance Bubble

2.6 Performance Test Methods and Monitoring

2.7 Alternative Compliance Methods

2.8 Recordkeeping and Reporting

2.9 Miscellaneous

Table 2-1. LIST OF COMMENTERS ON PROPOSED STANDARDS OF PERFORMANCE FOR RUBBER TIRE MANUFACTURING

Docket Entry Number[a]	Commenter and Affiliation
IV-D-1	Mr. Frank T. Ryan Rubber Manufacturers Association 1901 Pennsylvania Avenue, N. W. Washington, DC 20006
IV-D-2	Mr. Bill Wood Engineering Services Section/Air Program Alabama Department of Environmental Protection State Capitol Montgomery, AL 36130
IV-D-3	Mr. Robert M. Walter The Firestone Tire and Rubber Company 1200 Firestone Parkway Akron, OH 44317
IV-D-4	Mr. E.J. Burkett The Goodyear Tire and Rubber Company Akron, OH 44316
IV-D-5	Mr. Lynn B. Cooper Michelin Tire Corporation P.O. Box 2846 Greenville, SC 29602
IV-D-6	Mr. Daniel J. Pyanowski Dunlop Tire and Rubber Corporation Box 1109 Buffalo, NY 14240
IV-D-7	Mr. Geoffrey K. Barnes Squire, Sanders, and Dempsey [for Bridgestone Tire Manufacturing (U.S.A.), Inc.] 1800 Union Commerce Building Cleveland, OH 44115
IV-D-8	Mr. Robert C. Niles Uniroyal, Incorporated World Headquarters Middlebury, CT 06749

Table 2-1. LIST OF COMMENTERS ON PROPOSED STANDARDS OF PERFORMANCE FOR RUBBER TIRE MANUFACTURING (Concluded)

Docket Entry Number[a]	Commenter and Affiliation
IV-D-9	Mr. W.C. Lang The General Tire and Rubber Company One General Street Akron, OH 44329
IV-F-2	Mr. Ron Clark The B.F. Goodrich Company 500 South Main Street Akron, OH 44318
IV-F-3	Mr. Frank T. Ryan Rubber Manufacturers Association 1901 Pennsylvania Avenue, North West Washington, D.C. 20006

[a]The docket number for this project is A-80-09. Dockets are on file at the EPA Headquarters in Washington, D.C., and at the Office of Air Quality Planning and Standards in Durham, N.C.

2.1 SELECTION OF AFFECTED FACILITIES

2.1.1 Bead Cementing

Comment:

Two commenters (IV-D-2, IV-D-4) requested that bead cementing not be included as an affected facility because: (1) this type of cementing uses only a small quantity of VOC and it is not feasible to recover a high percentage of emissions; and (2) the proposed standard would not appreciably reduce VOC emissions, but would add significantly to the economic burden of each company and control agency.

Response:

As required by the Clean Air Act, the Administrator has published in 40 CFR Part 60, Subpart A, a list (called the "priority list") of stationary sources, each included ". . . if in his judgement it causes, or contributes significantly to, air pollution which may reasonably be anticipated to endanger public health or welfare." The priority list includes synthetic rubber, of which rubber tire manufacturing is a part, as a source category ranked twentieth of 59 source categories.

The development of a standard for bead cementing, as well as other sources in a rubber tire manufacturing plant, is consistent with the requirements of the Clean Air Act, that is, to set standards that reflect the degree of emission reduction achievable through the application of BDT at each new source for which BDT can be identified. In determining BDT, the Agency takes into consideration the cost associated with the emission reduction requirements.

The EPA has identified BDT for bead cementing facilities. Low VOC use has been demonstrated at bead cementing facilities at the majority of existing plants. For each company that supplied data, at least one plant emits 10 grams per tire (5 grams per bead) or less VOC from bead cementing operations without using emission reduction systems. In the EPA's judgement, this has resulted from the employment of low VOC use technology and good work practices at bead cementing facilities. The standard for bead cementing [proposed at 10 grams of VOC per tire (10 g/tire), revised to 5 grams of VOC per bead (5 g/bead) (see Section 2.4.2 of this document regarding bead cementing emission limit)] consequently represents an emission level which has been demonstrated to be achievable without the use of VOC emission controls. Therefore, the standard

can be met without incurring the costs associated with an emission reduction system.

The EPA disagrees that no significant emission reductions would be achieved with the bead cementing standard. For example, the average uncontrolled VOC emission rate for the few existing plants exceeding the 5 g/bead limit is about 9.3 g/bead. If the grams per bead emission rate at one medium-sized passenger tire plant (30,000 tires per day) were reduced from 9.3 g/bead to 5 g/bead, the overall VOC emission reduction would be about 70 megagrams (Mg) per year. The EPA considers this amount of emission reduction to be significant.

The EPA also disagrees that the standards for bead cementing would add significantly to the economic burden of each company and control agency. An analysis of the recordkeeping and reporting costs for the manufacturers and for control agencies to assure compliance with the standard shows that the costs would be reasonable (see docket entry number IV-B-6). No information was provided by the commenters to support their claim regarding an economic burden. For the above reasons, the EPA is not changing its decision to select bead cementing as an affected facility.

2.1.2 Tread End Cementing

Comment:

One commenter (IV-D-4) requested that manual tread end cementing be exempted from the proposed standard for tread end cementing or that manual tread end cementing be designated as new source performance standard (NSPS) equivalent technology. The commenter wrote that because of very low solvent usage, it is technically unreasonable to further reduce emissions from manual tread end cementing. The commenter further noted that attempts to recover emissions from manual tread end cementing have been unsuccessful.

Response:

The standard for both automatic and manual tread end cementing is 10 g/tire. The 10 g/tire limit is based on emission rates which have been demonstrated to be achievable throughout the industry without the use of capture and control technology. Therefore, any difficulty associated with recovering VOC from tread end cementing facilities will not affect the ability of those facilities to comply with the standards. Also, the commenter's company would not need to reduce emissions

further at manual tread end cementing, as available data indicate that VOC use at all existing tread end cementing operations at that company's plants is less than 10 g/tire.

Although emissions from manual tread end cementing may be as low as 2 g/tire (see BID, Section 4.3.3), use of manual tread end cementing is not conclusive evidence that a facility is in compliance with the tread end cementing standard that the EPA has selected as reflecting BDT, since some plants that currently employ manual tread end cementing exceed the 10 g/tire limit. The average emission factor for existing manual tread end cementing facilities that exceed the limit is about 22.5 g/tire. By exempting manual tread end and cementing operations from the standards or by treating them as NSPS equivalent technology, an additional 100 Mg of VOC per year could be emitted from a medium-sized plant (30,000 tires per day). Designating manual tread end cementing as NSPS equivalent technology or exempting it from the standards, therefore, would not be appropriate.

2.1.3 Combined Affected Facilities

Comment:

One commenter (IV-D-3) requested that the standards be revised to provide for a combination of emission limits in those cases where affected facilities are combined. The commenter wrote that an example of this situation would be one separate undertread cementing facility combined with a separate sidewall cementing facility so that both operations would be performed in one operation. The commenter stated that in the future some tire plants may adopt operations which would combine affected facilities into a single operation.

Response:

The commenter referred specifically to the situation where undertread cementing and sidewall cementing are performed simultaneously. The standards provide for combined undertread and sidewall cementing operations through §60.541(a), which defines an undertread cementing operation as ".... a system used to apply cement to a continuous strip of tread or combined tread/sidewall component." (emphasis added). The decision to apply the standard for undertread cementing to operations where undertread and sidewall cementing are combined is based on cost analyses and information from tire manufacturers that employ combined

cementing operations. The cost to control VOC emissions from combined facilities is essentially the same as the cost to control VOC emissions from a single undertread cementing facility because cement application equipment and emission reduction systems that would be used for a combined undertread and sidewall cementing operation are similar in size and cost to equipment and control systems used for a separate undertread cementing operation. Thus, there is no reason to allow addition of the cost-based solvent use cutoffs for undertread cementing and sidewall cementing.

At this time, the EPA knows of no other operations that could be combined and for which combined limits might be appropriate. If operations are combined in the future, the EPA will set standards appropriate to the combined operations.

2.2 MODIFICATION AND RECONSTRUCTION

2.2.1 General Provisions for Modifications

Comment:

Two commenters (IV-D-1, IV-D-4) asked that the general regulatory language of 40 CFR 60.14 be reaffirmed in the rubber tire NSPS to ensure that normal changes or variations in the operation of tire plants would not be considered modifications. The commenters wrote that most changes that occur at an affected facility are in the tire type produced. As a facility is designed initially to produce a large variety of tire types, such changes would not constitute a modification. The commenters further asked that rubber compounds, tread stock, tire components, sprays, and unfinished tires be considered "raw materials" for the purposes of §60.14, thereby excluding them from the modification provisions. The commenters also noted that Section 5.3.1.1.2 (p. 5-4) of the BID is inconsistent with the modification provisions and should be clarified.

Response:

The EPA agrees with the commenters that routine changes of the type described in the comments would not be considered modifications. The EPA also agrees that under §60.14(e), rubber compounds, tread stock, tire components, sprays, and unfinished tires are "raw materials" which, if routinely changed, and provided the raw material change is within the facility's original or amended design specifications, would not bring an existing facility within the scope of the modification provisions.

However, changes that are not within the facility's design specifications and that would increase the emission rate could be considered modifications.

The EPA agrees that Section 5.3.1.1.2 of the BID is inconsistent with the modification provisions. Line 7 on page 5-5 should read "Either change, if within the design specifications of the affected facility, would not be considered a modification." An errata sheet is being added to the BID to correct this error.

2.2.2 Retrofit Situations

Comment:

One commenter (IV-D-2) stated that the proposed rules should include more provisions for retrofit situations since most changes in the industry are expected to be modifications and reconstructions. Another commenter (IV-D-6) felt that existing plants will be subject to the modification and reconstruction provisions since existing plants are in a constant state of improving the manufacturing method of tires in order to remain competitive. This commenter (IV-D-6) also wrote that modifications will arise as market demands change for different tires, since the changes will affect existing facilities rather than cause construction of new facilities.

Response:

The commenters indicated that most of the facilities that will be subject to the standards will be modified and reconstructed facilities in existing plants, rather than new facilities in new plants. Although the EPA expects that most facilities that will be subject to the standards will be new facilities in existing plants, the EPA recognizes that in some cases existing facilities could become subject to the standards through modification and reconstruction. Consequently, the installation and operating costs of emission reduction systems retrofitted on single existing facilities were used in selecting BDT for each affected facility. The costs and emission reductions for the retrofitted control systems were developed for a range of uncontrolled VOC emission rates and used as a factor in developing VOC use cutoffs for undertread cementing, sidewall cementing, and green tire spraying facilities where organic solvent-based sprays are used. Neither commenter suggested any specific reason that the resulting standards do not adequately reflect retrofit situations, and the EPA is aware of none. The EPA therefore believes

that the standards of performance give sufficient consideration to retrofit situations.

2.2.3 Determination of Modifications and Reconstructions on a Case-by-Case Basis

Comment:

One commenter (IV-D-9) believes that the Administrator should be authorized to review the conditions which may trigger modification and reconstruction and make certain exceptions on a case-by-case basis. In particular, the commenter felt that those operations which would require an expenditure of over $2,000 per megagram of solvent removed should be given special consideration.

Response:

The installation and operating costs of emission reduction systems retrofitted on single existing facilities were used in selecting BDT for each affected facility. These same retrofit cost analyses served as the basis for selecting the VOC use cutoffs for undertread cementing, sidewall cementing, and organic green tire spraying facilities that use VOC-based sprays (see Sections 2.4.1 and 2.4.8 of this document). Single-line retrofit controls were selected because some industry representatives claim that most facilities to be affected by the standards will be located at existing plants. The emission limits for bead cementing and tread end cementing facilities are based on VOC emission rates currently achievable by existing facilities (see Sections 2.4.2 and 2.1.2 of this document). Modifications to existing bead cementing and tread end cementing facilities are not expected to affect adversely the ability of these facilities to meet their respective emission limits. Since the effect of the standards on existing facilities is reflected in the VOC use cutoffs and emission limits, providing modified affected facilities with exemptions to the standards on a case-by-case basis is not considered necessary.

However, 40 CFR 60.15 provides for the Administrator's case-by-case review of whether a facility is considered reconstructed and therefore subject to the standards. Criteria used by the Administrator to determine whether a facility is considered reconstructed and exempt from the

standards are: (1) whether the capital costs exceed 50 percent of the cost to build a new facility, and (2) whether it is technologically and economically feasible to meet the standards.

2.3 EMISSION CONTROL TECHNOLOGY

2.3.1 Michelin Tire Corporation Affected Facilities

Comment:

One commenter (IV-D-5) stated that emission reduction technology that is adequately demonstrated to be technically and economically feasible does not exist for Michelin-C-automatic operations. The commenter stated that the operation is relatively new, and equipment configurations make enclosure and capture of VOC very difficult. Capture efficiencies below 50 percent have been obtained. The commenter wrote that efforts to improve capture efficiency have produced several productivity and mechanical problems. An attachment, placed in confidential files at the EPA, was included by the commenter to outline some of the technical problems involving VOC capture at this facility.

Response:

The proposed standard for Michelin-C-automatic operations [§60.542(a)(9)] is based on the EPA's determination that 65 percent emission reduction represents application of BDT. The EPA based that determination on its knowledge of the process and its judgment on the potential for emissions capture. (See response to comment 2.7.3.1.) The information submitted by the commenter after proposal did not demonstrate that 65 percent emission reduction does not represent BDT at Michelin-C-automatic operations. Rather, the information confirmed that the operations can achieve a capture efficiency well beyond the level the commenter now claims is achievable. The EPA believes that improvements could be made to the existing design of the capture system that would result in at least 70 percent efficient capture. These improvements include installing floor sweeps in the cement application area and keeping all exhaust hoods close to the tire during cement application. Increased efficiency of the capture/control system could be achieved by venting all hood exhaust, including floor sweeps, to the control device. Therefore, the proposed 65 percent reduction requirement for Michelin-C-automatic operations has not been changed.

2.3.2 Carbon Adsorber Performance

Comment:

One commenter (IV-D-8) felt the assumption that a carbon adsorption system will operate at a 95 percent rate of efficiency cannot be supported. The commenter stated that since a carbon adsorber has not been demonstrated to attain a 95 percent efficiency for tire manufacturing applications, it does not make sense to write a regulation that is not attainable.

Response:

The standards are based on a 95 percent efficient carbon adsorber unit, because this level of control has been demonstrated to be reasonable for other applications which have uncontrolled exhaust streams with similar VOC compositions and concentrations. The selection of a 95 percent efficient carbon adsorber also is based in part on the performance of an adsorber used to control undertread cementing emissions.

VOC removal efficiencies exceeding 95 percent have been achieved where carbon adsorbers have been employed in rubber hose, fan belt, rubber glove, roof coating, and pressure sensitive tapes and labels manufacturing operations. Exhaust gases from these operations are similar in VOC concentration and composition to exhaust gases from tire manufacturing operations (see BID, Section 4.2.2).

Removal efficiencies of 90 percent have been observed for a carbon adsorber used to control emissions from undertread cementing (see BID, Section 4.3.1). However, discussion with the owners of the undertread cementing control unit indicated that removal efficiency of the device was impaired because of design problems which did not permit full desorption of the carbon beds prior to their being placed back on line. Based on the level of control demonstrated by carbon adsorbers in other applications, results of tests performed on the adsorber servicing undertread cementing, and improvements that could be made to this control device, the EPA has determined a 95 percent removal efficiency to be achievable.

2.4 SELECTION OF EMISSION LIMITS AND VOC USE CUTOFFS

2.4.1 VOC Use Cutoffs and Definition of the Total Number of Tires Processed (T_o)

Comment:

Several commenters (IV-D-1, IV-D-3, IV-D-4, IV-D-5) contended that the proposed method of counting tires at an affected facility to determine the

gram per tire VOC usage rate [T_0 in §60.542(c)(2)] would penalize tire manufacturers who eliminate organic solvent application for part of their production at a particular affected facility. Several commenters (IV-D-1, IV-D-3, IV-D-4, IV-D-5, IV-D-6, IV-F-2) subsequently requested that the EPA delete the phrase "... which receive an application of cement (green tire spray)" from the proposed definition of T_0. These commenters suggested that, for the purpose of performance test calculations in §60.543(c)(2), T_0 should equal the total number of tires or tire components processed at an affected facility. One commenter (IV-D-5) contended that under the proposed definition of T_0, an affected facility theoretically could be required to install VOC control technology when less than 10 percent of the tires or tire components passing through the affected facility actually are cemented. Another commenter (IV-F-2, p. 25) showed that under the proposed definition of T_0, add-on emission controls would be required for one of his plants' undertread cementing operations even though 60 percent of the production is not cemented. This commenter explained that if 0.1 gram of VOC were applied to each tire presently not cemented at the facility, no add-on controls would be required because the proposed definition of T_0 would count all tires cemented. The commenter (IV-F-2) remarked that, based on the example presented above, the proposed definition of T_0 would have a result which is contrary to the EPA's intent to have tire manufacturers reduce or eliminate organic solvent use. This commenter stated that if the definition of T_0 were revised as requested, credit would be given to his company for eliminating the application of undertread cement to a portion of its production and, consequently, no VOC controls would be required.

Response:

A. VOC Use Cutoffs and Method of Counting Tires -- Undertread Cementing and Sidewall Cementing

The proposed standards would require that VOC emissions be reduced by 75 percent at affected undertread cementing and sidewall cementing facilities where in each calendar month VOC use exceeds an average of 25 g/tire [§60.542(a)(1) and (2)]. The percent emission reduction requirement reflects the application of BDT as required by the Clean Air Act.

The gram per tire VOC use cutoffs were provided to exempt from the emission reduction requirements facilities that would incur control costs which the Administrator judged to be too high for the emission reduction achieved. In selecting the 25 g/tire number, the EPA recognized that some tires receiving undertread or sidewall cement would receive less than 25 grams of VOC and others would receive greater than 25 grams of VOC, but, on the average, VOC use at each the facility would be 25 g/tire, assuming that all tires received an application of cement.

The commenter (IV-F-2) presented a situation where a large portion of the tire production does not receive undertread cement. However, VOC use is greater than 25 g/tire for the portion of production receiving cement, the only tires that would be counted under the proposed definition of T_O. In this situation, the EPA agrees that the proposed definition of T_O could result in requiring a manufacturer to reduce VOC emissions where the control costs were judged unreasonable for the emission reduction achieved.

With this concern in mind, the EPA has revised the cutoffs. The revised cutoffs are based on total (uncontrolled) monthly VOC usage at the facility. The total (uncontrolled) monthly VOC use cutoffs are equivalent to the proposed 25 g/tire cutoffs, as they were developed using the same bases (production rates, etc.) that were used to determine the proposed 25 g/tire cutoffs. In addition, the VOC use cutoff numbers reflect the same cost-effectiveness value as the 25 g/tire cutoff numbers. (See docket entry number IV-B-9 for conversion of 25 g/tire format to monthly VOC use format.) Furthermore, the VOC use format better reflects the EPA's basis (total solvent use, regardless of the number of tires processed) for exempting facilities that would incur control costs judged too high for the amount of emission reduction that would be achieved. This format also eliminates the commenter's problem of having to reduce emissions by 75 percent where total VOC use could be relatively "small", but the amount of VOC applied per tire could exceed the proposed 25 g/tire cutoff.

The monthly VOC use cutoff figure would depend on whether a calendar month schedule or "4-4-5" week production schedule is used for compliance and the number of days in a calendar month (see Section 2.6.1 of this document for discussion on definition of month). Where VOC use at each

undertread cementing facility is equal to or less than the following monthly cutoffs, 75 percent emission reduction is not required at that facility:

Number of Days Per Month	VOC Use Limit
28	3,870 kilograms (kg)
29	4,010 kg
30	4,150 kg
31	4,280 kg
35	4,840 kg (for 5-week production months only).

Where VOC use at each sidewall cementing facility is equal to or less than the following monthly cutoffs, 75 percent emission reduction is not required at that facility:

Number of Days Per Month	VOC Use Limit
28	3,220 kg
29	3,340 kg
30	3,450 kg
31	3,570 kg
35	4,030 kg (for 5-week production months only).

VOC use cutoffs also have been included for green tire spraying operations that use organic solvent-based sprays. These cutoffs are discussed in Section 2.4.8.1 of this document.

B. Method of Counting Tires -- Bead Cementing, Tread End Cementing, and Green Tire spraying Operations that Use Water-Based Sprays

The standards for bead cementing operations, tread end cementing operations, and green tire spraying operations that use water-based sprays require tire manufacturers to maintain VOC emissions from these operations at or below the levels selected as representative of BDT. VOC consumption and tire production data supplied by the industry indicated that, on the average, VOC emissions of 10 g/tire or less for tires receiving tread end cement and emissions of 5 g/bead or less for beads receiving cement are achievable (see Section 2.2.1 and 2.1.2 of this document for further discussion of bead cementing and tread end cementing). The data also show that VOC emissions of 1.2 g/tire or less

for tires receiving water-based inside green tire sprays and emissions of 9.3 g/tire or less for tires receiving water-based outside green tire sprays are achievable. Commenters have not provided information indicating that these levels are not achievable. Consequently, T_o for bead cementing, tread end cementing, and water-based green tire spraying will remain as the number of tires or components receiving an application of cement or spray.

2.4.2 Bead Cementing Limits

Comment:

Two commenters (IV-D-1, IV-D-6) implied that plants producing certain types of tires having more than two beads per tire would be covered by the proposed standards, and would not be able to meet the 10 g/tire limit of §60.542(a)(4). Tires requiring more than two beads, which would be covered by the proposed NSPS, are types which must meet high weight loading requirements, such as LUV pickup tires, implement tires, bulldozer trailer tires, space shuttle tires, and some other 12-ply tires. One commenter (IV-D-1) noted that the proposed definition of T_o for bead cementing is the total number of beads to which cement is applied, divided by 2. The commenter felt this definition indicates the assumption that each tire to be covered by the NSPS has two beads. The commenter then stated that the proposed definition of T_o, in conjunction with the 10 g/tire limit therefore actually represents a 5 g/bead emission limit. This commenter stated there is no problem with §60.542(a)(4) if the VOC emission limit is defined as 5 g/bead, rather than 10 g/tire.

Response:

The EPA agrees with the commenter (IV-D-1) that the proposed 10 g/tire limit for bead cementing is based on the assumption that all tires to be covered by the standards would be produced with two beads per tire. Information obtained by the EPA from the tire industry during development of the proposed standards indicated that two beads were used in producing each tire to be covered by the NSPS. VOC use data were provided by industry on a per bead basis (see docket entries II-D-126, II-D-130, II-D-132, II-D-133, II-D-136-140, II-D-144, II-D-145, II-D-156). The gram per tire VOC use factors for each plant consequently were calculated by multiplying the gram per bead factors by 2. These gram per tire VOC

use factors ultimately demonstrated that the majority of plants, and at least one plant in each company supplying data, used 10 grams or less VOC per tire, or 5 grams or less VOC per bead, to cement beads for tires which would be covered by the NSPS.

Information provided after the public hearing (IV-D-1, IV-D-6) has established that more than two beads per tire are required for certain high weight load bearing tires which will be covered by the standards. Consequently, the EPA has concluded that a 10 g/tire limit is not technologically feasible for plants producing tires having more than two beads. The emission limit for affected bead cementing facilities therefore has been revised to 5 g/bead.

2.4.3 Absorption of VOC

Comment:

Two commenters (IV-D-1, IV-D-5) expressed concern that absorption of VOC by rubber is not reflected in the proposed standards. One commenter (IV-D-5) also stated that the overall control efficiency for an affected facility should be based upon the quantity of VOC available for capture and that the absorption factor does not appear in the calculations for determining system efficiency. Both commenters stated that the quantity of VOC not immediately available for capture probably was substantially higher than the 8 percent figure assumed by the EPA. The commenters referenced a report by TRC, Inc. (docket entry number II-A-39) to support their statements.

Response:

The absorption of VOC into rubber stock was taken into account by the EPA in selecting the percent emission reduction requirements in the standards. These requirements could have been expressed either as a percent of the total VOC used, or as a percent of the VOC available for capture (i.e., that VOC which is not absorbed into the rubber). If the percent of VOC available for capture format had been chosen, a procedure that subtracts the absorbed VOC from the total VOC used would have been necessary to determine the quantity available for capture. This would have required extensive testing on the different types and sizes of the tire components cemented at each affected facility to determine their absorption figures. By choosing the percent of VOC used format, absorption

can be implicitly considered, and the additional testing and calculations can be avoided.

The assumptions used in selecting the 75 percent emission reduction requirement for undertread and sidewall cementing were that at least 80 percent of the VOC used could be captured and that the control device could recover or destroy at least 95 percent of the captured VOC. At least 70 percent of the VOC used was assumed to evaporate in the cement application area. Of the remaining 30 percent, 90 percent was assumed to evaporate from the rubber within 30 seconds after its application; thus an additional 27 percent of the VOC used would be available for capture after cement application (see BID, Section 3.2.2.1.1). Therefore, a total of at least 97 percent of the VOC used should be available for capture within 30 seconds after application. Under these circumstances, 80 percent of the VOC used could be captured.

The TRC report referenced by two of the commenters primarily was an investigation of the feasibility of developing a test method for measuring absorption of VOC into rubber. The test methodologies used were not representative of actual plant conditions. In actual practice, rubber is not cooled and reheated before receiving cement; the test methodology required the rubber samples to be reheated, possibly affecting the amount of solvent absorbed. Absorption factors reported for cemented samples that were weighed under ventilated conditions are highly suspect because an airflow of 100 feet per minute was directed on the cemented surface, a condition which is unlikely to be encountered in capture systems. The force of the air impinging on the surface of the rubber samples could inflate the actual absorption rate value. The TRC report also points out that this method of ventilation had an adverse effect on the extremely sensitive weighing device used. Further, control group samples (that is, reheated uncemented rubber) were not weighed for comparison to the cemented samples.

The TRC report does appear to indicate that under some circumstances more than 10 percent of the VOC which does not evaporate in the cement application area may not evaporate within 30 seconds after application. None of the data for unventilated samples, however, indicate that so much VOC remains on the rubber 30 seconds after application that 80 percent of the VOC used could not be captured.

The EPA believes that the absorption of VOC into rubber has been adequately accounted for in the percent emission reduction requirements and that no changes to these requirements are warranted. (Also, see Section 2.3.2 of this document for additional information.)

2.4.4 Emission Limits for Undertread and Sidewall Cementing

Comment:

One commenter (IV-D-4) stated support for a cutoff for undertread cementing and sidewall cementing facilities of no lower than 25 g/tire. The commenter's reason for supporting the cutoffs was: as solvent usage per component decreases, the feasibility of installing control decreases significantly; and control of emissions from production of small tires, where solvent use is correspondingly small, is not feasible. The commenter provided no data pertaining to feasibility of control of emissions from small tire production.

Response:

No response is necessary.

2.4.5 Emission Limits for Michelin-A, -B, and -C-Automatic Affected Facilities

Comment:

One commenter (IV-D-5) stated that solvent use rate cutoffs should be established for Michelin-A, Michelin-B, and Michelin-C-automatic affected facilities to provide incentives for the company to develop methods of utilizing low solvent and no solvent technologies. Cost data to support such cutoffs previously were provided to the EPA. Additional cost information was provided with these comments on the proposed regulation; these attachments have been placed in the project confidential files.

Response:

As stated in the preamble to the proposed standards, the VOC use cutoffs were provided to exempt, from the specific emission reduction requirements of the standards, those facilities where the control costs were judged to be too high for the emission reduction achieved. Based on the uncontrolled emission rate data and on the control cost data provided by Michelin for its three unique facilities, the cost effectiveness of the proposed standards for Michelin facilities was judged by the Administrator to be reasonable. Consequently, there is no need for the EPA to determine and to provide VOC use cutoffs for the

Michelin facilities. However, given Michelin's stated intent to reduce VOC use at new facilities, the EPA recognizes that there may be a VOC use rate (at such new facilities) where the costs per ton of VOC removed would exceed the costs determined by the Administrator to be reasonable.

More detailed information on the design and cost of the emission reduction systems which the commenter believed would be necessary to meet the proposed percent emission reduction requirements at Michelin-A, Michelin-B, and Michelin-C-automatic operations were received after proposal (see docket entry number IV-D-12). After reviewing this information and conducting an independent cost analysis (see docket entry number IV-B-15) at various levels of VOC use, the Administrator has decided to include total monthly low VOC use cutoffs in the final standards for these three types of affected facilities. These cutoffs are based upon the cost, including credits for recovered VOC, of using a carbon adsorber to control VOC emissions from a single affected facility. The cutoffs exempt from the percent emission reduction requirement those affected facilities where the cost of VOC emission control would be disproportionate to the emission reduction achieved. The cutoffs are equivalent to 12.5 g/tire at Michelin-B operations and 15 g/tire at Michelin-A and Michelin-C-automatic operations.

The total monthly VOC use cutoff figure would depend on whether a calendar month or a "4-4-5" week month is used for compliance and the number of days in a calendar month (see Section 2.6.1 of this document for discussion on definition of month). Where VOC use at each Michelin-A, or -C-automatic facility is equal to or less than the following monthly cutoffs, 65 percent emission reduction is not required at that facility:

Number of Days Per Month	VOC Use Limit
28	1,570 kilograms (kg)
29	1,630 kg
30	1,630 kg
31	1,740 kg
35	1,970 kg (for 5-week production months only).

Where VOC use at each Michelin-B facility is equal to or less than the following monthly cutoffs, 75 percent emission reduction is not required at that facility:

Number of Days Per Month	VOC Use Limit
28	1,310 kilograms (kg)
29	1,360 kg
30	1,400 kg
31	1,450 kg
35	1,640 kg (for 5-week production months only).

2.4.6 Emission Limits for Undertread Cementing and Sidewall Cementing

Comment:

One commenter (IV-D-2) suggested that the proposed standards for undertread cementing and sidewall cementing be changed, by deleting §§60.542(a)(i) and (ii) and replacing them with "(i) 25 grams of VOC per tire processed for each calendar month or 25 percent of the VOC used (75 percent emissions reduction, whichever is greater)." The commenter supported his suggestion by writing that the change still would require installation of capture and control systems where large amounts of VOC are used but would provide relief to small emitters.

Response:

The proposed 25 g/tire cutoffs were based on the level of VOC consumption below which the Administrator judged annualized costs to be unreasonable for 75 percent emission reduction. This approach reflects the requirement of Section 111 of the Clean Air Act to promulgate standards that reflect the application of the best system of continuous emission reduction. The commenter's suggestion would allow a manufacturer whose undertread cementing or sidewall cementing facility emits between 25 and 100 g/tire to install VOC emission reduction systems that are less than 75 percent efficient, even though the EPA has shown that the cost of 75 percent reduction is reasonable. The commenter's suggested revision, therefore, would permit the use of controls which are not the best system of continuous emission reduction, and would be contrary to the requirements of the Clean Air Act. Furthermore, because the cutoffs now are expressed in terms of total VOC use (see Section 2.4.1 of this

document), the EPA believes that the cutoffs are appropriate for small emitters.

2.4.7 Percent Emission Reduction Requirements

Comment:

One commenter (IV-D-2) stated that the 75 percent emission reduction requirements for undertread cementing and sidewall cementing facilities are unrealistic. One reason cited was that the only emission reduction system currently in operation achieves an overall efficiency of about 63 percent. The commenter also stated that some facilities that use only a small amount of VOC per tire could have trouble achieving 75 percent emission reduction. The commenter provided a theoretical example to support this claim.

Response:

The 75 percent emission reduction requirements for undertread and sidewall cementing were set based on the EPA's conclusion that at least 80 percent of the VOC used could be captured and sent to a control device that would destroy or recover at least 95 percent of the captured VOC. The emission test data referenced by the commenter are for a retrofitted undertread cementing emission reduction system. This system is one of only two such systems known to exist. No test data are available for the second system.

The available emission test data show short-term overall VOC emission reduction efficiency of about 67 percent (docket entry number II-A-28). Available long-term materials balance calculations indicate an emission reduction efficiency of 63 percent (docket entry number II-A-13). Section 4.3.1 of the BID and the preamble to the proposed standards outlined operational and design problems cited by the operator of the retrofitted control system which he cited as reasons for reduced efficiency. Among the problems cited by the operator, the EPA found the following factors to most significantly affect the control system's performance:

1. VOC was emitted from undertread cement application equipment over weekends and holidays when the line and emission reduction system were not operating. This problem can be mitigated by placing tight fitting covers over the equipment when not used for extended periods. The amount of solvent estimated to be used by undertread cementing therefore was greater than actually would be used during normal operating periods.

2. VOC losses from solvent and cement storage tanks in the cement house were included in total solvent consumption calculations for undertread cementing. These losses inflated actual VOC use values for the the facility.

3. Vent dampers were not equipped with vapor loss seals, which reduced the amount of VOC available to the carbon adsorber.

4. Carbon beds were not adequately cooled and dried. Adsorber VOC removal efficiency consequently was impaired (see Section 2.3.2 of this document for full discussion of reasons why the efficiency of this carbon adsorber was impaired).

5. VOC recovered by the carbon adsorber was lost because of improper decanter design, thereby misrepresenting the actual reduction efficiency of the system.

6. Improper installation of the end flap on the drying conveyor enclosure allowed VOC to escape from the capture system and consequently reduced the amount of VOC available to the carbon adsorber.

The EPA believes that by correcting the problems outlined above, the overall capture efficiency can be increased to at least 80 percent of total VOC used and consequently the emission reduction efficiency of the system can be increased to at least 75 percent.

In his "small" VOC user example, the commenter assumed that exactly 80 percent of the VOC that evaporates in the cement application area and in the first 30 seconds after cement application would be captured. This resulted in an overall capture of less than 80 percent of the total VOC used, since not all of the VOC used evaporates within 30 seconds after cement application. The commenter then concluded that the "small" VOC user could not achieve an overall 75 percent emission reduction, even when using a 96 percent efficient control device.

In contrast to the commenter's assumption, however, the EPA has concluded that 80 percent of the <u>total VOC used</u> could be captured. Of the 38.2 g/tire applied by the "small" VOC user, the commenter assumed that 19.2 g/tire would evaporate in the cement application area, and 17.1 of the remaining 19.0 g/tire would evaporate within 30 seconds, after cement application. Of the 36.3 g/tire which evaporate, and therefore are available for capture, 30.6 g/tire (84.3 percent of the available VOC) would have to be captured to achieve 80 percent capture of the total VOC used. The EPA believes this capture efficiency is achievable through the measures discussed at proposal and above.

By venting the captured VOC to a 95 percent efficient control device, 75 percent overall emission reduction would be achievable. Therefore, no change has been made to the percent emission reduction requirements for undertread cementing and sidewall cementing facilities.

2.4.8 Green Tire Spraying

2.4.8.1 Organic Green Tire Spraying Emission Limits.

Comment:

Two commenters (IV-F-1, pp. 9-11; IV-D-9) requested that the proposed standards for inside and outside green tire spraying be revised to include provisions for use of organic solvent-based green tire sprays. One commenter was concerned that the proposed standards assume that all affected green tire spraying operations can use water-based sprays and that the proposed emission limits (1.2 g/tire for inside sprays, 9.3 g/tire for outside sprays) are significantly more stringent than could be achieved by using organic solvent-based sprays in conjunction with the best capture and control devices.

Response:

The proposed standards for inside and outside green tire spraying were based on industry-supplied information indicating that water-based sprays were replacing organic solvent-based sprays at most operations. While the EPA still believes that use of water-based sprays will predominate, it recognizes that organic solvent-based green tire sprays must be used in some cases. Consequently, a standard of performance has been developed for green tire spraying operations where organic solvent-based sprays are used. The EPA has determined that 75 percent emission reduction, based on 80 percent capture and 95 percent control, represents the best system of continuous emission reduction for organic solvent-based green tire sprays. Accordingly, the standard requires a 75 percent emission reduction at a facility where VOC use from organic solvent-based sprays exceeds the monthly cutoffs. In addition, an alternative compliance method is provided.

The following monthly total (uncontrolled) VOC use cutoffs (see docket entry number IV-B-9) represent the combined VOC use rate for organic solvent-based inside and outside spray applications below which the cost to reduce VOC emissions by 75 percent from a single green tire

spraying facility has been judged unreasonable for the emission reduction achieved:

Number of Days Per Month	VOC Use Limit
28	3,220 kg
29	3,340 kg
30	3,450 kg
31	3,570 kg
35	4,030 kg (for 5-week production months only; see Section 2.6.1 of this document for discussion on definition of month).

Costs used to develop the cutoffs were based upon a retrofit situation, where VOC emissions captured in an enclosed booth are vented to a baghouse for particulate removal and then to a carbon adsorber for recovery.

Equipment requirements are provided as an alternative means of demonstrating compliance with the standards for VOC-based green tire spray facilities (see Section 2.4.8.2 of this document).

2.4.8.2 Alternative Compliance Method for Organic Solvent-Based Green Tire Spraying.

Comment:

Four commenters (IV-D-1; IV-D-4; IV-9; IV-F-1, pp. 9-11) requested that the EPA provide an alternative compliance method for plants that must use organic solvent-based green tire sprays. Limited supporting information was provided which showed that some tire plants must use organic solvent-based sprays to manufacture certain types of tires. Some plants that had converted to water-based sprays have had to return to use of organic solvent-based sprays for production of some tire types. The commenters also wrote that the proposed numerical emission limits reflect an assumption that water-based sprays will be used at all operations, and that these limits cannot be achieved where organic solvent-based sprays are employed, even when using the best capture and control equipment. One commenter (IV-D-1) suggested that the alternative compliance method for green tire spraying facilities where organic solvent-based green tire sprays are used should be similar to the alternative compliance method for undertread cementing and sidewall

cementing facilities [§60.543(h)]. However, these alternative methods should not be identical since some spray constituents form solid particles which require different control measures. No additional information concerning particle formation was provided.

Response:

The EPA is including equipment requirements as an alternate method of demonstrating compliance with the standards for green tire spraying operations. This alternative compliance method is similar to that included in the alternative compliance method for undertread cementing and sidewall cementing [§60.543(j)].

Under the alternative compliance method, the owner or operator of an affected green tire spraying facility can seek to demonstrate compliance with the standards for green tire spraying facilities where organic solvent-based sprays are used by meeting the following design and equipment requirements:

1. Enclosure (i.e., the capture system) of spray application and drying areas.

2. 100 feet per minute (fpm) face velocity through all permanent openings in the capture system.

3. Coated green tires retained in capture system for at least 30 seconds.

4. The total area of all permanent openings into the enclosure does not exceed the area necessary to maintain the VOC concentration of the exhaust stream at 25 percent of the lower explosive limit (LEL) when the facility is operating at its maximum solvent use rate, the face velocity through all permanent openings is 100 fpm, and all temporary openings are closed.

5. Captured VOC vented to a 95 percent efficient control device.

The 100 fpm face velocity requirement for all permanent openings and the 30-second retention time requirement for coated green tires are to assure optimal capture of VOC. The purpose of the maximum permanent opening area requirement is to minimize the escape of fugitive emissions from the enclosure. Twenty-five percent of the LEL was selected as the reference point for sizing permanent openings because it represents the level of dilution most commonly used to avoid fire and explosion hazards. Ninety-five percent control of captured VOC is required as this is considered best demonstrated technology (see Section 2.3.3 of this document).

A particulate removal device, such as a scrubber, a filter, cyclone, or baghouse, may be needed in some cases to pretreat the green tire spray exhaust stream prior to its entering the VOC control device in order to avoid fouling of the VOC control device by particulates in the green tire overspray. However, exhaust stream pretreatment for particulate removal is not required by these standards.

2.4.8.3 Proposed Water-Based Green Tire Spray Emission Limits.

Comment:

One commenter (IV-D-4) stated that the proposed regulations for green tire spraying [§60.542(a)(5) and (6)] are acceptable when water-based sprays can be used.

Response:

No response is necessary.

2.5 COMPLIANCE BUBBLE

2.5.1 Bubble Considerations

Comment:

Most of the commenters (IV-D-1, IV-D-3, IV-D-4, IV-D-5, IV-D-6, IV-D-7, IV-D-8) requested that a general bubble provision be added to the standards before promulgation. The commenters believe that a bubble is appropriate for this industry because there is a large number of small affected facilities, and they claim that the cost of capture and control technology may vary widely from facility to facility. A bubble provision would allow the industry to reduce further emissions at those facilities where it is least costly in exchange for avoiding control at facilities where it is more costly. The commenters state that the control flexibility provided by a bubble would provide the potential for large cost savings to the industry. Two specific examples of how a compliance bubble could result in cost savings were provided (IV-D-6, IV-D-8). One commenter proposed a trade of emissions between an undertread cementing facility and a tread end cementing facility. The uncontrolled VOC emissions from the facilities would be 63 g/tire and 15.1 g/tire, respectively. The commenter used the proposed 25 g/tire VOC use cutoff level as the emission limit for the undertread cementing facility and combined that level with the 10 g/tire limit for tread end cementing for a bubble limit of 35 g/tire. The commenter would install a 75 percent efficient capture and control system at the undertread

cementing facility to reduce emissions to 15.7 g/tire. The 15.7 g/tire emission rate combined with the uncontrolled emission rate of 15.1 g/tire at the tread end cementing facility (15.7 + 15.1 = 30.8) would be less than the commenter's 35 g/tire bubble limit, thereby allowing the manufacturer to avoid reducing emissions from the tread end cementing facility.

Commenter IV-D-8 urged the Agency to consider a bubble that would allow a plant owner/operator to obtain emission credits for operations that are not performed at a particular tire plant. This commenter's company no longer cements beads as part of the manufacturing process and wants to obtain credit equal to the 10 g/tire bead cementing limit for use at another facility (presumably to avoid installing a control system at an undertread cementing or sidewall cementing facility).

Response:

The bubble suggested by commenter IV-D-6 used the proposed 25 g/tire VOC use cutoff (now revised to a monthly VOC use level) as an allowable emission level for an undertread cementing facility that uses a capture/control system, instead of the 15.7 g/tire level that would be required by the standards (75 percent reduction from the uncontrolled level of 63 g/tire). Under the facility-by-facility standards, the combined emissions from undertread cementing and tread end cementing would be, at most, 25.7 g/tire (15.7 + 10 = 25.7); under the commenter's proposed bubble, the emissions would be 30.8 g/tire, or at least 5 g/tire greater than the emissions under the facility-by-facility application of the standards. If this plant were a medium-sized plant producing 30,000 tires per day, the 5 g/tire increase would result in a total emissions increase of about 50 tons per year.

Furthermore, the commenter's use of the VOC use cutoff numbers as emission limits for facilities with capture/control systems is a misapplication of the cutoffs. The cutoff numbers represent a VOC use rate where the costs of operating a capture/control system were judged to be too high for the emission reduction achieved; that is, if a facility used only 25 g/tire or less, no further emission reduction would be required. However, facilities using more than 25 g/tire were required to reduce emissions by 75 percent because the costs are reasonable for these facilities. Thus, the commenter is applying the

wrong emission limit to undertread cementing, since his uncontrolled level is 63 g/tire.

The second example (from commenter IV-D-8) proposed to allow a plant owner/operator to obtain emission credits for operations that are not performed at a particular tire plant. This commenter no longer cements beads as part of the manufacturing process and wanted to obtain credit equal to the 10 g/tire bead cementing limit for use at another new facility (presumably to avoid installing BDT controls at an undertread cementing or sidewall cementing facility).

The approach of generating emission reduction credits from avoiding construction of certain emitting facilities would not be permitted where the credits would clearly result in increased emissions. If credit were given for production facilities that have not been built, other facilities that have been built might not need to install BDT. For example, if the 5 g/bead limit for bead cementing (again, this figure is equivalent, in most cases, to 10 g/tire) in the commenter's proposal were given as a credit to be applied elsewhere, emissions from the plant could be 10 g/tire higher under a bubble than they would be under the facility-by-facility standards.

For the reasons discussed above, the Agency has not provided a generic NSPS compliance bubble in the standards. However, the Agency has recently approved an NSPS bubble application (52 FR 28946). In doing this, the Agency made clear that we will receive case-by-case applications for NSPS compliance bubbles. The major factors that will influence decisions on whether to approve them were also described. The Agency will consider bubbles for rubber tire manufacturing facilities on a case-by-case basis in accordance with such factors.

2.5.2 Affected Facilities

Comment:

One commenter (IV-D-7) suggested that, if the compliance trade-off was not sufficiently flexible, that the EPA should redefine "affected facility" more broadly so that a company could implement changes with no net increase in emissions. This commenter also stated that with the proposed narrow definition, almost any equipment change likely would be considered construction of a new source or modification.

Response:

The purpose of Section 111 of the Clean Air Act is to minimize emissions by application of BDT at all new and modified sources. A narrow designation of an affected facility therefore is presumed to ensure that new emission sources will be subject to the standards as they are installed. As stated at proposal, this presumption can be overcome and a broader designation of an affected facility used when the broader designation would yield greater emission reduction, equal emission reductions at lower cost or other impact, or lesser reductions at such a low cost that the incremental cost of using a narrow designation is exorbitant. The commenter, however, offered no supporting evidence indicating that a broader designation of an affected facility is appropriate under this test.

Furthermore, assuring extra flexibility to the industry is not a goal or a factor to be considered when determining BDT under Section 111 of the Clean Air Act. Selecting BDT requires only consideration of emission reduction cost and nonair quality health, environmental, and energy impacts. These factors have been adequately considered by the EPA in developing the standards.

2.6 PERFORMANCE TEST METHODS AND MONITORING

2.6.1 Definition of Month

Comment:

Several commenters (IV-D-1, IV-D-6, IV-D-8) stated that some tire manufacturers use a cycle closing calendar based on "4-4-5 week" months which would make it extremely difficult for these companies to conduct performance tests each calendar month. The "4-4-5 week" month cycle consists of two 28-day (4 week) months and one 35-day (5 week) month per quarter year. The "4-4-5 week" month system is employed by at least one commenter's company to provide a uniform system of statistical analysis for all accounting, production, and marketing (IV-D-8). The commenters offered no details of problems expected to be encountered in switching from a "4-4-5 week" month to a calendar month system for performance test purposes.

Response:

The EPA feels that the results of performance tests that are conducted using averaging times of 28, 30, or 35 days are essentially

the same. The EPA therefore has no objection to companies making compliance calculations, as are required by the performance test provisions, in a manner compatible with company accounting records.

The EPA has defined "month" in §60.541 to be a calendar month or a period of 28 days or 35 days. By this definition of month, companies that employ a "4-4-5 week" month cycle closing calendar will be required to conduct performance tests by the 28th day, 56th day, and 91st day of each quarter year or some other combination of two 4-week and one 5-week intervals. At the initial startup of an affected facility, each plant's owner or operator will be required to specify in an initial report to the Administrator the monthly interval at which performance tests will be conducted.

2.6.2 Monthly Performance Testing

Comment:

Two commenters (IV-D-1, IV-D-6) wrote that monthly performance testing is neither necessary nor appropriate. One commenter (IV-D-1) cited performance test provisions of the NSPS for the publication rotogravure printing industry (40 CFR 60.433) and the proposed standards for the petroleum dry cleaning industry (§60.624) as precedent for dropping the monthly performance test requirements. This commenter also wrote that an affected rubber tire facility which is shown to be in compliance by an initial performance test is no more or no less likely to fail to comply at a later date than an affected facility in any other industry. Both commenters (IV-D-1, IV-D-6) also contended that most of the data required for monthly performance tests are not routinely collected and maintained by every company and that the monthly performance test requirements would impose undue burdens on most plants.

Response:

Routine performance testing assures compliance with the standards on a continuous basis, for example, by assuring that control equipment is operated and maintained properly. Routine testing is required for NSPS wherever it is technically feasible and the cost, or labor burden, is judged reasonable.

The reasons the EPA did not require monthly performance tests in the rotogravure NSPS and proposed petroleum dry cleaning NSPS are not relevant to the decision to require monthly performance tests in the

standards for rubber tire manufacturing. Monthly performance test provisions were dropped from the rotogravure NSPS because of problems associated with measuring ink temperature and in calibrating and operating the large number of ink flow meters that would have been required to determine the volume of solvent used (see Rotogravure BID Volume II, EPA-450/3-80-031b, Sections 2.6.1-2.6.3, 2.6.5). As discussed above, the standards do not require temperature correction factors or flow meters. Monthly performance testing was not required in the petroleum dry cleaning NSPS because calculations showed that the costs of such testing would be unreasonably high.

Monthly performance tests required by the standards are simple materials balance determinations. The standards do not require the more complex and costly stack measurement tests, installation of flow meters, or application of temperature correction factors. The labor burden of monthly performance tests and recordkeeping requirements also are judged to be reasonable. The average industry-wide burden of the performance test and recordkeeping requirements over the first 5 years of the standards would be about 5,700 person-hours (2.75 person-years) per year (docket entry number IV-B-6). The EPA therefore has concluded that monthly performance testing is necessary and appropriate to ensure compliance with the standards on a continuous basis.

2.6.3 Temporary Total Enclosure for Incinerators

Comment:

One commenter (IV-D-2) suggested that where a control device is employed which destroys VOC, a better method of determining compliance during the performance test would be to measure the amount of VOC removed by the control unit and divide the amount by the quantity of VOC used during the test. A total enclosure for performance testing of emission reduction systems that destroy VOC [§60.543(d)(2)(i)] probably would produce results different from those produced under actual operating conditions and construction of a "total" enclosure probably would be impractical.

Reponse:

The commenter's suggested approach in determining compliance for emission reduction systems that use incinerators is infeasible due to difficulties with making direct comparisons between the test results for

VOC content of liquids under Method 24 and the test results for VOC content of gases under Method 25. Unlike Method 24, Method 25 measures total carbon in the gaseous phase, which can include compounds other than VOC. Consequently, Method 25 can show that more VOC is captured in the gaseous phase than actually is available from the liquid phase.

The EPA therefore considers the method used in §60.543(f) and (g) to be the best available for determining overall emission reduction efficiency of control systems that employ incinerators. With these procedures, the overall emission reduction efficiency of the control system (R) is ascertained by multiplying the gaseous fraction of total VOC used which enters the control device (F_o) (i.e., the capture efficiency) and the destruction efficiency of the control device (E).

Although the term "temporary total enclosure" was used in a practical engineering sense, a literal interpretation of this term could lead to both compliance and enforcement problems. Literal interpretation of "temporary total enclosure" could impose performance test conditions that would be difficult to achieve when determining the fraction of total VOC used which enters the control device. In view of this possibility, the EPA has changed the wording of §60.543(f)(2)(i) to require that during a performance test, a temporary enclosure be constructed and operated at a negative pressure to ensure that all evaporated VOC is measurable.

2.7 ALTERNATIVE COMPLIANCE METHODS

2.7.1 General

Comment:

Three commenters (IV-F-1, IV-D-1, IV-D-4) specifically supported the inclusion of an alternative compliance method for undertread cementing and sidewall cementing, saying the proposed method is technically sound and necessary.

Response:

No response is necessary.

2.7.2 Capture System Design Criteria

Comment:

Two commenters (IV-D-1, IV-D-5) implied that they supported the use of alternative compliance methods and wrote that the proposed alternative compliance method should be flexible concerning capture system design criteria. The commenters wrote that because capture systems must be

designed according to the requirements and configurations of a particular operation, the VOC capture will vary with individual process variables. One commenter (IV-D-1) supported the alternative compliance method requirement that a 100 fpm minimum face velocity must be maintained through each permanent opening in the enclosure. This commenter also felt that the alternative compliance method provision which requires enclosure of the undertread cement and sidewall cement drying areas for 30 seconds after cement application or to the water bath, whichever distance is less, is a good example of the flexibility needed to meet the proposed standard. The other commenter (IV-D-5) suggested that the proposed alternative compliance method be changed to allow for suspension of drying area enclosure retention time limits where tire components must be moved to another location, have other components applied to them, or where there is some other occurrence that would make it impractical to retain these components in an enclosure for the required time limits. This commenter, however, provided no information supporting the request to suspend time limits under certain circumstances.

Response:

The EPA based the capture system requirements of the alternative compliance method on good engineering practices, VOC emissions data, and process design information provided by the tire industry. The EPA considers the 30-second retention time requirement necessary to assure 80 percent capture and 75 percent overall emission reduction. Without this assurance, the EPA cannot waive the requirement for performance tests in accordance with §60.8(b)(4) of the General Provisions. Consequently, the EPA has not changed the alternative compliance method.

2.7.3 Alternative Compliance Methods for Affected Facilities Other Than Undertread Cementing, Sidewall Cementing, and Michelin-B Facilities

2.7.3.1 Comment:

One commenter (IV-D-5) requested that all compliance methods and particularly the alternative compliance method be made available for each type of affected facility. The commenter wrote that some affected facilities currently are not adaptable to all compliance alternatives, but future changes could make alternatives more attractive, economical, and environmentally sound. The commenter felt that exclusion of some

affected facilities could hinder development that could have potentially beneficial impacts on its company, the industry, and the environment.

Response:

Alternative compliance methods are provided in the promulgated standards for undertread cementing, sidewall cementing, and Michelin-B facilities. An alternative compliance method for affected green tire spraying facilities where organic solvent-based sprays are used also is included (see Section 2.4.8.2 of this document). Compliance of affected bead cementing and tread end cementing facilities with the standards would be demonstrated in most cases by determining the mass of VOC used per component processed, since, in the EPA's view, installation of capture and control technology would not be necessary.

The EPA has concluded that it cannot establish an alternate compliance method for Michelin-A and -C-automatic facilities. In determining BDT for Michelin-A and -C-automatic operations, the EPA recognized that it was necessary to assume certain modifications to the capture system that was assumed for undertread cementing operations, sidewall cementing operations, and Michelin-B operations. Michelin indicated before proposal that the capture systems at Michelin-A and -C-automatic facilities would have to have a larger area of openings to accommodate the movement of tires and associated equipment into and away from the cementing stations. Because of the increased open area, the efficiency of this capture system would be less than the 80 percent efficiency achievable at undertread cementing, sidewall cementing, and Michelin-B operations. Based on the EPA's evaluation of the information provided by Michelin before proposal and on the EPA's knowledge of capture systems applicable to undertread cementing and sidewall cementing operations, the EPA determined at proposal that 70 percent capture efficiency is achievable at reasonable costs at Michelin-A and -C-automatic operations. A range of costs for this modified system was assumed and was judged to be reasonable. Michelin indicated before proposal of the standards that a 65 percent overall emission reduction efficiency, based on a 70 percent efficient capture system and a 95 percent efficient control device, was achievable at reasonable costs at Michelin-A and -C-automatic operations.

Before the standards were proposed, Michelin provided the EPA with a description of the capture system (including operating parameters, such as flow rate velocity) being used at an existing Michelin-A operation. This system, which Michelin believes will achieve 70 percent capture, is unlike the enclosures evaluated by the EPA. Additional information that Michelin submitted after proposal indicated that its capture system for -C-automatic facilities is also unlike those evaluated by the EPA. While the EPA is confident that 70 percent capture can be achieved at Michelin-A and -C-automatic facilities, based on the reasoning described in the previous paragraph and Section 2.3.1 of this document, the EPA is not satisfied that the system suggested by Michelin for use at its -A and -C-automatic facilities is equivalent to the system the EPA believes represents BDT. In accordance with §60.8(b)(4) of the General Provisions, the EPA may waive the requirement for performance tests only if the owner or operator has demonstrated to the Administrator's satisfaction that the system in question would bring the affected facility into compliance with the standard. Because the Administrator is not satisfied that Michelin-A and -C-automatic facilities can comply with the standards using systems like those at Michelin's existing facilities, the EPA cannot rely on those systems as a basis for waiving the performance test requirements. Moreover, the EPA need not initiate the process of listing the specific parameters of a BDT-level capture system in the NSPS for purposes of providing Michelin a §60.8(b)(4) waiver option. For these reasons no alternative compliance method is being provided for Michelin-A and -C-automatic facilities.

2.7.3.2 Comment:

One commenter (IV-D-7) believes that the proposed standards may be economically unreasonable or technologically infeasible when applied to his company's processes and requested that the proposed rules include a provision for an alternative compliance standard. The commenter stated that although the EPA has acknowledged that significant differences in production processes exist to the extent that different standards were justified for one company's processes, the proposed rules do not appear to provide sufficient flexibility to accommodate his company's tire production methods.

Response:

The grams of VOC per tire standards reflect application of BDT at specific affected facilities. In instances where one company's processes are sufficiently different from processes generally found in the industry, such as Michelin-A, -B, and -C-automatic operations, the EPA has developed separate standards of performance that reflect application of BDT at these facilities. The EPA, however, cannot speculate and develop regulations for an affected facility that does not exist at this time, particularly where there is a lack of information about the process.

Although the commenter claims his company has processes that could be affected facilities if tire types within the scope of the standards were produced, the company currently has no production facilities operating in the U.S. that could be affected by the standards of performance. Except for bead cementing processes, the commenter also has provided no specific details regarding compliance problems anticipated by the company if it begins producing tires of the type that would result in any facilities' becoming subject to the standards.

The commenter, however, does describe problems that it expects to encounter if its bead cementing operations are affected by the standards. The commenter indicated that the amount of VOC used at bead cementing would make compliance with a 10 g/tire (revised to 5 g/bead) limit technically infeasible. The type of process described by the commenter, however, does not appear to be within the scope of the bead cementing definition, and the bead cementing limit probably would not apply. The commenter's process involves the cementing of a separate, all-rubber component which is later assembled along with the bead wire. While more information would be necessary to make a determination, the process appears to fall within the definition of a sidewall cementing facility and therefore would be subject to the emission limits for sidewall cementing. The EPA knows of no reason why the commenter's facility could not comply with the emission limits for sidewall cementing.

2.7.4 Maintenance of 25 Percent of the Lower Explosive Limit

Comment:

One commenter (IV-D-7) wrote that with his company's solvent usage reduction program, it would be difficult to maintain VOC concentrations

in the emission reduction systems at the level specified in the proposed alternative engineering standard [§60.543(h)(4)], that is, 25 percent of the LEL.

Response:

The alternative compliance method does not require the commenter's company to maintain VOC concentrations in the capture system exhaust stream at 25 percent of the LEL. For further discussion of how the LEL requirement applies, refer to Section 2.4.8.2 of this document.

2.8 RECORDKEEPING AND REPORTING

2.8.1 The Standards In Relation to the General Provisions

Comment:

One commenter (IV-D-1) stated that the three classes of records required by the proposed standards repeat requirements of the General Provisions and, therefore, are redundant. The three classes of records to which the commenter refers to are: (1) records of all continuous monitoring data; (2) records of 3-hour periods during which monitoring shows certain specified below-average conditions; and (3) records of all data and computations used to calculate VOC emissions from an affected facility. The commenter wrote that special requirements for maintaining solvent use records would have some merit if the monthly performance tests were omitted.

Response:

The recordkeeping and reporting requirements of the standards, like similar requirements in standards of performance for other industries, clarify what the General Provisions require. The commenter therefore is correct in observing that the recordkeeping and reporting requirements repeat some of the General Provisions' requirements. These provisions are repeated for purposes of clarification. The EPA, however, does not agree that maintenance of solvent use records has no merit unless monthly performance tests are omitted. The rationale for requiring solvent use records in conjunction with monthly performance tests is presented in Section 2.6.2 of this document.

2.9 MISCELLANEOUS

2.9.1 VOC Emission Factors

Comment:

One commenter (IV-D-3) wrote that the emission factors indicated for undertread cementing (63.2 g/tire) and for sidewall cementing (41.1 g/tire) were not realistic for his company. This commenter objected to the emission factors because the company felt they may be applied to its operations at a future date. The commenter, in support of his objection, wrote that it may not be possible for a company or plant to change its processes to reduce emissions to an average rate achieved by other companies and other plants which have different manufacturing processes.

Response:

The average VOC emission factors presented in BID Volume I were used only to develop control cost, economic, and environmental impacts of the regulatory alternatives. The regulatory alternatives subsequently were used with other information as bases for developing the standards. The EPA therefore has not used and would not expect to use the average VOC emission factors to develop standards of performance for affected undertread cementing or sidewall cementing facilities.

2.9.2 Sidewall Cementing Facilities

Comment:

One commenter (IV-D-7) stated that his company could not meet the proposed standards for bead cementing because of the unique method in which it applies the cement. This method involves the cementing of a separate, all-rubber component which is later assembled along with the bead wire.

Response:

The proposed definition of a sidewall cementing operation [§60.541(a)] has been revised to clarify that sidewall cementing is the cementing of any continuous strip of material that is wrapped around the bead prior to tire building or is incorporated into the sidewall of the tire, and that it is not only cement application to an extruded strip of rubber. The cementing process described by the commenter therefore appears, without further information, to fall within the scope of the sidewall cementing definition.

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This document presents the final environmental impact statement (EIS) for standards of performance for the control of volatile organic compound emissions from rubber ti manufacture

16. ABSTRACT

Standards of performance for the control of volatile organic compounds (VOC) emissions from rubber tire manufacturing facilities are being promulgated under Section 111 of the Clean Air Act. These standards will apply to newly constructed, modified, or reconstructed facilities in rubber tire manufacturing plants. This document summarizes the public comments received on the proposed standards and the Agency's responses to those comments. The document also summarizes the changes made to the standards since proposal.

17. KEY WORDS AND DOCUMENT ANALYSIS

a. DESCRIPTORS	b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group
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