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**ENVIRONMENTAL PROTECTION
AGENCY**
40 CFR Part 60
[AD-FRL 1907-8]
**Standards of Performance for New
Stationary Sources; Rubber Tire
Manufacturing Industry**
AGENCY: Environmental Protection
Agency (EPA).

ACTION: Proposed rule and notice of
public hearing.

SUMMARY: The proposed standards would limit volatile organic compound (VOC) emissions from new, modified, and reconstructed facilities within rubber tire manufacturing plants. The proposed standards implement Section 111 of the Clean Air Act and are based on the Administrator's determination that emissions from rubber tire manufacturing plants cause, or contribute significantly to, air pollution which may reasonably be anticipated to endanger public health or welfare. The intent is to require new, modified, and reconstructed facilities at rubber tire manufacturing plants to control emissions to the levels achievable through use of the best demonstrated systems of continuous emission reduction, considering costs, nonair quality health, and environmental and energy impacts.

A public hearing will be held to provide interested persons an opportunity for oral presentation of data, views, or arguments concerning the proposed standards.

DATES: *Comments.* Comments must be received on or before April 1, 1983.

Public Hearing. A public hearing will be held on March 3, 1983 beginning at 9 a.m.

Request to Speak at Hearing. Persons wishing to present oral testimony must contact EPA by February 9, 1983.

ADDRESSES: *Comments.* Comments should be submitted (in duplicate if possible) to: Central Docket Section (A-130), Attention: Docket Number A-80-9, U.S. Environmental Protection Agency, 401 M Street, S.W., Washington, D.C. 20460.

Public Hearing. The public hearing will be held at the Office of Administration Auditorium, Research Triangle Park, N.C. Persons wishing to present oral testimony should notify Mrs. Naomi Durkee, Standards Development Branch, Emission Standards and Engineering Division (MD-13), U.S. Environmental Protection Agency, Research Triangle Park, North

Carolina 27711, telephone number (919) 541-5578.

Background Information document. The Background Information Document (BID) for the proposed standards may be obtained from the U.S. EPA Library (MD-35), Research Triangle Park, North Carolina 27711, telephone number (919) 541-2777. Please refer to "Rubber Tire Manufacturing Industry—Background Information for Proposed Standards," EPA 450/3-81-008a.

Docket: Docket No. A-80-9, containing supporting information used in developing the proposed standards, is available for public inspection and copying between 8:00 a.m. and 4:00 p.m., Monday through Friday, at EPA's Central Docket Section, West Tower Lobby, Gallery 1, Waterside Mall, 401 M Street, S.W., Washington, D.C. 20460. A reasonable fee may be charged for copying.

FOR FURTHER INFORMATION CONTACT: Ms. Susan R. Wyatt, Standards Development Branch, Emission Standards and Engineering Division (MD-13), U.S. Environmental Protection Agency, Research Triangle Park, North Carolina 27711, telephone number (919) 541-5578.

SUPPLEMENTARY INFORMATION:
Proposed Standards

Standards of performance for new sources established under Section 111 of the Clean Air Act reflect:

*** Application of the best technological system of continuous emission reduction which (taking into consideration the cost of achieving such emission reduction, any nonair quality health and environmental impact and energy requirements) the Administrator determines has been adequately demonstrated (Section 111(a)(1)).

The proposed standards would limit VOC emissions from new, modified, and reconstructed facilities. The affected facilities would be each undertread cementing operation, each sidewall cementing operation, each tread end cementing operation, each bead cementing operation, each inside green tire spraying operation, each outside green tire spraying operation, each Michelin-A operation, each Michelin-B operation, and each Michelin-C-automatic operation.

Facilities affected by the proposed standards would be those where components for agricultural, airplane, industrial, mobile home, light-duty truck or passenger vehicle tires which have a bead diameter up to and including 0.5 meter (m) [19.7 inches (in)] and cross section dimension up to and including 0.325 m (12.8 in) are mass produced in assembly-line fashion.

VOC emissions from the rubber tire industry are caused by solvent application to different components of a tire during the manufacturing process. To meet the proposed standards for each undertread cementing and sidewall cementing operation, an owner or operator would have the option of using less solvent and maintaining emissions at or below 25 grams per tire (a level currently achieved at some plants) without the use of an emission reduction system, or installing a 75 percent efficient emission reduction system if solvent use exceeds 25 g/tire. Using less solvent has the advantages of no cost (other than possibly developmental cost), no energy usage, and solvent conservation. The proposed standards for four affected facilities are based on the use of less solvent and would require that emissions be limited to 10 grams per tire (g/tire) for each tread end cementing and each bead cementing operation, 1.2 g/tire for each inside green tire spraying operation, and 9.3 g/tire for each outside green tire spraying operation. Thus, the proposed standards are structured so they could be met through solvent use reductions without employment of a control device.

The proposed standards would require 75 percent emission reduction for each Michelin-B operation and 65 percent emission reduction for each Michelin-A and Michelin-C-automatic operation.

Separate testing, monitoring, and recordkeeping requirements are proposed for each combination of standard format (g/tire or percent emission reduction), control technique (low solvent use or emission reduction system), and compliance method (performance tests or equipment specifications). Initial performance tests would be required for each affected facility, unless the owner or operator chooses to demonstrate compliance with the recommended standards by meeting the equipment specifications. An exemption has been provided for facilities that meet the equipment specifications. The proposed standards would require the owner or operator to report the results of all initial performance tests.

Monthly performance tests would be required to determine compliance with each of the g/tire limits. Whether or not monthly performance tests would be required to determine compliance with the percent emission reduction standards depends primarily on the type of control device used, and then on the method of demonstrating compliance. The proposed standards would not

require an owner or operator to report results of monthly performance tests.

The proposed standards would require continuous monitoring and recording of thermal incinerator combustion temperature and the temperature before and after the catalyst for catalytic incinerators. The requirement for a continuous monitor on a solvent recovery system is not applicable until performance specifications for the monitor have been proposed and promulgated. The proposed standards would require that the owner or operator maintain at the source for a period of at least two years records of all data and calculations used to determine VOC emissions for each affected facility.

Reference Method 24 would be used to determine the VOC content of cements and green tire spray materials. Reference Method 25 would be used to determine the concentration of VOC in exhaust gas streams.

Summary of Environmental, Energy, and Economic Impacts

The incremental impacts of the proposed standards in the Background Information Document were determined using the levels of emission reduction recommended in the control technique guidelines (CTG) document, "Control of Volatile Organic Compound Emissions from Manufacture of Pneumatic Rubber Tires" (EPA-450/2-78-030), as the regulatory baseline. This assumes that in the absence of standards of performance, all new, modified, and reconstructed facilities would be required to limit volatile organic compound emissions to the levels recommended in the CTG. The CTG recommends an average overall emission reduction of about 70 percent from undertread cementing, tread end cementing, bead cementing, and inside and outside green tire spraying operations. This reduction would be achieved by using emission reduction systems at each of these affected facilities. Water-based sprays could also be used at inside and outside green tire spraying operations.

State Implementation Plans (SIPs) are currently being revised, and the level of control which would actually be required for a particular rubber tire plant in the absence of these proposed standards of performance is uncertain. Some States may adopt regulations that require different levels of emission reduction than the regulatory baseline or that allow the use of emission reduction strategies different from those assumed for the regulatory baseline. Some States may not include regulations limiting VOC emissions from rubber tire

manufacturing plants in their SIPs. Therefore, basing the impacts of the proposed standards on the assumption that all plants would be controlled to the level recommended in the CTG tends to underestimate the emission reductions and costs of the proposed standards. Therefore, in this summary, the impacts of the proposed standards are presented two ways: (1) As the difference between uncontrolled levels and the proposed standards, and (2) as the difference between the regulatory baseline and the proposed standards. The actual impacts of the proposed standards will depend on the mix of control levels required by States and the location of newly constructed, modified, and reconstructed facilities, and will be between the two sets of numbers presented here.

Compared to the regulatory baseline, the proposed standards would reduce nationwide emissions from newly constructed, modified, and reconstructed facilities by 1,430 Mg (1,570 tons) in the fifth year after proposal. This represents a 46 percent reduction in emissions beyond the CTG baseline. For a single medium-sized plant, the emission reduction compared to the baseline, would be 375 Mg (415 tons).

Compared to the uncontrolled levels, the proposed standards would reduce nationwide emissions by 8,285 Mg (9,130 tons). This represents an 83 percent reduction from uncontrolled levels. For a single medium-sized plant, the emission reduction compared to uncontrolled levels would be 1,775 Mg (1,960 tons) per year.

Compared to the regulatory baseline, the proposed standards would not result in an increase from baseline levels of water pollution and solid waste or energy consumption. Since baseline levels of water pollution, solid waste, and energy consumption show no significant increase over uncontrolled levels, the proposed standards also show no significant increase over uncontrolled levels.

Control costs calculated for the regulatory baseline assume that each affected facility would use a VOC emission reduction system to control emissions except for inside and outside green tire spraying operations, where water-based sprays were assumed to be used. Since the proposed standards are partially based on process modifications, both the capital and annualized costs to comply with the proposed standards are smaller than the costs projected to comply with the baseline levels. The total nationwide capital cost for VOC emission reduction from uncontrolled levels to the level of

the proposed standards would be about \$10.8 million during the first five years. The total nationwide annualized cost in the fifth year would be about \$1.5 million, with solvent recovery credits. (Without solvent recovery credits, the nationwide annualized cost would be about \$3.4 million; recovery credits are anticipated.) For a single medium-sized plant controlling all affected facilities to the level of the proposed standards, the annualized cost would be approximately \$110,000 if credit is given for solvent recovery or \$403,000 without solvent recovery credit.

Price increases and reductions in return on investment (ROI) are projected to be zero compared to those projected for the baseline control level. Assuming all costs are passed through to consumers, the average increase in the retail price of a tire from uncontrolled levels would be about 0.26 percent in the worst case. Upon full cost absorption, using no control as a base of comparison, the return on investment (ROI) of new radial tire manufacturing plants may decline from an assumed rate of 5.17 percent to 5.04 percent in the worst case. Worst case conditions in both situations are represented by the use of a separate capture system and carbon adsorber control device at each affected facility where control equipment is used to achieve emission reductions. These impacts are not expected to inhibit industry growth.

Standards of performance have other benefits in addition to achieving reductions in emissions beyond those required by a typical SIP. They establish a degree of national uniformity, which precludes situations in which some States may attract new industries as a result of having less stringent air pollution standards relative to other States. Further, standards of performance provide documentation which reduces uncertainty in case-by-case determinations of best available technology (BACT) for facilities located in attainment areas, and lowest achievable emission rates (LAER) for facilities located in nonattainment areas. This documentation includes identification and comprehensive analysis of alternative emission control technologies. The costs are provided for an economic analysis that reveals the affordability of controls in an unbiased study of the economic impact of controls on an industry.

The rulemaking process that implements a performance standard assures adequate technical review and promotes participation of representatives of the industry being considered for regulation, government,

and the public affected by that industry's emissions. The resultant regulation represents a balance in which government resources are applied in a well publicized national forum to reach a decision on a pollution emission level that allows for a dynamic economy and a healthful environment.

Rationale

Selection Source

The EPA Priority List (40 CFR Part 60, § 60.16, 44 FR 49222, August 21, 1979) reflects the Administrator's determination that emissions from the listed source categories contribute significantly to air pollution, which may reasonably be anticipated to endanger public health or welfare. The Priority List identifies major sources of emissions on a nationwide basis in order of priority for regulation based on three factors: (1) quantities of emissions from source categories, (2) the mobility and competitive nature of each source category, and (3) the extent to which each pollutant endangers health or welfare. Tire manufacturing is included on the Priority List as a subcategory under Synthetic Rubber, which is ranked number 20 out of a total of 59 source categories. Rubber tire manufacturing industry VOC emissions for 1979 were estimated to be about 59,000 Mg (65,000 tons).

About 140,000 tires per day will be produced by new, modified and reconstructed facilities in operation by 1985. In the absence of additional regulation, new, modified, and reconstructed facilities would emit about 3,120 Mg of VOC per year (3,430 tons/yr).

Emission reduction systems composed of a capture system and control device are available to the industry for reducing VOC emissions. Water-based green tire sprays with low VOC content are in use at many plants. Techniques which minimize solvent use can reduce emissions from tread end cementing and bead cementing operations. The predicted growth of this industry with its attendant increase in emissions and the availability of control technology further support the development of standards of performance for this industry.

Selection of Pollutants and Affected Facilities

At a rubber tire manufacturing plant, raw rubber and chemicals are first mixed in proportions determined by specifications for the tire component in which the rubber will be used. The rubber is then transported to different parts of the plant for processing into

various components, such as treads, sidewalls, beads, plies, and belts. In some of these processes rubber is combined with fabric, steel, or fiberglass. Manufactured components are brought together and assembled at a tire building area. The assembled green tire is sprayed with a green tire spray, which acts as a mold release agent and lubricant, and placed in a press where, with a specific combination of time, temperature, and pressure, the tire is molded to its final form and the rubber is cured. Tires are then inspected for quality and appearance, or "finished."

VOC is used at several points in the tire manufacturing process. Organic solvents or organic solvent-based cements are applied to components during production or during tire building to facilitate adhesion. Organic solvents are used in many green tire sprays to facilitate application of mold release and lubricating agents and at finishing, where minor cosmetic repairs are made.

The processes used to manufacture components and to assemble tires vary among companies and among plants owned by the same company. Whether any VOC is used in a process and in what amounts also vary among companies and plants owned by the same company. Each company considers some or all of its production processes to be proprietary. In developing the proposed standards, EPA was requested to maintain the confidentiality of much of the process and solvent use data submitted by industry. At the same time EPA sought to develop regulations which reflect use of best systems of continuous emission reduction and which apply equitably to each manufacturer. Further, EPA sought to avoid proposing any requirement which would adversely affect tire safety and performance.

Volatile organic compounds (VOC) are the principal pollutants emitted to the atmosphere from rubber tire manufacturing plants. The VOC emitted from all but one company's plants is predominantly white gasoline and petroleum naphtha. Heptane is the major solvent used at one company's plants. Toluene, xylene, ketones, and esters are also used throughout the industry, but in smaller amounts.

About 98 percent of the VOC emitted from an average uncontrolled existing plant results from solvent application in seven solvent-using processes. These processes and their average contribution to overall plant VOC emissions, as calculated from solvent use and tire production data, provided by industry, are shown below:

Process	Emission contribution (percent)
Undertread cementing.....	20.5
Sidewall cementing.....	13.3
Tread end cementing.....	4.9
Bead cementing.....	2.7
Tire building.....	10.7
Inside green tire spraying (roganic solvent-based).....	15.6
Outside green tire spraying (organic solvent-based).....	28.9
Finishing.....	1.8
Non solvent-using facilities.....	1.6
Total.....	100

Industry-supplied data show wide variations in solvent usage rates among companies and among plants owned by the same company. These differences occur for a variety of reasons, including differences in specifications for how tires are to be produced, and the types of tires produced.

Emissions are significant at undertread cementing, sidewall cementing, tread end cementing, bead cementing, inside green tire spraying, and outside green tire spraying operations. Further, emission reduction technology is available and is technically and economically feasible for use at each of these types of operations. Therefore, these operations were selected for control by the proposed standards.

Tire building, while contributing about 11 percent of total plant emissions, is characterized by low VOC concentrations emanating from 50 or more individual machines within each plant. The need for liberal worker access dictates that machines be open, and, as a result, high ventilation rates would be needed to remove organic vapors to a control device. Technically, control systems could be constructed to reduce VOC emissions from tire building. The air in the tire building room could be ducted to a control device such as an incinerator or carbon adsorber. However, exhaust stream VOC concentrations in existing tire building areas where general dilution ventilation is employed are very low, ranging from 0.01 to 0.32 g/m³ (0.6 x 10⁻⁶ to 20.0 x 10⁻⁶ lb/ft³). The cost of such a system would range from \$68,000 per Mg of VOC removed (\$62,000/ton) to \$306,000 per Mg of VOC removed (\$280,000/ton). The Administrator concluded that these costs are exorbitant for the emission reduction achieved and has not included tire building in the proposed standards.

Finishing contributes about 2 percent of total plant emissions. Organic solvent is used in protective coatings for whitewalls and in coating used for cosmetic purposes. Both uses, while

performed in separate areas, are part of the finishing process. Solvent application is intermittent and is performed at worker discretion. For these reasons, finishing has not been included in the proposed standards.

Compounding, milling, extrusion, calendaring, and curing, where no organic solvent is used, together account for less than 2 percent of total plant VOC emissions, and have not been included in the proposed standards.

Michelin Tire Corporation uses three operations, referred to in this preamble and in the regulation as "Michelin-A," "Michelin-B," and "Michelin-C," for which they have claimed confidentiality. EPA is currently treating the specific information provided by Michelin on these operations as confidential and has initiated a confidentiality determination in accordance with 40 CFR Part 2. Since Michelin-A, Michelin-B, and Michelin-C are operations believed unique to the Michelin Tire Corporation, emissions from these operations were not included in the above list. VOC emissions from each of these operations are significant, and collectively account for a substantial portion of total uncontrolled emissions from each Michelin plant.

Emission reduction technology which is technically and economically feasible is available for use at Michelin-A and Michelin-B operations. Therefore, Michelin-A and Michelin-B operations were selected for control by the proposed standards.

The Michelin-C operation is performed with either manual or automatic cement application depending on the type of tire being made. Emission reduction technology, which is technically and economically feasible, is available for use at automatic Michelin-C operations. Therefore, Michelin-C-automatic operations were selected for control by the proposed standards. VOC concentrations in the exhaust streams from manual Michelin-C operations are reportedly very low, ranging from 0.10 to 0.30 g/m³. The cost of operating an emission reduction system at a manual Michelin-C operation would be similar to that previously stated for tire building. The Administrator has concluded that these costs are exorbitant for the emission reduction achieved and has not included manual Michelin-C operations in the proposed standards. Not all tires manufactured by Michelin Tire Corporation can be made using the Michelin-C-automatic operation. Therefore, the proposed standards do not preclude the use of manual Michelin-C operations.

Affected Facilities

The choice of the affected facility(ies) for this standard is based on the Agency's interpretation of Section 111 of the Act and judicial construction of its meaning. Under Section 111, the NSPS must apply to "new sources;" "source" is defined as "any building, structure, facility, or installation which emits or may emit any air pollutant" [Section 111(a)(3)]. Most industrial plants, however, consist of numerous pieces or groups of equipment which emit air pollutants, and which might be viewed as "sources." EPA therefore uses the term "affected facility" to designate the equipment, within a particular kind of plant, which is chosen as the "source" covered by a given standard.

In choosing the affected facility, EPA must decide which pieces or groups of equipment are the appropriate units for separate emission standards. The Agency must do this in light of the terms and purpose of Section 111. One major consideration is that the use of a narrower definition results in bringing replacement equipment under the NSPS sooner. For example, if an entire plant were designated as the affected facility, no part of an existing plant would be subject to the standard unless the plant as a whole were "modified." If on the other hand, each piece of equipment were designated as an affected facility, then as each piece was replaced, the replacement piece would be a new source subject to the standard. Since the purpose of Section 111 is to minimize emissions by the application of the best demonstrated control technology (considering cost, other health and environmental effects, and energy requirements) at all new and modified sources, there is a presumption that a narrower designation of the affected facility is proper. This ensures that new emission sources would be subject to the standards as they are installed. This presumption can be overcome, however, if the Agency concludes that relevant statutory factors (technical feasibility, cost, energy, and other environmental impacts) point to a broader definition.

In a rubber tire plant, the narrowest designation of affected facility for which standards of performance might be appropriate is each individual operation. The rubber tire industry maintains that much of the anticipated growth in the industry by 1985 will result from non-routine replacement of existing operations with new operations. New individual operations would qualify as new sources subject to standards of performance under this narrowest definition of affected facility. As a result, control costs were calculated

assuming each operation would be controlled separately. In practice, however, a single control device could be used to control emissions from several operations. Examination of these costs showed that control is economically feasible (i.e., the costs would not inhibit growth or replacement) in all cases where a separate emission reduction system would be used at an individual operation. Defining an affected facility as each separate operation is supported by technical, cost, and economic considerations. The Agency requests comments from interested parties about this definition of an affected facility.

With each operation defined as an affected facility, any change which qualified as a modification or reconstruction would cause only that changed operation to become subject to standards of performance. Further, if a new operation were constructed at an existing plant where other operations were not subject to standards of performance, only the new operation would be subject to standards of performance.

Undertread cementing and tread end cementing are usually performed at different points on the same tread line. At an undertread cementing operation, cement is applied to a continuous strip of tread rubber or to a combined tread/sidewall component. The tread rubber is usually transported from the extruder to the undertread cementing operation by a conveyor. After cement is applied, the tread rubber strip passes along a conveyor where it air dries and then usually through a water bath for cooling. At undertread cementing operations, VOC is emitted from cement storage and application equipment and from cemented rubber as VOC evaporates after application. Therefore, an undertread cementing operation consists of a cement application station and all other equipment, such as the cement supply system, and feed and takeaway conveyors, which are necessary to apply cement to tread or combined tread/sidewall components and to allow evaporation of solvent from tread or combined tread/sidewall components. Each undertread cementing operation is an affected facility.

After the water bath and forced-air drying, the continuous strip is cut to specified lengths and then is usually conveyed to a tread end cementing operation. At a tread end cementing operation, cement is applied to one or both tread ends. Cement is usually applied to tread ends either by spraying with an electronically-triggered automatic spray arm or manually by a

worker equipped with a pot of cement and an applicator. VOC is also emitted from cement storage and application equipment and from cemented treads as VOC evaporates after application. Therefore, a tread end cementing operation consists of a cement application station and all other equipment, such as the cement supply system, and feed and takeaway conveyors, which is necessary to apply cement to tread end components and to allow evaporation of solvent from tread ends. Each tread end cementing operation is an affected facility. Although undertread cementing and tread end cementing operations are usually performed on the same tread line, they are separate emission points and each can be controlled separately. This supports designating each tread end cementing operation as an affected facility separate from each undertread cementing operation.

For some types of tires, sidewalls may be extruded as part of the tread. Cement application for this tread/sidewall component usually occurs at an undertread cementing operation, and VOC emissions are counted as part of those from undertread cementing. When sidewall cementing is performed as a separate operation, the extrusion, conveying, cementing, and cooling equipment is usually similar to but smaller than that used for undertread cementing. Instead of being cut to specific lengths, however, the continuous sidewall strip is rolled in a non-stick fabric and stored until needed. VOC is emitted from cement storage and application equipment and from cemented rubber as VOC evaporates after application. Therefore, a sidewall cementing operation consists of a cement application station and all other equipment, such as the cement supply system, and feed and takeaway conveyors, which is necessary to apply cement to sidewall components and to allow evaporation of solvent from sidewall components. Each sidewall cementing operation is an affected facility.

Bead cementing may occur before or after the rubber-coated wire is fashioned into a bead. If cement is applied before bead fashioning, the cement application apparatus is usually a swab or roller suspended in a trough of cement attached to the bead fashioning equipment. Cement is applied as the rubber-coated wire passes over the trough. If cement is applied after beads are fashioned, it is usually accomplished by spraying or by dipping the beads into a vat of cement. Spraying or dipping equipment is separate from

bead fashioning equipment. A bead cementing operation consists of a cement application station, such as a dip tank, spray booth and nozzles, cement trough, and roller or swab applicator; and all other equipment necessary to apply cement to beads or bead components and to allow the evaporation of solvent from cemented beads. Each bead cementing operation is an affected facility.

Green tire sprays are usually applied inside and outside with automatic spray nozzles. Whether water-based or organic solvent-based inside and outside green tire sprays are used, outside sprays usually contain more VOC than inside sprays. Inside and outside sprays are usually applied using different nozzles in the same booth. However, different booths may be employed at some plants. The spray booth is designed to contain overspray and vent it to a dust collector or uncontrolled to the atmosphere. Inside green tire spraying and outside green tire spraying are separate operations and are separate affected facilities. An inside green tire spraying operation consists of the inside spray application station and related equipment, such as the lubricant supply system, the booth where spraying is performed, and associated fans and ductwork. Each inside green tire spraying operation is an affected facility. An outside green tire spraying operation consists of the outside spray application station and related equipment, such as the lubricant supply system, the booth where spraying is performed, and associated fans and ductwork. Each outside green tire spraying operation is an affected facility.

Cement is applied to tire components at Michelin-A, Michelin-B, and Michelin-C-automatic operations. Each of these operations is distinct and has VOC emissions which can be accounted for and controlled independently. Each operation consists of cement storage and application equipment, and other equipment necessary for the application of cement to and the evaporation of VOC from tire components processed at the operation. Each Michelin-A, Michelin-B, and Michelin-C-automatic operation is an affected facility.

Selection of Basis of Proposed Standard

Three general methods of emission reduction technology are available to the rubber tire manufacturing industry: (1) emission reduction systems (capture and control); (2) low solvent use techniques; and (3) low VOC content materials.

Emission Reduction Systems

Current use of emission reduction systems is limited in the rubber tire industry. Only two such systems are present in this industry, both employing carbon adsorbers as the control device. One of these systems is part of the original design of the undertread cementing process at a new plant. This plant has not yet operated at full production capacity, and emission control data on the new system are not yet available. The other system is the only emission reduction system in full use in the industry. It consists of a capture system and carbon adsorber installed on an undertread cementing line in 1973 and has been shown by materials balance calculations to have an average solvent recovery efficiency of about 63 percent. The carbon adsorber has been tested separately and shown to be about 90 percent efficient, thus the capture system averages about 70 percent efficiency. The company operating this system has submitted information concerning factors which limit system performance. Factors which according to the company limit system efficiency include:

- (1) About 8 percent of VOC applied to a rubber component is absorbed by the rubber and is not immediately available for capture (emissions from cemented rubber account for about 30 percent of total VOC emissions from this line, thus about 2.4 percent of VOC used is absorbed);
- (2) Enclosure system access doors are open for a finite period for periodic threading of new tread sizes;
- (3) Length of the drying area conveyor is limited by the configuration of existing extrusion equipment;
- (4) The switching damper installed for enclosure emergency situations is not equipped with vapor loss seals;
- (5) Operating practices do not provide for containment of VOC emissions during weekend shutdown, either by draining cement tanks or by equipping tanks with tight fitting covers;
- (6) Operating practices do not provide for air drying and cooling of the desorbed carbon bed prior to the next adsorption cycle; and
- (7) The company does not account for vapor losses from cement mixing churns, recirculating cement distribution system storage tanks, recovered solvent storage tanks, pumping, and venting from decanter.

In EPA's judgment, this type of emission reduction system could be improved to achieve an overall efficiency of 75 percent or better. VOC loss during periods of worker access

could be minimized by restricting access opening size and by maintaining sufficient ventilation to contain VOC. Where cemented rubber components are allowed to dry on a conveyor after cement is applied, enclosed conveyors could be employed to contain VOC emitted from cemented rubber. The length of conveyor enclosed would depend upon conveyor speed and the time required to contain VOC emitted. Analysis of evaporation rates has shown that about 90 percent of VOC applied to rubber components is emitted within 30 seconds after application. Other design features to minimize VOC loss, such as vapor loss seals attached to a switching damper, could also improve overall system efficiency. Cement tanks could be covered during periods of non-use. Desorbed carbon beds could be air dried and cooled between cycles. These improvements in operating practices would improve overall system efficiency. VOC loss due to absorption is the only area in which improvements in design and operating practices would have little or no effect.

Several sources of information were used to establish the level of control that could be achieved by emission reduction systems in the rubber tire industry. Information was obtained from: (1) Available technical literature concerning emission reduction systems applicable for the control of VOC emissions in the rubber industry; (2) hood and enclosure design parameters from *Industrial Ventilation: A Manual of Recommended Practice*; (3) VOC use and process information supplied by the rubber tire industry; (4) visits to rubber tire manufacturing plants; (5) results of emission measurements and materials balance tests conducted by EPA; and (6) results of tests of VOC absorption by rubber conducted by industry.

Thermal and catalytic incinerators are effective VOC emission control devices for the types of solvents used in rubber tire manufacturing operations. A thermal incinerator operating at 870°C (1600°F) with 3/4 second residence time will typically achieve 98 percent VOC reduction efficiency or 20 parts per million on a continuous basis. A catalytic incinerator can be designed to achieve a 98 percent emission reduction efficiency on a continuous basis. In both cases, primary heat recovery should be employed to reduce operating costs.

Carbon absorbers have been demonstrated in the rubber processing industry, the pressure sensitive tape and label industry, and in other industries to achieve better than 95 percent removal of VOC emissions on a continuous basis when applied to exhaust gas streams

similar to those generated in the rubber tire industry. Steam is usually employed for carbon bed regeneration, although any hot, non-reactive gas may be used.

The overall degree of continuous emission reduction achieved is not only a function of control device efficiency, but also of capture efficiency. A capture system contains VOC vapors at the emission source and directs them to the control device. VOC emissions from rubber tire plant operations result primarily from two activities: (1) application of cement or spray to rubber components; and (2) evaporation of VOC from cement or spray applied to a rubber component. Effective capture of VOC must account for both of these sources of VOC emissions.

Industry-supplied data show that at an undertread cementing operation about 70 percent of total emission is attributable to evaporation of VOC from application equipment, and about 30 percent is attributable to evaporation of VOC from rubber component surfaces. Similar data for tread end cementing and green tire spraying show that about 80 percent of total emissions is attributable to evaporation of VOC from application equipment, and about 20 percent is attributable to evaporation of VOC from rubber component surfaces. No such data are available to show a ratio for sidewall cementing or bead cementing. However, since sidewall cementing is a process very similar to undertread cementing, the ratios for these processes should be similar. Both tread end cementing and bead cementing involve the application of cement to relatively small surface areas. Therefore, EPA estimates that the ratio for bead cementing resembles the 80:20 ratio for tread end cementing.

To approach total vapor collection, a completely sealed enclosure of the emission source would be necessary. However, completely sealed enclosures are not practical in the rubber tire industry. Some affected facilities require intermittent worker access, usually for startup, maintenance, and repair purposes, while other facilities, such as manual tread end cementing, require continual worker access to the tire component.

Capture systems for cement application areas that require only intermittent access to the equipment, such as automatic tread end cementing, undertread cementing, sidewall cementing, and roller bead cementing, could consist of enclosures containing access ports equipped with self-closing doors. The capture system currently in use at one undertread cementing operation which was discussed earlier

could be adapted for use at other undertread cementing operations as well as at automatic tread end cementing and sidewall cementing. Capture efficiencies of at least 80 percent could be achieved on a continuous basis.

Capture systems for cement application areas that require constant worker access could be similar to those used on portable chipping and grinding tables or soldering tables in other industries. These enclosures provide worker access and conveyor movement through side openings and are designed to minimize pressure losses through the openings. Associated with these cement application areas are conveyors that transport the cemented component. Solvent evaporates from the component while it is on the conveyor. To achieve maximum capture efficiency, the conveyors must be enclosed to allow for capture of the evaporated solvent. Conveyor enclosures such as those used for straight-line automatic buffing would be appropriate. These enclosures consist of hoods, with hinged access doors, that surround the top, sides, and underside of the conveyor. Each end of the hood is partially covered by flaps to minimize the opening size. Capture efficiencies of such enclosures are related to the percentage of total solvent that evaporates off the component while it is inside the enclosed area; however, efficiencies of at least 80 percent could be achieved on a continuous basis. The length of the enclosure would depend on the conveyor speed and the rate of evaporation of the solvent.

Dip bead cementing and inside and outside green tire spraying operations usually consist only of a cement or spray application area. For dip bead cementing, the beads are lowered into a tank which can be enclosed and the enclosure equipped with access ports. Beads could be placed in the enclosure through access ports which would remain open only until the beads were inside. The beads could be dipped into the cement, then raised, and would remain in the enclosure for enough time to allow maximum evaporation of solvent. For inside and outside green tire spraying, spray booths are usually used for application. Tires could remain inside the booths for a sufficient time after cement application to allow for maximum evaporation. Capture efficiencies of at least 80 percent could be achieved on a continuous basis.

The most effective capture systems applicable at reasonable cost to Michelin-B operations are similar to those described above for undertread and sidewall cementing operations and can achieve at least 80 percent capture

efficiency. Capture systems for Michelin-A and Michelin-C-automatic operations must allow for continual intrusion of mechanical devices, frequent worker access, and introduction of additional tire components into both the cement application and drying areas. These features limit capture efficiency at these operations. EPA has determined that the most effective capture system applicable at reasonable cost to Michelin-A and Michelin-C-automatic operations is capable of achieving 70 percent capture efficiency.

Technology exists for new and retrofit systems to achieve emission reductions of 75 percent at undertread cementing, sidewall cementing, tread end cementing, bead cementing, inside and outside green tire spraying, and Michelin-B operations, and of 65 percent at Michelin-A and Michelin-C-automatic operations. Control devices demonstrated in other industries, which achieve an average removal or destruction efficiency of at least 95 percent, are available and can be used in conjunction with capture systems similar to those described above to achieve these levels of overall emission reduction.

Low Solvent Use Techniques

Emission reduction in the rubber tire industry can also be achieved by reducing cement usage. For tread end cementing and for bead cementing operations, each company reporting solvent use data has demonstrated that it can achieve an emission rate of 10 g/tire without the use of an emission reduction system. Solvent use rates as low as 2 g/tire have been reported for some plants.

Most of the low solvent use rates reported for tread end cementing operations were for those where cement is applied manually. However, low solvent use rates were also reported for operations where cement is applied by automatic spray arms. Most low solvent use rates for bead cementing operations were for facilities that use rollers to apply the cement. However, low solvent use rates were also reported for facilities that use a bead dipping method. EPA identified the following good work practices as helping to achieve low solvent use rates: minimizing the surface area for openings on cement pots at manual tread end cementing stations, covering cement tanks used for bead dipping, and minimizing overspray at automatic tread end cementing stations. In EPA's judgment, any new, modified, or reconstructed tread end or bead

cementing operation can use 10 g/tire or less of VOC.

Substitution of Low VOC Content Materials

Green tire spraying represents another affected facility where significant emission reduction can be achieved without the use of emission reduction systems. Water-based sprays have been substituted for organic solvent-based sprays at inside and outside green tire spraying operations in a number of plants. Uncontrolled emission rates calculated for water-based inside tire sprays ranged from zero to 1.2 g/tire; uncontrolled emission rates calculated for water-based outside sprays ranged from zero to 9.3 g/tire. Product quality considerations have been cited by industry as the reason for retaining a small amount of VOC in some water-based sprays. Emissions from water-based green tire sprays are at least 90 percent less than average uncontrolled emissions from solvent-based sprays. Water-based sprays have been widely used under conditions representative of the industry and are available to all companies.

Selection of the Regulatory Alternatives

The regulatory alternatives considered in developing the standards of performance are based on the methods available to control the VOC emissions from the rubber tire industry. The three control methods considered were emission reduction systems (capture and control technology), low solvent use techniques, and low VOC content materials were considered. Impacts calculated for the regulatory alternatives were based on the use of carbon adsorber control devices where emission reduction systems are used. The proposed standards would allow the use of other types of control devices.

Regulatory Alternative I represents the regulatory baseline. State Implementation Plan (SIP) regulations for control of VOC emissions from rubber tire manufacturing plants are expected to be based on information presented in the control techniques guideline (CTG) document "Control of Volatile Organic Emissions from Manufacture of Pneumatic Rubber Tires" (EPA-450/2-78-030). Therefore, Regulatory Alternative I has been set at the level of control recommended in the CTG. Under Regulatory Alternative I, VOC emissions from undertread cementing, tread end cementing, bead cementing, and inside and outside green tire spraying operations would be reduced by an average of about 70 percent. Sidewall cementing operations and Michelin-A, Michelin-B, and

Michelin-C-automatic operations were not addressed in the CTG; therefore, Regulatory Alternative I does not limit VOC emissions from these affected facilities.

Emission reduction systems could be used for all affected facilities under Regulatory Alternative I to achieve a 70 percent emission reduction efficiency. Water-based sprays could be used at inside and outside green tire spraying facilities to meet or exceed a 70 percent emission reduction for Regulatory Alternative I.

Regulatory Alternative II is based upon the use of 75 percent efficient emission reduction systems for undertread cementing, sidewall cementing, tread end cementing, and bead cementing facilities, and upon the use of water-based sprays (90 percent emission reduction) for inside and outside green tire spraying facilities.

Since Michelin-A, Michelin-B, and Michelin-C-automatic operations are believed unique to Michelin Tire Corporation, they were not included in Regulatory Alternative II. Regulation of these operations was considered separately and is discussed under the section on "Best System of Continuous Emission Reduction."

Emission reductions achievable with water-based green tire sprays are significantly greater than the reductions achievable where organic solvent-based spray VOC emissions are reduced with the use of an emission reduction system. Water-based inside and outside green tire sprays have been adequately demonstrated in the industry and are available to all companies.

Environmental Impacts

Under Regulatory Alternative I (the regulatory baseline), emissions in the fifth year from new, modified, and reconstructed affected facilities would be about 3,120 Mg/year (3,430 tons/yr). The fifth year air quality impact of Regulatory Alternative II would be a reduction of about 1,700 Mg/yr (1,870 tons/yr) from baseline emissions. This is a reduction of 55 percent from the baseline.

Under each of the regulatory alternatives there could be effluent from steam regeneration of carbon adsorption beds and from overspray of inside and outside water-based green tire sprays. The VOC used in tire manufacturing is virtually insoluble in water. Therefore, most adsorbed VOC which escapes decanting and most VOC contained in overspray from inside and outside water-based green tire sprays will volatilize rather than remain in the water. Wastewater flow in 1985 under

Regulatory Alternative I would be about 4.8 million m³/yr (1.3 billion gal/yr). Regulatory Alternative II would not increase the wastewater flow beyond the baseline.

Under Regulatory Alternative I, solid waste generated in 1985 would be about 238,000 Mg/yr (263,000 tons/yr). Regulatory Alternative II would not increase the quantity of solid waste generated. Solid waste could result from disposal of spent carbon from carbon adsorbers. Spent carbon can be recycled for other industrial uses, incinerated or disposed of by landfilling.

Energy Impacts

Energy use for pollution control equipment is based on the use of carbon adsorbers as the control technique for both regulatory alternatives. Under Regulatory Alternative I, facilities that are built, modified, or reconstructed by 1985 would use a total of about 2.5×10^{17} joules/yr of electricity for process, non-process, and pollution control purposes. Emission reduction to the level of Regulatory Alternative II would not increase the fifth-year energy usage.

Economic Impacts

A detailed analysis of the economic impact of the regulatory alternatives on the rubber tire manufacturing industry has been developed. Price increases or alternative decreases in return on investment (ROI) were determined to be reasonable for both regulatory alternatives, even under worst case conditions. In no case do capital costs of control exceed 1 percent of total investment requirements.

Regulatory Alternative I (baseline) fifth-year cumulative capital control costs would be about \$16.3 million. Fifth-year annualized control costs without solvent recovery credits would be about \$4.9 million; with solvent recovery credits, annualized control costs would be about \$3.3 million.

Regulatory Alternative II fifth-year cumulative capital control costs would be about \$7.9 million above the baseline. Fifth-year annualized costs without solvent recovery credits would increase above the baseline figure by about \$2.3 million. The increase above the baseline in fifth-year annualized costs with solvent recovery credits would be about \$1.5 million. Under full cost pricing, the product price would increase by about 0.14 percent under worst case conditions. Under full cost absorption, the ROI of new radial tire manufacturing plants may decline from an assumed rate of 5 percent to 4.93 percent in the worst case. In either situation the worst case is represented by the use of a separate capture system and a carbon

adsorber control device at each affected facility where control equipment is used to reduce emissions. Neither impact would inhibit industry growth or replacement.

Best Systems of Continuous Emission Reduction

Regulatory Alternative II is technically and economically feasible for all affected facilities, would achieve greater emission reduction than Regulatory Alternative I, and would cause no adverse water, solid waste, or energy impacts. Capture and control technology is available to meet Regulatory Alternative II emission reductions for undertread cementing, sidewall cementing, tread end cementing, and bead cementing. Water-based inside and outside green tire sprays are available to all rubber tire manufacturers and are already in use by most companies at one or more plants. Water-based sprays can meet or exceed Regulatory Alternative II emission reductions. Alternative II would decrease overall VOC emissions from the affected facilities by about 55 percent below the baseline. Annualized costs without recovery credits would increase by about 47 percent; with recovery credits the increase would also be about 47 percent. The increase is due primarily to addition of sidewall cementing as an affected facility. Based on consideration of these factors, Regulatory Alternative II was judged superior to Regulatory Alternative I, and Regulatory Alternative II was used as the basis for selecting the best system of continuous emission reduction.

Data on existing plants indicate that there is a wide variation in solvent use rates (and a corresponding wide range in uncontrolled emission rates) from each type of affected facility. At some low solvent use rate, the cost of employing an emission reduction system could be unreasonably high for the amount of emission reduction achieved. Since the cost per unit of emission reduction achieved is an important factor in determining the reasonableness of control at facilities with low uncontrolled emissions, the Agency considered requiring less efficient emission reduction at facilities with low solvent use rates and/or establishing solvent use cutoffs, below which no level of control would be required. These choices would be considered if, indeed, there was a solvent use rate at which the control costs were judged to be unreasonably high when compared to the emission reduction.

As a first step in the Agency's determination, annualized costs of applying a 75 percent efficient emission

reduction system were calculated for the range of solvent use rates (numbers equal to the uncontrolled emission rates) at undertread cementing, sidewall cementing, tread end cementing, and bead cementing facilities. Annualized costs per megagram of VOC emission reduction were then plotted across the range of solvent use rates. (See Figures 8-1 and 8-2 in the BID.) It was assumed that a separate capture system and control device would be used for each operation and that flow rates and capital costs for each operation are constant over the entire range of solvent use rates. These costs do not represent the actual amounts of money spent for any particular plant. Rather, the costs are estimates which represent additional lines and plants likely to be built. The costs of VOC emission reduction systems will vary according to production rate, production equipment, plant layout, geographic location, and company preferences and policies.

As was expected, the annualized cost per megagram of emission reduction increases as the solvent use rate decreases. For solvent use rates above 50 grams per tire (g/tire), the total annualized costs for a carbon adsorber, assuming recovery credits, would be about \$400 per megagram of VOC emissions reduced. As the solvent use rate decreases, through changes in process and manufacturing techniques, from 50 to 25 g/tire, the costs gradually increase to about \$1250 per megagram. From 25 to 15 g/tire costs begin rising at a more rapid rate. However, there is no point on the curve at which a sharp upward swing is distinguishable. In the 25 to 15 g/tire range, costs begin to exceed \$2,000 per megagram. Based on VOC emission control costs in other industries regulated by standards of performance, costs above \$2,000 per megagram are generally considered to be unreasonably high (although, in some instances, there may be overriding considerations that affect the determination of reasonable cost).

To reduce the cost per megagram of pollutant removed for facilities within the 25 to 15 g/tire range, the Agency considered less effective and less costly emission reduction systems for those facilities. However, systems which are less than 75 percent efficient are not significantly lower in cost than 75 percent efficient systems. Consequently, requiring a level of control less than 75 percent efficient for facilities between 25 and 15 g/tire would not bring the cost per megagram significantly below the level generally considered unreasonably high.

To identify a cutoff point between 25 and 15 g/tire, the Agency considered other cost-related factors in selecting the exact cutoff. Specifically, the Agency considered the additional cost savings that would be achieved by establishing a cutoff at 25 g/tire rather than 15 g/tire. These cost savings are associated with: conservation of energy required to operate these systems, conservation of resources required for their operation and maintenance, and the encouragement of solvent conservation at facilities that can, or may develop methods to, reduce solvent usage to meet the cutoff limits rather than install capture and control systems. In light of these benefits and the general view that the Agency should set standards that encourage development of inherently low-emitting processes, and in the absence of a clearly identified VOC use rate at which the control costs per megagram reduction are clearly unreasonable, the Administrator is proposing 25 g/tire as the cutoff solvent use rate for undertread cementing and sidewall cementing facilities. While solvent use rates average about 63 g/tire for existing undertread cementing and 41 g/tire for existing sidewall cementing facilities, solvent use rates below 25 g/tire have been reported for each of these operations. The costs to reduce emissions by 75 percent at solvent use rates above 25 g/tire are considered reasonable, and 25 g/tire is an appropriate cutoff point considering both the benefits which accrue and the rapidly increasing cost per megagram associated with control at solvent use rates below 25 g/tire. Therefore, the best system of continuous emission reduction for undertread and sidewall cementing operations is an emission reduction system that achieves 75 percent overall control for facilities that use more than 25 g/tire, and low solvent techniques for facilities that use 25 g/tire or less. The 75 percent efficient emission reduction system was based on an 80 percent efficient capture system and a 95 percent efficient carbon adsorber control device. The proposed standards would also allow use of other types of control devices, and any combination of capture and control efficiencies that result in at least a 75 percent overall emission reduction.

A similar analysis was done for tread end cementing and bead cementing, and cutoffs of 25 and 20 g/tire respectively were selected. (See Figures 8-3 to 8-5 in BID.) These cutoffs were higher than VOC use rates for most existing tread end cementing and bead cementing facilities. No new tread end or bead cementing operations are expected to

use more than the 25 or 20 g/tire cutoffs. Therefore, requiring those tread end cementing or bead cementing operations that use more than the cutoff amounts of VOC to reduce emissions by 75 percent would achieve no emission reduction. However, an alternative means of minimizing emissions has been adequately demonstrated to achieve effective control at tread end cementing and bead cementing facilities. Industry-supplied solvent use data show that each company has at least one plant that uses 10 g/tire or less at each of these operations. Further, many existing plants already use substantially less than 10 g/tire. Emission rates of 10 g/tire, or less, could be achieved without the use of emission reduction systems. A 10 g/tire emission limit for all tread end cementing and bead cementing operations would result in a greater nationwide emission reduction than would be achieved by requiring installation of a 75 percent efficient emission reduction system for those facilities that use more than the cutoff amounts of VOC. Since no emission reduction systems would be used, capital and operating costs, and water, solid waste and energy impacts would be reduced. For the above reasons, the best system of continuous emission reduction for tread end and bead cementing operations is low-solvent techniques that use less than 10 g/tire.

The best system of continuous emission reduction for inside green tire spraying and outside green tire spraying operations is water-based green tire sprays. Water-based green tire sprays result in lower emissions than when solvent-based sprays are used in conjunction with emission reduction systems.

Choosing low solvent use techniques as the best system of continuous emission reduction for tread cementing and bead cementing operations, and setting 25 g/tire cutoffs for undertread cementing and sidewall cementing operations result in the impacts of the proposed standards being different from the impacts of Regulatory Alternative II. Under the proposed standards, baseline emissions from undertread cementing, sidewall cementing, tread end cementing, bead cementing, inside green tire spraying, and outside green tire spraying would be reduced by about 1,430 Mg (1,570 tons) in the fifth year, a 46 percent reduction. This emission reduction would be about 9 percent less than the emission reduction estimated for these affected facilities under Regulatory Alternative II. The amounts of energy used, and water pollution and solid waste generated under the

proposed standards would be less than under Regulatory Alternative II.

Because the proposed standards would not in most cases require the use of emission reduction systems for affected facilities other than undertread cementing and sidewall cementing, capital and annualized costs would be less than those for Regulatory Alternatives I and II. Fifth-year cumulative capital costs would be about \$10.8 million above uncontrolled levels, about 34 percent less than the baseline and about 55 percent less than Regulatory Alternative II. Annualized costs in the fifth year without recovery credits would be about \$3.4 million above uncontrolled levels; with recovery credits the fifth-year annualized cost would be about \$1.5 million above uncontrolled levels. These annualized costs represent reductions from the baseline of about 31 percent and 54 percent, respectively; they represent cost reductions from Regulatory Alternative II of about 53 percent and 69 percent, respectively. The average product price would rise about 0.26 percent above uncontrolled levels in the worst case. The product price is not expected to increase above baseline levels. Under full cost absorption, using uncontrolled levels as a base comparison, the ROI would decrease from an assumed rate of 5.17 percent to about 5.04 percent under worst case conditions. The ROI is not expected to decrease below baseline levels.

Based on EPA's analysis of information submitted by Michelin Tire Corporation, the Agency has determined the best technological system of continuous emission reduction for the Michelin-B operation to be a VOC capture system and carbon adsorber control device that will achieve a 75 percent overall emission reduction. For Michelin-A and Michelin-C-automatic operations, EPA has determined the best technological system of emission reduction to be a VOC capture system and carbon adsorber control device that will achieve a 65 percent overall emission reduction. EPA has determined that these systems are available at reasonable cost and do not impose unreasonable adverse water, solid waste, or energy impacts. The proposed standards would also allow the use of control devices other than carbon adsorbers.

Selection of Format of Proposed Standard

Concentration, mass units, and efficiency were considered as formats for the proposed standards. A concentration format for the proposed

standards would limit the amount of VOC per unit volume of exhaust gas discharged into the atmosphere but not the total mass of VOC discharged. The advantage of the concentration format is that the test method would not require measurement of gas flow or composition of the solvent. The primary disadvantage of using a concentration format is that solvent application rates (hence emissions) are variable, and, as a result, vapor concentrations also vary widely. A further complication is the assertion by some industry representatives that air flow rates affect product quality, and companies may therefore differ in their ventilation specifications. For these reasons, concentration units were rejected as a format for the proposed standards.

A second option is to express the proposed standards in terms that limit VOC emissions to a maximum allowable mass per unit of production. A mass standard for this industry could be expressed in grams of VOC emitted per tire processed (g/tire). A g/tire standard is suitable where low solvent use techniques are employed to minimize VOC emissions at tread end cementing and bead cementing facilities, and where water-based sprays are employed to minimize VOC emissions at inside and outside green tire spraying facilities. As a result, the proposed standards for tread end cementing, bead cementing, and green tire spraying facilities are expressed as grams of VOC emitted per tire processed (g/tire).

Gram per tire emission limits were not considered to be appropriate where the best system of continuous emission reduction is an emission reduction system. Establishing g/tire emission limits based on reduction from the highest uncontrolled emission rates would ensure achievability of the standards but would require installation of the best system of continuous emission reduction only on the few facilities with the highest emission rates. Facilities with lower uncontrolled rates could achieve the standards without using best control technology. Gram per tire emission limits based on reduction from less than the highest (e.g., the average) uncontrolled emission rates could result in limits that may not be achievable by all facilities, especially those with the highest uncontrolled emissions. Further, some industry representatives expressed concern at the December 2, 1980, meeting of the National Air Pollution Control Techniques Advisory Committee that gram per tire emission limits based on a reduction from even the highest reported emission rate may not be achievable.

This concern was based on the possibility that a new facility could have an uncontrolled emission rate higher than those reported for existing facilities. These problems could be overcome by choosing an efficiency format, which would reflect the use of capture and control systems irrespective of the uncontrolled emission rate at the facility. Therefore, an efficiency format was chosen for the standards for undertread and sidewall cementing operations that use more than 25 g/tire and for Michelin-A, Michelin-B, and Michelin-C-automatic operations. To ensure that all aspects of the issue have been considered adequately, the Agency requests comments from interested parties about the recommended percent reduction format.

Selection of Numerical Emission Limits

Based on the best systems of continuous emission reduction, the proposed standards consist of the following numerical emission limits. Each undertread cementing operation and each sidewall cementing operation where more than 25 grams of VOC are used per tire would be required to reduce emissions by at least 75 percent. Undertread cementing and sidewall cementing operations that use less than 25 g/tire would not be required to install emission reduction systems. Each tread end and bead cementing facility would be required to limit emissions to no more than 10 g/tire. Each inside green tire spray operation would be required to limit emissions to no more than 1.2 g/tire, and each outside green tire spray operation would be required to limit emissions to no more than 9.3 g/tire. Each Michelin-B operation would be required to reduce emissions by at least 75 percent. Each Michelin-A operation and each Michelin-C-automatic operation would be required to reduce emissions by at least 65 percent. As stated above, these emission limits reflect application of the best demonstrated system of emission reduction at each affected facility in a rubber tire manufacturing plant.

Rubber tire industry representatives have requested EPA to consider adding a provision to the proposed standards which would allow a plant owner or operator the option of meeting an emission limit calculated for a group of individual affected facilities rather than individual limits for each affected facility. The emission limit for the group would be calculated by combining prescribed emission limits for individual affected facilities and, for purposes of the following discussion, is termed an NSPS compliance bubble, i.e., a tradeoff

of emissions among affected facilities for compliance purposes.

EPA believes a compliance tradeoff for rubber tire manufacturing may be appropriate and may be consistent with Section 111 of the Clean Air Act and is considering incorporating such a tradeoff in the standards before promulgation. Standards currently proposed or promulgated under Section 111 of the Act do not contain such a provision. EPA is in the early stages of evaluating a general policy for Section 111 standards which, if adopted, would provide for compliance tradeoffs where determined appropriate for plants containing multiple affected facilities. Until EPA establishes a policy for Section 111 standards in general, the Agency is not prepared to propose such a policy in the rubber tire standard. However, EPA will make a decision on this policy before the rubber tire standard is promulgated. Therefore, EPA is requesting comments on the use of a compliance tradeoff as a part of this package. It is anticipated that any compliance tradeoff incorporated into the rubber tire standard would allow aggregation of individual emission limits only for those facilities within a plant which are subject to the standards (newly constructed, modified, or reconstructed) and which are present in that specific plant.

Modification/Reconstruction Considerations

Modification, as defined in § 60.14 of Chapter I, Title 40 of the Code of Federal Regulations (CFR), may occur when any physical or operational change to an existing facility results in an increase in emission rate to the atmosphere of any pollutant to which a standard applies. However, there are several changes that result in increased emission rates which are exempt from the modification provision. Once such provision is for a production rate increase that is accomplished without a "capital expenditure" as defined in § 60.2.

The production rate of a rubber tire manufacturing plant is usually directly related to the capacities of the tire building or curing press operations, which are not subject to the proposed standards. Other operations, including operations selected as affected facilities, normally run at less than full capacity, and their production rates can usually be increased up to full capacity without a capital expenditure. Most changes expected to occur would be of this nature. As a result, few, if any, modifications are expected.

Reconstruction, as defined in § 60.15 of Chapter I, Title 40 of the CFR, occurs

when the fixed capital cost of replacement components of an existing facility exceeds 50 percent of the fixed capital cost that would be required to construct a comparable entirely new facility and compliance is technically and economically feasible. Upon replacement of components, the Administrator will determine, on a case-by-case basis, whether a reconstruction has taken place and whether the existing facility becomes an affected facility under the NSPS.

Investigation of the rubber tire manufacturing industry has indicated that repair or rebuilding of an existing facility where costs would exceed 50 percent of the cost of replacing the facility is unusual.

Selection of Performance Test Methods

The proposed standards would require two types of performance tests, initial performance tests and monthly performance tests. Initial performance tests would be required for all affected facilities except those facilities that demonstrate compliance with the percent emission reduction requirements by meeting certain equipment specifications. These facilities would conduct an initial performance test on the control device but not on the capture system. However, the owner or operator would be required to state in the initial compliance report whether or not each capture system specification has been met. Monthly performance tests would be required for most, but not all, affected facilities.

Monthly performance tests were chosen, where practical, to ensure continual compliance. Requiring only an initial performance test would somewhat reduce the monitoring workload on the owner or operator, but would not be as useful to either the owner or operator or to the Agency for ensuring continual compliance. In addition, most of the data required for monthly performance tests are routinely collected and maintained by the source as part of production and inventory records. Performance tests that consist of costly stack testing are not required on a monthly basis in order for EPA to ensure that compliance costs are maintained at a reasonable level.

Monthly performance tests would be required to determine compliance with each of the g/tire limits. Whether or not monthly performance tests would be required to determine compliance with the percent emission reduction standards depends primarily on the type of control device used, and then on the method of demonstrating compliance. If the control device recovers VOC and compliance is demonstrated by

achieving a 75 percent emission reduction, monthly performance tests would be required. If the control device recovers VOC but compliance is demonstrated by meeting the equipment specifications, monthly performance tests would not be required. If the control device destroys VOC, monthly performance tests would not be required, regardless of the method used to demonstrate compliance.

Performance test procedures for each type of affected facility vary depending on the format of the standard (g/tire or percent emission reduction) and the type of emission control device, if any, that is used. The performance test procedures are outlined below.

For each affected facility that complies with a g/tire limit, the mass of VOC emitted per tire processed for a calendar month would be determined during the initial performance test. This determination would necessitate a materials balance calculation if compliance is achieved by reducing solvent usage or by using a control device that recovers VOC. If a control device that destroys VOC is used, the determination would require a stack test.

Monthly performance tests for facilities that comply with g/tire limits would be the same as the initial performance test except for those affected facilities where a control device that destroys VOC is used. For these affected facilities, the overall emission reduction efficiency determined in the initial performance test could be used for monthly performance tests until the Administrator requests that the efficiency be redetermined, or the operating conditions of the system are changed. The rationale for this provision is that a requirement for an owner or operator to conduct monthly stack tests could result in unreasonable costs.

For each affected facility for which the owner or operator choose to use an emission reduction system with a control device that recovers VOC to meet a percent reduction requirement, the overall efficiency of the emission reduction system for a calendar month would be determined during the initial performance test. This would be done by comparing the mass of VOC recovered by the emission reduction system to the mass of VOC used at the affected facility. No stack testing would be required. Monthly performance tests would be the same as the initial performance test.

For each affected facility for which the owner or operator chooses to use an emission reduction system that destroys VOC to meet a percent reduction requirement, the overall efficiency of the

emission system would be determined by a stack test performed during the initial performance test. No monthly performance test would be required. The emission reduction system efficiency would be redetermined by a stack test when requested by the Administrator or when the operating conditions of the system are changed.

Data necessary to calculate the VOC content of cement or spray material would be obtained from formulation data supplied by the manufacturer of the spray, or through the analysis of each cement or spray material by Reference Method 24 "Determination of Volatile Organic Compound Content of Paint, Varnish, Lacquer, or Related Products" or an alternative or equivalent method acceptable to the Administrator. Reference Method 24 would serve as the reference method for the calculation of the VOC content of the cement or spray materials in case of dispute.

Alternative Compliance Method

As an alternative method for demonstrating compliance with the proposed standards for undertread cementing, sidewall cementing, or Michelin-B operations, the owner or operator may elect to meet equipment specifications for capture systems used in conjunction with a 95 percent efficient control device. These specifications include enclosure of cement application and drying areas, maintenance of 100 feet per minute face velocity through each permanent opening to an enclosure, and an upper limit on the area of permanent openings to an enclosure. The Administrator has determined that meeting these specifications in conjunction with operating a 95 percent efficient control device is an acceptable means of demonstrating compliance.

An initial performance test of the control device would be required within 180 days after initial start-up of the affected facility. This test would be repeated when requested by the Administrator or when control device operating conditions are changed. The owner or operator would be required to continuously monitor the control device as described in the section on Selection of Monitoring Requirements. No monthly performance tests would be required because the cost of monthly stack tests could be unreasonable.

Neither an initial performance test nor monthly performance tests would be required for the capture system. However, the owner or operator would be required to include in the initial compliance report a statement

indicating whether each of the equipment specifications has been met.

Selection of Monitoring Requirements

Monitoring requirements are included in standards of performance to provide a means for ensuring proper operation and maintenance of emission reduction systems and to provide plant and enforcement personnel with sufficient data to determine compliance with the proposed standards.

Where thermal incineration is used to achieve compliance, the owner or operator would be required to install, calibrate, operate, and maintain a monitoring device to continuously record the combustion (firebox) temperature of the control device. If catalytic incineration were used, the owner or operator would be required to install a monitoring device to continuously record the gas temperature both upstream and downstream of the catalyst bed. The owner or operator would be required to continually record these values.

Where a control device that recovers VOC is used to achieve compliance with a percent reduction requirement by meeting equipment specifications, the owner or operator would be required to install a continuous monitoring device. Equipment is available to monitor the operational variables associated with solvent recovery system operation. Monitoring of operations indicates whether the solvent recovery system is being properly operated and maintained, and whether the system is continuously reducing VOC emissions to an acceptable level. The variable which would yield the best indication of system operation is VOC concentration at the solvent recovery system outlet.

EPA has not yet developed performance specifications for solvent recovery system monitors, but a program is underway to develop these specifications. Consequently, until EPA proposes and promulgates monitor performance specifications, owners and operators subject to the requirement to install a continuous monitor on the solvent recovery system will not be required to do so.

Recordkeeping and Reporting Requirements

The proposed standards would require that the owner or operator maintain records of all data and calculations used to determine VOC emissions from each affected facility for at least two years. For each affected facility which uses thermal incineration to achieve compliance, continuous records of the incinerator combustion chamber temperature must be

maintained at the source for a period of at least two years. Where catalytic incineration is used, continuous records of the gas temperature, both upstream and downstream of the incinerator catalyst bed, must be maintained at the source for a period of at least two years. Where a control device that recovers VOC is used to achieve compliance with a percent reduction requirement by meeting the equipment specifications, the owner or operator must maintain at the source for a period of at least two years continuous records of VOC concentration at the solvent recovery system outlet.

The proposed standards would require the owner or operator to maintain records of all 3-hour periods during which the average temperature of a thermal incinerator is more than 28°C (50°F) less than the average temperature during the most recent performance test at which the destruction efficiency was determined. For catalytic incinerators the owner or operator would maintain records of all 3-hour periods during which the average temperature immediately before the catalyst bed is more than 28°C (50°F) less than the average temperature during the most recent performance test at which the destruction efficiency was determined. Where a control device that recovers VOC is used to achieve compliance with a percent reduction requirement by meeting the equipment specifications, the owner or operator must maintain records of all 3-hour periods during which the average VOC concentration from the outlet of the solvent recovery system is greater than the average value measured during the most recent test of the control device.

The proposed standards would require notification reports and reports of all initial performance tests, as required by the General Provisions.

Impacts of Reporting Requirements

A reports impact analysis for the rubber tire manufacturing industry was prepared. The purpose of the analysis is to estimate the economic impact of the reporting and recordkeeping requirements that would be imposed by the proposed standards and by those appearing in the General Provisions of 40 CFR Part 60. Included in the analysis are the rationale for the selection of the proposed requirements, an evaluation of the major alternatives considered prior to the selection of the proposed requirements, and a description of the

information required by the General Provisions and by the proposed standards. A copy of the reports impact analysis is included in the rubber tire manufacturing docket (EPA Docket No. A-80-9-II-B-14).

Based on the reports impact analysis, a maximum of 3 person-years would be required industry-wide to comply with the recordkeeping and reporting requirements through the first five years of applicability.

The Paperwork Reduction Act of 1980 (Pub. L. 96-511) requires clearance from the Office of Management and Budget (OMB) of certain public reporting/recordkeeping requirements before this rulemaking can be promulgated as final. The reporting/recordkeeping requirements associated with this standard have been submitted to OMB for approval.

Public Hearing

A public hearing will be held to discuss the proposed standards in accordance with Section 307(d)(5) of the Clean Air Act. Persons wishing to make oral presentations should contact EPA at the address given in the ADDRESSES section of this preamble. Oral presentations will be limited to 15 minutes each. Any member of the public may file a written statement before, during, or within 30 days after the hearing. Written statements should be addressed to the Central Docket Section address given in the ADDRESSES section of this preamble.

A verbatim transcript of the hearing and written statements will be available for public inspection and copying during normal working hours at EPA's Central Docket Section in Washington, D.C. (see ADDRESSES section of this preamble).

Docket

The docket is an organized and complete file of all the information submitted to or otherwise considered in the development of this proposed rulemaking. The principal purposes of the docket are (1) to allow interested parties to readily identify and locate documents so that they can intelligently and effectively participate in the rulemaking process, and (2) to serve as the record in case of judicial review (except for those portions of the docket excluded from the record under Section 307(d)(7)(A)).

Miscellaneous

As prescribed by Section 111, establishment of standards of performance for rubber tire manufacturing plants was preceded by the Administrator's determination (40

CFR 60.16, 44 FR 49222, dated August 21, 1979) that these sources contribute significantly to air pollution which may reasonably be anticipated to endanger public health or welfare. In accordance with Section 117 of the Act, publication of this proposal was preceded by consultation with appropriate advisory committees, independent experts, and Federal departments and agencies. The Administrator will welcome comments on all aspects of the proposed regulation, including economic and technological issues, and on the proposed test methods.

It should be noted that standards of performance for new stationary sources established under Section 111 of the Clean Air Act reflect:

* * * application of the best technological system of continuous emission reduction which (taking into consideration the cost of achieving such emission reduction, any nonair quality health and environmental impact and energy requirements) the Administrator determines has been adequately demonstrated. (Section 111(a)(1).)

Although there may be emission control technology available that can reduce emissions below those levels required to comply with standards of performance, this technology might not be selected as the basis of standards of performance due to costs associated with its use. Accordingly, standards of performance should not be viewed as the ultimate in achievable emission control. In fact, the Act requires (or has the potential for requiring) the imposition of a more stringent emission standard in several situations.

For example, applicable costs do not play as prominent a role in determining the "lowest achievable emission rate" for new or modified sources located in nonattainment areas, i.e., those areas where statutorily-mandated health and welfare standards are being violated. In this respect, Section 173 of the Act requires that a new or modified source constructed in an area where ambient pollutant concentrations exceed the National Ambient Air Quality Standard (NAAQS) must reduce emissions to the level that reflects the "lowest achievable emission rate" (LAER), as defined in Section 171(3), for such category of source. The statute defines LAER as that rate of emissions based on the following, whichever is more stringent:

(A) The most stringent emission limitation which is contained in the implementation plan of any State for such class or category of source, unless the owner or operator of the proposed source demonstrates that such limitations are not achievable, or

(B) The most stringent emission limitation which is achieved in practice by such class or category of source.

In no event can the emission rate exceed any applicable new source performance standard (Section 171(3)).

A similar situation may arise under the prevention of significant deterioration of air quality provisions of the Act (Part C). These provisions require that certain sources (referred to in Section 169(1)) employ "best available control technology" (BACT) as defined in Section 169(3) for all pollutants regulated under the Act. Best available control technology must be determined on a case-by-case basis, taking energy, environmental and economic impacts and other costs into account. In no event may the application of BACT result in emissions of any pollutants which will exceed the emissions allowed by any applicable standard established pursuant to Section 111 (or 112) of the Act.

In all events, State Implementation Plans (SIPs) approved or promulgated under Section 110 of the Act must provide for the attainment and maintenance of NAAQS designed to protect public health and welfare. For this purpose, SIPs must in some cases require greater emission reduction than those required by standards of performance for new sources.

States are free under Section 116 of the Act to establish even more stringent emission limits than those established under Section 111 or those necessary to attain or maintain the NAAQS under Section 110. Accordingly, new sources may in some cases be subject to limitations more stringent than standards of performance under Section 111, and prospective owners and operators of new sources should be aware of this possibility in planning for such facilities.

This regulation will be reviewed four years from the date of promulgation as required by the Clean Air Act. This review will include an assessment of such factors as the need for integration with other programs, the existence of alternative methods, enforceability, improvements in emission control technology, and reporting requirements. The reporting requirements in this regulation will be reviewed as required under EPA's sunset policy for reporting requirements in regulations.

Section 317 of the Clean Air Act requires the Administrator to prepare an economic impact assessment for any new source standard of performance promulgated under Section 111(b) of the Act. An economic impact assessment was prepared for the proposed regulations and for other regulatory alternatives. All aspects of the assessment were considered in the formulation of the proposed standards

to ensure that the proposed standards would represent the best system of emission reduction considering costs. The economic impact assessment is included in the Background Information Document.

"Major Rule" Determination. Under Executive Order 12291, EPA is required to judge whether a regulation is a "major rule" and therefore subject to certain requirements of the Order. The Agency has determined that this regulation would result in none of the adverse economic effects set forth in Section 1 of the Order as grounds for finding a regulation to be a "major rule." Fifth-year annualized costs of the standard, compared to an uncontrolled situation, would be about \$3.4 million in the worst case. The product wholesale price is not expected to increase. The Agency has therefore concluded that the proposed regulation is not a "major rule" under Executive Order 12291.

This regulation was submitted to the Office of Management and Budget for review as required by Executive Order 12291. Any comments from OMB to EPA and any EPA response to those comments are available for public inspection in Docket No. A-80-9, EPA's Central Docket Section, West Tower Lobby, Gallery 1, Waterside Mall, 401 M Street, S.W., Washington, D.C. 20460.

Regulatory Flexibility Analysis Certification. The Regulatory Flexibility Act of 1980 requires that adverse effects of all Federal regulations upon small businesses be identified. According to current Small Business Administration guidelines, a small business in the SIC category 3011, "Tires and innertubes," is one that has 1,000 employees or less. This is the criterion to qualify for SBA loans or for the purpose of government procurement. Of the 16 tire manufacturing companies, 3 existing companies have less than 1,000 employees. An industry representative has stated that employment in a typical new plant is expected to average 1,400, with a range of 1,000 to 2,000. Thus, it is unlikely that any new plant would be considered a small entity. Existing small entities are not expected to become subject to the NSPS through new construction, modification, or reconstruction. However, if a small business did become subject to the NSPS, the cost of compliance would have minimal impacts.

Pursuant to the provisions of 5 U.S.C. 605(b), I hereby certify that the attached rule will not have a significant economic impact on a substantial number of small entities.

List of Subjects in 40 CFR Part 60

Air pollution control, Aluminum, Ammonium sulfate plants, Asphalt, Cement industry, Coal, Copper, Electric power plants, Glass and glass products, Grains, Intergovernmental relations, Iron, Lead, Metals, Metallic minerals, Motor vehicles, Nitric acid plants, Paper and paper products industry, Petroleum, Phosphate, Sewage disposal, Steel sulfuric acid plants, Waste treatment and disposal, Zinc, Tires.

Dated: January 5, 1983.

John W. Hernandez, Jr.,
Acting Administrator.

PART 60—[AMENDED]

It is proposed that 40 CFR Part 60 be amended by adding a new Subpart BBB to read as follows:

Subpart BBB—Standards of Performance for the Rubber Tire Manufacturing Industry

Sec.

- 60.540 Applicability and designation of affected facilities.
60.541 Definitions.
60.542 Standards for volatile organic compounds.
60.543 Performance test and compliance provisions.
60.544 Monitoring of emissions and operations.
60.545 Reporting and recordkeeping requirements.
60.546 Reference methods and procedures.

Authority: Secs. 111 and 301(a), Clean Air Act, as amended, (42 U.S.C. 7411, 7601(a)), unless otherwise noted.

* * * * *

Subpart BBB—Standards of Performance for the Rubber Tire Manufacturing Industry**§ 60.540 Applicability and designation of affected facilities.**

(a) The provisions of this subpart apply to the following affected facilities in rubber tire manufacturing plants: each undertread cementing operation, each sidewall cementing operation, each tread end cementing operation, each bead cementing operation, each inside green tire spraying operation, each outside green tire spraying operation, each Michelin-A operation, each Michelin-B operation, and each Michelin-C-automatic operation.

(b) The provisions of this subpart apply to each affected facility which is identified in paragraph (a) of this section and which commences construction or modification after January 20, 1983.

(c) The provisions of § 60.544(c), § 60.545(c)(3), § 60.545(f), and § 60.545(h) will not apply until EPA has established and promulgated performance specifications for the VOC

concentration monitoring device. After the promulgation of performance specifications, these provisions will apply to each affected facility under paragraph (b) of this section.

§ 60.541 Definitions.

(a) All terms which are used in this subpart and are not defined below are given the same meaning as in the Act and in Subpart A of this part.

(1) "Bead" means rubber covered strands of wire, wound into a circular form, which ensure a seal between a tire and the rim of the wheel onto which the tire is mounted. Each tire usually contains two beads.

(2) "Bead cementing operation" means the system which is used to apply cement to the bead rubber before or after it is wound into its final circular form. A bead cementing operation consists of a cement application station, such as a dip tank, spray booth and nozzles, cement through and roller or swab applicator; and all other equipment necessary to apply cement to wound beads or bead rubber and to allow evaporation of solvent from cemented beads.

(3) "Component" means a piece of tread, combined tread/sidewall, or separate sidewall rubber of the length needed to manufacture a tire of the size and type for which the component is produced.

(4) "Drying area" means the area where VOC from applied cement or green tire sprays is allowed to evaporate.

(5) "Enclosure" means a structure, designed to contain evaporated VOC, which surrounds a cement, solvent, or spray application area, and/or drying area and ducts contained VOC to a control device(s). Enclosures may have permanent and temporary openings.

(6) "Green tire" means an assembled, uncured tire.

(7) "Inside green tire spraying operation" means the system used to apply a mold release agent and lubricant to the inside of green tires to facilitate the curing process and prevent rubber from sticking to the curing press. Sprays may be organic solvent-based or water-based. An inside green tire spraying operation consists of the inside spray application station and related equipment, such as the lubricant supply system, the booth where spraying is performed, and associated fans and ductwork.

(8) "Michelin-A operation" means that operation where cement is applied which is identified as Michelin-A in the Emission Standards and Engineering Division confidential file as referenced in Docket A-80-9-II-B-12.

(9) "Michelin-B operation" means that operation where cement is applied which is identified as Michelin-B in the Emission Standards and Engineering Division confidential file as referenced in Docket A-80-9-II-B-12.

(10) "Michelin-C-automatic operation" means that operation where cement is automatically applied which is identified as Michelin-C-automatic in the Emission Standards and Engineering Division confidential file as referenced in Docket A-80-9-II-B-12.

(11) "Outside green tire spraying operation" means the system used to apply a mold release agent to the outside of green tires to facilitate the curing process and prevent rubber from sticking to the curing press. Sprays may be organic solvent-based or water-based. An outside green tire spraying operation consists of the outside spray application station and related equipment, such as the lubricant supply system, the booth where spraying is performed, and associated fans and ductwork.

(12) "Permanent opening" means an opening designed into an enclosure to allow tire components to pass through the enclosure by conveyor or other mechanical means, to provide access for permanent mechanical or electrical equipment, or to direct air flow through the enclosure. A permanent opening is not equipped with a door or other means of obstruction.

(13) "Sidewall cementing operation" means the system used to apply cement to a continuous strip of sidewall component. A sidewall cementing operation consists of a cement application station and all other equipment, such as the cement supply system and feed and takeaway conveyors, necessary to apply cement to sidewall strips and to allow evaporation of solvent from cemented sidewall.

(14) "Temporary opening" means an opening into an enclosure that is equipped with a means of obstruction, such as a door, window, or port, which is normally closed.

(15) "Tire" means any agricultural, airplane, industrial, mobile home, light-duty truck and/or passenger vehicle tire which has a bead diameter less than or equal to 0.5 meter (m) [19.7 inches] and cross section dimension less than or equal to 0.325 m (12.8 in.) and is mass produced in an assembly-line fashion.

(16) "Tread end cementing operation" means the system used to apply cement to one or both ends of tread or combined tread/sidewall component. A tread end cementing operation consists of a cement application station and all other equipment, such as the cement supply

system and feed and takeaway conveyors, necessary to apply cement to tread ends and to allow evaporation of solvent from cemented tread ends.

(17) "Undertread cementing operation" means the system used to apply cement to a continuous strip of tread or combined tread/sidewall component. An undertread cementing operation consists of a cement application station and all other equipment, such as the cement supply system and feed and takeaway conveyors, necessary to apply cement to tread or combined tread/sidewall strips and to allow evaporation of solvent from cemented tread or combined tread/sidewall.

(18) "VOC emission control device" means equipment that destroys or recovers VOC.

(19) "VOC emission reduction system" means a system composed of an enclosure, hood, or other device for containment and capture of VOC emissions and a VOC emission control device.

(b) Notations used under this subpart are defined below:

C_a = Concentration of VOC in gas stream in vents after control device (parts per million by volume)

C_b = concentration of VOC in gas stream in vents before control device (parts per million by volume)

C_t = concentration of VOC in gas stream in vents from affected facility to atmosphere (parts per million by volume)

D_c = density of cement or spray material (grams per litre)

D_r = density of VOC recovered by an emission control device (grams per litre)

E = emission control device efficiency, inlet versus outlet (fraction)

F_c = capture efficiency, VOC captured and routed to one control device versus total VOC used for an affected facility (fraction)

F_o = fraction of total mass of VOC used in a calendar month by all facilities served by a common cement or spray material distribution system that is used by a particular affected facility served by the common distribution system

G = monthly average mass of VOC used per complete tire processed for a particular affected facility (grams per tire)

L_c = volume of cement or spray material used for a calendar month (litres)

L_r = volume of VOC recovered by an emission control device (litres)

M = total mass of VOC used for a calendar month by all facilities served by a common cement or spray material distribution system (grams)

M_o = total mass of VOC used at an affected facility for a calendar month (grams)

M_r = mass of VOC recovered by an emission control device (grams)

N = mass of VOC emitted to the atmosphere per complete tire processed for an affected facility for a calendar month (grams per tire)

Q_a = volumetric flow rate in vents after control device (dry standard cubic meters per hour)

Q_b = volumetric flow rate in vents before control device (dry standard cubic meters per hour)

Q_t = volumetric flow rate in vents from affected facility to atmosphere (dry standard cubic meters per hour)

R = overall efficiency of an emission reduction system (fraction)

T_o = total number of tires processed at a particular affected facility for a calendar month

W_o = weight fraction of VOC in a cement or spray material.

§ 60.542 Standards for volatile organic compounds.

(a) On and after the date on which § 60.8(b) requires a performance test to be completed, each owner or operator subject to the provisions of this subpart shall not cause to be discharged into the atmosphere more than:

(1) For each undertread cementing operation:

(i) 25 percent of the VOC used (75 percent emission reduction) for each calendar month if the operation uses more than 25 grams of VOC per tire processed; or

(ii) 25 grams of VOC per tire processed for each calendar month if the operation uses 25 grams or less of VOC per tire processed and does not employ a VOC emission reduction system.

(2) For each sidewall cementing operation:

(i) 25 percent of the VOC used (75 percent emission reduction) for each calendar month if the operation uses more than 25 grams of VOC per tire processed; or

(ii) 25 grams of VOC per tire processed for each calendar month if the operation uses 25 grams or less of VOC per tire processed and does not employ a VOC emission reduction system.

(3) For each tread end cementing operation: 10 grams of VOC per tire process for each calendar month.

(4) For each bead cementing operation: 10 grams of VOC per tire processed for each calendar month.

(5) For each inside green tire spraying operation: 1.2 grams per tire processed for each calendar month.

(6) For each outside green tire spraying operation: 9.3 grams per tire processed for each calendar month.

(7) For each Michelin-A operation: 35 percent of the VOC used for each calendar month (65 percent emission reduction).

(8) For each Michelin-B operation: 25 percent of the VOC used for each calendar month (75 percent emission reduction).

(9) For each Michelin-C-automatic operation: 35 percent of the VOC used for each calendar month (65 percent emission reduction).

§ 60.543 Performance test and compliance provisions.

(a) Section 60.8(d) does not apply to the monthly performance test procedures required by this subpart. Section 60.8(d) does apply to initial performance tests. Section 60.8(f) does not apply when Reference Method 24 is used.

(b) The owner or operator of an affected facility shall conduct an initial performance test as required under § 60.8(a) except as described in paragraph (h) of this section. The owner or operator of an affected facility shall thereafter conduct a performance test each calendar month except as described in paragraphs (e)(1) and (h) of this section. Initial and monthly performance tests shall be conducted according to the procedures in this section.

(c) For each undertread cementing, sidewall cementing, tread end cementing, bead cementing, inside green tire spraying, and outside green tire spraying operation which does not use a VOC emission reduction system, the owner or operator shall use the following procedure to determine compliance with the applicable g/tire limit specified under § 60.542(a).

(1) Calculate the total mass of VOC (M_o) used at the affected facility for the calendar month by the following procedure.

(i) For each affected facility for which cement or spray is delivered in batch or via a distribution system which serves only that affected facility:

$$M_o = \sum_{i=1}^n L_{ci} D_{ci} W_{oi}$$

where: n equals the number of different cements or sprays used during the calendar month.

(ii) For each affected facility for which cement or spray is delivered via a common distribution system which also

serves other affected or existing facilities.

(A) Calculate the total mass (M) of VOC used for all of the facilities served by the common distribution system for the calendar month:

$$M = \sum_{i=1}^n L_{ci} D_{ci} W_{oi}$$

where: n equals the number of different cements or sprays used during the calendar month.

(B) Determine the fraction (F_o) of M used by the affected facility by comparing the production records and process specifications for the material cemented or sprayed at the affected facility for the calendar month to the production records and process specifications for the material cemented or sprayed at all other facilities served by the common distribution system for the calendar month or by another procedure acceptable to the Administrator.

(C) Calculate the total monthly mass of VOC (M_o) used by the affected facility:

$$M_o = MF_o$$

(2) Determine the total number of tires (T_o) processed at the affected facility for the calendar month by the following procedure.

(i) For undertread cementing, T_o equals the number of tread or combined tread/sidewall components which receive an application of undertread cement.

(ii) For sidewall cementing, T_o equals the number of sidewall components which receive an application of sidewall cement, divided by 2.

(iii) For tread end cementing, T_o equals the number of tread or combined tread/sidewall components which receive an application of tread end cement.

(iv) For bead cementing, T_o equals the number of beads which receive an application of bead cement, divided by 2.

(v) For inside green tire spraying, T_o equals the number of green tires which receive an application of inside green tire spray.

(vi) For outside green tire spraying, T_o equals the number of green tires which receive an application of outside green tire spray.

(3) Calculate the mass of VOC used per tire processed (G) by the affected facility for the calendar month:

$$G = \frac{M_o}{T_o}$$

(4) Calculate the mass of VOC emitted per tire processed (N) for the affected facility for the calendar month:

$$N = G$$

(5) Where the value of the mass of VOC emitted per tire processed (N) is less than or equal to the applicable g/tire limit specified under § 60.542(a), the affected facility is in compliance.

(d) The owner or operator shall use the following procedure for each tread end cementing, bead cementing, inside green tire spraying, and outside green tire spraying operation which uses a VOC emission reduction system with a control device that destroys VOC (e.g., incinerator) to comply with the applicable g/tire limit specified under § 60.542(a).

(1) Calculate the mass of VOC used per tire processed (G) for the affected facility for the calendar month as described under § 60.543(c)(3).

(2) Calculate the mass of VOC emitted per tire processed (N) for the affected facility for the calendar month:

$$N = G(1-R)$$

For the initial performance test, the overall reduction efficiency (R) shall be determined as prescribed in (d)(2) (i), (ii), and (iii) of this section. In subsequent months, the owner or operator may use the most recently determined overall reduction efficiency (R) for the performance test providing the control device and capture system operating conditions have not changed. The procedure in (d)(2) (i), (ii), and (iii) of this section shall be repeated when directed by the Administrator or when the owner or operator elects to operate the control device or capture system at conditions different from the most recent determination of overall reduction efficiency.

(i) Determine the fraction (F_o) of total VOC used for the affected facility which enters the control device, the owner or operator of an affected facility shall construct a temporary total enclosure around the application and drying areas during the performance test for the purpose of capturing fugitive VOC emissions and use the following equation:

$$F_o = \frac{\sum_{i=1}^m C_{bi} Q_{bi}}{\sum_{i=1}^m C_{bi} Q_{bi} + \sum_{i=1}^n C_{ni} Q_{ni}}$$

where: m is the number of vents from the affected facility to the control device and n is the number of vents from the affected facility to the atmosphere.

(ii) Determine the destruction efficiency (E) of the control device by using values of the volumetric flow rate of each of the gas streams and the VOC content (as carbon) of each of the gas streams in and out of the control device by the following equation:

$$E = \frac{\sum_{i=1}^n Q_{bi} C_{bi} - \sum_{i=1}^m Q_{ai} C_{ai}}{\sum_{i=1}^n Q_{bi} C_{bi}}$$

where: n is the number of vents before the control device, and m is the number of vents after the control device.

(iii) Determine the overall reduction efficiency (R) using the following equation:

$$R = EF_o$$

(3) Where the value of the mass of VOC emitted per tire processed (N) is less than or equal to the applicable g/tire limit specified under § 60.542(a), the affected facility is in compliance.

(e) The owner or operator shall use the following procedure for each undertread cementing, sidewall cementing, Michelin-A, Michelin-B, and Michelin-C-automatic affected facility which uses a VOC emission reduction system with a control device that destroys VOC (e.g., incinerator) to comply with the applicable percent emission reduction requirement specified under § 60.542(a).

(1) For the initial performance test, the overall reduction efficiency (R) shall be determined as prescribed in § 60.543(d)(2)(i)-(iii). The performance test shall be repeated using this same procedure when directed by the Administrator or when the owner or operator elects to operate the control device or capture system at conditions different from the most recent determination of overall reduction efficiency. No monthly performance tests are required.

(2) Each undertread cementing, sidewall cementing, or Michelin-B facility where R is greater than or equal to 0.75 is in compliance.

(3) Each Michelin-A or Michelin-C-automatic facility where R is greater than or equal to 0.65 is in compliance.

(f) The owner or operator shall use the following procedure for each tread end cementing, bead cementing, inside green tire spraying, and outside green tire spraying affected facility which uses a

VOC emission reduction system with a control device that recovers VOC (e.g., carbon adsorber) to comply with the applicable g/tire limits specified under § 60.542(a).

(1) Calculate the mass of VOC used per tire processed (G) at the affected facility for the calendar month as described under § 60.543(c)(3).

(2) Calculate the total mass of VOC recovered (M_r) from the affected facility for the calendar month using the following equation:

$$M_r = L_r D_r$$

(3) Calculate the overall reduction efficiency (R) for the VOC emission reduction system for the calendar month using the following equation:

$$R = \frac{M_r}{M_o}$$

(4) Calculate the mass of VOC emitted per tire processed (N) for the affected facility for the calendar month using the following equation:

$$N = G(1-R)$$

(5) Where the value of the mass of VOC emitted per tire processed (N) is less than or equal to the applicable g/tire limit specified under § 60.542(a), the affected facility is in compliance.

(g) The owner or operator shall use the following procedure for each undertread cementing, sidewall cementing, Michelin-A, Michelin-B, and Michelin-C-automatic affected facility which uses a VOC emission reduction system with a control device that recovers VOC (e.g., carbon adsorber) to comply with the applicable percent reduction requirement specified under § 60.542(a).

(1) Calculate the total mass of VOC used at the affected facility (M_o) for the calendar month as described under § 60.543(c)(1).

(2) Calculate the total mass of VOC recovered (M_r) from the affected facility for the calendar month using the following equation:

$$M_r = L_r D_r$$

(3) Calculate the overall reduction efficiency (R) for the VOC emission reduction system for the calendar month using the following equation:

$$R = \frac{M_r}{M_o}$$

(4) Each undertread cementing, sidewall cementing, or Michelin-B facility where R is greater than or equal to 0.75 is in compliance.

(5) Each Michelin-A or Michelin-C-automatic facility where R is greater than or equal to 0.64 is in compliance.

(h) Rather than demonstrate compliance with the provisions of § 60.542(a)(1),(2), or (8) using the performance test procedures described in paragraphs (e) and (g) of this section, an owner or operator of an undertread cementing, sidewall cementing, or Michelin-B affected facility that uses a VOC emission reduction system may demonstrate compliance by meeting the equipment design and performance specifications listed in (1)-(5) below and by conducting a performance test to demonstrate compliance with (5) below. The owner or operator shall conduct this performance test of the control device efficiency (as specified in § 60.8(a)) not later than 180 days after initial startup of the affected facility. The Administrator has decided that meeting the capture system design and performance specifications, in conjunction with operating a 95 percent efficient control device, is an acceptable means of demonstrating compliance with the standard. Therefore, in accordance with § 60.8(b), the Administrator has waived the requirement for a performance test on the enclosure (as required by § 0.8(a)). No monthly performance tests are required.

(1) The cement application and drying area of the affected facility shall be contained in an enclosure which meets the criteria in paragraphs (h) (2), (3), and (4) of this section;

(2) The drying area shall be enclosed between the application area and the water bath or to the extent necessary to contain all tire components for at least 30 seconds after cement application, whichever distance is less;

(3) A minimum face velocity of 100 feet per minute shall be maintained through each permanent opening into an enclosure;

(4) The total area of all permanent openings into the enclosure shall not exceed the area that would be necessary to maintain the VOC concentration of the exhaust gas stream at 25 percent of the lower explosive limit (LEL) under the following conditions:

(i) The affected facility is operating at maximum solvent use-rate;

(ii) The face velocity through each permanent opening is 100 feet per minute;

(iii) All temporary openings are closed.

(5) All captured VOC are ducted to a VOC emission control device which achieves at least 95 percent destruction or recovery efficiency. To determine the efficiency (E) of the control device, for

the initial performance test, use values of the volumetric flow rate of each of the gas streams and the VOC content (as carbon) of each of the gas streams in and out of the control device by the following equation:

$$E = \frac{\sum_{i=1}^n Q_{bi} C_{bi} - \sum_{j=1}^m Q_{aj} C_{aj}}{\sum_{i=1}^n Q_{bi} C_{bi}}$$

The control device efficiency shall be redetermined when directed by the Administrator or when the owner or operator elects to operate the control device at conditions different from the most recent determination of control device efficiency.

§ 60.544 Monitoring of emissions and operations.

(a) Each owner or operator subject to the provisions of this subpart and using a VOC emission reduction system with a thermal incinerator shall continuously monitor and record the temperature of the gas in the combustion zone. The monitoring instrument shall have an accuracy equal to ± 0.75 percent of the temperature being measured in $^{\circ}\text{C}$ or $\pm 2.5^{\circ}\text{C}$, whichever is greater.

(b) Each owner or operator subject to the provisions of this subpart and using a VOC emission reduction system with a catalytic incinerator shall continuously monitor and record the temperature in the gas stream immediately before and after the catalyst bed. The monitoring instruments shall have an accuracy equal to ± 0.75 percent of the temperature being measured in $^{\circ}\text{C}$ or $\pm 2.5^{\circ}\text{C}$, whichever is greater.

(c) Each owner or operator of an undertread cementing, sidewall cementing, or Michelin-B operation which uses a VOC emission control device that recovers VOC to meet the requirements of § 60.543(h)(5) shall continuously monitor and record the VOC concentration of the exhaust gas stream from the VOC recovery device. The VOC concentration monitoring device shall be installed in a location that is representative of the VOC concentration in the exhaust vent, at least two equivalent stack diameters from the exhaust point, and protected from any interferences due to wind, weather, or other processes.

(d) Each monitoring device shall be installed, calibrated, operated, and maintained according to accepted practices and the manufacturer's specifications.

§ 60.545 Reporting and recordkeeping requirements.

(a) Each owner or operator of an affected facility shall include the following data in the initial performance test report required under § 60.8(a).

(1) For each affected facility which complies with a g/tire limit specified in § 60.542(a) without the use of a VOC emission reduction system.

(i) The mass of VOC used (M_o), the number of tires processed (T_o), and the mass of VOC emitted per tire processed (N).

(ii) A description of the method used to determine M_o and T_o .

(2) For each affected facility which uses a VOC emission reduction system with a control device that destroys VOC (e.g., incinerator) to comply with a g/tire limit specified in § 60.542(a).

(i) The mass of VOC used (M_o), the number of tires processed (T_o), the mass of VOC emitted per tire processed (N), the mass of VOC used per tire processed (G), the emission control device efficiency (E), the capture system efficiency (F_c), the overall system emission reduction (R), and the mass of VOC emitted per tire processed (N).

(ii) A description of the method used to determine M_o , T_o , E, and F_c .

(3) For each affected facility which uses a VOC emission reduction system with a control device that destroys VOC (e.g., incinerator) to comply with a percent emission reduction requirement specified in § 60.542(a).

(i) The emission control device efficiency (E), the capture system efficiency (F_c), and the overall system emission reduction (R).

(ii) A description of the method used to determine E and F_c .

(4) For each affected facility which uses a VOC emission reduction system with a control device that recovers VOC (e.g., carbon adsorber) to comply with a g/tire limit specified in § 60.542(a).

(i) The mass of VOC used (M_o), the number of tires processed (T_o), the mass of VOC used per tire processed (G), the mass of VOC recovered (M_r), the overall system emission reduction (R), and the mass of VOC emitted per tire processed (N).

(ii) A description of the method used to determine M_o and T_o .

(5) For each affected facility which uses a VOC emission reduction system with a control device that recovers VOC (e.g., carbon adsorber) to comply with a percent emission reduction requirement specified in § 60.542(a).

(i) The mass of VOC used (M_o), the mass of VOC recovered (M_r), and the overall system emission reduction (R).

(ii) A description of the method used to determine M_o .

(b) Each owner or operator of an undertread cementing, sidewall cementing, or Michel in-B affected facility where the method in § 60.543(h) has been chosen to demonstrate compliance shall include in the initial compliance report a statement indicating which of the equipment design and performance specifications have been met and identifying each which has not been met. The initial compliance report shall also include the following data.

(1) The emission control device efficiency (E), the airflow through all permanent enclosure openings with all temporary enclosure openings unobstructed, the total area of all permanent enclosure openings, the total area of all temporary enclosure openings, the maximum solvent use rate (kg/hr), the type(s) of VOC used, the lower explosive limit (LEL) for each VOC used, and the length of time each component is enclosed after application of cement or spray material.

(2) A description of the method used to determine E, the system airflow, and the maximum solvent use rate.

(c) Each owner or operator of an affected facility shall include the following data, as measured by the continuous monitoring device(s), in the initial performance test report.

(1) The average combustion temperature during the test of incinerator destruction efficiency for each thermal incinerator.

(2) The average temperature before and after the catalyst during the test of incinerator efficiency for each catalytic incinerator.

(3) The average VOC concentration of the exhaust gas stream from the VOC recovery device during the test of VOC recovery device efficiency for each undertread cementing, sidewall cementing, or Michel in-B operation that uses a VOC emission control device that recovers VOC to meet the requirements of § 60.543(h)(5).

(d) Each owner or operator of an affected facility which uses a thermal incinerator shall maintain at the source, for a period of at least two years, records of all 3-hour periods of operation for which the average combustion temperature was more than 28°C (50°F) below the temperature at which the destruction efficiency of the thermal incinerator was last determined.

(e) Each owner or operator of an affected facility which uses a catalytic incinerator shall maintain at the source, for a period of at least two years, records of all 3-hour periods of operation for which the average temperature before the catalyst bed is more than 28°C below the temperature

at which the destruction efficiency of the catalytic incinerator was last determined, and all 3-hour periods for which the average temperature difference across the catalyst bed is less than 80 percent of the temperature difference when the destruction efficiency of the catalytic incinerator was last determined.

(f) Each owner or operator of an undertread cementing, sidewall cementing, or Michelin-B operation which uses a VOC emission control device that recovers VOC to meet the requirements of § 60.543(h)(5) shall maintain at the source, for a period of at least two years, records of all 3-hour periods of operation for which the average VOC concentration of the exhaust gas stream from the VOC recovery device exceeds the average value measured during the most recent test of the control device.

(g) Each owner or operator subject to the provisions of this subpart shall maintain at the source, for a period of at least two years, records of all data and calculations used to determine VOC emissions from each affected facility. At affected facilities where compliance is achieved through the use of thermal incineration, each owner or operator shall maintain at the source, for a period of at least two years, continuous records of the incinerator combustion chamber temperature. If catalytic incineration is used, the owner or operator shall maintain at the source, for a period of at least two years, continuous records of the gas temperature, both upstream and downstream of the incinerator catalyst bed.

(h) Each owner or operator of an undertread cementing, sidewall cementing, or Michelin-B operation that uses a VOC emission control device that recovers VOC to meet the requirements of § 60.543(h)(5) shall maintain at the source, for a period of at least two years, continuous records of the VOC concentration of the exhaust gas stream from the VOC recovery device.

(i) Each owner or operator is exempted from the quarterly reports required under § 60.7(c).

§ 60.546 Reference methods and procedures.

(a) The reference methods in Appendix A to this part, except as provided in § 60.8, shall be used to conduct performance tests.

(1) Reference Method 24 for the determination of the VOC content of cements or green tire spray materials. In the event of dispute, Reference Method 24 shall be the reference method.

(2) Reference Method 25 for the determination of the VOC concentration in the effluent gas in each stack entering and leaving an emission control device. The owner or operator shall notify the Administrator 30 days in advance of any stack test by Reference Method 25. The following reference methods are to be used in conjunction with Reference Method 25:

(i) Method 1 for sample and velocity traverses,

(ii) Method 2 for velocity and volumetric flow rate,

(iii) Method 3 for gas analysis, and

(iv) Method 4 for stack gas moisture.

(b) For Reference Method 24, the cement or green tire spray sample must be a 1-litre sample collected in a 1-litre container at a point where the sample will be representative of the material as applied in the affected facility.

(c) For Reference Method 25, the sampling time for each of three runs must be at least one hour. The minimum sample volume must be 0.003 dscm except that shorter sampling times or smaller volumes, when necessitated by process variables or other factors, may be approved by the Administrator.

(Sec. 114 of the Clean Air Act as amended (42 U.S.C. 7414))

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