

Air



**Surface Coating
Of Plastic Parts
For Business
Machines—
Background
Information for
Promulgated Standards**

**Final
EIS**

N S P S

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SURFACE COATING OF PLASTIC PARTS FOR BUSINESS MACHINES--
BACKGROUND INFORMATION FOR PROMULGATED STANDARDS

Emission Standards and Engineering Division

U. S. Environmental Protection Agency
Office of Air and Radiation
Office of Air Quality Planning and Standards
Research Triangle Park, North Carolina 27711

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ENVIRONMENTAL PROTECTION AGENCY

Background Information
and Final
Environmental Impact Statement
for the Surface Coating of Plastic Parts for Business Machines

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(Date)

1. The promulgated standards of performance would limit emissions of volatile organic compounds (VOC's) from new, modified, and reconstructed facilities that surface coat plastic parts for business machines. Section 111 of the Clean Air Act (42 U.S.C. 7411), as amended, directs the Administrator to establish standards of performance for any category of new stationary source of air pollution that ". . . causes or contributes significantly to air pollution which may reasonably be anticipated to endanger public health or welfare."
2. Copies of this document have been sent to the following Federal Departments: Labor, Health and Human Services, Defense, Transportation, Agriculture, Commerce, Interior, and Energy; the National Science Foundation; the Council on Environmental Quality; State and Territorial Air Pollution Program Administrators; EPA Regional Administrators; Local Air Pollution Control Officials; Office of Management and Budget; and other interested parties.
3. The comment period for review of this document is 75 days from the date of publication of the proposed standard in the Federal Register. Mr. C. Douglas Bell may be contacted at (919) 541-5578 regarding the date of the comment period.
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1. SUMMARY

On January 8, 1986, the Environmental Protection Agency (EPA) proposed new source performance standards (NSPS) for surface coating of plastic parts for business machines (51 FR 866) under authority of Section 111 of the Clean Air Act. Public comments were requested in the proposal in the Federal Register. A total of three comments from industry, one from a trade association, and one from a State agency were submitted during the comment period. The comments that were submitted, along with responses to these comments, are summarized in this document. The summary of comments and responses serves as the basis for the revisions made to the standards between proposal and promulgation.

1.1 SUMMARY OF CHANGES SINCE PROPOSAL

In response to the public comments and as a result of EPA reevaluation, certain changes have been made in the proposed standards. The more significant changes are summarized below.

Section 60.721, Definitions, has been amended by the addition of a definition for the term "coating operation." The addition of this definition will clarify the compliance provisions of the regulation for situations where two or more types of coatings are applied at different times at the same spray booth.

Also in Section 60.721, the meaning of the symbol "T" used in the equations to determine compliance was revised to be the transfer efficiency for each type of coating application equipment used at a coating operation. A symbol " T_{avg} " was added to represent the volume-weighted average transfer efficiency for a coating operation to ensure that the distinction is clear between transfer efficiency and average transfer efficiency in equations presented later in the regulation.

Section 60.722, Standards for volatile organic compounds (VOC's), has been clarified to state specifically that all VOC emissions that are caused by coatings applied in each affected facility, regardless of the actual point of discharge of those emissions into the atmosphere, are covered by the standard and must be included when compliance with the numerical emission limits is determined. Refer to Chapter 2, Section 2.1, Standards and affected facility, for further explanation of the change.

In Section 60.723, Performance tests and compliance provisions, Table 1 has been revised to clarify the applicability of the transfer efficiency (TE) values. Table 1 now specifies the TE's for each type of application equipment for specific types of coatings (i.e., prime, color, texture, fog, and touch-up). This change was made because air-assisted airless and electrostatic spray guns have not been used to apply texture, touch-up, or fog coats. Therefore, the TE's presented in Table 1 at proposal were not applicable to these types of operations. However, if an owner or operator can demonstrate to the satisfaction of the Administrator that TE's other than those presented in Table 1 are appropriate, the Administrator will approve their use on a case-by-case basis. The TE values for application methods not listed in Table 1 shall also be approved by the Administrator on a case-by-case basis.

1.2 SUMMARY OF IMPACTS OF PROMULGATED ACTION

1.2.1 Alternatives to Promulgated Action

The regulatory alternatives are discussed in Chapter 6 of Volume I of the background information document (BID) for the proposed standards (EPA-450/3-85-019a). These regulatory alternatives reflect the different levels of emission control, one of which is selected that represents best demonstrated technology (BDT), considering costs, nonair quality health, and environmental and economic impacts for facilities that surface coat plastic parts used in business machines.

1.2.2 Environmental Impacts of Promulgated Action

The environmental impacts are discussed in Chapter 7 and Appendix D of the Volume I BID. These impacts have remained unchanged since proposal. The changes that have been made to the regulation are not of sufficient magnitude to affect the environmental impact analysis. Therefore, the Volume I BID now becomes the final Environmental Impact Statement for the promulgated standards.

1.2.3 Energy and Economic Impacts of the Promulgated Action

The energy impacts of the proposed standards were evaluated in Chapter 7 of the Volume I BID. It was determined that the control technologies that are the basis for the regulatory alternatives have a negligible effect on the energy requirements for facilities that surface coat plastic parts for business machines. Therefore, a negligible energy impact is attributed to the proposed or final standards.

The economic impacts of the proposed standards were evaluated in Chapter 9 of the Volume I BID. Since proposal, no changes have been made to the economic analysis. The nationwide cost in the fifth year of implementation is projected to be a net credit.

1.2.4 Other Considerations

1.2.4.1 Irreversible and Irretrievable Commitment of Resources. The Volume I BID concluded in Chapter 7 that for many of the regulatory alternatives, additional equipment will be required. However, consumption of steel and other raw materials for this purpose will be small compared to the national usage of each material.

1.2.4.2 Environmental and Energy Impacts of Delayed Standards. Delay in the standards would cause a similar delay in realizing the beneficial impacts associated with the standards. No changes in the potential effects of delaying the standards have occurred since proposal of the standards.

2. SUMMARY OF PUBLIC COMMENTS

A list of commenters, their affiliations, and the EPA docket entry number assigned to each comment is shown in Table 2-1. Five letters containing comments on the proposed standards for the surface coating of plastic parts for business machines industry were received. Significant comments have been organized into the following six categories:

1. Standards and Affected Facility;
2. Achievability of the Standards;
3. Recordkeeping and Reporting Requirements;
4. Emission Control Technology;
5. Economic Impact; and
6. Electromagnetic Interference/Radio Frequency Interference (EMI/RFI) Shielding.

The comments and the issues they address are discussed in the following sections of this chapter.

2.1 STANDARDS AND AFFECTED FACILITY

Comment: One commenter (IV-D-4) stated that because the affected facility is the spray booth, the standards for VOC emissions set forth in Section 60.722 could be interpreted as applying only to those VOC's emitted from the spray booth. The effect of this interpretation would be to exclude VOC's that are emitted from outside the spray booth (i.e., flash-off area and oven) from the coverage of the standards. To rectify this problem, the commenter suggested that VOC emission limits be established for the entire line (i.e., spray booth, flash-off area, and oven) but that the reconstruction provisions still apply only to the spray booth.

TABLE 2-1. LIST OF COMMENTERS ON PROPOSED STANDARDS OF PERFORMANCE FOR PLASTIC PARTS FOR BUSINESS MACHINES INDUSTRY^a

Docket item No.	Commenter/affiliation
IV-D-1	Mr. Robert K. Brothers Director, Regulatory Affairs Eastman Kodak Company 343 State Street Rochester, New York 14650
IV-D-2	Mr. Ryan Sullivan Research and Development Associate The B. F. Goodrich Company Electronic Chemicals Department 9221 Brecksville Road Brecksville, Ohio 44141
IV-D-3	Ms. Ellen Robinson Staff Director The Society of the Plastics Industry, Inc. Structural Foam Division 355 Lexington Avenue New York, New York 10017
IV-D-4	Mr. Charles M. Taylor Chief, Division of Air Pollution Control State of Ohio Environmental Protection Agency 361 East Broad Street Columbus, Ohio 43266-0149
IV-D-5	Mr. Ryan Sullivan Research and Development Associate The B. F. Goodrich Company Electronic Chemicals Department 9921 Brecksville Road Brecksville, Ohio 44141

^aThe docket No. for this project is A-83-50. Dockets are on file at EPA Central Docket Section in Washington, D.C. and at the Office of Air Quality Planning and Standards in Durham, N.C.

Response: The EPA believes that the wording of the proposed standards precludes the interpretation suggested by the commenter and, therefore, believes it to be unnecessary to implement the commenter's solution. Section 60.722 uses the language "no affected facility shall cause the discharge into the atmosphere" (emphasis added). The coatings application which takes place in the spray booth is clearly the cause of VOC emissions from the flash-off area and oven. Therefore, VOC emissions from these areas are covered by the standards.

To protect against possible misinterpretation, Section 60.722 has been revised by the addition of the following:

(b) All VOC emissions that are caused by coatings applied in each affected facility, regardless of the actual point of discharge of emissions into the atmosphere, shall be included in determining compliance with the emission limits in (a) above.

The language of Section 60.723 also precludes the commenter's interpretation. The calculations by which performance is determined include all VOC's resulting from coatings applied in the spray booth and do not allow for the exclusion of VOC's that may be emitted from the flash-off area and oven. It should be noted that because the affected facility remains unchanged, the reconstruction provisions still apply only to the spray booth.

2.2 ACHIEVABILITY OF THE STANDARDS

2.2.1 Availability of Compliance Coatings

Comment: One commenter (IV-D-3) stated that "conformance coatings" (i.e., coatings that comply with the standards) cannot achieve performance levels for abrasion, adhesion, and chemical resistance. Another commenter (IV-D-1) stated that "compliance coatings" (high-solids, solvent-based and waterborne coatings) could not meet performance specifications (i.e., chemical and stain resistance) for certain business machine uses. The commenter suggested that the regulation allow variances on a case-by-case basis if the coater can demonstrate to the satisfaction of the Administrator that no coating exists that meets both the emission limits and necessary performance specifications.

Response: The commenters were contacted for information on the specific cases for which they stated that compliance coatings could not

meet certain performance specifications.¹⁻⁴ However, no information was provided that would clarify the specific situations mentioned by the commenters.

The EPA has determined that high-solids, solvent-based and waterborne coatings that comply with the emission limits when used with appropriate coating application technologies are being used for prime, color, texture, and touch-up coats by coaters in at least two States.^{5,6} These coatings have been approved by some original equipment manufacturers (OEM's) for performance specifications including abrasion, adhesion, and chemical and physical stain resistance.^{5,6} The EPA expects coaters to use high-solids, solvent-based coatings to achieve compliance and has determined that these coatings are available for use.^{5,6} Waterborne coatings also can be used to meet the standards and are available for use.^{5,6} For the reasons presented above, EPA has determined that the standards are achievable and has not revised the proposed standards.

2.2.2 Availability of Primers for Waterborne Coatings

Comment: One commenter (IV-D-3) stated that none of the primers available for waterborne coatings will achieve the standards.

Response: Discussions with several coaters, coating manufacturers, and a regional air quality management district representative affirmed that primers that will achieve the standards are available for use with waterborne coatings. Two coaters stated that they are using waterborne coatings for primers and, in addition, that these waterborne coatings can be applied as a combination primer/barrier coat for certain types of plastic that are sensitive to direct application of solvent-based coatings.^{5,7} Two coating manufacturers are producing waterborne primer coatings.^{8,9} A regional air quality management district representative also stated that waterborne primers are available that will achieve the standards and are being used in production.⁶ He noted that, in many cases, waterborne coatings are not used as primers but are applied as a color coat to the part(s) without the use of a primer coating.⁶

2.3 RECORDKEEPING AND REPORTING REQUIREMENTS

2.3.1 Recordkeeping and Reporting Requirements

Comment: One commenter (IV-D-1) stated that recordkeeping requirements to determine compliance are excessive, particularly for large surface coating operations that coat both plastic and metal parts with a variety of coatings. The commenter also stated that the cost of analyzing coatings using EPA Reference Method 24 could be unreasonable. He requested that the language of the standards be changed to allow alternate methods of compliance on a case-by-case basis for facilities that use a large number of paint formulations. One such method suggested by the commenter would allow small volume coatings to be grouped with a large volume coating having similar formulation and application characteristics, with the large volume coating required to comprise 90 percent of the total coating volume. The costs of monthly compliance testing would be reduced because it would be necessary only to test the large volume coating formulation and to measure the total coatings volume.

Response: The level of effort necessary for recordkeeping is not considered excessive. Most coaters maintain at least some of the information that would be required by these standards, and some coaters are already maintaining the information needed to perform the calculations to determine compliance with the standards. This information is available from the operation and inventory logs kept by the coaters. In addition, the recordkeeping requirements, as written, are the only feasible way for a coater to demonstrate continuous monthly compliance with the standards. The time and costs necessary to determine compliance have previously been evaluated by EPA and were determined to be reasonable.¹⁰

In most cases, coating composition data determined by EPA Reference Method 24 can be obtained from the coating manufacturer. The coater can use these data and plant records of VOC used for dilution to perform the calculations necessary to demonstrate monthly performance. The EPA recognizes that there are rare cases for which the coater cannot obtain EPA Reference Method 24 data from an outside coating manufacturer. Examples of such cases occur when coaters manufacture coatings in-house or modify the formulation (e.g., tinting) of a purchased coating. The estimated cost to the coater to perform EPA Reference Method 24 is \$200 per coating. The EPA considers this cost to be reasonable.

Because the time and costs necessary to perform the compliance calculations were determined to be reasonable and because EPA Reference Method 24 coating composition data can, in most cases, be obtained from the coating manufacturer, EPA has determined that the recordkeeping and reporting requirements of the standards are not excessive. Therefore, it is unnecessary to implement the commenter's suggested method of compliance determination.

2.3.2 Sample Size for Method 24

Comment: One commenter (IV-D-1) stated that the 1-liter sample size requested for the determination of VOC content of each coating using EPA Reference Method 24 is unreasonable, especially in the case of specialty coatings. The commenter said that 1 liter may be equivalent to the total volume of coating manufactured or supplied for a specialty coating, whereas EPA Reference Method 24 requires only a 10-gram sample size. The commenter noted that the cost of manufacturing or purchasing additional paint for sample analysis alone would be unreasonable. The commenter recommended that the standards be rewritten to specify a sample size of 10 grams.

Response: The sample size was set at 1 liter for several reasons: (1) losses of the sample could occur during transfer of the sample between pieces of equipment or sample container and equipment, (2) losses of the sample could occur during equipment setup, and (3) additional runs of the EPA Reference Method 24 tests could require additional sample in the event of problems with the initial runs. Therefore, to account for any sample losses and for the need for additional test runs, the sample size remains at 1 liter.

Additionally, the low-volume usage of specialty coatings is expected to be a rare occurrence. It should be noted that if coaters run the EPA Reference Method 24 test, they are free to use as small a volume as necessary to conduct the test. However, the 1-liter sample size requirement would apply when a coating sample is requested for analysis by EPA.

2.4 EMISSION CONTROL TECHNOLOGY

Comment: One commenter (IV-D-4) requested additional information on control techniques and cost effectiveness of add-on controls for the

oven. In further discussion with the commenter to clarify his submittal, he stated that in many cases, the State of Ohio requires that emissions from new ovens be controlled with best available technology (i.e., an incinerator), yet the standard does not give credit for the emission reduction achieved through the use of add-on control devices.¹¹

The commenter also stated that there was no discussion on techniques to increase the VOC concentration and to reduce the volumetric flow rate of the exhaust gases from the spray booth and the oven (e.g., recirculation systems). He noted that these factors could affect the cost effectiveness of any vapor control technologies.

Response: The EPA evaluated incineration as a vapor control technology for the spray booth, flash-off areas, and oven for a medium-size typical surface coating facility.^{12,13} Total coating consumption for this model plant was estimated to be 155,000 liters per year with total VOC emissions of 85 megagrams (Mg) per year. The cost-effectiveness value for vapor control of the oven and flash-off areas was estimated to be \$3,380/Mg of VOC controlled.¹² The cost-effectiveness values for vapor control of the spray booth were estimated to range from \$10,700/Mg of VOC controlled to \$20,620/Mg of VOC controlled, depending on the spray booth ventilation rate.¹³ Spray booth and oven exhaust air recirculation systems were not examined in this analysis.

The EPA believes that the costs of add-on control devices will result in few, if any, coaters selecting such devices to control VOC emissions from facilities that coat plastic parts for business machines. However, the compliance provisions in Section 60.723(b)(2)(iv) are written to allow an owner or operator to use add-on controls in order to reduce VOC emissions to within the limits of the standard. If add-on controls are used, the owner or operator must demonstrate that the volume-weighted average mass of VOC's emitted to the atmosphere during each nominal 1-month period per unit-volume of coating solids applied (N) is within the limits given in Section 60.722 of the standards because of this equipment in order to demonstrate compliance. In such cases, compliance would be determined by the Administrator on a case-by-case basis.

2.5 ECONOMIC IMPACT

Comment: One commenter (IV-D-3) said that because compliance coatings that will meet all performance specifications are not available, the proposed standards would force OEM's to change to solid wall plastics that can have molded-in color, thereby eliminating structural foam and all coatings and severely impacting both industries, or to move tooling, molding, and finishing operations offshore, which would result in additional loss of jobs in the already depressed business machine cabinetry market as well as loss of local, State, and Federal tax revenues.

Response: The commenter was contacted for clarification of areas where compliance coatings would not meet the performance specifications, and EPA was referred to an industry contact.¹ No specific information to support the comment was given by the contact or by a suggested third contact.^{14, 15}

Several coaters and coating manufacturers have affirmed that both waterborne and high-solids solvent-based coatings that could meet the standards are available and are being used by industry.^{8, 9} In addition, EPA has performed an economic market analysis, presented in Chapter 9 of the Volume I BID for this industry, that indicates that the net effect from the use of the combination of the BDT coatings and coating application equipment is a net credit to industry of \$30 million/yr. Therefore, because BDT coatings are available and are being used and, because there is a net credit from the use of BDT coatings, no adverse economic impacts are expected.

2.6 EMI/RFI SHIELDING

Comment: One commenter (IV-D-2, IV-D-5) stated that there should be an EMI/RFI shielding standard and that the basis of this standard should be a waterborne EMI/RFI shielding coating. The commenter noted that the proposed exemption of shielding coatings from the regulation provides no motivation to maintain the momentum toward lower VOC emissions without an increase in the cost of coating operations. He suggested that the standard be revised to give credit to coaters using waterborne shielding coatings instead of solvent-based shielding coatings.

Response: The waterborne EMI/RFI shielding coating referred to by the commenter was not available during development of the standards. The coating is presently undergoing production trials in some areas of the country but cannot be considered a demonstrated shielding coating at this time.^{6,16} At the 4-year review of the standard, EPA will reevaluate the need and technological bases for a standard for VOC emissions from EMI/RFI shielding.

2.7 REFERENCES FOR CHAPTER 2

1. Telecon. Larson, J., MRI, with Robinson, E., The Society of the Plastics Industry, Inc. April 10, 1986. Discussion about comments submitted by Ms. Robinson.
2. Telecon. Larson, J., MRI, with Simmons, I., Eastman Kodak Company. April 8, 1986. Discussion about comments submitted by Mr. Brothers.
3. Telecon. Larson, J., MRI, with Simmons, I., Eastman Kodak Company. June 5 and 17, 1986. Discussion about coatings usage, coating test results, and plant operations.
4. Telecon. Larson, J., MRI, with Simmons, I., Eastman Kodak Company. August 5, 19, and 22, 1986. Discussion about coatings usage.
5. Telecon. Larson, J., MRI, with Kyle, H., Hewlett-Packard. April 15, 1986. Discussion about coatings usage and application techniques.
6. Telecon. Larson, J., MRI, with Guthrie, J., Bay Area Air Quality Management District. April 11, 1986. Discussion about coatings usage in the district.
7. Telecon. Larson, J., MRI, with McDonald, C., Foam Molding Company. April 15, 1986. Discussion about coatings usage and application techniques.
8. Telecon. Larson, J., MRI, with Edwards, F., Breakthrough Coatings Company. April 15, 1986. Discussion about coatings manufactured by the company.
9. Telecon. Larson, J., MRI, with Adams, G., Cardinal Industrial Finishes. April 9, 1986. Discussion about coatings manufactured by the company.
10. Docket Item No. _____. (Supporting Statement for Standard Form 83.).
11. Telecon. Larson, J., MRI, Butler, L., EPA:SDB, and Salman, D., EPA:CPB, with Juris, W., State of Ohio Environmental Protection Agency. April 16, 1986. Clarification of comments on proposed NSPS.

12. Memorandum from Larson, J., MRI, to Plastic Parts project file. November 15, 1985. Cost-effectiveness calculations for the control of VOC emissions from flash-off areas and ovens used in the surface coating of plastic parts used in business machines.
13. Memorandum from Newton, D., MRI, to Plastic Parts project file. February 17, 1984. Cost effectiveness calculated for the control of VOC emissions from the surface coating of plastic parts used in business machines by thermal incineration.
14. Telecon. Larson, J., MRI, with Reilly, J., Electro Kinetic Systems, Inc. April 25, 1986. Discussion about coatings usage.
15. Telecon. Larson, J., MRI, with Keough, G., CTI/EM Lubricants, Inc. May 19, 1986. Discussion about coatings usage.
16. Telecon. Larson, J., MRI, with Sullivan, R., B. F. Goodrich. April 22, 1986. Discussion about new waterborne EMI/RFI shielding coating.

TECHNICAL REPORT DATA

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16. ABSTRACT Standards of Performance for the control of VOC emissions from affected facilities that perform exterior surface coating of plastic parts for business machines are being promulgated under authority of Section 111 of the Clean Air Act. These standards apply to each new, modified, and reconstructed spray booth in which plastic parts for business machines are surface coated and for which construction commences on or after the date of proposal of the regulation. This document contains a detailed summary of the public comments on the proposed standards (51 FR 854), responses to these comments, and a summary of the changes to the proposed standards.				
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